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Policy Design and Risks to Compliance: The New Zealand Nursery Industry and the HSNO Act

A thesis submitted in partial fulfilment of the requirements for the Degree of Master of Resource Studies

At

Lincoln University

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Lincoln University

2004
The regulation of the importation of new plant species underwent a major shift in the late 1990's with the implementation of the Hazardous Substances and New Organisms Act 1996. Under HSNO plant species entering New Zealand for the first time are assessed for their invasive potential. These risks are weighed against the benefits of importing the species. HSNO addresses the primary pathway for introduction of environmental weeds to New Zealand: intentionally imported horticultural species. This thesis explores the effectiveness of HSNO in regulating the importation of new plant species. The research focuses on the response of the nursery industry, a key target group, to the Act. Both qualitative and quantitative research methods are used to examine nursery industry views of the HSNO Act. Possible problems with noncompliance are investigated with the aid of a conceptual framework of policy design and compliance behaviour. The analysis suggests that targets may perceive the costs of compliance to outweigh the benefits thus undermining calculated motivations for compliance. The analysis also indicates that targets may perceive HSNO to be unfair and impracticable thus detracting from normative motivations for compliance. The implications of these issues for HSNO's effectiveness are discussed and means for addressing the problems identified are considered.
Acknowledgements

Thank you to everyone at Friends of Trees who gave me enthusiasm for this topic. I would like to thank my supervisors from Lincoln University’s Environment, Society, and Design Division. I am very grateful for the support provided me by Simon Kerr. His knowledge, patience, and encouragement have been much appreciated. Dr. Ton Bührs deserves thanks for generating ideas and insights that helped me immensely. Thank you to those who participated in my research via interviews and by filling in the questionnaire. I enjoyed learning from you and appreciate your time.

A huge thank you to Peter who has left no stone unturned in looking after me during the busiest bits of my thesis. I am also grateful to the Seylani family for taking such good care of me. Thank you Romina for the beautiful pictures you drew for my office wall. To Cat, Lisa, Kim, Chris, Christine, Franzi, Peter, and Keith thanks for heaps of fun and mischief as well as words of wisdom about statistics, women in the sciences, the many benefits of surfing for thesis writing, and the art potential of parsnips. Thanks Ann, Kim, and Cat for proofreading. I especially appreciate Kim’s disgust upon encountering “words” such as ‘operationalisation’. For the airplane tickets I thank Erika, Chris Runyard, and Dad O’ Mine. Thank you Ari for wandering West Coast beaches with me – in both hemispheres – to help me through this thesis. Finally, to Deva, Dad, Brina, Martha, Tirzah, Paul and Joyce – I am the luckiest girl ever to have your love and faith in me.
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Chapter One – Introduction

Thousands of non-indigenous plant species have been introduced both purposefully and accidentally to New Zealand since the onset of European colonisation. Some of these species are vital to primary industries while others are highly desirable as ornamentals in home gardens. Unfortunately, a growing number of non-indigenous taxa have naturalised and become invasive weeds. The majority of invasive weeds in New Zealand have eventuated from plants imported intentionally rather than introduced accidentally, therefore, regulation of this pathway is important to prevent further undesirable plant introductions (Mack et al., 2000, p. 691; Sullivan, Timmins & Williams, 2001b, p. 3; Williams & Randall, 2002, p. 1). With the advent of the Hazardous Substances and New Organisms Act 1996 (HSNO) New Zealand changed course from the approach taken historically to regulating the importation of plant taxa not yet present in New Zealand. HSNO (the Act) requires that all new plant species be assessed for their likely environmental, cultural, and economic risks and benefits. Approval for importation is based upon this assessment.

It is unclear how effective HSNO’s regulation of new plant species importation has been thus far (ERMA, 2003b, p. 60). This thesis seeks to improve understanding of the Act’s effectiveness by exploring the New Zealand nursery industry’s response to the regulations. This group was selected for study because commercial nurseries are a primary importer of plant material (Williams & Randall, 2002, p. 1; Williams, Nicol & Newfield, 2001, p. 104). Concerns about possible problems with noncompliance of nursery operators with HSNO identified in the initial, qualitative phase of the research were investigated by subsequent, quantitative inquiry. Possible triggers for noncompliance of the nursery industry were identified and means of mitigating these risks to compliance were considered.

1 A ‘non-indigenous’ species is one that has been introduced “beyond its native range by human activity” (Kolar & Lodge, 2001, p. 200).
2 A ‘naturalised’ species is one that has established self-sustaining populations (Richardson & Rejmanek, 1999, p. 14). An ‘invasive’ weed is defined by Owen (1998, p. 50) as “a weed that can significantly and adversely affect indigenous species and communities.... Whether a species is an invasive weed depends on the nature and significance of its existing or potential impacts.”
3 In contrast, invasive microorganisms, insects, and marine invertebrates are chiefly introduced accidentally via ballast water or as passenger organisms on imported goods (Mack et al., 2000, p. 691).
This chapter begins by describing the Act and placing it within the context of New Zealand’s overall policy framework for addressing the problem of pest plants. Next, existing evaluations of HSNO’s effectiveness and the uncertainties they raise are discussed. Conclusions drawn from these evaluations formed the rationale for my research objectives and the approach I took to pursuing these. The research objectives and methods are then presented. An overview of the chapters ahead concludes the introduction.

**HSNO’s Regulation of the Importation of New Plant Species**

HSNO’s purpose is to “protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms” (Anonymous, 1996, s 4). Under the Act ‘new organisms’ refer to plants, animals, micro-organisms, and genetically modified organisms (GMO’s) that were not present in New Zealand prior to 1998 (Anonymous, 1996, s 1, 2). HSNO aims to prevent introductions of undesirable species by considering a species’ possible negative effects before importation rather than becoming aware of these effects after the species has been released (House of Representatives New Zealand, 1994, p. 4603). This approach contrasts sharply with that taken by previous importation regulations. Prior to HSNO, importation of new plant species was regulated by a ‘prohibited list’ approach. This meant that all plant species could be imported except those that had been identified as major weeds of agriculture (Owen, 1998, p. 7).

HSNO takes a ‘permitted list’ approach to plant importation. If a commercial nursery operator, for example, wants to import a plant species not yet present in New Zealand, she or he must submit an application, outlining the risks and benefits of the introduction, to the Environmental Risk Management Authority (ERMA). ERMA is the agency established to administer HSNO. ERMA assesses the possible adverse effects of the species proposed for introduction to the environment, communities, and human

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4 Legislation and regulations in New Zealand use the term ‘pest plant’ rather than ‘environmental weed’ or ‘invasive plant.’ A pest plant is any plant that people seek to control or eradicate for any reason (Dr. P. Williams, personal communication, 27 November 2002).

5 New Zealand and Australia are the only nations to adopt a ‘permitted list’ approach to date despite the fact that globally, ecologists have recommended this approach for nearly a decade as the best means for preventing introductions of undesirable species (Ruesink, Parker, Groom & Kareiva, 1995, p. 474; Simberloff, 2001, p. 310; Westbrooks, Gregg & Eplee, 2001, p. 303).
health alongside any potential benefits. Scientific assessment of weed risk, Maori views, and, in ‘high risk’ applications, public opinion through submissions and hearings, are taken into account (Sutherland, 1997, pp. 202 - 205). If ERMA approves a species for importation then it is added to the Plant Biosecurity Index (PBI), a data-base of taxa approved for import.

**HSNO within a Policy Framework**

HSNO is one of a number of policies that are designed, in part, to prevent or control weed invasions. Other relevant policies include the Biosecurity Act 1993, the National Pest Plant Accord, and several Acts that direct the Department of Conservation’s (DoC) pest control activities. To demonstrate how these policies address weed invasions each policy will be briefly examined in relation to the invasion process. Ecologists describe biological invasions as a series of transitions. These are entrainment, transport and introduction, establishment, naturalisation, and invasion (Kolar & Lodge, 2001, p. 201).

Species may be ‘entrained’ in a transport pathway either intentionally or accidentally. Intentional entrainment could occur, for example, when a commercial grower orders a shipment of clover seed from overseas. Accidental entrainment could occur if the clover seed shipment is contaminated with weed seeds. ‘Introduction’ takes place if the entrained species survives transport and is not destroyed by quarantine officials at a port of entry. The third transition, ‘establishment’, is achieved if an intentionally introduced species succeeds in cultivation, or an accidentally imported species establishes successfully. So far more than 20,000 non-indigenous plant species are established within New Zealand (Wilton, 2000, p. 539). If an established population continues to reproduce and spread without deliberate and direct human assistance, it is considered to have ‘naturalised’ (Owen, 1998, p. 49). There are approximately 2,000 naturalised plant species within New Zealand and naturalisation is continuing at a rate of approximately 14 species per year (Williams & Randall, 2002, p. 1; Wilton, 2000, p. 539). The final transition stage, ‘invasion,’ occurs if a naturalised species begins to adversely affect native biodiversity and ecosystems (Owen, 1998, p. 50). These effects may include competition with indigenous species and habitat modification such as changing fire regimes, nutrient cycles, or hydrology which indirectly harms indigenous

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6 While plant importation regulations in New Zealand have long sought to protect primary industry, HSNO is one of the first policies in New Zealand to require consideration of adverse environmental effects (Owen, 1998, p. 7).
flora and fauna (Simberloff, 2003, p. 180). Invasive weeds are the primary threat to 61 of New Zealand’s 125 threatened plant species (Williams & Timmins, 2002, p. 183). To date, there are approximately 240 invasive weeds within New Zealand (Owen, 1998, p. 11).

HSNO addresses intentional entrainment of nonindigenous species by requiring assessment of new plant species before permission is granted for their importation. The Biosecurity Act focuses on accidental entrainment by aiming to prevent biosecurity ‘risk goods’ from entering New Zealand inadvertently (Anonymous, 1993 - 1998, III). Under the Act the Ministry of Agriculture and Forestry (MAF) develops Import Health Standards that specify measures which must be taken to prevent diseases or unwanted passenger organisms from accompanying imported goods, including plant material (Ministry of Agriculture and Forestry, 2003a). Countries exporting to New Zealand must ensure their certification systems comply with these import health standards (Budd, 2000, p. 9).

Transport and introduction is also addressed by the Biosecurity Act via the efforts of MAF and the Ministry of Fisheries (MFish). MAF Quarantine Service screens incoming luggage and passengers, inspects freight, and enforces importation regulations to discourage unwanted passenger organisms or smuggled material from entering New Zealand (Williams & West, 2000, p. 431). MFish develops and enforces regulations to prevent introduction of nonindigenous organisms via ballast water and boat hulls (Owen, 1998, p. 62).

Establishment of nonindigenous species is monitored by MAF surveillance, as required by the Biosecurity Act, to detect intrusions of undesirable organisms as early as possible (O'Hara, 1999, p. 2). HSNO also plays a role by requiring ERMA to monitor the impacts of new organisms released with ERMA approval (Anonymous, 1996).

Naturalisation and invasion are addressed by a variety of policies. Created in 2001, the National Pest Plant Accord aims to prevent banned pest plants from being sold, distributed, or propagated (Ministry for Agriculture and Forestry, 2001). Regional Councils who sign the accord are responsible for monitoring nurseries and garden centres to ensure they are not selling banned plants (White, 2002, p. 9). DoC, responsible for managing New Zealand’s eight million hectare conservation estate,

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7 ‘Risk goods’ are defined as any substance or organism that may harm New Zealand’s physical or natural resources or hinder efforts to deal with other pest organisms (Anonymous, 1993 - 1998).

8 In this thesis the term ‘smuggling’ is used to refer to the intentionally concealing plant materials and bringing them into New Zealand.

**HSNO’s Effectiveness: Observations and Uncertainties**

Evaluations of HSNO’s effectiveness in regulating the importation of new plant species have been inconclusive so far. There are indications that problems may exist with compliance. Further research is needed to address unanswered questions and provide a more conclusive evaluation of HSNO’s success in regulating new plant species’ importation.

Evaluations of HSNO’s effectiveness are provided in a number of Government reports, ranging from annual monitoring conducted by ERMA to a report on the management of the importation of aquatic plants. Effectiveness has been assessed in a variety of ways. ERMA summarises the number and type of applications submitted for importation and relays feedback about the HSNO process to the Government from applicants, prospective importers and other stakeholders. The number of new species released illegally as well as statistics summarising MAF’s seizures of illegal plant material are also reported. The observations provided and uncertainties raised by these various measures of effectiveness will be considered below.

ERMA (2003b, p. 60) reports that the number of people importing new plant species into New Zealand through legal channels has dropped dramatically since HSNO

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9 In addition to Regional Councils, other government agencies and industry groups may take the lead on developing Regional Pest Management Strategies as long as they collaborate with all affected parties (Williams & West, 2000, p. 442).

10 One further measure of HSNO’s effectiveness that may be useful in the future is the monitoring of the impacts of plant species approved by ERMA for importation. The monitoring strategy currently available for this task relies upon an indicator framework. Unfortunately, there are few sources of information that summarise the effects of organisms on the values HSNO seeks to protect. So far, only two non-GMO plant species have been approved for importation and release, therefore ERMA has not yet needed these indicators (ERMA, 2003a, p. iv).
was implemented. From 1998, when the Act came into effect for new organisms, to
February 2004, a total of seven applications were lodged for the importation and release
of new plant species (J. Catley, personal communication, 18 February 2004). ERMA
suspects that due to the cost and effort of applying under HSNO, some plant importers
are choosing not to bring new species into New Zealand, while others are opting to
smuggle new species into the country (Nahkies, Loutit & Rogne, 2003b, p. 98).
Feedback from those interested in importing plants indicates that both of these scenarios
are possibly occurring.

Applicants and prospective importers describe the HSNO process as inflexible,
arduous, and too costly in comparison to the profit expected from sales of the imported
plant taxa. Further, the ‘first applicant pays’ approach of the Act has been noted as
posing a commercial disadvantage to the initial importer (Champion & Clayton, 2001,
p. 25; Nahkies et al., 2003b, p. 102; Taylor, Gebbie, Botherway, James & Mormorunni,
2000, p. 38). In addition to frustration with HSNO another issue identified by ERMA is
prospective importers’ low awareness of HSNO’s regulations (ERMA, 2003b, p. 60).
Research commissioned by ERMA indicated that only 53 percent of a representative
sample of the general public were aware of HSNO (Network Communications, 2002a,
p. 9). Qualitative interviews with 20 potential new organism applicants indicated that,
apart from those working for a government agency, interviewees were poorly informed
of HSNO’s requirements and ERMA’s roles (Network Communications, 2002b, p. 38).
However, ERMA has not assessed the awareness of a representative sample of
prospective new organism importers.

Apart from anecdotal evidence, it is unknown how much smuggling occurs as a
response to frustration with HSNO or as a consequence of low awareness of the Act’s
requirements (Champion & Clayton, 2000, p. 21; ERMA, 2003b, p. 60). Assessing
noncompliance is made difficult by a lack of crucial information. While ERMA tallies
the number of new organisms intentionally and illegally released (Nahkies et al., 2003b,
p. 52) these incidents can only be reported if they have been detected. Detection is
made difficult by the lack of a complete and accurate inventory of the nonindigenous
species already present within New Zealand (Champion & Clayton, 2000, p. 41; Wilton,
2000, p. 539). The PBI (permitted list) is intended to provide this information but is
fraught with errors and omissions. Neither MAF, DoC, nor ERMA have yet been able

11 Of these seven applications one (for two species) was approved and another was denied. Two
applications were withdrawn, one stalled, and two applications are currently at the pre-application stage
(J. Catley, personal communication, 18 February 2004).
to undertake the time-consuming task of updating and correcting the permitted list (Nahkies et al., 2003b, p. 52).

Not only is the list of existing species incomplete, but also data describing seized plant material at the border do not always identify the taxa. MAF Quarantine Service personnel often lack adequate taxonomic skill and knowledge to provide this information (Champion & Clayton, 2000, p. 18). Despite this shortcoming, data relevant to noncompliance are available. MAF Quarantine Service reports the number of seizures of plant material per annum and indicates the proportion of these seizures that were of undeclared material. In 2001, for example, MAF made 5,800 seizures of bulbs and live plants (Biosecurity Council, 2003, p. 38). The percentage of seizures of undeclared plant material increased from 1999 to 2003 from approximately 20 percent to 38 percent of total seizures (ERMA, 2003a, p. 22). Following the recent bovine spongiform encephalopathy scare, MAF began screening 100 percent of incoming baggage thereby increasing the likelihood of detection (Controller and Auditor-General, 2002, p. 92). However, ERMA and other government stakeholders are concerned that the increase in seizures of undeclared material is caused, in part, by importers trying to circumvent the HSNO Act (ERMA, 2003a, p. 22; Nahkies et al., 2003b, p. 69; Taylor et al., 2000, p. 60).

The monitoring efforts recounted above indicate that fewer people are importing new species through the correct channels since HSNO came into effect. Frustrations with the HSNO process as well as a lack of awareness of the rules have been observed. A link is suspected, but not established, between these issues and the increase in seizures of undeclared plant materials at the border. Lack of crucial information, such as an accurate inventory of non-indigenous plant species within New Zealand, hinders ERMA’s ability to identify unauthorised releases of new plant species. Reports raising concerns about HSNO’s effectiveness maintain a tentative tone and lack the information needed to form firm conclusions regarding these issues.

The least tentative evaluation of HSNO merits consideration of both its findings and the approach taken by the researchers. Champion and Clayton (2000, p. 5; 2001, p. 5) examined the effectiveness of management systems relevant to the importation and surveillance of non-indigenous aquatic plants. The scope of their research extends well beyond HSNO, however, a number of their findings address HSNO’s effectiveness. In order to ascertain what prospective importers thought of the current approach to regulating the importation of aquatic plants, the researchers interviewed all major
importers and distributors of aquatics.\textsuperscript{13} To create a more accurate inventory of aquatic taxa within New Zealand, the researchers surveyed and identified the plants on the interviewees’ premises (Champion \& Clayton, 2001, p. 7). Doing an inventory of aquatic species was feasible because the total number of nonindigenous aquatics comprises only a small percentage of the ~20,000 nonindigenous plant species established within New Zealand.

Champion and Clayton (2001, p. 25) found that aquatic plant suppliers were dissatisfied with importation regulations. Interviewees expressed frustration with HSNO’s requirements and MAF’s quarantine requirements. HSNO’s application costs were perceived as prohibitive and MAF’s regulations too strict. Officials examining plant material at the border were criticised for poor taxonomic skills and inadequate ability to intercept smuggled plant material (Champion \& Clayton, 2000; 2001, p. 20, 25). Interviewees alleged that frustration with importation regulations were prompting people to smuggle (Champion \& Clayton, 2000, p. 20).

The research uncovered evidence of smuggling. For 27 percent of the 181 aquatic species identified as present in New Zealand no record of legal importation could be found (Champion \& Clayton, 2001, p. 25). This indicates either that these species were imported prior to 1976 when MAF began recording species imported, or have been smuggled into New Zealand since then. Aquatic suppliers did not observe many of these species in the industry until the 1980’s or more recently (Champion \& Clayton, 2001, p. 15). A series of entry pathways were identified for non-indigenous aquatics including mail order seeds passing undetected through the postal system, incorrect declaration of species using names from the permitted list, and plant material concealed on individual’s bodies or in their luggage (‘pocket plants’) (Champion \& Clayton, 2000, pp. 18 - 20). Incorrect naming of species and ‘pocket plant’ smuggling were judged to be the most likely pathways for aquatics to enter New Zealand.

Although interviewees gave accounts of these practices, uncertainty about the prevalence of illegal plant importation persists as individuals engaging in this illegal behaviour seek to remain covert for obvious reasons (Champion \& Clayton, 2000, p. 20). Champion and Clayton (2001, p. 28) concluded that New Zealand’s current system has done a poor job of regulating the importation of aquatic plant species. The

\textsuperscript{12} MAF does not yet screen all incoming mail; MAF screened 50 million of the 72 million items of incoming mail in 2001 (Controller and Auditor-General, 2002, p. 92).

\textsuperscript{13} There are only eight major suppliers of aquatic plants thus it was possible to interview all of them (Champion \& Clayton, 2001, p. 7).
researchers recommended further assessment of HSNO in order to find more effective means of managing new aquatic plant species importation.

Champion and Clayton’s (2001, pp. 25, 28) findings about HSNO’s effectiveness echo those reported elsewhere. However, their research findings are more conclusive than those of other evaluations. The approach taken to their research bolstered the certainty of the findings. Qualitative interviews with all major aquatic plant suppliers improved the reliability of the results. In contrast, other research is likely to be less reliable because it was collected from nonprobability samples (see Nahkies et al. 2003 and ERMA, 2002b). Champion and Clayton were able to estimate the number of species imported illegally because they completed an inventory of aquatic species present in New Zealand. They compared these data to importation records to determine which species were imported through legal channels in place since the late 1970’s (Champion & Clayton, 2001, p. 15). Despite their robust approach to the research, some information remains elusive. The clandestine nature of plant smuggling makes it difficult to ascertain the frequency of this behaviour and the reasons behind it.

Collectively, evaluations of HSNO identify issues that may be compromising HSNO’s effectiveness. Further research is needed to produce a complete and accurate list of species present in New Zealand, quantify incidents of smuggling, and determine if the species involved are new to New Zealand. This would require a large-scale, collaborative effort possibly involving ERMA, DoC, MAF, and researchers skilled in taxonomy. Better understanding of prospective importers attitudes and beliefs about HSNO and linkages between these and their behaviour in response to the Act is also desirable in order to ascertain if changes to HSNO and/or its implementation are needed. While I lack the taxonomic skills and resources needed to undertake the former research priority, I am capable of carrying out the latter. The first phase of my research explored HSNO’s effectiveness by examining nursery operators’ reasons for importing plant species, experiences with HSNO, and views of the Act. Possible problems with compliance were identified in the qualitative research. These issues were then investigated quantitatively.

Consideration of Champion and Clayton’s (2000, 2001) reports offered insight into how to approach the quantitative research. Their findings suggest that identifying triggers for noncompliance is challenging because people are unlikely to divulge that they are smuggling, therefore it is difficult to empirically verify the alleged connection between frustrations with HSNO and smuggling. Consequently, I sought a theoretical framework that would enable me to identify and assess the likely triggers for
noncompliance. The framework contained a theory of policy design that established a causal link between targeted individuals’ conceptions of a policy and their behaviour in response to that policy. An empirically validated model of compliance behaviour was also integrated into the framework enabling me to relate conceptions of HSNO to motivations for compliance.

It is important to note that I approached the research from a particular perspective. I originally selected HSNO as a focus for research because of my concern about the ecological impacts of invasive weeds. Through work experience in invasive weed control I had observed the challenges of dealing with established weeds. I became interested in learning more about preventing introductions of potentially invasive plants. HSNO’s regulation of the importation of new plant species captured my interest because of its permitted list approach, which has been recommend by ecologists as a promising means for preventing the introduction of potentially invasive plants.

My position in relation to the research shifted as my research progressed. As I heard the perspectives of nursery operators and plant enthusiasts about HSNO I found it easy to sympathise with the frustrations and difficulties they were experiencing with the statute. I retain a strong concern about the ecological impacts of invasive weeds and believe that policies to prevent introductions are essential. However, I have developed a greater appreciation for the importance of ensuring such policy is palatable and workable for those it regulates.

Research Objectives and Research Methods

When I began my research I sought what Davidson and Tolich (2003, p. 199) describe as “a great depth of information on people, rather than breadth...with the research problem emergent, not fixed.” The inductive approach inherent in qualitative research (Neuman, 2000, p. 145) was appropriate considering the exploratory nature of the first phase of the research. 14

The objective of the initial phase of the research was to explore the effectiveness of HSNO in regulating the importation of new plant species. While this inquiry could be directed in numerous ways, I elected to focus on the response of a key target group to the regulations. ‘Targets’ are those required to change their behaviour so that policy

14 An inductive approach means that theory is formed from, and substantiated by, the evidence uncovered by the research (Neuman, 2000, p. 145). In contrast to quantitative research, which seeks to empirically test existing theory, qualitative researchers allow the data to drive the inquiry (Tolich & Davidson, 1999, p. 32).
goals may be achieved (Schneider & Ingram, 1997, p. 82). HSNO’s regulation of plant importation applies to anyone who wishes to import a new plant species. This may include commercial nurseries, seed companies, botanical gardens, garden clubs, home gardeners, plant enthusiast societies, and individual plant enthusiasts (Reichard & White, 2001). Research has identified commercial nurseries and plant enthusiasts as the groups responsible for most plant introductions (Sullivan, Timmins & Williams, 2001a, p. 12; Williams et al., 2001, p. 104). I focused on commercial nurseries because it was most feasible to identify and contact this group.

The qualitative research was designed to examine attitudes and beliefs of nursery operators regarding HSNO’s regulation of plant importation. Several research questions focused the inquiry:

- Why do nursery operators wish to import new plant species into New Zealand?
- What experiences have nursery operators had with HSNO?
- How do nursery operators view HSNO’s requirements and the Act’s implementation by ERMA and MAF?

To answer the research questions I interviewed twenty-four nursery operators and persons involved in implementing HSNO’s plant regulations. My interviewees provided their perspectives on HSNO, the nursery sector’s interactions with the Act, and HSNO’s historical, social, and environmental context. In order to collect data high in validity I conducted semi-structured interviews (Tolich & Davidson, 1999, p. 34). Interviewees were selected through a snowball sampling technique. For greater detail about sampling, the interview process, and subsequent data analysis see Appendix A.

Analysis of the qualitative data illuminated possible problems with compliance of the nursery industry with HSNO. Themes that appeared to be linked with noncompliance included the cost and effort involved in applying to import a plant species and a difficult relationship between prospective importers and ERMA and MAF.

The contention that HSNO has pushed plant importation ‘underground’ was prevalent among respondents. Public sector respondents were uncertain about the scope of the problem and anxious about the adverse environmental effects that smuggled plant materials could bring about. Some nursery sector respondents reported having smuggled while others worried that smuggled materials could bring diseases detrimental to their industry to New Zealand.

15 Validity describes the “extent to which an empirical measure adequately reflects the real meaning of the concept under consideration” (Babbie, 2001, p.143).
The concerns raised about noncompliance, along with the criticisms of the design and delivery of HSNO, led to the emergence of a new set of research objectives. These objectives were approached by developing a quantitative questionnaire and administering this research instrument to a representative sample of wholesale nursery owners and managers. A conceptual framework was utilised to inform this investigation. This framework drew upon a theory of policy design and a theory of compliance behaviour. The following research objectives were identified:

- Describe the elements of HSNO’s policy design. This included HSNO’s goals, implementing agencies, rules, tools and assumptions underlying all of these.
- Describe nursery operators’ understandings of HSNO’s elements of policy design.
- Determine how nursery operator’s understandings of HSNO are likely to impact compliance.
- Consider the implications of the findings for the effectiveness and appropriateness of HSNO’s policy design.

A series of research questions provided a clearer focus and finer level of detail for these objectives:

- To what extent are wholesale nursery operators aware of HSNO’s regulation of new plant species importation?
- What experiences have nursery operators had with HSNO?
- What are nursery operators’ interpretations and conceptions of HSNO’s elements of policy design? This entailed focus upon targets’ views of HSNO’s goals, agents, implementation structure, rules, and tools and assumptions underlying these.
- Are there statistically significant relationships between targets’ understandings of HSNO and characteristics such as nursery size and enthusiasm for plants?
- Considering the theory of compliance behaviour, how might nursery operator’s understandings of HSNO pose risks to compliance?
- How might these risks to compliance be mitigated?

The quantitative questionnaire (displayed in Appendix B) was distributed by post. The population from which I drew a probability sample consisted of wholesale
nursery owners and/or managers throughout New Zealand. I generated a systematic sample with a random start from the most inclusive sample frame available, the *New Zealand Nursery Register* (2003). Questionnaires were posted to 950 potential respondents. A response rate of 48 percent was achieved. Please see Appendix C for a more detailed account of the quantitative research methods used.

**Summary and Looking Ahead**

This chapter has introduced the two phases of research designed to explore HSNO's effectiveness. First, a description of HSNO was provided in relation to the Act's regulation of the importation of new plant species. HSNO was placed within the context of New Zealand's overall policy framework addressing the various stages of weed invasions. Next, existing evaluations of HSNO's effectiveness were discussed. The issues and uncertainties expressed in these evaluations provided the rationale for my research. Finally, the research objectives, research questions, and methods used to pursue these were briefly described.

In Chapter Two the conceptual framework used to structure and inform the research is described and the framework is operationalised. The following chapter examines the HSNO Act through a policy design lens to provide a foundation for the quantitative analysis. Chapter Four further contributes to this foundation by presenting the qualitative research results and explaining how the second set of research objectives arose from these findings. The results and discussion of the quantitative research begins in Chapter Five with consideration of targets' social constructions of HSNO's elements of design. The theory of compliance behaviour is used in Chapter Six to identify possible risks to compliance. The implications of these risks for the effectiveness of HSNO's policy design are discussed. Possible means of mitigating these risks and identification of future research priorities concludes the thesis.
Chapter Two – Stepping Through the Looking Glass: A Conceptual Framework for Understanding Compliance

This chapter describes and discusses the conceptual framework that structured and informed the second phase of my research. The framework integrates a theory of policy design with a theory for compliance behaviour. The causal theory of policy design offers a tool for empirical research that can be used to understand policy design, how target groups interpret these designs, and how this in turn influences their behaviour (Schneider & Ingram, 1990b, p. 78; 1997, p. 72). The theory of compliance identifies motivations for compliance thus offering further insight into individuals’ decision-making and behaviour in response to a policy (Winter & May, 2001, p. 676). The framework synthesising these theories aided me in examining the risks of noncompliance with the HSNO Act on the part of wholesale nursery operators.

Theoretical frameworks help policy analysts to simplify, organise, and interpret the many complex components and forces constituting public policy by “imposing a way of thinking about the world...creating an order out of what does not have an objective order in itself” (Parsons, 1995, p. 57). While frameworks enable researchers to tackle complexity, such constructs should not be mistaken for objective reality but rather one paradigm among many alternative paradigms (Parsons, 1995, p. 57).

This chapter begins with an introduction to the policy sciences. The emergence of policy design approaches within the discipline will then be discussed briefly. Next, the theory of policy design will be presented, followed by description of the theory of compliance. The final section of the chapter discusses the synthesis of these theories and demonstrates how the resulting framework was utilised in my research.

The Policy Sciences

Public policies are the primary means for solving a society’s collective problems (Schneider & Ingram, 1997, p. 80). Groups and individuals within government create public policies, however these actors do not operate in isolation. The influence of contextual factors, such as public opinion, relationships between the private and public sectors, and financial resources, help shape public policies (Howlett & Ramesh, 1995, p. 5; Schneider & Ingram, 1997, p. 80). A public policy can be defined as a “relatively stable, purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern” (Anderson, 2000, p. 4). This process can be viewed as a series of steps: setting an agenda, identifying policy alternatives, choosing an
alternative, implementing the chosen policy or policies, and later evaluating these policies (Kingdon, 1984, p. 3). Dividing the policy process into phases makes a complex reality comprehensible to the analyst. In practice, rather than proceeding sequentially through distinct phases, the policy process is likely to unfold messily (Hill, 1997, p. 20).

The policy sciences began to develop in the 1950's. This emerging discipline aimed to improve the process and products of policy making with the aid of empirical research (deLeon, 1988b, p. 302). Harold Lasswell, whose work is widely regarded as forming the foundation of the policy sciences, argued that policy analysis should help solve real-world problems deemed to be of importance (Howlett & Ramesh, 1995, p. 3). As Lasswell (1951, cited in Parsons, 1995, p. 18) explained, the policy sciences should address “fundamental and often neglected problems which arise in the adjustment of man in society....” To address these policy problems effectively, he advised practitioners to take a multi-disciplinary approach in order to amalgamate various types of knowledge relevant to the policy problem (Parsons, 1995, p. 19).

Since Lasswell first outlined the policy sciences, numerous theoretical perspectives have been developed within the discipline (Bobrow & Dryzek, 1987, p. 5). Analysts have strived to improve public policies and the policy process (deLeon, 1988b, p. 302). Over the past five decades, their efforts have focused on various phases of the policy cycle. First, formulation gained much attention followed by evaluation and then later, implementation (deLeon, 1988b, p. 302). Theory generation within the discipline has been criticised by its own practitioners as lacking coherence and direction and failing to produce unified theories (deLeon, 2002, p. 469; Winter, 1990, p. 20). It falls outside the purpose of this thesis to provide an overview of the dominant standpoints within the policy sciences or address the divergences observed among these approaches. For critiques of dominant standpoints see Howlett and Ramesh (1995), Ingram and Schneider (1997, pp. 13 - 65), Bobrow and Dryzek (1987), and Dryzek (1993, pp. 217 - 222).

Policy design approaches arose from the implementation strand of the policy sciences. Although the importance of studying implementation was highlighted by Lasswell in the 1950's it was not until the 1970's that research focused upon this stage
of the policy cycle (deLeon, 2002, p. 467). The first surge of implementation research consisted of case studies of public policies that had failed to achieve policy goals (deLeon 2002, p. 468). A ‘top-down’ perspective to policy analysis emerged as a second generation of implementation research. This perspective argued that policy success depended upon clarity of objectives, accurate causal theory, legal consequences for noncompliance, skilful implementers, and a supportive social and economic context (Sabatier, 1986, pp. 23 - 25). Critiques of the top-down approach then developed a ‘bottom-up’ perspective which emphasised the role of ‘street level’ implementers in impacting on policy success (Sabatier, 1986, p. 32).

A third generation of implementation research developed many theories crafted to suit specific contexts. The theories were critiqued for their ambiguous variables and limited applicability (deLeon, 2002, p. 469). Frustration with implementation literature grew as a single, widely agreed upon theory of implementation failed to emerge. It was in this context that some theorists sought to address the deficiencies of implementation literature by developing a new approach – theoretical frameworks of ‘policy design’ (deLeon, 2002, p. 482). Policy design proponents felt implementation theory had given inadequate attention to the contexts surrounding the policy cycle (deLeon, 2002, p. 302). From a policy design perspective, context is the foremost determinant of policy design (Schneider and Ingram, 1997, p. 69). Proponents of policy design argued that the impact of context could not be appreciated unless the policy cycle was examined in its entirety rather than in stages (deLeon, 1988b, p. 304).

As with any concept within the policy sciences, scholars provide varying definitions for ‘policy design.’ I follow Schneider and Ingram’s (1997, p. 1, p. 2; 1990b, p. 76, p. 80) definition presented in tandem with their theory of policy design. Policy designs are products that emerge from a process. They contain elements produced by human agency. One, several, or many people’s intentions may shape the design. Other elements of the design may be unintentional. Policy designs are dynamic, changing as people and contexts change. Culture and values from a policy design’s context are reflected in the design. Likewise, designs influence context by promoting certain values, beliefs, and behaviours. Those targeted by a policy, actors designing the policy, and the public at large may interpret a policy in differing ways and these interpretations may change over time.

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17 Although the terms ‘policy science’ and ‘policy analysis’ are often used interchangeably, deLeon (1988a, p. 8) clarifies that ‘policy sciences’ refer to the discipline while ‘policy analysis’ refers to the use of the methodologies and tools found within policy science.
Schneider and Ingram (1997, p. 72) observe that attempts to generate policy design theory focused on specific elements of design rather than taking a comprehensive view. Further, these efforts failed to provide a model applicable to all designs. To address these deficiencies Schneider and Ingram developed a causal model of policy design. Their theory is described in the following section.

**A Causal Theory of Policy Design**

Theoretical frameworks for studying public policy should improve understanding of policy design problems and identify ways of solving these problems (Schneider & Ingram, 1997, p. 7). Schneider and Ingram’s causal theory of policy design can be used in this way. The theory provides a tool for analysis that addresses its authors’ concern that many policy designs are damaging democracy in the United States by discouraging citizens’ understanding and engagement with government, and increasing feelings of alienation and frustration (Schneider & Ingram, 1997, p. 5). However, Schneider and Ingram point out that their theory can be employed at a less global scale. The theoretical model portrays the relationships between societal context, policy problems, and policy design (Schneider & Ingram, 1997, p. 74). Analysis can begin with an element in the causal model, such as a target group’s policy participation, and move in either direction through the model, for example, looking at the policy design’s impact on policy participation (Schneider & Ingram, 1990b, p. 83). Figure 1 below portrays the causal model.

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18 'Policy participation' is defined as "the decisions and actions of direct and indirect target populations that impinge on achievement of policy goals" (Schneider & Ingram, 1997, p. 76).
The societal context is comprised of a nexus among social, political, physical, psychological, and historical realms (Schneider & Ingram, 1997, p. 73). When examining this vast nexus in relation to policy design, Schneider and Ingram (1997, pp. 80 - 81) focus specifically on four social-political values they believe are vital to a healthy democracy: responsive democratic institutions, respect and equality for citizens, active citizens who balance private and public interests, and effective, efficient solving of collective problems. Successful problem solving, of most relevance to my research, is achieved by policy design that uses natural and human resources efficiently, and effectively mitigates the problem addressed by the policy (Schneider & Ingram, 1997, p. 80). Problem solving is germane to my focus on compliance behaviour because the response of the nursery industry to HSNO impacts on the policy’s effectiveness in evaluating and addressing the risks posed by new plant species.

Issues emerge from the societal context through processes of social construction, referred to as ‘framing dynamics,’ whereby versions of reality are created and shared by groups within society or society as a whole (Schneider & Ingram, 1997, p. 73). As groups or individuals experience their societal context, they make sense of these encounters by constructing beliefs, stereotypes, and images. If, for example, an individual witnesses law enforcement officers assaulting peaceful protesters she may construct a stereotype of police officers as hostile towards freedom of expression. If the person’s social group tells her of police brutalising racial minorities she may then
reframe her stereotype of police officers as hostile towards freedom of expression and racist. Through exposure to media, academic research, and anecdotes from friends, she may construct a belief that policy change is needed to promote more appropriate police behaviour. This example demonstrates how people socially construct policy problems through their interactions with societal contexts.

The ‘issue context’ contains the socially constructed issues that emerge from the framing dynamics. Power and institutional culture are influential in determining if issues reach the policy agenda as well as in determining how ensuing policies are designed (Schneider & Ingram, 1997, p. 75). Power relationships between the parties involved dictate which policy actions would be too risky politically and thus not feasible for policy makers. Comprised of power dynamics, norms, operational structure, and rules, the culture of institutions involved in policy design also influences the design of the policy (Schneider & Ingram, 1997, p. 76).

An example of the influence of institutional culture can be observed in the design of New Zealand’s electricity policy that emerged in the mid-1980’s. The Labour Government strove to reduce the role of government and increase the role of the market in the electricity industry (Bührs & Bartlett, 1993, p. 91). Power dynamics in government shifted as management of natural resource use was privatised reflecting the belief that past shortcomings of natural resource management would be remedied if management was market driven (Bührs & Bartlett, 1993, p. 96). The energy policies that resulted placed electricity generation in the hands of a State Owned Enterprise (SOE). Electricity was treated as a private good to be regulated by the market. Under SOE management, energy conservation and development of cleaner sources of energy did not occur (Bührs & Bartlett, 1993, p. 97). The institutional culture prompted market driven electricity management. The resulting policies produced financial benefits for the Government but did not recognise or respond to environmental or social externalities because these fell outside a market paradigm.

The interaction between the issue context, design options, and human agency comprise the ‘designing dynamics’ (Schneider & Ingram, 1997, p. 77). Reframing often occurs during this process, for example, an agency may alter the parameters defining their targeted population so as to be eligible for a new programme, a designer may reconstruct a policy problem to fit a solution she or he favours, or policy analysts

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19 Schneider and Ingram (1997, p. 75) delineate three types of power: direct power to make decisions, indirect power to shape the policy agenda or shape an influential institution, and the power to influence people’s perceptions and desires.

20 Institutions are interactions and relationships that endure in stable patterns, e.g. parliament, governmental ministries, and courts (Schneider & Ingram, 1997, p. 76).
may present research that alters understanding of a policy tool’s effectiveness (Schneider & Ingram, 1997, p. 78).

Actors within the designing dynamic produce a ‘policy design’ (Schneider & Ingram, 1997, p. 77). Policy designs consist of a set of empirical elements: goals, target populations, agents, tools, rules, rationales and assumptions. Policy goals are connected to agents, institutions charged with implementing the policy, and populations targeted by the policy in two ways. First, by rules, which stipulate actions that must be undertaken or avoided and, second, by tools, which aim to promote behaviour in accordance with these rules. Likewise, agents are connected to targets by rules and tools. Rationales and assumptions underlie the policy’s goals, rules and tools (Schneider & Ingram, 1997, p. 82). The elements of design are portrayed in Figure 2. I have depicted the connection between goals, agents, and targets with double-headed arrows because influence may flow both ways. Agents, for example, impose rules and tools on targets. Targets’ responses to these rules and tools may then prompt the agent to modify their administration of the policy or make changes to the policy itself.

Figure 2. Elements and Linkages of Policy Design

![Figure 2. Elements and Linkages of Policy Design](image)

(Adapted from Schneider and Ingram, 1997, p 83; 1990b, p. 82)

The elements of design affect societal conditions through ‘translation dynamics.’ In translation dynamics, targeted citizens encounter and react to the policy. As targets learn about and experience a policy, they construct understandings of what the policy means and how they should act in response. Targets may respond as policy designers intended or they may behave in ways that detract from policy goals (Schneider & Ingram, 1997, p. 79). When policy participation positively affects the policy goals, the target groups are engaging in ‘coproduction.’ Conversely, if their behaviour detracts
from policy goals their behaviour is termed ‘counterproduction’ (Schneider & Ingram, 1990b, p. 85). Targets’ understandings of policies not only impact their behaviours but also their values (Schneider & Ingram, 1990b, p. 79). They may internalise values introduced or reinforced by the policy or may reject these values (Schneider & Ingram, 1997, p. 80). Examining translation dynamics enables analysts to better understand target behaviour and consider the impacts of this behaviour on societal context. If, for example, targets’ encounters with a policy prompt counterproduction then the policy may fail to effectively solve the policy problem. This may affect citizens’ perspectives of government effectiveness or prompt reconsideration of the policy problem and its possible solutions.

To identify the impacts of policy design on policy outcomes, such as behaviour of targets, each policy design element should be examined in relationship to targets’ reactions to that element. Because my research undertakes this analysis, each element of design will be detailed below. Although the elements are presented individually, all are inter-related from a targets’ perspective as they construct an understanding of a policy and decide how to behave in response.

Goals
Goals convey a social construction of a policy problem and a solution. A problem in a society can be interpreted in many different ways (Schneider & Ingram, 1997, p. 83). Interpretations reflect the societal and issue contexts from which the policy arose. The substantive content of goals, they way they are expressed, and the way they are operationalised through rules and tools help shape policy outcomes. When making sense of these outcomes it is useful to determine if goals were intended to be symbolic, instrumental, or disingenuous, concealing other motives (Schneider & Ingram, 1997, p. 83).

Targets
The groups of people who are called upon to change their behaviours in order to achieve policy goals are called ‘targets.’ When problems are socially constructed, certain groups are identified as deserving assistance, as causing problems, or as well situated to help solve a problem. Understanding why a given target group is selected provides insight into policy outcomes. How the policy problem is perceived and the tractability of targets, their political power and status in society often determine target group selection (Schneider & Ingram, 1990b, p. 85). If a group whose behaviour does not have much bearing on the policy problem is selected then policy goals are unlikely
to be achieved. If groups feel unfairly targeted they may resist the policy, resulting in unintended policy outcomes.

 Agents and Implementation Structures

Agents are those entities mandated by a statute to implement the rules and tools laid out by the statute, and in some cases, develop additional rules and tools (Schneider & Ingram, 1997, p. 89). Ingram and Schneider identify several ‘implementation structures’ differentiated by how authority is distributed between the statutes, agents and targets. ‘Strong statutes’ contain clear goals and give few choices to policy implementers, keeping authority to design or modify a policy exclusively with policy makers (Ingram & Schneider, 1990, p. 75). In contrast ‘grass roots’ policies have broad goals that implementers and/or targets decide how to reach (Schneider & Ingram, 1990, p. 79). The ‘support building approach’ places greater importance on resolving conflicts and building support than on the instrumental goals of the policy (Schneider & Ingram, 1990, p. 81). The ‘Wilsonian perspective,’ like strong statutes, entails setting clear goals. However, this approach enables agents, rather than policy-makers, to determine the best means to administer the policy (Schneider & Ingram, 1990, p. 77).

Rules

Rules stipulate how targets should respond to a policy. ‘Eligibility’ rules delineate who is included in the target populations. ‘Timing’ rules dictate the sequence and time frame of policy implementation. ‘Boundary’ rules determine who can take part in decision-making under the policy, e.g. the rules for public hearings. ‘Decision’ rules stipulate how decisions are to be made while ‘information’ rules determine what sort of information is valid input for decision-making. As targets encounter rules they may perceive them as fair or unfair, flexible or inflexible, and compatible or incompatible with internal values and social norms. These perceptions may in turn affect targets’ policy participation (Schneider & Ingram, 1997, pp. 97, 98).

Tools

The purpose of policy tools is to increase the likelihood that targets and agents will obey policy rules. In order to be effective, tools must be based on an accurate understanding of why targets are engaging in the undesirable behaviour in the first place (Schneider & Ingram, 1990b, p. 89). Schneider and Ingram (1990a, pp. 514 - 521) classify policy tools in five categories, each defined by an assumption about what motivates compliance. ‘Authority tools’ assume that targets view the government as a
legitimate authority and therefore will comply with directives from government.

'Inducements and sanctions' provide positive or negative incentives for compliance such as tax credits or fines for noncompliance. This approach expects that people will act out of self-interest and will respond rationally to 'carrots' and 'sticks'. 'Capacity-building tools' give targets resources they need, such as education or skills, based upon the belief that lack of these resources thwarts compliance. 'Hortatory tools' exhort people to comply by connecting compliance with widely held values. 'Learning tools' aim to encourage innovation and discovery and entrust agents or targets with selecting goals based on what they learn.

**Rationales and Assumptions**

Rationales validate a policy by making the case that goals are legitimate and the policy design is an effective way to achieve these goals (Schneider & Ingram, 1997, p. 99). A rationale may be broad, for example, stating that policy goals will promote justice or economic prosperity, or quite specific, for example, justifying an eligibility rule for determining the duration of unemployment benefits by citing statistics about job availability. Whereas rationales justify a policy, assumptions are the logic that these justifications are based upon (Schneider & Ingram, 1990b, p. 81). The assumption beneath the eligibility rule for unemployment benefits for instance, might be that statistics about job availability are a good indicator of how long a person should expect to spend seeking employment.

Each element of policy design described above has a causal connection with policy participation. The model assumes that through encounters with the various elements of policy design, targets socially construct understandings of the policy and then decide how to behave in response. While outlining broad causal links relevant to my research aims, the model alone is inadequate for the task of assessing the risks of noncompliance. In order to make sense of policy participation, the model requires an accompanying theory of individual decision-making and behaviour (Schneider & Ingram, 1990b, p. 89). A theory of noncompliance which is compatible with the causal theory of policy design will be discussed below.

**A Theory of Compliance Behaviour**

Schneider and Ingram (1990b, pp. 92 - 93) describe individual behaviour as prompted by a diverse array of 'rules of thumb' that individuals refer to when choosing behaviour. These include: self image, values and norms, assessment of risks and benefits to oneself and others, knowledge of possible choices, and consistency with past
choices. In contrast, most theories of compliance rely on expected utility as the sole explanation for behaviour (Hatcher, Jaffry, Thébaud & Bennett, 2000, p. 449; Winter & May, 2001, p. 676). Expected utility fails to recognize other influences on decision-making and lacks empirical support (Schneider & Ingram, 1990b, p. 89; Winter & May, 2001). Expected utility theories characterise decision making as rational while empirical research indicates that decision makers may judge overconfidently with little information and may underestimate the harm their actions might cause while overestimating the harm caused by others (Schneider & Ingram, 1990b, p. 93). To respond to the deficiencies of assuming the primacy of rational expected utility in decision making, some theorists have shifted their focus to normative/social motivations (Winter & May, 2001, p. 676) while others have incorporated 'non-rational' motivations by subordinating them to an expected utility calculus (See Haab & McConnell, 2002). Neither of these options captures the complexity of decision-making.

Fortunately, an empirically based theory of compliance has been developed that recognizes the complexity of factors which influence compliance (Burby, May & Paterson, 1998; Burby & Paterson, 1993; Hatcher et al., 2000; Winter & May, 2001). The theory consists of four main motivations for compliance: 'calculated motivations', 'normative motivations', 'social motivations', and 'ability to comply' (Winter & May, 2001, p. 676).

'Calculated motivations' result from an individual weighing the benefits of compliance versus the costs and choosing the option that appears to offer the best outcome for the individual. This may include considering the risk of getting caught, the likelihood that penalties will be awarded, and the size of the penalties (Winter & May, 2001, p. 676). As explained above, these calculations are unlikely to be purely rational, objective exercises. Nevertheless, the idea that decision makers may attempt to weigh personal risks and benefits when making decisions is what is important about this criterion.

'Normative motivations' stem, in part, from an individual's moral principles. These principles consist of beliefs about the appropriate roles of an individual within society as well as all other internalised values within his or her moral framework (Winter & May, 2001, p. 677). The second aspect of normative motivations is an individual's assessment of whether a regulation is fair in its design and implementation and if violating the regulation is likely to cause harm (Winter & May, 2001, p. 678).

21 'Expected utility' refers to a rational calculation of risks and benefits undertaken to determine which choice in a given situation maximises personal satisfaction (utility) for the decision maker (Winter & May, 2001, p. 676).
‘Social motivation’ refers to an individual’s desire to act in ways that are approved by people or social groups who are important to the individual. He or she then seeks to behave in accordance with norms of others whether or not these norms are internalised (Winter & May, 2001, p. 678). Those the individual wishes to please could range from family and friends to agencies implementing the policy or others within the target group.

The final aspect of the compliance theory is ‘ability to comply.’ If targets know little or nothing about a policy, or are confused by the information they have encountered then they are less likely to comply. Further, financial capacity dictates their ability to comply: if the financial costs of compliance handicaps the individual they are less likely to comply (Winter & May, 2001, p. 680). Ability to comply is a foundational aspect of compliance which underlies calculative, normative, and social motivations.  

The theory of compliance added an essential component to my conceptual framework. While the policy design theory offers a meta-perspective on understanding policy participation, the theory of compliance facilitates analysis at a finer, more specific level. Integrating the theory of compliance with the theory of policy design enabled me to ‘step within’ the translation dynamics and identify and examine possible triggers for noncompliance. The conceptual framework that resulted from this synthesis will be explored in more detail as the operationalisation of the framework is discussed below.

Applying the Theories

I used the conceptual framework presented in this chapter to explore how the nursery industry’s encounters with HSNO might affect compliance. Concerns that plant importers were not complying with HSNO arose during the qualitative phase of the research. While identifying and quantifying incidents of noncompliance was not feasible, it was possible to identify and analyse factors that may jeopardise compliance with HSNO.  

An amalgamation of the causal theory of policy design and the theory of compliance behaviour provided the conceptual tools I needed to do this.

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22 Each motivation for compliance identified by the theory links to Schneider and Ingram’s (1990a, pp. 514 - 521) typology for policy tools. Inducement or sanction policy tools assume that calculated motivations are in play. Policies sometimes appeal to normative motivations by using hortatory tools. Authority tools aim to promote compliance based on an aspect of social motivation. Capacity building tools focus on improving ability to comply.

23 To review why quantifying non-compliance was impractical please see p. 9 in Chapter One.
Schneider and Ingram’s causal theory of policy design (Schneider & Ingram, 1990b; 1997) is a useful model for informing and structuring empirical research at both broad and specific scales. Analysis can begin with any aspect of the model and move through it in either direction (Schneider & Ingram, 1990b, p. 83; 1997, p. 82). In my analysis, the elements of policy design and the translation dynamics were the relevant aspects of the theory. My analysis was premised on the existence of a causal link, comprised of socially constructed understandings, between the elements of policy design and policy participation.

Compliance or failure to comply with HSNO is a form of policy participation. Because the elements of policy design have a causal relationship to policy outcomes, such as policy participation, analysis should centre on interaction between targets and the elements of design in order to predict policy participation (Schneider & Ingram, 1990b, p. 83; 1997, p. 79, 82).

The first analytic task was to define HSNO’s elements of policy design using the text of the statute, relevant parliamentary proceedings, and evaluations of the Act produced by Government and other bodies. The goals of the Act, the agents charged with implementing and enforcing the Act, the implementation structure, and HSNO’s rules, tools, and assumptions relevant to new plant species importation were described. Subsequently, the themes from the qualitative data relevant to compliance were linked to their corresponding elements of design.

Quantitative research was then undertaken to address the first research objective; to describe wholesale nursery operators’ social constructions of HSNO. This objective was based on the assumption that as targets have experiences with a policy and gather information about the policy they socially construct understandings of what the policy means as well as what actions they should take in response (Schneider & Ingram, 1990b, p. 86). Targets’ understandings included views of HSNO’s goals, agents, rules, and tools. As it was not feasible or necessary to investigate every facet of HSNO’s design, the research focused primarily upon themes identified as possible triggers for noncompliance by the qualitative research.

From the quantitative data a depiction of wholesale nursery operators’ social constructions of HSNO emerged. In order to assess the risks of noncompliance from this portrayal the theory of compliance behaviour was employed (Winter & May, 2001, p. 676). The theory of compliance identified calculative, normative, and social motivations and ability to comply as determining compliance (Burby et al., 1998; Burby
The following research objectives were pursued:

- Determine how nursery operators’ understandings of HSNO are likely to impact on their compliance.
- Consider the implications of the findings for the effectiveness and appropriateness of HSNO’s policy design.

The theory offered a means of relating social constructions of HSNO to compliance behaviour. By using the theory I was able to identify and assess possible triggers for noncompliance. This was achieved by relating targets’ conceptions of HSNO to the four motivations for compliance. If, for example, my research indicated that respondents viewed HSNO’s rules about fees as unfair I could then contend that one normative motivation was absent and could thus increase the risk of noncompliance. Or, as another example, if I found that respondents perceived that violators had a high risk of detection I could argue that this aspect of calculated motivations was likely to support compliance. Figure 3 below depicts how I applied the conceptual framework to the research.

Figure 3. Application of the Conceptual Framework

In Chapter Six I discuss the risks to compliance identified in the analysis. The implications of these risks for the effectiveness of HSNO’s design are then considered. By using the conceptual framework to identify and assess the risks of noncompliance I am able to offer insights into the appropriateness of HSNO’s design and the
effectiveness of HSNO in addressing the problem of invasive weeds being imported to New Zealand.

Conclusion

This chapter has introduced the conceptual framework that informed and structured my research. First, a brief introduction to the policy sciences was provided. Next, Schneider and Ingram’s theory of policy design was put in the context of the discipline. The theory of policy design was then described, with special attention granted to the aspects of the theory germane to the research: the elements of policy design and their connection to translation dynamics. Following this, I introduced a theory of compliance to use in conjunction with the policy design theory. The theory’s compatibility with Schneider and Ingram’s work was considered and the four motivations for compliance identified by the theory were described. The final portion of the chapter demonstrated how a synthesis of these theories was operationalised to pursue the aims of my research.

With the application of the conceptual framework now clear the next task of this thesis will be to put the theory into practice. In the following chapter, HSNO’s elements of policy design are described. This provides a foundation for subsequent assessment of the targets’ social constructions of HSNO and analysis of risks to compliance.
Chapter Three – HSNO through the Policy Design Lens

This chapter situates the HSNO Act within the causal model of policy design. HSNO’s elements of design relevant to the regulation of plant importation will be described to build a foundation for the analysis that follows. In order to make sense of both the qualitative and the quantitative data, a description of HSNO is necessary. The chapter begins by providing an account of the social, cultural, and ecological context from which HSNO emerged. HSNO’s policy design is then outlined. This will include a description of HSNO’s goals, agents, implementation structure, rules, tools, and several of the rationales and assumptions underlying these.

Background: the societal context that led to HSNO

To understand the societal context from which HSNO’s regulation of plants emerged it is useful to consider how introduction of non-indigenous species was dealt with in the past. The social, economic, and ecological components of this history provide insight into the subsequent social construction of plant introductions as a policy problem.

European explorers and colonisers believed that familiar species from Europe, as well as exotic species from other parts of the globe, would make New Zealand a more productive and pleasant place in which to live (Crosby, 1987). A desire to bring familiar species from home was shared by settlers throughout Europe’s colonies (Bright, 1998, p. 135). Homesickness, uncertainty about using unfamiliar flora and fauna to meet their needs, and wariness about trying new foods prompted colonizers to introduce nonindigenous species. Familiar species were brought to provide food, timber, and pasture and to beautify the landscape as ornamentals (Mack, 2001, p. 23). Not only did the colonists enthusiastically seek to introduce new species, but also they brought many by accident, such as weeds in pasture grasses, insects in ship timbers, rats in cargo and pathogens in people, livestock and plants (Mack et al., 2000, p. 4).

European explorers initiated the flow of species to New Zealand from around the globe. Explorers broadcast seeds as they walked through the new landscape in hopes of enhancing an unfamiliar and seemingly deficient flora (Crosby, 1987, p. 229). In the 1770’s, James Cook introduced rabbits, pigs, and several food crops and their attendant weeds (Crosby, 1987, p. 229). The pace of introductions increased when the first major wave of settlers began arriving in the 1840’s. They brought livestock, crops, pasture
plants and their associated weed species in order to establish farming operations like those they were familiar with in Europe (Crosby, 1987, p. 222; King, 1990, p. 17). Beginning in the 1860's, colonists formed acclimatization societies to organize species introductions in hopes of making New Zealand feel more like 'home' (Williams & West, 2000, p. 426).

As time passed, it became apparent that some of these well-intended introductions were becoming agricultural pests. From rabbits and stoats to gorse and thistles, the colonists were discovering that introduced species did not behave as they had in their native habitats (King, 1990, p. 14). Although the settlers tried to control introduced pests as they emerged, overall, new species were still perceived as desirable. Laws to control problem species were passed alongside those promoting further species introductions. One of the earliest pieces of legislation aimed at controlling invasive weeds was “The Act to Prevent the Propagation of Certain Plants known as Thistles,” passed in Wellington in 1854 (Thomson, 1922, p. 543). Gorse and broom soon became targets of numerous laws beginning with an ordinance adopted in 1859 in Taranaki (Thomson, 1922, p. 543). Simultaneously, laws were enacted to protect introduced species, many of which later became hated pests. Statutes such as the “Act to Provide for the Protection of Certain Animals, Birds, and Fishes Imported into the Province of Nelson,” passed in 1861, exemplified the colonisers’ aspirations to introduce exotic species to New Zealand (Thomson, 1922, p. 544).

The Noxious Weeds Act of 1900 was the first comprehensive policy to deal with a growing array of plants that had become agricultural pests, requiring landowners and land managers to control noxious weeds (Thomson, 1922, p. 552). The Act was amended several times and many species were added to its schedules. By 1950 the Act had grown to include nearly 90 species from the original 25 species in 1900 (Hilgendorf, 1967, p. 7; Thomson, 1922, p. 553). Despite these changes, the Act’s basic themes remained constant. Although responding to existing weed invasions, it was not anticipatory lacking provisions for surveillance to identify naturalised species that were becoming pests. Under the Act, weeds were defined solely as plants that were harmful to agriculture; the concept of invasive weeds was absent.

Efforts to prevent harmful plants and other pest organisms from entering New Zealand also focused exclusively on those threatening agriculture, but showed more foresight than the Noxious Weed Act. Species known to be pests in other parts of the
world were placed on a list of prohibited species. In 1903, for example, “The Orchard and Gardens Pest Act,” sought to prevent a range of insects and fungi, some not yet present in New Zealand, from entering the country on imported plant material, timber, or fruit (Thomson, 1922, p. 550). In assessing the adequacy of these early efforts, one author observed in 1922 that, “there is pretty close inspection at all ports of entry of seeds, fruits, etc. and few deleterious things pass the inspectors” (Thomson, 1922, p. 554). In retrospect, the precautions taken at the border and efforts to control agricultural weeds appear inadequate. Since colonization began in the 1770’s, numerous non-indigenous plants that have been introduced to New Zealand have become weeds impacting not only agriculture but also native biodiversity and ecosystem function.

The policies established at the turn of the century were maintained for decades. New border policies that were implemented over the years, such as the Plants Act 1970, continued to rely on a prohibited list approach. Until the 1990’s, all plants species could be imported to New Zealand as long as they were disease free and were not on a ‘prohibited list’ of known agricultural weeds (Owen, 1998, p. 7). With the introduction of HSNO in 1996, the prohibited list approach was turned on its head. Under HSNO all new species must be evaluated for their risks and benefits before they can be added to the ‘permitted list’ of plants approved for import.

The Resource Management Act (RMA) foreshadowed the development of HSNO by calling for a Hazards Control Commission to manage the adverse effects of new organisms. In seeking to “promote the sustainable management of natural and physical resources” the RMA recognised that the effects of new organisms must be addressed (Sutherland, 1997, p. 203). As it turned out, HSNO was developed as a separate statute and the Hazards Control Commission was ultimately abandoned in favour of creating an independent body to administer HSNO (Sutherland, 1997, p. 203).

In the following section, the elements of HSNO’s design are described. This description provides background information needed to understand the results and discussion in the chapters that follow. While the qualitative and quantitative research present nursery operators’ understandings of HSNO’s elements of design, this chapter draws upon HSNO’s designers, the text of the Act, and implementing agencies to offer the ‘official’ perspective on HSNO.
The Policy Design of the HSNO Act

HSNO's Goals

Policy goals express the desired outcomes a policy is to attain within its social context. These outcomes represent perceived needs and aspirations which may or may not resonate with target groups or society at large (Schneider & Ingram, 1997, p. 83). Assumptions underlying goals may include the cause and significance of the problem/s the policy addresses, and beliefs about who should be held responsible forremedying the problem/s. Some policy goals are specific and instrumental, while others state broad visions and are designed mainly to achieve a hortatory effect (Schneider & Ingram, 1997, p. 84).

The text of HSNO states the statute's purpose is “to protect the environment, and the health and safety of people and communities by preventing or managing the adverse effects of hazardous substances and new organisms” (Anonymous, 1996, S 4). 'New organisms' are defined as plant, animal, or microorganism species that were not present in New Zealand prior to 1998 (Anonymous, 1996, S 2A). As in the RMA, 'environment' is defined to include natural, social, and cultural components (Sutherland, 1997, p. 203). HSNO's goals are 'instrumental,' linking a desirable end-state with actions that must be taken. Although the purpose of the Act is stated in general terms the principles in s 5 describe the desired end-state in more detail. S 5 states that persons charged with the Act’s implementation must acknowledge and take into consideration two essential principles:

a) The safeguarding of the life-supporting capacity of air, water, soil and ecosystems;

b) The maintenance and enhancement of the capacity of people and communities to provide for their own economic, social, and cultural well-being and for the reasonably foreseeable needs of future generations (HSNO, S 5).

Protection of the environment is placed on an equal footing with protection of economic, social and cultural 'well-being.' Because the Act does not specify how environment and economy should be weighted, policy designers required that the agent develop a methodology (approved by Government) outlining how these values would be

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25 This principle is similar to the principles underlying the purpose of the RMA (See RMA 1991, S 5). HSNO shares a number of common principles and term definitions with the RMA. One benefit of this is that interpretation of the RMA to date can provide guidance for interpreting HSNO (Christensen & Williams, 1997, p. 303).
considered in relation to one another during decision-making (House of Representatives New Zealand, 1996, p. 11902).

S 6 of the Act sets out a series of desired values which agents must consider when assessing the risks posed by new organisms and hazardous substances. The values HSNO seeks to protect are:

(a) The sustainability of all native and valued introduced flora and fauna;
(b) The intrinsic value of ecosystems;
(c) Public health;
(d) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga;
(e) The economic and related benefits to be derived from the use of a particular hazardous substance or new organism;
(f) New Zealand’s international obligations (Anonymous, 1996, S 6).

HSNO’s goals differ from those of previous plant importation legislation in several ways. Firstly, the Act requires that the likely effects of a species be assessed prior to importation so adverse effects can be minimised either by forbidding importation or by imposing controls. Secondly, the Act seeks to protect native flora, fauna, and ecosystems whereas previous policy focused solely on protection of primary industry (House of Representatives New Zealand, 1995, p. 5). HSNO not only extends concern to ecological values but also strives to balance these with economic potential of new organisms. Finally, cultural values include those specific to Maori. Previous policy sought to protect valued introduced flora and fauna, which has both economic and cultural importance but did recognise values uniquely Maori.

**HSNO’s Agents**

Agents are the entities identified by a statute that must connect policy goals with target actions. Agencies implement rules and tools according to the implementation structure imposed by the statute (Schneider & Ingram, 1997, p. 89). Rules instruct agents and/or targets to undertake or avoid certain actions. Tools are measures designed to increase the likelihood of compliance (Schneider & Ingram, 1997, pp. 93, 97).

The HSNO Act states that new organisms and hazardous substances shall not be manufactured or imported without the consent of ERMA, the agent created by the statute to administer HSNO and make decisions on applications (Anonymous, 1996, S 14; Christensen & Williams, 1997, p. 301). ERMA consists of three groups: The
Authority, Nga Kaihautu Tikanga Taiao, and ERMA New Zealand. Figure 4 depicts the relationship between these groups.

Figure 4. Organisational Structure of ERMA.

(Adapted from ERMA, 2001c, p. 1)

The Authority is a six to eight member, decision-making body. It considers applications for importation into containment or importation for release of new organisms and hazardous substances by weighing the adverse effects of a proposed import versus its benefits (Christensen & Williams, 1997, p. 305). Nga Kaihautu Tikanga Taiao is the Maori Advisory Committee. Its role is to provide the Authority with a Maori perspective on all applications. ERMA New Zealand, comprised of a Chief Executive and a staff of approximately 90, administers the HSNO Act (Nahkies, Loutit & Rogne, 2003a, p. 84). It manages the application process, evaluates applications from a scientific perspective, raises public awareness of the Act and related biosecurity issues, monitors the Act’s effectiveness, and oversees enforcement (ERMA, 2001c, pp. 1 - 3).

Enforcement for new plant species is carried out by MAF. MAF is far more familiar with the Biosecurity Act and thus far as chosen to prosecute under this Act rather than HSNO. MAF notes that the Biosecurity Act gives them greater power in enforcement than HSNO and they can make use of case law accumulated from past prosecutions (Nahkies et al., 2003a, p. 99). MAF’s enforcement role is arranged via a memorandum of understanding as HSNO does not specify a particular agency for enforcement of the new organism provisions of the Act (Ministry for the Environment, 2002, p. 77). An amendment is planned for HSNO that will identify MAF as the enforcing agency for new organisms (Nahkies et al., 2003a, p. 71).
HSNO's Implementation Structure

Schneider and Ingram (1997, p. 89) define 'implementation' as the "value added to design." 'Value' consists of any alteration to policy design, intended or unanticipated, made by agents and/or targets. Statutes shape implementation by specifying the roles that agents and targets may play in putting the policy into practice. The relationship between agents and targets dictated by a statute is referred to as the 'implementation structure' (Ingram & Schneider, 1990, p. 73).

The implementation structure imposed by HSNO's designers primarily resembles the 'Wilsonian' approach but also contains features of a 'strong statute.' The former describes policy designs that set out clear goals and instruct agents to determine how to pursue these goals (Ingram & Schneider, 1990, p. 77). The rationale for placing implementation discretion in the hands of agents is that government involvement often taints implementation with politically pressured decision-making. A strong statute contains clear goals and objectives as well as providing detailed prescriptions that implementers must follow in pursuit of these (Ingram & Schneider, 1990, p. 74).

HSNO's purpose is stated in broad terms but is made more specific by the accompanying principles and values in s 5 and s 6. The Act enables ERMA to develop means to achieve the goals of the statute. However, the statute provides a series of parameters to shape ERMA's efforts. The Act, for example, requires that the agent develop a methodology in order to ensure that a consistent, transparent process is used to weigh the risks and benefits of a proposed species introduction (Anonymous, 1996, s 9). A framework for application requirements and information to be considered in decision-making is also outlined in the statute (Anonymous, 1996, s 34 - 38). The utilisation of a precautionary approach to deal with technical and scientific uncertainty and adherence to the principles of the Treaty of Waitangi is a requirement of s 7 and s 8 (Anonymous, 1996).

The combination of discretion and oversight evidenced in HSNO's implementation structure is illustrated in the following example. ERMA must strive to balance the ecological and economic values set out in s 5 of HSNO. But the Act does not specify how this balance should be achieved. This provides ERMA with a great deal of discretion (as well as a very challenging task). By developing a methodology ERMA is able to determine how to balance ecological and economic considerations. However, a measure of control is imposed upon this discretion by requiring that their
methodology be approved by Government (House of Representatives New Zealand, 1996).

In a Wilsonian approach much emphasis is placed on holding agents accountable for their success in achieving policy goals (Ingram & Schneider, 1990, p. 77). Although ERMA is held accountable by monitoring and reporting requirements (Anonymous, 1996, S 20), HSNO simultaneously adopts a ‘strong statute’ approach by providing an avenue for government intervention and accountability. The Act enables the Minister for the Environment to over-ride the Authority’s power by ‘calling in’ application decisions if the Minister decides that the organism proposed for import is likely to have ‘significant’ effects on the economy, environment, human health, or the global community (Anonymous, 1996, S 10, 68). The rationale for this design choice was that an official accountable to the electorate should be required to make the final decision on any politically contentious applications (Upton, 1999, p. 9).

**HSNO’s Rules**

A number of HSNO’s rules that direct ERMA’s activities were touched upon in the account of HSNO’s implementation structure. The rules which nursery operators are likely to encounter if they seek to import a plant species not listed on the permitted list are described below.

Part V of HSNO describes how prospective importers may apply to have a new organism considered for approval. This portion of the Act also stipulates what ERMA must consider in the assessment process (Anonymous, 1996). Under HSNO, the applicant must demonstrate that their organism will bring more benefits than adverse effects to New Zealand (Sutherland, 1997, p. 202). Their applications must detail the detrimental effects that could arise from the release of the species in question (Christensen, 1997, p. 305).

Anyone wishing to bring a new plant to New Zealand must seek import approval from ERMA under Section V of the HSNO Act. The two pathways that applications can take under the Act are: rapid assessment applications or full assessment applications. In addition, if a species is present in New Zealand but not included on the permitted list applicants may request that ERMA determine whether the species is a new organism under Section 26 of HSNO. As was mentioned in Chapter One, many plant species found within New Zealand are not yet listed on the Plant Biosecurity

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26 In addition to applying for importation approval under HSNO, importers must also meet MAF biosecurity standards under the Biosecurity Act to prevent harmful passenger organisms from
Section 26 determinations

If an iris enthusiast, for example, wishes to import *Iris prismatica* seeds they must first determine if the flower is considered a new organism. If *Iris prismatica* is not listed in the PBI but the importer knows the species is already present in New Zealand, they can request the Authority to add the species to the index under Section 26 of the HSNO Act. Their section 26 application must provide evidence establishing that the iris was present in New Zealand prior to 1998. Such evidence can include records from nursery catalogues, botanic gardens, or Landcare Research databases (ERMA, 2000, p. 3). Section 26 applications are processed without charge, but the applicant must pay for any services required in assembling evidence of the species’ presence in New Zealand (ERMA, 2000, p. 2).

If the Authority approves the Section 26 determination, the species will be added to the permitted list. The iris enthusiast can then proceed with the importation process by applying to MAF for biosecurity clearance. So far, the Authority has added 177 plants to the PBI as a result of Section 26 determinations (Watson, 2002, p. 10).

Rapid assessment applications

If a plant species is not on the PBI and there is insufficient evidence that the species was in New Zealand prior to 1998, then a Section 26 determination is not an option. In these cases the prospective importer must apply for approval to import from the Authority. Unlike Section 26 determinations, rapid assessment and full assessment applications are processed on a ‘user pays’ basis under the HSNO Act. But once a species gains ERMA approval, subsequent importers may bring it into the country without charge. Rapid assessment applications for the release of plants cost $500 per species (ERMA, 2003c, p. 2). If ERMA must do further research in addition to reviewing the information provided in the application, then the applicant is charged either 10 percent of the base fee or $2,500 (the lesser of the two is selected) (ERMA, 2003c, p. 3).
Applicants can determine if a species is eligible for rapid assessment by referring to the rapid assessment criteria. Firstly, the species in question must not have 'unwanted organism' status. Expert opinion must then establish that the organism is "highly improbable" to form a self-sustaining population in the wild. Finally, experts must determine that the organism is unlikely to displace valued species, cause habitat deterioration, adversely affect safety and human health, cause or spread disease, or harm the environment (Anonymous, 1996, S 35).

Since HSNO was implemented in 1998 to February 2004, seven rapid assessment applications to import new plants for release have been lodged (J. Catley, personal communication, 18 February 2004). ERMA approved one application for two new species, which have been added to the PBI.

**Full assessment applications**

A full assessment application requires detailed information covering a range of subjects including the organism’s biological characteristics, a risk and benefit assessment examining effects on the environment and public health and safety, and incorporation of Maori perspectives (ERMA, 2003e, p. 4). Application fees for full assessment of a new plant species for release are $30,000 (ERMA, 2003c, p. 2). In a full assessment, ERMA solicits written public comment and in some cases, convenes public hearings (ERMA, 2001a, p. 3).

In compliance with section 36 of HSNO, the Authority should reject the application if the plant species is likely to displace native species, impact on Maori cultural values to an unacceptable degree, cause habitat deterioration, adversely affect safety and human health, or act as a source or vector of disease or parasites (with the exception of biocontrol agents). Section 37 provides ERMA with further direction by requiring that they determine if the organism could establish a self-sustaining population. If this is considered possible, then the feasibility of eradicating such a population must be evaluated (Anonymous, 1996, S 36, 37). So far ERMA has not received an application to import a new plant species under full assessment.

**HSNO's Tools**

Tools are measures imposed by a statute and/or by agents to increase the likelihood of compliance (Schneider & Ingram, 1997, p. 93). Schneider and Ingram (1990a) describe several categories of policy tools. Of these, sanctions, hortatory tools,

28 An 'unwanted organisms' register was created under the HSNO Act. It lists organisms banned from sale, import, and/or propagation.
and capacity building tools can be identified in ERMA’s implementation of HSNO. Sanctions provide negative incentives for compliance, such as fines, and are premised on the assumption that people choose to comply with a policy based upon a rational assessment of the risks and benefits of their behaviour (Schneider & Ingram, 1990a, p. 515). In contrast, hortatory tools assume behaviour is guided by internal norms. These tools create a link between compliance with the policy and public values that are likely to be seen in a positive light (Schneider & Ingram, 1990a, p. 519). Capacity building tools provide resources such as information or skills to targets. This approach is based on the rationale that a lack of resources is a barrier to compliance (Schneider & Ingram, 1990a, p. 517).

HSNO stipulates strict sanctions for noncompliance. The Act authorises fines of up to $500,000 and prison terms of up to three months for violators (Anonymous, 1996, S 114). Policy designers assumed that targets would consider the severity of the penalty and the risk of detection when choosing whether or not to comply with the Act. During design, fines were increased from $100,000 to $500,000 in recognition of the fact that detecting breaches of the Act would be difficult (House of Representatives New Zealand, 1995, p. 10).

So far, no one has been prosecuted under the HSNO Act for importing new plant species without ERMA approval. MAF Biosecurity Authority carries out enforcement under the Biosecurity Act rather than HSNO (Environmental Risk Management Authority, 2002, p. 2). From 1994 to 2003 MAF prosecuted 40 individuals under the Biosecurity Act for making false declarations or intentionally failing to declare plant material. Fifteen of these offenders received fines of $1,000 or more. The highest fine imposed was for $10,000 while most were approximately $1,500 (Ministry of Agriculture and Forestry, 2003b). The remaining 25 offenders incurred fines of several hundred dollars. MAF’s records do not specify if plant material involved in these offenses were new organisms or not (Ministry of Agriculture and Forestry, 2003b). Failure to declare plant material when intent to conceal this material appears unlikely is punished by instant fines of $200. In 2000, 40 instant fines were issued for undeclared nursery stock (Anonymous, 2002, p. 5). These fines were a small portion of those awarded overall; During a six month period in 2002, 4,965 people received an instant fine (Ministry of Agriculture and Forestry, 2004).

ERMA utilises a hortatory tool by appealing to HSNO’s values as a reason for compliance. As the agent states, “ERMA New Zealand expects that most people will voluntarily comply with approvals because they recognise that they are necessary to
achieve a safe environment and ensure safety of people and communities” (ERMA, 2001b, p. 1). S 11 of HSNO calls upon the ERMA to “promote awareness of the adverse effects of hazardous substances and new organisms on people or the environment…” (Anonymous, 1996). ERMA conducts capacity building in a variety of ways. Through the website and printed material they offer a range of guides and reports aimed to inform interested parties of HSNO and ERMA, the application process, and enforcement. A presence at various conferences and public awareness sessions further contribute to the agent’s capacity building (Nahkies et al., 2003a, p. 63).

Conclusion

This chapter has placed HSNO within a societal context by briefly considering the role nonindigenous plants have played in New Zealand since colonisation and the polices that have been developed to regulate their importation. Up until the 1990s, a ‘prohibited list’ approach allowed importation of all species except those known to be agricultural weeds. With the introduction of HSNO in 1998 a new approach was taken to regulating the importation of plant species not yet found in New Zealand.

HSNO’s goals include protection not only of primary industry but also of the environment, human health, and cultural values from the adverse effects of new species. The principles underlying HSNO’s goals require that ERMA balance ecological and economic benefits of a proposed species introduction when making decisions under the Act. HSNO’s implementation structure provides discretion to ERMA while imposing parameters to shape their implementation approach. A possible advantage of the mix of oversight and flexibility given ERMA is that the agency should be able to respond to fluid public understandings of, and tolerance for, risk, while adhering to the underlying principles of the Act.

HSNO’s rules appear to be based on the assumption that the initial importer of a new plant species will benefit most from the introduction. Both the user pays approach of the application process and the responsibility of the applicant to gather the information that addresses the criteria in s 35 and s 36 reflect this assumption. ERMA’s responsibility is to evaluate the evidence provided that can aid the Authority in decision-making. The sanctions included in HSNO suggest that severe fines were seen as necessary to deter noncompliance.

The information provided in this chapter provides a context for the research results reported in Chapters Four and Five. Further, the description of HSNO’s
elements of design provides a basis for the discussion in Chapter Six, which considers the implications of risks to compliance for the effectiveness of HSNO's design.
Chapter Four – Exploring HSNO’s Effectiveness

The first stage of the research explored how effectively HSNO is regulating the importation of new plant species. This inductive, qualitative inquiry focused on how the nursery industry, a key target group, viewed HSNO and were responding to the Act. Nursery operators’ reasons for wanting to import new plant species, their experiences with HSNO, and their reactions to the Act were explored via 24 semi-structured interviews. The results of the qualitative research are presented in this chapter.

The reasons nursery operators import new plant species are considered following a brief description of the interviewees. Respondents indicated that financial profit and a passion for plants are important motivations to import new plants. The chapter then focuses on nursery operators’ views of HSNO’s aims. While most nursery respondents were familiar with, and supportive of these aims, a number of those interviewed did not perceive that the plants they wished to import posed a risk to the values HSNO seeks to protect. Further, many were critical of the means employed by the Act to achieve its goals. HSNO’s requirements and its implementation by government agencies provide the focus for the next section of the chapter and centre around three themes: inaccessibility for nursery operators due to the cost of applying, difficulty in understanding the application process and providing the information required, and issues of distrust and disrespect. The final portion of the chapter is devoted to the issue of noncompliance. The research suggests that nursery operators may resort to smuggling as a means of circumventing the HSNO Act. The concern that plant imports are being ‘pushed underground’ brings into question the effectiveness of HSNO in regulating the importation of new plant species. Investigation of the perceived problems with compliance, which formed the basis for the second stage of the research, will be discussed in Chapters Five and Six.

Those interviewed included people within the nursery industry as well as those implementing and enforcing HSNO. Twelve interviewees were involved in the nursery industry. Eight of these managed and/or owned medium to large wholesale nurseries or seed companies. All of these respondents had imported new species into New Zealand prior to HSNO and some had imported new plants after the Act came into effect. The remaining four nursery industry respondents were plant enthusiasts involved in collecting and/or breeding species. They had been engaged in this pastime for between
18 to 38 years. Three of these respondents were operating small-scale nurseries on a part-time basis and one respondent planned to do so in the future. All four had imported new species prior to HSNO. Since HSNO's implementation one had submitted a successful Section 26 application and others had considered this option but decided against it.

Eight persons in the public sector were interviewed. They had various roles in implementing HSNO, enforcing HSNO, or advising HSNO applicants and ERMA. Their HSNO related duties included providing expert opinion on the possible ecological impacts of new plant species, processing new organism applications, implementing biosecurity at the border, and contributing to scientific and Maori perspectives within ERMA's decision-making process. I also interviewed three public sector respondents who were not directly involved with HSNO, but had expertise on the impacts of invasive species in New Zealand, perspectives on the relationship of the nursery industry to the Act, and experience with plant import regulations prior to HSNO.

In the presentation and discussion of the data collected from the qualitative interviews pseudonyms will be used when presenting quotes from my respondents in order to protect their anonymity. Respondents from the public sector will be identified by 'agent' following their pseudonym. All pseudonyms lacking this suffix refer to nursery operators.29

**Motivations for Importing New Plant Species**

I wished to gain insight into why nursery operators import new plant species and gauge the importance of new species to them within the context of their professional and personal interest in plants. This information could in turn, offer insights into targets’ reactions to HSNO and help assess the effectiveness of HSNO’s approach to regulating plant importation. When respondents were asked what prompted them, and others in the industry, to import new plant species, two distinct motives for importing new species were identified: financial profit and a passion for plant collecting.

The research indicates that nursery operators benefit financially from importing new species in several ways. New species may be sought to improve ‘production efficiencies.’ If, for example, a new species propagates more easily or has greater

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29 As was discussed in the methods section of the Introduction, the results of the qualitative research are valuable for their ‘validity’ rather than their ‘reliability.’ Because my sample is not representative of the population, I rarely quantify how many respondents expressed a given view, but rather use approximate terms such as ‘few’, ‘several’, ‘a majority’ and ‘most.’ For details of how many respondents expressed each view please see appendix D.
disease resistance then the grower can produce plants at lower cost. In other instances
new species are sought as sources of germ plasm for developing species through
breeding for release on the market.

Finally, species are imported either for use as parent material or for selling
directly to retailers or the public. Because the popularity of any given species among
consumers is in a constant state of flux (Douglas, 2003, p. 13) developing something
new via breeding or importing new species to sell on without modification, helps
maintain and/or boost revenue for nurseries. Consumers are willing to pay more for a
product when it first appears on the market. Ben and Adam explained:

> The consumer is in for new and different things all the time. And so that's
what's driving the grower and the marketer to look for that material because
we're going to make some money and hopefully instead of 60 cents you can sell
[each plant] for two or three dollars.

> The main, number one reason [to import a new species] would be to make
money, sell something that nobody else has got or to be first in with a new
product. It's just normal commercial reality.

Consumers will pay a premium for something new, not solely for its novelty but
in order to keep up with fashion trends. A number of respondents identified the fashion
appeal of new plants. David described the types of plants he sells as "very trendy and
always expensive" and as having an appealing "style." Josh and Ariana remarked:

> It's a fashion item we've got here...we need a new colour for winter next year
you know, it's got to change.

> I think there are fashions in gardening same as in everything else. People want
a new look. Grasses were 'in' now it's succulents.

Offering something new is also important to maintain an interested customer base.
Mitch raised the concern that since accessing new species has become more difficult
under the HSNO Act the industry risks losing consumer interest:

> It would be like saying, "well from now on there will be no new colours for our
clothing"...well that's not going to do terribly much for the fashion industry in
New Zealand. Well, gardening is exactly the same. We need to have the new
fad colours, we need to have the plants with better disease resistance, all those
sorts of things. Yet if we persist with the current system of importation we're not
going to get those new colours...so therefore New Zealand gardeners will get

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30 Horticulture, currently a four billion dollar industry (Kerr, Hewett & Aitken, 2002, p. 3), is based upon
production from exotic species. Throughout its history in New Zealand horticulture has sought out new
species to keep up with changing markets. The agriculture and forestry industries have followed a similar
pattern. Introducing new products to maintain sales is not unique to the horticulture industry. Within the
current economic system expanding one's market and modifying the range of products on offer are vital
to business survival and profitability.

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tired of what's already available and move on to doing something that's a bit more exciting.

Nursery people may be especially concerned that limited access to new species could decrease consumer interest in gardening in light of other pressures on the industry that are currently causing it to contract.31

Promoting and keeping up with ‘plant fashions’ and pursuing other means of financial profit by importing new species formed the primary, but not sole, motivation for importation. Either referring to themselves, their customers, or others in the industry, a number of respondents described an avid interest in plant collecting as an important motive for importing new plant species. Mitch explained:

In New Zealand we have a lot of gardeners ... who are interested in a particular type of thing. You know, like miniature bulbs or alpines - those sorts of groups. A lot of those people are avid plant collectors and they love to import seed of new things that they see.

Describing herself, Mary, a part-time, small-scale nursery operator, observed:

...really my whole life revolves around plants because I simply love plants. I belong to several [plant enthusiast societies] and I garden all the time. I have a job as well, but I garden from choice rather than as just a spare time thing...basically, I'm a 'plants person.'

‘Plants people’ derive great enjoyment from growing new species. One respondent fondly remembered obtaining “amazing stuff” by purchasing shares in plant hunting expeditions where yet un-named species were collected from wilderness areas overseas. Another respondent, Sheryl, commented:

You can bring these species in from other parts of the world but they won’t necessarily always grow in our climate. But collectors will love to have a go. That's all part of the fun I suppose, being able to grow something that's grown in another part of the world.

Nursery operators reported that they had encountered plant enthusiasts who were baffled by the new regulations and frustrated that nurseries were not providing the species they desired. One respondent lamented how HSNO had limited her and her peers’ access to new species. She vividly explained that being unable to obtain new plant species was like forbidding a chef from trying a new recipe or showing a musician a new composition but allowing him to play only the “old, familiar stuff.”
This description not only conveys an artistic passion for plant collecting, but it also demonstrates the similarity of plant collecting to other well-loved past-times. Mack (2001, p. 30) points out that collecting as a behaviour is not unique to ‘plant people.’ People avidly collect items such as stamps, antique cars, and Lord of the Rings action figures. These collectors share a passion for obtaining items that are linked by a theme, difficult to obtain, and durable for the life-time of the collector. Plant collectors specialise in certain genera or communities of plants such as rhododendrons or alpine plants. Plant collecting has a recorded history back to the 6th century B.C. but did not become widely popular until European explorers described and brought home novel species from their travels (Mack, 2001, pp. 31, 32).

The economic and social/psychological motivations described above shed light on why people seek to import new species into New Zealand. As in the production and sale of other commodities, offering a ‘new model’ is seen as vital for nursery people in order to capture and maintain consumer interest. Importers driven by a passion for collecting appear to gain much personal satisfaction from the acquisition and cultivation of new additions to their ‘set.’ In the rest of this chapter, attention shifts to nursery operators’ views of the HSNO Act. Keeping in mind the motivations for importing plants described above may be of help to understand the views and reactions of targets to the Act.

Responses to HSNO’s goals

Nursery respondents were asked to comment on their views on HSNO’s purpose. The research indicated that, on the whole, respondents were moderately to strongly supportive of HSNO’s goals. However, three issues emerged that appeared to undermine this support. Firstly, several respondents suggested that HSNO might have an unstated agenda to block the industry from importing exotic species. Secondly, most respondents perceived that the plant species they wished to import posed little risk to the values HSNO seeks to protect. Finally, the majority of respondents felt the means employed by the Act to pursue its goals were problematic.

In expressing their support for HSNO’s goals several respondents described mistakes of the past, where plants were imported that later became pernicious weeds.

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These pressures include rising interest in other leisure activities, busier lifestyles and a business environment where the industry is increasingly dominated by a few large nurseries, rather than a range of business sizes as in the past (Gill Ellis & Associates, 2000).
commenting that additional pest plants would be undesirable. David and Ariana remarked:

_The reasons for keeping some plants out, the weeds and that, are sound you know. We don’t have a problem with that. We’re very much in favour of doing it properly._

_One has only to look at things around the country-side like gorse and broom and old man’s beard to use the classic examples. There can be really, terribly dangerous plants._

Others perceived the need for biosecurity primarily in terms of keeping pests and diseases that could harm primary industry from entering the country as hitchhikers on imported plant material. Chris observed:

_We know, being in the plant industry, that there are certainly a lot of pests and diseases overseas that we definitely don’t want in New Zealand. It makes sense to me that any new organisms are checked out. I don’t have any problem with that at all._

Awareness of plants as a threat to the environment is a relatively new phenomenon in New Zealand, becoming wide-spread in the 1980’s (Williams & West, 2000, p. 432). Agents Tabitha and Richard both noted that plant importation regulation preceding HSNO and the Biosecurity Act was “_basically a phytosanitary standard not really aimed at plants, what it was concerned with was plants’ diseases._” To the extent that the prohibited list approach did exclude plants for weediness, Richard observed it was “_concerned primarily with agricultural weeds and with bulk imports of seeds for sowing to detect contaminants._”

Respondents who expressed ambivalence or suspicion about HSNO’s intent mentioned the importance of its stated goals on the one hand but suggested a possible unstated agenda. One respondent described HSNO as being “_very slanted towards the greenies,_” while Danielle mused:

_I suppose overall it’s to protect the environment...the people environment, the flora and fauna environment, the tourist environment. A lot of us would say that it’s motivated by the green movement generally who want to keep New Zealand native.... I know the green lovers had a big input into the formulation of the Act._

Josh speculated:

_[HSNO] could be a very indirect way of [stopping plant imports]. ‘Oh look, you guys can do it. It’s going to cost you an arm and a leg. We know behind the scenes it’s really unrealistic so you’ll never do it. But the avenue is open.’_
Many respondents argued that while HSNO’s goals were sound, the Act “targets plants that are plainly not a problem.” Nursery operators perceived that the species they wished to import posed little to zero risk to New Zealand as expressed in the quotes below:

There’s no way they are ever going to be any kind of hazard of any kind. There’s no weed potential (Danielle).

The risk of a particular plant being a problem is certainly, in ornamental horticulture, bloody low, almost minimal (Josh).

Respondents noted that the species or genera that interested them were often “damn difficult to grow.” They mentioned biogeographical characteristics such as slow growth, difficulty in propagation, and poor climate match. Respondents’ perception that their imports pose little risk alongside their overall concerns about biosecurity is an interesting juxtaposition. Research commissioned by ERMA indicated that a representative sample of New Zealanders demonstrated a similar attitude to risk. They expressed high concern about the adverse effects of new plants and animals on New Zealand but strongly supported hypothetical proposals to import a new flower, fruit or vegetable species (Network Communications, 2002a, pp. 7, 17). Schneider and Ingram (1990b, p. 93) also shed light on this matter when noting that individuals tend to under-estimate risks of hazards within their control while over-estimating risks of hazards they view as external to themselves.

Several respondents felt that while the relatively low-risk activity of importing new plant species was receiving excess scrutiny under HSNO, other pathways of biosecurity concern were being neglected. Adam commented:

Shipping containers pose a much greater risk. [The current approach to biosecurity] is like spending ten thousand dollars putting in security cameras and flash locks on the front of your building and then leaving your back door open all night.

The concerns raised about HSNO’s possible hidden agenda, the low risk of plant imports, and the neglect of other biosecurity risk pathways were dwarfed by another issue that emerged repeatedly in the interviews; HSNO’s requirements and the implementation of the Act were seen as problematic. As Mitch noted:

I think [HSNO] is a sensible way to make sure that we protect our environment and also protect some of the major export crops that we have.... The philosophy behind HSNO... is actually a very good philosophy, I have no problem with it
Views of the Act’s Requirements and their Implementation

When discussing the impacts of HSNO, one agent observed that the Act had “slammed the door shut” on the “honest importation of plants.” My research suggests that, at least for those I spoke with, this holds true. Eleven of the 12 nursery respondents had decided against importing new plant species under the Act. These decisions were based upon their assessments of the Act and its implementation. Their concerns can be placed into three categories. First that HSNO is inaccessible to nursery operators because of the cost of applying, second that going through the application process seems too difficult, and finally that the implementing agencies show a lack of trust and respect for the nursery industry.

Issues with Costs

Inaccessibility because of cost was the most frequently raised issue among respondents. Almost all nursery operators interviewed explained that the application fees were too high in relation to the profit that could be anticipated from future sales of a new plant species. The smaller nursery operators were especially adamant about this point. As Chris explained:

*The problem you have in New Zealand is it’s a small market and basically to go through the current process doesn’t justify the costs involved. I mean we’re not really big enough to do any sort of numbers. For me to actually go through that process I would never get the money back just to put a few hundred plants on the market. So it’s sort of limited to the bigger commercial people rather than the likes of us.*

Plant enthusiasts operating ‘backyard’ nurseries often import very small quantities of seed of a variety of species. Likewise, larger nurseries often trial species on a small scale before identifying and marketing one with commercial promise. Growers wishing to import species for breeding often have a long lead-time as they develop something for the market, thus delaying their opportunity to recoup the cost of applying to import the species. In noting that the nursery industry was losing many mid-size operators, a respondent noted that a “very small group of real large growers…[are] the only ones that are going to be able to promote new material.”
The one respondent who did not find HSNO's fees to be a barrier had submitted a low-risk Section V application and was given approval by ERMA to import two new species. He explained that from the outset he was confident that he could recover his costs and he felt sure that the plants posed such a low risk to New Zealand that ERMA was very likely to approve his application. For his type of nursery operation, specialising in the sale of trendy specimen trees and shrubs, HSNO's fees were not prohibitive.

Although this nurseryman did not perceive application fees to be a barrier to using HSNO, he did join a large number of other respondents in expressing concern for another aspect of application fees; the lack of protection for the 'first mover.' That is, the person who submits an application to import a new plant species must pay the application fee while subsequent importers of that species pay nothing, thus putting the first mover at a commercial disadvantage. Adam and David explained:

*I think the big thing for me is the fact that at the end of [the application process] you haven't got any exclusivity. You spend all that money and you know that every man and his dog is going to get straight on it. So that is a powerful reason for not [applying to HSNO].

The moment you [apply to HSNO] the results of that application are published and then everybody has access to your work. Everyone can bring it in then... you've gone and done it for them.... I would like that to be changed because we try to stay ahead you know.

Respondents were divided on the best way to resolve barriers posed by fees. Some felt it was best to retain a 'user pays' approach but mitigate the impact of fees by decreasing them and /or providing protection for the first mover. In supporting 'user pays' they noted that importers have the most to gain from bringing in a new species and therefore should pay the cost. Some also saw publicly funded applications as "government hand-outs." Other respondents favoured tax-payer funded applications. They argued that HSNO endeavours "to protect the environment in New Zealand as a whole" and that many New Zealanders reap gardening satisfaction from the presence of new species.

**Difficulties with the application process**

Another theme that surfaced frequently during interviews was that applying under HSNO was made difficult by a confusing, technically demanding application process and a lack of flexibility or 'common sense' on ERMA's part. Further, HSNO's
complexity was intensified by the simultaneous need to comply with MAF importation requirements. A number of respondents felt overwhelmed by the technical information needed to complete an application. A nursery operator, who in most other respects viewed HSNO positively, commented:

I mean we're only lay people, we're not scientists. Getting the information when you don't know where to look - you just have to ferret about, be a bit creative (David).

Commenting on the confusing nature of the application procedure one respondent described ERMA as 'untouchable' and explained:

I don't think ERMA have made any real efforts to get themselves touchable by the ordinary person. I mean I've attended seminars, I'm not stupid, this is technical stuff. I sit there like a complete dummy. I mean it's so intense (Josh).

Several respondents seemed to lack accurate understanding of HSNO's requirements and other steps in the importation process because they related information to me during interviews that I knew to be incorrect. Others with a good understanding of the requirements felt it should be possible to assess the risks and benefits of new species in a simpler, more efficient, and less costly manner.

Respondents who argued that the species they wished to import were low-risk found ERMA inflexible and unable to assess plants using “common sense.” ERMA’s lack of common sense was sometimes attributed to the agency being too “idealistic” at the expense of being “broadminded” and “user friendly.” Some felt that low-risk genera should be identified and added to the PBI rather than requiring each species to be assessed separately.

Another aspect of HSNO’s implementation that concerned most respondents was the fact that the PBI is an incomplete list of plant species present in New Zealand prior to 1998. In order to import a species omitted from the data-base, importers must submit an application to ERMA to determine if the organism is present in New Zealand (a Section 26 application). Although there is no application fee for adding a species to the PBI, assembling the evidence may be costly and time consuming. A number of respondents felt it was unfair that they had to remedy omissions in the PBI made by the government. Preparing a Section 26 application was described by respondents as “a slow process of finding information” and as “very difficult.” Chris commented:

[An incomplete PBI] makes [importing] difficult because as a ‘plants person’ you can know that a particular species has been here and you try to introduce another variety from overseas of the same species, then you've got to go to the process of proving that the species does exist in New Zealand....
Respondents’ difficulties with HSNO appeared to be compounded by the fact that they found the importation process as a whole to be complex. MAF import requirements were seen as confounding, burdensome, and constantly in a state of flux. In the importer’s mind distinctions between regulations such as HSNO, the Biosecurity Act, and Import Health Standards seemed blurred. All play a part in the importation process and are experienced as a whole. The frustration directed towards MAF may have coloured perceptions of HSNO and ERMA for nursery operators who, so far, had not had direct experience with the Act or its implementing agency.

Respondents raised a variety of issues pertaining to MAF. Some reported imports delayed or blocked by a shortage of quarantine facilities and a backlog of import health requirements yet to be updated and reissued. Others noted that with greater emphasis on detecting plant pathogens and better technical capabilities MAF scientists are identifying a wider range of pathogens on imported plant material. Once identified, it takes MAF time to determine which of these already exist in New Zealand.

The behaviour of inspectors on the ground was criticised as pedantic and lacking common sense. An example of this was related to me by a respondent who had recently imported a container of plants in which inspectors had located several snails. The importer suggested removing the snails by hand, crushing them and then keeping the plants in quarantine for several months to monitor for newly hatched snails. However, the inspector rejected this option stating that destroying the snails before they reached maturity would make it impossible to identify them. Identification was necessary because if the snails were new organisms then their presence in New Zealand would be a contravention of the HSNO Act. As a result the importer shipped the plants back to the port of origin.

**Issues of Respect and Trust**

The final major theme that surfaced from the research related to respect and trust. When discussing a number of issues many respondents indicated doubts about ERMA’s trust and respect for members of the nursery industry. Those interviewed who had learned of HSNO after its implementation seemed irritated or hurt that their input had not been sought when the Act was being formulated. Others spoke of the expertise that they and others in the industry possessed and lamented the fact that ERMA was “inflexible” and failed to take their knowledge into consideration. Similarly, some felt that experts at ERMA and MAF were closed-minded towards expert opinion from overseas. ERMA and MAF’s “very narrow field of view” was
thought to lead to poor and belaboured decision-making. Several respondents sensed that concerns of the ornamental growers were less important to MAF than the concerns of larger constituencies such as agriculture or forestry. Others questioned if ERMA was charging fairly and felt adequate risk assessment could be completed for a lower fee.

More problems with trust and respect were raised regarding MAF than ERMA. This could be because MAF is the agency respondents interact with most. MAF is often the first port of call for inquiries about HSNO because MAF implements other importation regulations, and enforces all biosecurity regulations. Furthermore, MAF has been in existence for many more years than ERMA. Some respondents felt MAF should strive to improve relations with the nursery industry. Mitch explained:

*I would like to see a closer relationship between MAF and the industry so that they know I am not going to be pulling the wool over their eyes. It's within our interest to make sure that diseases don't come into the country. It's the last thing we want...we're not going to pull a swifty on them.*

Other respondents had felt humiliated by interactions with MAF staff, for instance, by being treated with suspicion at the border. Another nursery operator felt treated disrespectfully by MAF since inviting a MAF inspector to join her family for lunch after he had examined plants on her premises. She was hurt when she later discovered that he included the time lunching as her guest on the invoice charging her for his time.

The issues raised by interview participants about HSNO and its implementation are wide ranging. Greatest concern was expressed about application fees. Both the level of the fees and the lack of protection for first movers were perceived as making new plant species inaccessible to many. The difficulty in undertaking the HSNO process also troubled most respondents. Whether vexed by assembling evidence for a Section 26 application or irritated by perceived inflexibility in decision-making on ERMA's part, these issues held in common the sense that complying with the Act was arduous. Although less widespread among respondents, concerns about trust and respect from ERMA and MAF were also relevant.

What can be concluded from the themes discussed above in regards to HSNO's effectiveness? It is not unusual for members of an industry to view regulation negatively. Nursery industry publications reveal a number of other policies and laws that the industry finds burdensome, restrictive, and generally problematic (See Anonymous, 2003; Bourne, 2002; Gargiulo, 2003; Kennedy, 1999). While disparaging comments about regulation should not be equated with policy failure, the issues raised should be considered when evaluating the policy. How might the criticisms and concerns shared by those I interviewed impact on HSNO's effectiveness in regulating
the importation of new plant species? Insights relevant to this question can be found in respondents’ views of how these concerns might affect compliance with HSNO. Nearly every respondent commented that nursery operators frustrated with the Act were likely to resort to smuggling in order to get new plant species into New Zealand. This issue will be explored below.

**Smuggling: an Unintended Outcome of HSNO?**

Many respondents suggested plant importers are likely to smuggle because there are few incentives to comply with HSNO and several incentives not to comply. Most agents were concerned that enforcing HSNO was difficult thus making smugglers less likely to be deterred by fear of being caught and punished. The perception existed among some agents that it was “dead easy” to smuggle seeds into New Zealand via mis-labelling declared seed or failing to declare plant materials concealed in mail or luggage. A nursery operator commented: “[Smuggling] is actually very easy and I’ve had plenty of people offer to bring in plants for me which you shouldn’t bring in” (David).

One agent argued that HSNO is “unenforceable” and it would be difficult to “get a prosecution if someone broke the law...you are never actually going to catch them.” She supported this view by explaining that it can be challenging to detect smuggled material and difficult to prove culpability for material received through the post. Further, once a species is in cultivation it is hard to prove it entered New Zealand after HSNO came into effect. Several respondents felt that the only incentive for complying with HSNO was “knowing you’ve done the right thing” and looking after the “good of the country.” However, other respondents were more confident that smuggling could be detected, at least at the border. One agent commented:

> [MAF Quarantine Service are] really doing the best they can.... I’m sure there’s loopholes on how to get around it because they do have people smuggle things in and out of the country. But I don’t know how they’d do it. They’d have to be quite clever (Lisa).

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32 About two thirds of respondents initiated discussion of the smuggling issue when discussing their views on HSNO and its implementation. I prompted others by saying, “some people have suggested that plant importers might resort to smuggling as a means of getting around the HSNO Act. What do you think about that?”
Another agent explained that while MAF Quarantine Service must screen a large volume of passengers, mail, and luggage, they are aided by a dedicated staff, skilled detector dogs, and a good X-ray system.

Despite these strengths, the agent noted that increases in passenger numbers and their baggage were putting a strain on border screening. Further, in recent years he had observed that people were being more creative in concealing plant material, for example, attaching plants to their bodies or secreting seeds inside the tabs of Panadol packets. This respondent and several others also pointed out that seed can be difficult to identify, thus increasing the risk that falsely labelled seed could pass inspection.

The concern and uncertainty felt by agents regarding compliance was well expressed by Richard (agent):

*It's just a huge question mark as to whether the legislation is being complied with. We have no idea how much smuggling is going on. We have some idea as to what's detected at the border in terms of the frequency of interception of goods, seeds and stuff, that don't comply. But as incredible as it might seem...we actually don't undertake an analysis of what that stuff is.*

Due to the challenges in detection and enforcement it could be argued that positive incentives for compliance are quite important. However, many respondents indicated that positive incentives to comply with HSNO were few. Tabitha (agent) commented:

*I honestly believe that until you can 99 or even 95 percent guarantee that you'll catch people who try to import seed illegally...you cannot have a system that is so punitive.*

The aspects of HSNO that she and other respondents perceived to be punitive were prohibitively high application fees, complex, technical, and demanding application requirements, and disrespect for the nursery industry. Nursery operators commented:

*What ERMA have to be careful of...[is] if you regulate in an unreasonable way, an uneconomic way, in a completely untouchable way, you might increase the incidence of people trying to get material in another way (Josh).*

*By bringing in the fee structure, and bringing in draconian regulations, what it's going to do is just force people to be inventive...it's going to drive plant imports, seed imports, underground (Rob).*

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33 In 2003, approximately 3.7 million international arrivals were processed through New Zealand’s airports (Ministry of Agriculture and Forestry, 2004). Six years earlier, passengers per annum totalled only 1.4 million (Taylor et al., 2000, p. 50).

34 For presentation and discussion of the data available about detection and enforcement of sanctions under HSNO please refer to Chapter Three, p. 39.
It's just too inflexible so what's going to happen is people are going to smuggle (Sheryl).

A few nursery operators admitted that they had smuggled while others distanced themselves from this behaviour. The latter described themselves, and others like them, as “professionals,” “specialists,” or “bigger people” and explained that they had too much to lose to risk smuggling. As Adam put it:

“It’s not worth it. We can make money doing the safe stuff...you [smuggle] and you get caught – that’s everything down the gurgler.”

These respondents suggested that small nurseries, amateurs, plant collectors, and ‘bad apples’ were the likely smugglers. Respondents made many comments about smuggling such as:

*New plant material is coming into New Zealand. It appears all of a sudden on the marketplace. I’m sure it hasn’t come through legitimate channels and that really does concern me...* (Mitch).

[Smuggling] is happening, yes...there are various ways, which I’m not going to go into, but yes...the inventiveness of New Zealanders is still there (Wade).

*When I know in my mind that there are no dangers with a particular species I really wouldn’t hesitate to bring it in* (Danielle).

*A lot of people are angry and frustrated and regularly tell [ERMA] that mislabelling and smuggling occurs as a direct result of [HSNO] and the time and cost involved in processing applications* (Becky; agent).

*People have found the cost prohibitive and have been looking to find other means to bring material into the country...and I’ve had nurserymen on the phone being quite upset because they know that people have brought material into the country that isn’t supposed to be here. They’re worried about whatever diseases might have come affecting their trade* (Zeke; agent).

What should be made of the criticisms, concerns, and confessions recounted above? Although the majority of my respondents argued that frustrated plant importers were likely to turn to smuggling there is no easy way to corroborate these claims. The research did not rule out the possibility that the smuggling concerns revealed were simply ungrounded fears on the part of agents anxious to protect New Zealand’s biosecurity or spurious speculation from nurserymen frustrated with HSNO. Those who confessed to smuggling could well be in the minority. On the other hand, it is possible that my research underestimated the magnitude of noncompliance. Discussing a
sensitive subject such as smuggling could make nursery people cautious in what they reveal about their views and behaviours.

To investigate concerns about compliance further, it was feasible to take a closer look at what might trigger noncompliance. What began as an exploratory examination of the effectiveness of HSNO generated new questions about the relationship between the target group, HSNO's requirements and implementation, and the risks to compliance.

This chapter has chronicled an exploratory examination of the effectiveness of HSNO. This stage of the research was approached by focusing on a key target group's reactions to the Act. The qualitative data presented in this chapter provides one depiction of nursery operators' views of HSNO. Problems with the cost of compliance, the ease of compliance, and the relationship between targets and implementing agencies were revealed in the data. To varying degrees most respondents linked these issues to noncompliance. In order to explore how aspects of HSNO and its implementation might increase the likelihood of noncompliance I undertook a second stage of research. To assess the possible triggers for noncompliance I gathered quantitative data and analysed these data with the aid of the theoretical framework discussed in Chapter Two. The results of this phase of the research are presented and discussed in the chapters that follow.
Chapter Five - Socially Constructed Understandings of HSNO

Chapter Four discussed possible problems with noncompliance illuminated by the qualitative data analysis. Most respondents suggested that aspects of HSNO’s design and implementation may be prompting noncompliance. The primary disincentives identified were the cost and complexity of the application process, a lack of flexibility in implementation, a lack of trust and respect for the nursery industry on the part of agents, and ineffective enforcement. The relevance of these factors to noncompliance as well as the prevalence of noncompliance could not be determined by the qualitative research. While further research identifying incidents of smuggling and learning why people chose to smuggle in those instances was infeasible, research assessing possible triggers for noncompliance was practicable.

To explore the possible problems with noncompliance, quantitative research was undertaken. This research investigates the issues identified in the qualitative research with the aid of a theoretical framework. The framework, discussed in Chapter Two, incorporates a causal theory of policy design (Schneider & Ingram, 1997) with a theory of compliance behaviour (Winter & May, 2001). This chapter focuses on the policy design component of the framework. The ‘translation dynamics’ within the causal theory of policy design explain the relationship between HSNO’s elements of design and nursery operators’ policy participation. HSNO’s goals, rules, tools, and agents are cast as independent variables. As nursery operators encounter the Act they construct understandings of the policy which in turn, affects how they choose to behave in response to it. Their policy participation then affects the societal context. For instance, noncompliance may compromise the Act’s effectiveness in managing the adverse effects of introduced plant species while compliance may bolster the Act’s effectiveness in addressing this problem. The quantitative phase of the research sought to answer three research questions:

- What are nursery operators’ interpretations of HSNO’s elements of design?
- How are these interpretations likely to impact on compliance?
- What are the implications of the findings for the effectiveness and appropriateness of HSNO’s policy design?

35 Although the second phase of the research is primarily quantitative, some qualitative data was collected as well. These data are integrated with the quantitative results.
The first of these questions is addressed in this chapter while Chapter Six attends to the latter two. This chapter is structured around the series of descriptive and analytical tasks outlined below.

1. Describe sample characteristics.

Target groups are elements of policy design. Targets’ social, economic, political, and cultural characteristics affect their interpretations of a policy and their subsequent actions in response (Schneider & Ingram, 1990b, p. 77). Painting a clear picture of ‘who’ nursery operators are as a population may provide insights into their understandings of HSNO. Measuring their interest in importing new species as well as their past experience engaging in this behaviour provides an indication of their relevance as targets.

2. Describe the experiences nursery operators have had with HSNO.

3. Describe nursery operators’ awareness of HSNO’s requirements for the importation of new plant species.

Nursery operators may have direct experiences with the Act and/or may gather second-hand information about HSNO. Based upon these encounters operators form understandings of HSNO. Describing the population’s awareness of and experiences with HSNO provides information used in later analysis to ascertain if relationships exist between these characteristics and interpretations of HSNO.

4. Describe nursery operators’ interpretations of HSNO by examining their attitudes and beliefs towards its goals, agents, rules, and tools.

Themes from the qualitative data identified as posing a risk to compliance directed focus to specific aspects of HSNO’s design. Several open ended prompts were also included in the questionnaire to allow for the discovery of issues beyond those revealed in the first phase of the research. A portrayal of nursery operators’ constructed understandings of HSNO will provide the information necessary to determine how these interpretations might affect compliance. This analysis, undertaken in Chapter Six, will utilise the second component of the conceptual framework. The theory of compliance behaviour will be used to identify possible triggers for noncompliance.

5. Determine if there are statistically significant relationships between targets’ conceptions of HSNO and characteristics of nursery operators.

The qualitative research suggested that nursery size and enthusiasm for plants were related to compliance behaviour. The quantitative research seeks to determine if relationships exist between characteristics of nursery operators and particular views of HSNO. This will be useful in the analysis of possible triggers for noncompliance. The
statistical analysis began with determining if hypothesized relationships existed between variables. This was done by conducting chi-square tests for relatedness. If a significant result was found then post-hoc testing was carried out on all possible pairs of variables.

Characteristics of the Sample and Population Parameters

Data were gathered from a representative sample of nursery operators via a quantitative, postal questionnaire. Respondents ($n = 346$) were comprised of a random sample of wholesale nursery owners and/or managers throughout New Zealand who had imported plant material in the past and/or who were interested in doing so in the future. Screening questions excluded those who did not meet this criterion. Selecting respondents in this way ensured data were collected only from nursery operators whose past behaviour or future intentions suggested they were relevant targets of HSNO. Questionnaires were sent to a random sample of 950 nursery operators. A total of 346 valid questionnaires were returned while 218 nursery operators communicated that they were ineligible. Seventeen questionnaires were undeliverable by the postal service. This resulted in a response rate of 48 percent.$^{36}$ As few data describing wholesale nursery operators are available (J. Kennerly, personal communication, 15 August 2003; D. Shillito, personal communication, 24 March 2004), it was not possible to compare sample statistics with known population parameters.

Nursery owners and managers were targeted by the research because of their role in decision-making within a nursery. Most respondents both owned and managed their nursery (63 percent) while 25 percent of respondents were nursery owners and 12 percent nursery managers.

To determine the size of nursery operations gross annual revenue (GAR) was measured placing respondents in one of seven size categories. These are depicted in Figure 5 below.

$^{36}$ The response rate is calculated by dividing number of respondents by sample size. Sample size equals the number of questionnaires posted to respondents minus the sum of the number returned who were ineligible and the number returned by the postal service marked undeliverable.
The distribution above shows that the industry is composed primarily of smaller nurseries with 58 percent of the sample indicating gross annual revenues of less than $150 k per annum. The distribution mean lies between the $50 to 149k and $150 to $499 k categories.

Most of the nurseries’ revenues were generated from plant sales domestically: Seventy-six percent of respondents sold plant material exclusively on the domestic market while 21 percent catered to both domestic and export clients. Only three percent of respondents sold for export only. Whether selling domestically or for export, most nursery operators produced plant material for use in home gardens and/or amenity plantings. Seventy-one percent of respondents focused solely on plants with this end-use. A variety of other end-uses were also reported, as shown in Table 1 below. The fact that the majority of respondents sold plants for use in gardens and amenity plantings and focused solely upon a domestic market indicates that wholesale nursery operators are a relevant target of HSNO; Ornamental plants imported for distribution within New Zealand have thus far been the primary source of environmental weeds (Sullivan et al., 2001b, p. 3). Information about the end-use of plants sold by each nursery was also collected in order to determine if assessments of the risks posed by plants differed based upon the end-uses of a nursery operator’s plants. Subsequent analysis did not identify an association between this variable and assessments of the risks plants pose.

37 While the qualitative research sought respondents who produced plants for home gardens and amenity plantings, the quantitative research had a wider scope. All wholesale nurseries listed in the sample frame were drawn upon to form a random sample.
Table 1. End users for plants sold by wholesale nurseries.

<table>
<thead>
<tr>
<th>End Uses for Plant Material</th>
<th>Freq</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home gardens /amenity plantings</td>
<td>267</td>
<td>80%</td>
</tr>
<tr>
<td>Agriculture/horticulture</td>
<td>100</td>
<td>30%</td>
</tr>
<tr>
<td>Shelter belts</td>
<td>65</td>
<td>20%</td>
</tr>
<tr>
<td>Other (cut flowers = 14, native revegetation = 13)</td>
<td>49</td>
<td>15%</td>
</tr>
<tr>
<td>Forestry</td>
<td>38</td>
<td>11%</td>
</tr>
<tr>
<td>Erosion control</td>
<td>35</td>
<td>10%</td>
</tr>
</tbody>
</table>

The number of years operators had been involved in the industry was measured so that the policy environments with which respondents were likely to be accustomed could be identified. Respondents involved in the industry for longer than six years were present during the shift from the prohibited list approach to HSNO, while respondents joining the industry from 1998 to 2003 became involved once HSNO was already in place.

Figure 6. Number of years in the nursery industry.

The sample distribution has a range of one to 60 years with a mean of 19.5 years. The median is 17 years and the mode is 20 years. As these measures of central tendency suggest, most respondents experienced the transition to HSNO; only 12 percent of the sample had entered the industry since 1998.

In addition to ascertaining length of time in the industry, the reasons for respondents' involvement were also explored. The qualitative research suggested that two primary motivations existed for involvement in the industry: economic livelihood and interest in plants. The quantitative data indicates that both motivations were important to most nursery operators (See Table 2 below).
Table 2. Primary reason for involvement in the nursery industry.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primarily in the industry to make a living (n = 342)</td>
<td>45%</td>
<td>35%</td>
<td>12%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Primarily in the industry because passionate about plants (n = 340)</td>
<td>40%</td>
<td>41%</td>
<td>14%</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

It was hypothesized that respondents could be divided into two populations based upon their motivations for being in the nursery industry: those engaged primarily for economic reasons and those involved because of their passion for plants. However analysis did not reveal a statistically significant relationship between these variables.

Respondents were also described in regards to their status as plant enthusiasts. They were asked if they collected or bred plants in their spare time. Sixty-seven percent of the sample reported doing so. The qualitative results suggested that plant enthusiasts were more likely to smuggle. Ascertaining which respondents were plant enthusiasts made analysis of relationships between this characteristic and views of HSNO possible. Membership in plant enthusiast clubs and professional bodies such as the NGIA was also measured. Fifty-six percent of respondents were members of garden clubs or plant societies. Participation in professional bodies that advocate for the interests of the nursery industry was less common with 44 percent of respondents indicating membership.

Data were also collected about interest in importing plants and the activity of plant importation. These indicate that while most respondents have imported plant material into New Zealand far fewer have imported species that are new to New Zealand. Seventy-one percent \(n = 341\) had imported plant material in the past. In contrast, 21 percent reported importing new species. An additional nine percent indicated they were unsure if the species they had imported were new to New Zealand or not. Plant collectors and members of plant enthusiast groups were more likely to have imported new plant species \(\chi^2 = 14.83; \text{DF} = 1; P = .001\) and \(\chi^2 = 10.45; \text{DF} = 1; P = .001\).

Seventy-five percent of respondents expressed interest in importing new plant species in the future. A relationship was noted between having imported species in the past and wishing to import species in the future, with past importers less likely to indicate interest in importing in the future \(\chi^2 = 4.22; \text{DF} = 1; P = .04\).

Those interested in importing new species indicated that both the economic benefit of new species and being "keen on plants" were reasons for this interest.
Economic reasons were reported more frequently than being ‘keen on plants’ as is seen in Table 3, although this relationship is not statistically significant.

Table 3. Reasons for importing new species.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import new species for economic reasons. ( (n = 343) )</td>
<td>41%</td>
<td>34%</td>
<td>18%</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Import new species because “keen on plants” ( (n = 340) )</td>
<td>36%</td>
<td>35%</td>
<td>18%</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Qualitative responses to an open ended prompt in the questionnaire emphasised economic justifications for importing new species. Comments such as these were typical:

- *We need plant imports, including new species, to have a competitive industry.*

- *New plant material should be welcomed by the government because the economic benefits are huge.*

- *There are still new species being found and only by trialling them in a variety of locations will their potential economic value be ascertained.*

- *[New] species could provide megabucks export. New Zealanders are very enterprising and if you have a hunch that certain plants could provide a new export opportunity we should be allowed [to import].*

The importance of exotic species in primary industry was noted and it was suggested that under HSNO, kiwi fruit would not have been approved for import due to its weedy characteristics.

A few respondents justified new species importation as a means of conserving rare species from abroad. The enjoyment of growing new species was also mentioned by several nursery operators. One noted that an affordable, accessible plant importation system was needed so “*plantsmen have access to plants from throughout the world so that new cultivars and species can be enjoyed by all.*”

A few respondents (six percent) indicated that they did not wish to import new species in the future. Nearly a fifth of the sample (19 percent) chose “neutral” as a response to this item on the questionnaire. Qualitative comments made by a number of nursery operators offered insight into why they did not plan on importing new species in the future. Reasons included a focus on New Zealand natives, interest in importing new cultivars only, and possession of an adequate range of species from past imports. One respondent commented that she/he had “*made a positive decision not to import or export ... to limit the possibility of dispersing environmental weeds and pests.*” For
others, deciding not to import new species was in response to the complexity of importation regulations. Comments included:

*It seemed impossible to import so we dropped it.*

*Most people throw importing plant material into the 'too hard' bin.*

*When we started our business importing seed was a main part of building a unique business, however, with the number of seeds we have had held by MAF we now rarely consider buying seed from overseas. This is a shame for dedicated plant lovers.*

**Awareness of HSNO**

The questionnaire sought to determine if respondents were aware of HSNO’s plant importation regulations. A brief description of the Act, ERMA and the PBI were provided and respondents were asked to indicate if they had heard of each. Table 4 below summarises responses to these questions. Two-thirds of respondents were aware of HSNO and its role in regulating plant importation. Respondents learned of HSNO from a variety of sources, the most commonly cited being MAF (27 percent) while professional bodies (13 percent), horticulture publications (five percent), and friends (five percent) were also prevalent sources. Awareness of ERMA was higher than of HSNO and awareness of the PBI fell mid-way between the two. The PBI is an operational aspect of the Act. While nursery operators may not know the name or details of the legislation underlying the PBI, awareness of the approved plants database demonstrates understanding of at least one aspect of HSNO in practice.

**Table 4. Respondents awareness of HSNO.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Freq</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware of HSNO ((n = 343))</td>
<td>228</td>
<td>67%</td>
</tr>
<tr>
<td>Aware of the Plant Biosecurity Index ((n = 343))</td>
<td>262</td>
<td>76%</td>
</tr>
<tr>
<td>Aware of ERMA ((n = 342))</td>
<td>293</td>
<td>86%</td>
</tr>
</tbody>
</table>

Several qualitative comments conveyed uncertainty about HSNO, ERMA, and import requirements in general. One respondent mentioned having heard of ERMA solely in the context of the debate on the GMO crop moratorium.

Two characteristics describing respondents were found to have a relationship with awareness of HSNO: membership in a plant enthusiast group and membership in a professional body. Members of plant enthusiasts groups were more likely to be aware of HSNO \((\chi^2 = 10.45; \text{DF} = 2; P = .000)\) as were members of professional bodies \((\chi^2 = 16.13; \text{DF} = 2; P = .000)\).
Experiences with HSNO

Respondents' intentions and behaviour relating to importing species under the HSNO Act were investigated. As displayed in Table 5, approximately a third of respondents indicated that they had wanted to import a plant species not listed on the PBI. However, few respondents reported pursuing this interest by submitting a Section 27 application or an application to import a new species.

Table 5. Importation of plants and HSNO.

<table>
<thead>
<tr>
<th>Item</th>
<th>Freq.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Respondents who reported wanting to import a plant species not listed on the PBI (n = 340)</td>
<td>105</td>
<td>31%</td>
</tr>
<tr>
<td>b) Respondents who had submitted a Section 26 application (n = 236)</td>
<td>21</td>
<td>6%</td>
</tr>
<tr>
<td>c) Respondents who have submitted an application to ERMA to import a new plant species (n = 344)</td>
<td>15</td>
<td>4%</td>
</tr>
</tbody>
</table>

Since the implementation of HSNO in 1998, ERMA has received only seven applications for importation of new plant species for release (J. Cately, personal communication, 23 April 2004). The 15 respondents who answered ‘yes’ to item ‘c’ in Table 5 above are more than double the number of ERMA’s plant applicants. Therefore, some respondents must have misunderstood the question about submitting an application to import a plant species. Section 26 applicants, GMO applicants, or those who requested an import permit to bring in a plant species already on the PBI may account for the extra responses. To address the ambiguity in the data it is more accurate to state that between six to ten percent of respondents have made an application of some sort to ERMA.

Clearly, few respondents have had direct experience with HSNO as applicants. The nursery operators who wanted to import a non-PBI species but have not submitted an application may have had some encounters with the Act such as making enquiries to ERMA or checking the PBI to determine if their species of interest was listed. It is unknown what direct encounters, if any, the remaining respondents have had with HSNO.

Whether by first hand experiences with HSNO or via ‘the grapevine’, nursery operators interpret HSNO based upon the information they gather about the Act and its implementing agencies. As targets encounter a policy they develop views about its aims, logic, fairness, and usefulness, as well as its importance to them personally (Schneider & Ingram, 1997, p. 79). These impressions are drawn upon when targets’ decide how to behave in response to a policy. Nursery operators’ socially constructed understandings of HSNO’s elements of design are explored in the pages that follow,
beginning first with HSNO's goals and values. Each element of design will be introduced briefly before respondents’ views are presented.

Social Constructions of HSNO

Understandings of HSNO's Goals

The desired outcomes of a policy are expressed in policy goals (Schneider & Ingram, 1997, p. 83). HSNO’s goal is “to protect the environment, and the health and safety of people and communities by preventing or managing the adverse effects of hazardous substances and new organisms” (Anonymous, 1996, s 4). A series of principles are included to guide pursuit of this goal. The Act requires that ERMA balance ecological and economic values when making decisions under the Act. The specific values that must be protected and provided for include public health, resources important to Maori, native flora and fauna as well as valued introduced species, the intrinsic value of ecosystems, and the economic benefits to be derived from the new organism proposed for importation (Anonymous, 1996, S 6). Applicants must address each of these values in their application to import a new plant species.

The quantitative research examined how important HSNO’s values were to respondents and if they perceived new plant species as posing risks to these values. As can be seen in Table 6 below, most of those sampled concentrated their responses in the ‘very important’ or ‘important’ categories. Question design may have contributed to this pattern. The list of values presented to respondents were likely to be viewed positively, especially because costs and trade-offs of protecting each value were not posited. Even if some respondents held certain values in lesser regard, socially acceptable responses may have felt easiest and safest. In hindsight, an alternative question design requiring respondents to rank the values in relation to one another might have been more revealing.38

Despite this shortcoming in question design, several interesting observations can be made from the data. Most of the values HSNO seeks to protect were shown high regard, with primary industry receiving slightly more support than the other values. Respondents viewed the importance of protecting resources valued by Maori less positively. When asked about the importance of assessing new plant species for any

38 During questionnaire design a format which required respondents to rank the values in relation to one another on a vertical scale was considered. However, during pre-testing this approach was found to be confusing.
risks posed to each value, respondents indicated that this was less important than protecting these values in general. Examining the data below illustrates this shift.

Table 6. Views of the values HSNO seeks to protect.

<table>
<thead>
<tr>
<th>Item</th>
<th>Very important</th>
<th>Important</th>
<th>Neutral</th>
<th>Unimportant/very unimp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of protecting human health from pests and diseases (n = 345)</td>
<td>78%</td>
<td>19%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Importance of assessing the negative effects of plants on human health (n = 341)</td>
<td>63%</td>
<td>31%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Importance of protecting native plants, animals, and ecosystems from pests and diseases (n = 345)</td>
<td>77%</td>
<td>20%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Importance of assessing the negative effects of plants on native ecosystems (n = 342)</td>
<td>63%</td>
<td>31%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Importance of protecting primary industry from pests and diseases (n = 345)</td>
<td>85%</td>
<td>14%</td>
<td>.5%</td>
<td>.5%</td>
</tr>
<tr>
<td>Importance of assessing the negative effect of plants might have on primary industry (n = 342)</td>
<td>75%</td>
<td>21%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>Importance of protecting resources important to Maori from pests and diseases (n = 337)</td>
<td>30%</td>
<td>27%</td>
<td>26%</td>
<td>18%</td>
</tr>
<tr>
<td>Importance of assessing the negative effect of plants on resources important to Maori (n = 336)</td>
<td>27%</td>
<td>30%</td>
<td>27%</td>
<td>17%</td>
</tr>
</tbody>
</table>

Relevant qualitative data from the questionnaires offers further insights into the quantitative results displayed above. Strong support for protecting New Zealand from pests and diseases was expressed in comments such as these:

*It is important to have strict controls over imports so our native flora is protected.*

*Preventing more potential weeds from coming into the country safeguards against increasing costs of pest control. We should learn from past mistakes, not repeat those.*

Others showed support for HSNO's purposes but were critical of the means employed to achieve these goals. Comments included:

*In principle I have no problem with ERMA, I have no wish to introduce plant pests. However, [ERMA's] systems and administration are often difficult to cope with.*
I agree with the basic concepts. There are already far too many plant species escaped into the wild threatening indigenous biodiversity. [However, HSNO] makes it difficult to import plant materials for the bonafide ‘known’ operators.

I believe the Act, administering authority, and index are all vitally important for control and protection in New Zealand [however] I am fully aware of problems, costs, and delays of others due to MAF administration.

Both ERMA and the nursery industry have the same goals, but are miles apart in terms of implementation.

Explanation of the low support for protecting “resources important to Maori” was provided by numerous comments written in the questionnaire’s margins. Distinguishing Maori concerns from the other values was seen as offensive, racist, or unnecessary:

*I do not like how risks to resources important to Maori were separated from those of the whole community.*

*I am unaware of any resources that are important to Maori that aren’t also important to other New Zealanders.*

*Resources are important to all races, not just one!*  
*Racist statement.*

The discrepancy in the quantitative results between the importance placed on protecting HSNO’s values and the importance of screening new plants for potential adverse effects on these values was addressed by the qualitative comments. Some respondents indicated that the risks of plants were exaggerated by HSNO leading to unnecessarily strict scrutiny. They commented:

*HSNO has unsettled law-abiding citizens by making them out to be criminals for importing plant seeds, plants which would never be a biological threat to the country.*

*The vast majority of ornamental plants that people want to introduce are unlikely to be a biological or pest threat to New Zealand’s economy.... We wish to introduce rare and difficult plants...*

Other respondents indicated that the threat of plants was exaggerated under HSNO while other risk goods and import pathways received inadequate attention. They argued that shipping containers, GMO’s, tourists entering with risk goods, and produce importation should be accorded as much, or greater, biosecurity emphasis. Respondents observed:

*It is ironic that ERMA is so keen to keep potentially harmful species out of NZ but supports applications for field trials of GE crops.*
Of concern is fruit and foodstuffs...which often is a greater danger. The people handling this often have little respect for the dangers they carry.

The quantitative research also explored whether respondents thought HSNO was achieving its goals. Two questionnaire items focused on protection of the environment and economy from pests and diseases. A third related to HSNO’s aim to protect or bolster economic vitality. Table 7 depicts the responses to these questionnaire items.

Table 7. Assessments of HSNO’s outcomes.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>With HSNO in place I feel confident that plants which could become environmental weeds will be kept out of NZ. (n = 337)</td>
<td>8%</td>
<td>31%</td>
<td>24%</td>
<td>27%</td>
<td>10%</td>
</tr>
<tr>
<td>With HSNO in place I feel confident that plants and diseases that could harm primary industry will be kept out of NZ. (n = 335)</td>
<td>8%</td>
<td>28%</td>
<td>27%</td>
<td>26%</td>
<td>12%</td>
</tr>
<tr>
<td>HSNO is restricting the growth of the nursery industry. (n = 336)</td>
<td>26%</td>
<td>28%</td>
<td>33%</td>
<td>11%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Responses reflect that respondents are roughly equally divided in their assessments of HSNO’s protection of both primary industry and the environment. Comparing the percentage of respondents that strongly agreed with each statement shows that only a small percentage of the sample were confident that HSNO was protecting the environment and primary industry while more than three times as many respondents were adamant that the policy has restricted growth of the nursery industry.

Understandings of HSNO’s Agents

Agents are the bodies identified by a statute that must implement policy. Agents implement rules and tools according to the implementation structure imposed by the statute (Schneider & Ingram, 1997, p. 89).

ERMA administers HSNO and makes decisions on applications (Christensen, 1997, p. 301). ERMA is made up of the Authority, Nga Kaihautu Tikanga Taiao, and ERMA New Zealand. The Authority makes decisions on applications (Christensen &
Williams, 1997, p. 305). Nga Kaihautu Tikanga Taiao provides the Authority with a Maori perspective for decision-making. ERMA New Zealand administers HSNO by managing the application process, evaluating applications, raising public awareness of the Act and related biosecurity issues, monitoring the Act's effectiveness, and overseeing enforcement (ERMA, 2001c, pp. 1 - 3). In practice, enforcement for new plant species is carried out by MAF under the authority of the Biosecurity Act (Ministry for the Environment, 2002, p. 77).

As targets encounter MAF and ERMA in relation to HSNO, impressions of the agents and the Act are developed. Questionnaire respondents sometimes used 'HSNO' and 'ERMA' interchangeably, suggesting that as ERMA gives the policy a 'face,' distinctions between legislation and those delivering it are blurred. Respondents' views of ERMA and MAF were solicited primarily via an open response item in the questionnaire. A total of 142 nursery operators commented about the agents in response to the prompt. While estimates of population parameters cannot be generated from this non-representative sample, the data's high validity provides insight into the complexity of views relating to HSNO's agents.

Several comments conveyed respect for MAF and ERMA describing their role as essential in furthering biosecurity. The agents were characterised as helpful and cooperative. Concern was expressed that the tasks given to these agents were overwhelming. As one respondent said, "MAF are not resourced to cope with the demands of importers." Within these positive comments it was suggested that better communication between the nursery industry and MAF could decrease misunderstandings between these parties and improve MAF's reputation within the industry.

In contrast to the positive comments described above, the majority of feedback indicated a less salubrious view of HSNO's agents. The main concerns were that ERMA and MAF lacked the skill and expertise relevant to plant importation and secondly, that the agents displayed a lack of respect for the nursery industry. Comments relevant to the former criticism described MAF staff as "unfamiliar with their own rules," possessing "limited training and no experience," and incompetent. One respondent observed:

*It can be very time consuming to develop a new product range and part of the headache is a lack of consistency with MAF through lack of their own knowledge.*

39 Some of the themes expressed fit best in the discussion of respondents' views of rules and tools and will be presented under those sub-headings.
Some nursery operators shared stories of receiving inconsistent treatment and advice in identical import scenarios. Others cited ERMA or MAF’s lack of knowledge about particular genera. One respondent suggested that decision-makers within MAF should draw upon experts outside the agency rather than relying on internal expertise. Some felt valuable expertise could be tapped via better communication with the nursery industry. Along similar lines, another respondent proposed:

_I feel we should have one organisation solely for dealing with the importation and quarantine process and the body should have a mixture of horticulturists, arborists, DOC, and generally people with ‘hands on experience,’ not paper pushers._

The sentiment that agents did not respect the nursery industry was manifest in a variety of comments made by respondents. Some felt that nursery operators’ and plant enthusiasts’ input into importation regulation had been ignored. One operator advised that MAF should “visit nurseries and discuss the concerns and issues from a grower’s point of view.” Additional opinions consistent with this theme were that the industry had not been consulted during HSNO’s design and that ERMA showed little interest in communicating with the industry. Similarly, others commented:

_We spent many hours with MAF in the 1990’s discussing future plant and seed importations. All our input was totally ignored._

_[ERMA/MAF] never ask us which plants within our particular area of expertise could pose a threat to New Zealand and should be considered for a list of excluded plants.... Specialized plant societies and specialist growers know their plant far better than botanists in an office. Consulting them would be much better than making things stupidly difficult for them._

_Specialist growers and societies ...have a very good idea of what those species are likely to do here. The blanket ‘nothing new’ approach relegates their knowledge to the sidelines._

_The saddest part of this whole process is the way MAF/ERMA, in their arrogance have alienated so many citizens –mainly their attitude to the "list" as being comprehensive when it is not - and their general unwillingness to entertain listing at the generic level in some plant families - to the (sad) result that many citizens lose respect for the bureaucrats. It is the citizens that MAF/ERMA have to rely on to honestly label the seeds/plants they import. In most plant families it is practically impossible to identify what species a seed/seedling is, and we all suffer when people misname imports because of their contempt for the system._
A quantitative item on the questionnaire examined whether nursery operators felt that the concerns of the nursery industry had been overlooked during HSNO's design. More than half of respondents felt this was the case. Twenty-nine percent of respondents ‘strongly agreed’ with this statement and 24 percent ‘agreed.’ Only six percent of respondents disagreed however, 40 percent chose a ‘neutral’ response.

Some nursery operators perceived that ERMA and MAF treated importers with mistrust. One respondent said that merely being a member of the industry made agents perceive him as “guilty by association”. Others spoke of being treated with suspicion by quarantine officers at the airport when declaring plant material or when listing an occupation within the horticulture industry on their landing card. Comments were made such as:

[MAF Quarantine Officers] penalized me for being honest! I was dragged through ‘hell’ on this particular occasion when others on the same flight walked through ‘Scot free’ with illegal plants.

MAF and ERMA treat legitimate importers like criminals when we are trying to do things ‘by the book’ and keep pests, diseases, and weeds out of NZ.

The qualitative research also revealed a peripheral, but important issue: frustration with the import system as a whole. The system was described as “topsy turvey” and as experiencing a “logjam.” Some respondents were unable to import species because of the shortage of Level 3 quarantine facilities. Others were waiting for the backlog of import health standards to be revised and issued. Those who had recently imported species expressed the frustration that new regulations were overly strict. More comprehensive virus testing and the requirement that stock be inspected during the previous growing season were cited as examples. Inasmuch as HSNO is a one component of the import system as a whole, concerns about MAF and their regulations are relevant. As was noted when similar issues were discussed in Chapter Two, nursery operators perceive HSNO as just one component of the importation process.

**Understandings of HSNO's Rules**

Rules direct agents and/or targets to undertake or avoid certain actions in order to facilitate achievement of policy goals (Schneider & Ingram, 1997, p. 97). HSNO sets
out rules to structure the process by which importers may apply to have a new organism considered for approval. The quantitative research on HSNO’s rules focused upon issues suggested to be relevant to compliance identified in the first phase of research. Firstly, the application process as a whole was perceived to be confusing, technically complex, and requiring much effort. Secondly, the cost of applying was seen as prohibitively high and the way the costs were allocated judged unfair. Finally, the means for adding species already present in New Zealand to the PBI was found to be problematic. Respondents expressed frustration that the PBI is incomplete and that applicants must provide the evidence that a species is present in New Zealand rather than the agencies responsible for creating and maintaining the list. The rules relating to these issues will be briefly introduced prior to considering the relevant quantitative results.

The application requirements for release of a new plant species, detailed in a 33-page user guide (ERMA, 2003e), can be considered ‘information rules’ from a policy design perspective because they specify what evidence applicants must provide and how the evidence should be communicated to ERMA. Applicants are advised to consider how the proposed import might affect the values listed in s 5 and s 6 of HSNO in their application. Some of the information required in the application includes a taxonomic description of the species, its biological and ecological characteristics, details of the proposed release (i.e. how many, where, when), and discussion of the species’ risks and benefits (ERMA, 2003e). The latter requirement is guided by Section 35 of HSNO which calls for evidence regarding the likelihood that the species will form a self-sustaining population in the wild, displace valued species, cause habitat deterioration, adversely effect safety and human health, cause or spread disease, or harm the environment (Anonymous, 1996, S 35).

Section 21 of HSNO mandates ERMA to recover costs for the duties and functions they perform under the Act. ERMA must decide who should be charged, set the rate of charges, and notify the public of these arrangements (Anonymous, 1996 S 21). ERMA charges application fees to those seeking approval to import new plant species. If the agent approves the species for import then future importers do not pay any fees to ERMA. From a policy design perspective the rules ERMA has developed in response to Section 21 are best classified as ‘eligibility rules’. Eligibility rules delineate who receives the benefits or burdens of a policy (Schneider & Ingram, 1997, p. 97). In this case the ‘burden’ of covering some of ERMA’s costs are allocated to HSNO applicants.
The final rule seen as related to compliance in the qualitative research can be termed as both an eligibility rule and a ‘boundary rule’. Boundary rules specify who has decision-making power (Schneider & Ingram, 1997, p. 98). If someone wishes to import a plant species not listed on the PBI but present in New Zealand then he/she must provide evidence of the plant’s presence and request that ERMA determine if the species is a new organism (Anonymous, 1996 S 26; ERMA, 2003d, p. 2). ERMA makes this decision based upon the evidence supplied by the applicant. In the qualitative research respondents expressed frustration that the PBI is incomplete and that the burden of proof fell to the applicant rather than the agencies responsible for creating and maintaining the list. The eligibility aspect of the rule places responsibility on the applicant to prove their species does not require scrutiny under Section V of HSNO.

Respondents’ views of the rules introduced above were explored through a series of items on the quantitative questionnaire. Table 8 below summarises the first set of results.

Table 8. Prospective importers views of HSNO’s rules.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Respondent has not submitted an application because the costs are too high</td>
<td>58%</td>
<td>23%</td>
<td>17%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>b) Respondent has not submitted an application because the application takes too much effort</td>
<td>50%</td>
<td>19%</td>
<td>25%</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>c) Respondent has not submitted an application because the rights of the ‘first mover’ are not protected</td>
<td>30%</td>
<td>17%</td>
<td>44%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>d) Respondent has not submitted an application because the species was already in NZ – although missing from the PBI</td>
<td>32%</td>
<td>26%</td>
<td>31%</td>
<td>9%</td>
<td>2%</td>
</tr>
</tbody>
</table>

In examining the data depicted in Table 8 above, I sought to determine if aspects of HSNO’s rules discouraged people from submitting a HSNO application. Responses from nursery operators who had indicated that they had wished to import a plant not listed on the PBI are presented above. These respondents will be heretofore referred to as ‘prospective importers.’ While 92 percent of the sample indicated that they wished to import new species in the future, only 31 percent of the sample reported having wanted to import a specific species not listed on the PBI.
The effort required to complete an application and the cost of applying were the most frequently cited reasons for not submitting an application. For the most part qualitative comments regarding rules did not make a direct connection between views of the rules and a decision not to submit an application. However, these comments provided valuable insight into why some respondents took issue with certain rules. Qualitative comments addressing the effort of applying described the application process as ‘exhausting,’ ‘too involved,’ and ‘inflexible’ and called for a simpler system. Other comments focused on application fees:

Fees for importation certainly favour big business over smaller, adventurous nursery enthusiasts.

Fees are prohibitive for small growers.

The greatest incentive to compliance with regulations is to make costs affordable (preferably free) so that one of the major difficulties to importation, costs, make illegal importation less likely.

I feel ERMA has put ridiculous prices on their services – simply a revenue gatherer.

In my opinion the greatest incentive to comply with regulations is to make the costs affordable.

The ‘first mover’ issue was cited by just under half of prospective importers as a reason not to submit an application. Comments made about this included:

I will never commit the time and money to the [application] process if I cannot control the right to the plant or get a contribution from all those who will take advantage of my work at a later date.

As it stands, the person who takes the whole ERMA, HSNO pathway makes a huge investment. With approval granted to import any other person can jump in and take advantage of the work!

Omissions from the PBI were indicated as a reason for not applying under HSNO by approximately half of prospective importers. Many qualitative comments addressed this issue. Some stated:

ERMA’s biosecurity list is not very accurate. A lot of species are in NZ but not on their list.

ERMA does not even have an up-to-date list of all the [a plant family] that is current. This was proposed some six years ago but is still delayed. How can you control the importation of [this plant] when you don’t know what is in NZ already? Do the science first, then the paperwork.
There are many species present that are not on the list but it’s too difficult for me as a nurseryman to put the time, expense, and effort into proving this.

Respondents were asked to indicate if they were likely to profit from importing a new species considering the application fees. These responses are presented in Table 9 below.

Table 9. Views of HSNO's rules.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The application fees for rapid assessment make it unlikely that respondent could profit from bringing in a new plant species ( (n = 336) )</td>
<td>41%</td>
<td>25%</td>
<td>20%</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>The application fees for full assessment make it unlikely that respondent could profit from bringing in a new plant species ( (n = 337) )</td>
<td>70%</td>
<td>21%</td>
<td>7%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>New Zealand was better off with the 'prohibited list' approach ( (n = 336) )</td>
<td>23%</td>
<td>28%</td>
<td>29%</td>
<td>17%</td>
<td>3%</td>
</tr>
</tbody>
</table>

A strong majority of respondents felt the full assessment fees would preclude profits while close to two thirds felt the rapid assessment fees would make profits unlikely. It should be noted that at the time the quantitative data was gathered (November 2003) ERMA estimated application fees for rapid assessment at $1,500 to $3,000 and full assessment fees were estimated at $30,000 to $45,000 (ERMA, 2002, p. 2). The questionnaire responses are based upon these fee estimations. A new fee schedule with more precise estimates came into effect in December 2003 (ERMA, 2003c, p. 1). Currently, rapid assessment applications for the release of new plant species cost $500 per species plus additional fees if ERMA must gather further information (ERMA, 2003c, p. 3).

Respondents' overall assessment of HSNO was gauged by ascertaining if nursery operators felt New Zealand had been "better off with the prohibited list." A majority of respondents felt this was the case. A fifth of the sample disagreed with the statement and close to a third responded with 'neutral.' Relevant qualitative comments were made such as:

[ERMA should not assume] a species is a problem just because it is not here.

As there is a wealth of literature on weeds, I feel it would be much better to revert to the old system whereby everything was allowed in except for those that were specifically banned.
The final set of questionnaire items relating to rules were directed to respondents who had submitted a Section 26 application. These items investigated the views of the applicants about their experience. Of the 21 nursery operators who indicated having submitted a Section 26 application, 19 responded to the items evaluating their experience. Figure 10 below depicts the resultant data. The frequencies of each response are noted beneath the percentages because 19 respondents are too few to make inferences about the population of Section 26 applicants as a whole.

Table 10. Views of Section 26.

<table>
<thead>
<tr>
<th>Item</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Section 26 application process was easy to understand. (n = 19)</td>
<td>37%  (7)</td>
<td>26%  (5)</td>
<td>37%  (7)</td>
</tr>
<tr>
<td>The Section 26 process took too much effort. (n = 19)</td>
<td>63%  (12)</td>
<td>21%  (4)</td>
<td>16%  (3)</td>
</tr>
<tr>
<td>The effort involved in submitting the application was worth the benefits gained from having the plant species added to the PBI. (n = 18)</td>
<td>39%  (8)</td>
<td>22%  (4)</td>
<td>34%  (6)</td>
</tr>
</tbody>
</table>

Respondents were evenly divided in their assessments of ease of understanding the application process. They were similarly split in their views on the effort being worth the benefits. In contrast, a majority of applicants felt the process required too much effort.

**Understandings of HSNO’s Tools**

Tools are measures put in place to provide incentives for compliance (Schneider & Ingram, 1997, p. 93). HSNO’s tools include sanctions, in the form of fines of up to $500,000 and possible prison sentences. The Act also makes use of a hortatory tool by appealing to targets to comply because it is the ‘right’ thing to do. ERMA’s public awareness activities can be identified as capacity building tools.

In the qualitative research a number of respondents questioned the effectiveness of HSNO in deterring smuggling. Some suggested it was easy to smuggle because detection and the ensuing penalties were unlikely. It was suggested that ‘doing the right thing’ was an insufficient incentive for compliance. The quantitative research sought to explore these issues further.

Perceptions about the likelihood of being caught smuggling were measured. Seven percent of respondents strongly agreed with the statement, “MAF is unlikely to detect smuggled material” \(n = 340\). A much larger group, 35 percent, agreed with the
statement while a similar proportion (31 percent) chose disagreed. Neutral was the response chosen by 27 percent of the sample.

Respondents’ views about the effectiveness of HSNO’s sanctions are shown in Table 11.

Table 11. Views of HSNO’s sanctions.

<table>
<thead>
<tr>
<th>Item</th>
<th>Good deterrent</th>
<th>Ineffective deterrent</th>
<th>Too severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penalty of $500,00 allowable under HSNO Act (n = 340)</td>
<td>75%</td>
<td>11%</td>
<td>14%</td>
</tr>
<tr>
<td>Penalties of approximately $4,000 that have been awarded thus far (n = 340)</td>
<td>49%</td>
<td>47%</td>
<td>5%</td>
</tr>
</tbody>
</table>

A clear majority of the sample assessed the $500,000 penalty as an effective deterrent. However, respondents were divided in their assessment of the typical penalty that has been imposed thus far. Approximately half of respondents viewed $4,000 as an effective deterrent while nearly as many felt it was ineffective. Many nursery respondents were emphatic that the penalties as currently applied are inadequate:

Never heard of anyone being fined $500,000 (maybe that’s the problem).

Smuggling for commercial gain should be severely punished. Several hundred dollars fine is no disincentive. The ability to impose large fines exists but they need to be applied.

If the courts upheld the full weight of the fine e.g. hundreds of thousands [of dollars] then potential smugglers may be more wary.... If the statute has strong penalty provisions, then the judiciary should apply them.

[MAF/ERMA] have little effect on the importation of unwanted organisms, an example of this – the RCD virus was introduced illegally and no one was prosecuted.

The law should be applied in a firm manner to anyone caught smuggling plant material into the country. Is the law being applied hard enough?

All plant material smuggled into NZ should result in a heavy fine of no less than $10,000.

Some felt fines should be higher for commercial people caught smuggling than for plant enthusiasts or home gardeners. The latter were described as likely to be unaware of the importation regulations and therefore less culpable for their actions.

HSNO’s hortatory tools were assessed in relationship to sanctions and other possible motivations for compliance. This assessment was designed to see how respondents ranked ‘soft’ tools versus financial penalties. Nursery operators were asked
which of four motivations they felt most discouraged people from smuggling plant material. Table 12 below displays respondents’ first and second choice ranking.

Table 12. Motivations for compliance.

<table>
<thead>
<tr>
<th>Item</th>
<th>Most important</th>
<th>Second most important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial penalties for smuggling (n = 345)</td>
<td>50%</td>
<td>16%</td>
</tr>
<tr>
<td>Desire to do the right thing (n = 345)</td>
<td>36%</td>
<td>10%</td>
</tr>
<tr>
<td>Embarrassment of being caught (n = 345)</td>
<td>14%</td>
<td>18%</td>
</tr>
<tr>
<td>Other reasons (n = 345)</td>
<td>6%</td>
<td>8%</td>
</tr>
</tbody>
</table>

The results indicated that respondents perceive financial penalties to be the strongest deterrent against smuggling with 66 percent of respondents selecting this as the first or second most important motivator. This is consistent with qualitative comments expressing the need for more frequent and better-publicised penalties. ‘Doing the right thing’ also ranked highly with 46 percent of the sample selecting this normative motivation as their first or second choice.

Understandings of Noncompliance

While most of this chapter has been devoted to respondents’ understandings of HSNO’s element of design this final section addresses nursery operators’ views of one of HSNO’s possible outcomes: noncompliance. To gauge the prevalence of noncompliance respondents were asked if they were aware of instances where new plant species or species not listed on the PBI had entered New Zealand illegally. The question was worded carefully so as not to imply that the respondent themselves was smuggling. Thirty-two percent of respondents (n = 342) indicated that they were aware of instances where new species had entered New Zealand illegally. However, limited conclusions can be drawn from this statistic as both under-reporting and over-reporting may have occurred. Respondents may have been reluctant to indicate knowledge of smuggling for fear they could be identified as smugglers or that their industry would be placed in a negative light. It is also possible that more than one respondent may have reported the same incident of smuggling.

A more valuable aspect of this questionnaire item was the follow-up question which asked respondents to specify the main reasons that this smuggling occurred. These results relate to particular elements of HSNO’s design.
Table 13. Reasons for smuggling.

<table>
<thead>
<tr>
<th>Item</th>
<th>Most important</th>
<th>2nd most important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process was too bureaucratic</td>
<td>45%</td>
<td>16%</td>
</tr>
<tr>
<td>Fees too high</td>
<td>21%</td>
<td>14%</td>
</tr>
<tr>
<td>Not know that they must declare</td>
<td>15%</td>
<td>6%</td>
</tr>
<tr>
<td>Do not know reason</td>
<td>16%</td>
<td>3%</td>
</tr>
<tr>
<td>Other reason</td>
<td>29%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Some of the explanations in the ‘other category’ were quite eclectic while others cropped up repeatedly. Six respondents said the plant material was smuggled because it was already present in New Zealand but missing from the PBI. One nursery operator commented, “Importer knew the species already existed in the country and was not on the index. This is the biggest source of frustration to the industry.” Ignorance of the rules was given as a reason by four respondents. Financial gain, desire for novel species, and confidence that the plant posed no risk were also given as reasons for the smuggling incident.

The open-ended prompt in the questionnaire was found to contain many comments concerning smuggling. Some respondents remarked that that plant enthusiasts rather than nursery operators were more likely to smuggle. Others made connections between the difficulties of importation under HSNO and smuggling behaviour: Comments were made such as:

*Unfortunately, home gardeners continue to try and smuggle in material because of their ignorance and zeal for gardening.*

*I am aware of seed smuggling by the small-hobbyists in the groups I belong to but none in the industry.*

*Unfortunately ERMA have turned the importation of plants into a black market. I know many collectors that receive seed, tubers, corms etc. from all over the world that should not be in the country. This concerns me with disease and insects coming in.*

*I think that most seed [of new species] that comes into the country is brought in as other seed that is already on the biosecurity index.*

*The hoops and hurdles [of import policy] simply encourage smuggling- or renaming of plants material new to this country ... commonplace practice we understand. I have no confidence that border control can recognize the difference. [HSNO is] well intended legislation that fails to achieve its aims.*
Conclusion

In this chapter the results of the second phase of research have been presented. A quantitative questionnaire administered to a representative sample of wholesale nursery operators investigated their understandings of HSNO’s design. The theory of policy design identified the elements of design as independent variables which influence policy participation through translation dynamics. This theory enabled me to investigate concerns about possible problems with compliance identified in the first phase of research. Experiences with and information encountered about a policy forms targets’ understandings of the statute. This understanding influences their behaviour in response to the policy. In order to understand what might trigger noncompliance with HSNO, I examined nursery operators’ social constructions of HSNO. The results of the questionnaire presented in this chapter provide a view of “who” nursery operators are as well as depicting how they view the HSNO Act.

Respondents (n = 346) consisted of wholesale nursery owners and/or managers whose operations focus almost exclusively on the domestic market. Nearly two-thirds of respondents specialise in plants for use in home gardens or amenity plantings while a minority of nursery operators deal in plants for a variety of other end-uses including agriculture, horticulture, forestry, native revegetation, and cut flowers. Nursery size ranges from operations with gross annual revenues of less than $50,000 to gross annual revenues of more than five million. Smaller nurseries predominate, with 70 percent of the sample reporting gross annual revenue of less than $500,000. Time spent in the industry ranged from one to sixty years. The median length of time spent in the industry was 17 years. Only 12 percent of the sample had joined the industry since HSNO came into effect. Awareness of the HSNO Act was moderately strong among the sample, with approximately two-thirds of respondents having heard of HSNO’s requirements for plant importation and three-quarters of the sample familiar with the PBI, an operational aspect of the Act.

All nursery operators included in the sample were past or potential targets of HSNO. However, examining respondents’ importation behaviour suggests about a third of the sample appears more likely to import than the rest. Seventy-one percent of the sample had imported plant species in the past but only 21 percent indicated that the species they had imported were entering New Zealand for the first time. Seventy-five percent of the sample indicated interest in importing new plant species in the future but only 31 percent had wished to import a specific species that is not currently listed on the
PBI. These respondents, approximately a third of the sample, appear most likely to import as they have a specific species in mind and are aware it is not listed on the PBI.

The results indicate support for HSNO’s goals. Respondents showed strong support for protecting the environment, human health, and primary production from biosecurity threats. The only value that did not resonate with respondents was protecting resources important to Maori. Many perceived it unnecessary to have a specific focus on Maori concerns and took offence to this group being singled out from the rest of New Zealanders. Assessing plants for their adverse effects on human health, the environment, and primary production also received strong support although a smaller proportion of respondents rated this as ‘very important’ in comparison to protecting these values from biosecurity risks generally. Respondents were divided in their assessment of the contribution HSNO is making to keep undesirable pests and plants out of New Zealand. Just over half of the sample felt the Act was having an undesirable impact on the nursery industry and a similar proportion felt New Zealand was better off with the ‘prohibited list’ approach.

While a few respondents expressed positive views about HSNO’s agents, the bulk of comments made about ERMA and MAF resonated with the negative views expressed in the qualitative interviews. Respondents were concerned that agents, particularly MAF, lacked knowledge and training to perform their jobs well. The importation system agents are responsible for was described as “topsy turvey,” characterised by quickly changing rules, a backlog of unissued import health standards, and a lack of quarantine facilities. Some respondents felt MAF and ERMA were dismissive of nursery operators’ expertise on plants and ignored feedback from the industry. Others described feeling “guilty by association” with the nursery industry and described the importation process as an unpleasant experience because of the suspicion with which MAF treated importers. Some qualitative comments addressed ERMA and HSNO specifically but many applied to the importation process as a whole. The range of issues raised suggests that much frustration towards agents and the plant importation system they administer is not specifically directed towards HSNO.

Questionnaire results revealed concerns about HSNO’s rules. Most prospective importers were discouraged from applying under HSNO by the application fees and the effort required to complete the application process. More than a third of this group also found the lack of protection for first movers to be a barrier. Two-thirds of nursery operators indicated that low-risk application fees made profit from a new species unlikely.
Regarding tools, most respondents viewed the maximum fine allowable under HSNO as an effective deterrent to compliance. Views were split regarding the effectiveness of a typical fine awarded of $4,000. Respondents commented that current enforcement was too “soft” and that more severe fines should be charged to those caught importing plant material illegally. A number of respondents felt it unfair that they went through the expense and effort of complying, while smugglers received fines of only a few thousand dollars.

Nearly a third of the sample indicated awareness of specific instances where plant material has entered New Zealand illegally. Reasons given for these incidents included the desire to avoid the ‘bureaucracy’ of the HSNO process, the perception that application fees were too high, lack of awareness of the rules, and the contention that the plant was already present in New Zealand and posed no threat to the country.

The results described above depict nursery operators’ understandings of HSNO’s elements of design. While the theory of policy design establishes a connection between socially constructed understandings and ensuing policy participation, the model requires an accompanying theory that connects specific aspects of targets’ perceptions and their resultant compliance behaviour. The theory of compliance behaviour is used in Chapter Six to address the final two research questions. The risks of non-compliance are assessed according to four factors which motivate compliance. Elements of policy design relevant to the risks to compliance are scrutinised in the discussion that follows, to improve understanding of their effectiveness and appropriateness.
Chapter Six – Risks to Compliance: Discussion and Conclusions

This thesis has two distinct phases to its research. The second phase of the research examined nursery operators' understandings of HSNO's policy design by investigating attitudes and beliefs about aspects of HSNO's goals, agents, rules, and tools. These results were presented in the previous chapter. This chapter analyses these results and focuses on two research questions. The first research question to be addressed is: How are targets' understandings of HSNO likely to influence their compliance behaviour?

To answer this question the second component of the conceptual framework, the theory of compliance behaviour, is used. This theory identifies four factors that influence compliance: calculative, normative, and social motivations and the ability to comply. Calculative motivations are based upon cost benefit calculations. One's morals and internal assessment of a regulation's importance and fairness (normative motivations) alongside a desire to please others (social motivations) also direct compliance behaviour. Finally, the ability to comply refers to having adequate knowledge and financial resources in order to meet the requirements of a regulation (Winter & May, 2001, p. 676 - 680). The relationship of the factors to each other is not addressed by the theory. Further, the relative importance of these factors is assumed to vary depending upon context (Winter & May, 2001, p. 693). Therefore, the theory does not offer an a priori ranking of these motivations, but simply describes an internal framework for decision-making that can aid in identifying risks to compliance.

The factors influencing compliance behaviour are used as a lens through which to examine nursery operators' understandings of the Act described in Chapter Five. The analysis will consider how targets' understandings of HSNO are likely to undermine or support each compliance factor. Evidence that a motivation for compliance or the ability to comply is compromised is seen as a 'risk to compliance.' With this analytic task complete it is then possible to address the final research question of this thesis: What are the implications of the risks to compliance for the effectiveness of HSNO's policy design?

The meta-perspective provided by the theory of policy design makes it possible to relate the risks to compliance to the elements of design. The theory establishes a causal link between policy design and policy participation. As targets encounter the policy and interpret it, this in turn influences how they behave in response. The theory of compliance behaviour offers insight into how interpretations of the policy are likely to
influence policy participation. Policy participation then shapes policy outcomes, such as effectiveness in problem solving within the societal context. The chapter concludes with consideration of ways to mitigate the risks to policy compliance.

Risks to Compliance

Ability to Comply

'Ability to comply' refers to targets' awareness of a policy's requirements and financial capacity to comply. Targets must have sufficient information about what a policy requires of them in order to comply. They must also possess adequate financial resources to meet any costs associated with compliance. ‘Ability to comply’ can impede compliance even when targets have strong calculated, normative, and/or social motivations to comply (Winter & May, 2001, p. 679). This aspect of compliance behaviour validates the following assumption: If nursery operators are aware of HSNO’s requirements and have adequate financial capacity then they can comply with the policy.

Awareness

Awareness of HSNO is moderately high among nursery operators. Just over two thirds of the sample (67 percent) indicated awareness of HSNO’s rules for importing new plant species. Those most likely to be aware of the Act were respondents who had imported plant material in the past, with 74 percent of past importers aware of the Act compared to 48 percent of non-importers. Respondents from nurseries with a gross annual revenue below $150,000 were less likely to have heard of HSNO than larger operators. Respondents who were not members of professional bodies or plant enthusiast groups were also less likely to have heard of the Act. Awareness of the PBI, at 76 percent, was higher than of HSNO itself. This is a good indicator of awareness of HSNO’s requirements; if nursery operators know they are allowed to import only species on the ‘permitted plants’ list then they can avoid accidentally violating the Act’s requirements.

Lack of awareness of HSNO was cited as a reason for smuggling by 21 percent of those reporting specific instances of illegal plant importation. Detail was provided about some of these incidents citing “enthusiast gardeners,” “private collectors,” and “ethnic home gardeners with seeds from native country” as the perpetrators rather than
commercial nursery operators. Members of plant enthusiasts groups were more likely to report smuggling incidents than non-members with 39 percent of group members reporting these incidents compared to 23 percent of non group members.

If a nursery operator is unaware of HSNO's requirements they are likely to learn of them during the importation process unless they are intentionally concealing plant materials. MAF's requirements such as import permits, phytosanitary certificates, and the need to declare plant materials at the border enable the agency to intercept species not listed on the PBI and inform importers of HSNO. Twenty-seven percent of respondents who were aware of HSNO learned of the policy from MAF.41 The relatively high awareness of HSNO and the PBI combined with the likelihood that MAF will inform unaware importers suggests that lack of awareness of HSNO poses a minor risk to compliance.

**Financial Capacity**

Statistics describing targets' beliefs about the impact of HSNO's application fees provide insight into financial capacity. Sixty-six percent of the sample indicated that they would be unlikely to profit from importing a new species because of the amount they would pay in low risk application fees ($1,500 to $3,000). Respondents from nurseries with gross annual revenues of less than $1 million were more likely to indicate that, given the application fees, profiting from a new plant species was unlikely. Operations within this size range comprised 84 percent of the sample. Ninety-one percent of the sample stated that full assessment fees of $30,000 to $45,000 would prevent profits. Application fees were cited by 81 percent of prospective importers as a reason they had not yet submitted an application under HSNO.42 While these statistics suggest that financial capacity could be a problem for nursery operators it is not certain that application fees prevent nursery operators from applying under HSNO. Thus it is not possible to conclude whether lack of financial capacity poses a risk to compliance or not. The statistics above are a better indication of how respondents are likely to weigh application fees within a calculation of the costs and benefits of compliance. This will be explored further below.

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40 Thirty-two percent (n = 342) of the sample reported awareness of instances of illegal plant importation.
41 The second largest source of awareness was professional industry bodies at 13 percent.
42 'Prospective importers' is used to refer to the segment of the sample that reported having wanted to import a species not listed on the PBI.
Calculated Motivations

Calculated motivations are based upon an assessment of the costs and benefits of compliance. The likelihood of being caught and penalised as well as the magnitude of the potential penalty may be weighed. Compliance costs and financial incentives for compliance may also be taken into account (Burby & Paterson, 1993, pp. 755, 756; Winter & May, 2001, p. 677). Targets choose the behaviour which they anticipate will offer them the maximum net benefit. Although much of the theoretical literature on compliance behaviour assumes that targets are capable of instrumental rationality as they carry out these calculations, empirical evidence portrays a less rational approach to cost-benefit calculation (Schneider & Ingram, 1990b, p. 93; Winter & May, 2001, p. 677). The calculated motivation aspect of the theory of compliance behaviour supports the assumption that if nursery operators perceive that the benefits of compliance outweigh the costs, then they are more likely to comply with HSNO.

Examining targets’ perceptions of HSNO’s tools gives an indication of the extent to which avoiding sanctions is likely to be seen as a benefit of compliance. Avoiding financial penalties was viewed as a strong motivation for compliance by a majority of respondents. Sixty-six percent of the sample ranked financial penalties as an important reason for choosing not to smuggle. Social and normative motivations were seen as important to deterring smuggling by a smaller proportion of the sample. The relevance of these results will be discussed later in the chapter. 

43 Nursery operators’ assessments of penalties for smuggling suggest that typical fines awarded to date may be viewed as an ineffective deterrent. Reactions to an actual fine of $4,000 awarded under the Biosecurity Act were divided between the 49 percent of respondents who saw the fine as a good deterrent and the 47 percent who felt it was inadequate. In contrast more than three quarters of respondents saw the maximum fine allowable under HSNO of $500,000 to be an effective deterrent.

Many respondents indicated that the fines awarded were “not harsh enough.” Nursery operators propounded the need to apply “strong penalties” and give ERMA “more teeth.” One respondent noted that the Government’s failure to prosecute those who smuggled the RCD virus into New Zealand prior to HSNO had sent the message that smuggling is tolerated. Better publicity of the potential fines (“not many people would know of the $500,000 fine!”) and of actual fines awarded was recommended. The statistics and qualitative comments reviewed above suggest that penalties of several

44 To date, no one has been fined for breaching the HSNO Act by smuggling new plant species. For this reason I used a fine awarded under the Biosecurity Act for knowingly possessing unauthorised plant materials when entering New Zealand.
thousand dollars are less likely to be viewed as severe enough to deter noncompliance. This reduces the positive value placed on avoiding fines in cost benefit calculations.

The positive value of avoiding fines may be further eroded for those who perceive detection of smuggled plant materials to be unlikely. Forty-two percent of the sample perceived that MAF is unlikely to detect smuggled plant material. This is of concern because perceived risk of detection has been shown in most research to bear more weight in utility calculations than views about the likelihood of receiving sanctions or views about their severity (Winter & May, 2001, p. 677).

Any costs associated with compliance may be factored into cost benefit calculations. Looking at the role fees played in prospective importers’ decisions not to apply under HSNO provides insight into the weight given the costs of compliance. Fees appear to have a negative weight for the eighty-one percent of prospective importers who indicated that application fees were a reason they had not submitted an application. It can also be argued that the Act imposes a significant cost to compliance by taking a ‘first applicant pays’ approach. Described by critics as a “tax on innovation” (Nahkies et al., 2003a, p. 64), charging ‘first movers’ while offering no commercial protection may undermine calculated motivation to comply. Forty-seven percent of prospective applicants indicated that the lack of protection for ‘first movers’ was one reason they had not submitted an application.

Financial incentives may also be included in the cost-benefit calculation. However, HSNO does not offer targets remuneration for compliance. The profits nursery operators hope to earn from sales of new species could provide a strong financial incentive. However, the majority of respondents predicted that profit would be unlikely given the low-risk and full assessment application fees.

The discussion above identifies several factors that may undermine nursery operators’ calculated motivations to comply with HSNO. Detection is seen to be unlikely by approximately half of the sample. A similar proportion view the severity of fines as inadequate. For more than three quarters of the sample the costs of compliance are seen to be high and financial incentives to comply are seen to be low. These factors pose risks to compliance.

Normative Motivations

There are two aspects to normative motivations for policy compliance: Firstly, an individual’s internalised values and principles, including the moral obligation to comply with laws, which are developed through socialisation and are quite stable over time, and secondly, an individual’s evaluation of the importance and appropriateness of
the specific policy and its requirements (Winter & May, 2001, p. 677). The latter entails assessment of a regulation’s reasonableness, fairness, the importance of its aims, and the potential that noncompliance will cause harm (Winter & May, 2001, p. 678).

To what extent are nursery operators likely to be motivated by a moral obligation to comply with HSNO? When asked to rank several motivations for compliance with the Act according to the importance of each, thirty-six percent of nursery operators indicated that the “desire to do the right thing” was the most important prompt for compliance while ten percent chose this as the second most important reason.45 This statistic is most meaningful when viewed in relationship to the other motivations listed as possible responses. Sixty-six percent of respondents identified financial penalties as the foremost or second-most important reason for not smuggling. Desire to do the right thing was the second most commonly chosen motivation and “embarrassment of being caught” ranked third with 14 percent of the sample viewing it as most important and 18 percent viewing it as second most important. This latter motivation can also be interpreted as normative because it suggests the presence of an internal sense that disobeying rules is shameful. These statistics suggest that approximately half the sample view a moral obligation to comply as influential.

There is evidence that nursery operators’ internalised values include those that HSNO seeks to protect. HSNO’s aim to protect the environment, people, and communities from the adverse effects of hazardous substances and new organisms is guided by a series of values ERMA must consider in their decision-making. Accordingly, prospective importers must address each of these in their applications to ERMA. Overall, support for the values HSNO seeks to protect appears to be strong. In the questionnaire a majority of the sample indicated that protecting human health, native flora, fauna and ecosystems, and primary industry from biosecurity risks was ‘very important’. Primary industry was important to the largest proportion of nursery operators (85 percent). A value that received support from a minority of the sample was “protecting resources important to Maori” with 30 percent indicating this was ‘very important’.

Nursery operators appear to hold the economic values that HSNO seeks to provide for as important. ERMA must strive to balance protecting New Zealand from the adverse effects of new organisms with maintaining and enhancing New Zealand’s

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45 The limitation of this statistic is that nursery operators were responding to an item on the questionnaire that was posed in the third person (see Appendix B). It was considered inappropriate to ask respondents what most discouraged them personally from smuggling plant material into New Zealand.
economy. This entails considering the economic benefits anticipated from new organisms proposed for importation. As might be expected, the economic benefits of new plant species were important to most nursery operators. Seventy-five percent of the sample cited economic reasons as underlying their desire to import new plant species. An additional value important to nursery operators, but not included in HSNO, is the psychological value of obtaining new species. Seventy-one percent of the sample indicated that “being keen on plants” was an important reason for their interest in importing new species. The normative dimensions of the economic and psychological value placed on new species were intimated in qualitative comments such as: “Trialing a new plant species with potential economic benefits should be facilitated and encouraged,” and “New plant material should be welcomed by government because the economic benefits are huge.” Other comments spoke of the importance of obtaining new species “to be enjoyed by all” and noted that current barriers to accessing new plants were “a shame for dedicated plant lovers.” The importance targets place on the values HSNO seeks to protect and provide for, as evidenced in the questionnaire results could provide a normative motivation for compliance. However, the importance nursery operators place on these values is likely to positively affect compliance only if they perceive that HSNO plays a role in protecting and providing for these values.

One indication of whether this is the case or not is found in statistics describing the importance respondents place on ERMA considering the possible negative effects of plant species on human health, native flora, fauna, and ecosystems, primary production, and resources important to Maori. The majority of these values were very important to most respondents. Assessing adverse effects of plants on primary production was perceived as ‘very important’ to the largest proportion of respondents (75 percent) while considering adverse effects on Maori resources was ‘very important’ to only 27 percent of the sample. Support for screening of plant species included comments about the undesirability of “plant species escape[ing] into the wild threatening indigenous biodiversity,” the need for “strict controls,” and the importance of learning “from past mistakes.” Others questioned the importance of scrutinising plants for their adverse effects by commenting that this places a barrier to importing plants that “would never be a biological threat to the country,” and focuses on a low-risk pathway in comparison to shipping containers, and imported fruit and produce.

Respondents placed slightly less importance on assessing the adverse effects of plants on the list of values than they placed on the overall importance of protecting these values from biosecurity risks. The proportion of respondents rating the former as
‘very important’ dropped by ten to fifteen percent for each value. While this trend could suggest that respondents do not perceive plants as posing as great a risk to these values as other biosecurity risks, the discrepancy is too slight to draw firm conclusions.

Another indication of the normative importance of HSNO can be observed in views of the desirability of the prohibited list approach which preceded the Act. Fifty-one percent of respondents indicated that New Zealand was “better off with the prohibited list approach.” Nearly a third of respondents took a neutral stance on this question while 20 percent indicated that the current approach under HSNO is preferable. Respondents who had been in the industry for more than 20 years were more likely to express preference for the prohibited list approach than those joining the industry more recently.

Statistics describing nursery operators’ views of HSNO’s impact on New Zealand’s biosecurity also provide an indication of the perceived importance of HSNO. Approximately a third of respondents felt confident that with HSNO in place pest plants and diseases which could harm the environment or primary industry will be kept out of New Zealand. A similar proportion disagreed that this was the case. There was greater consensus on views of HSNO’s impact on the nursery industry. Fifty-four percent of respondents perceived that HSNO is restricting the development of the industry. This is reinforced by the related finding that fifty-three percent of the sample felt the concerns of the nursery industry had been overlooked during HSNO’s design.

Views expressed about HSNO’s rules, tools, and agents suggest that some nursery operators perceive problems with HSNO’s appropriateness in terms of fairness and practicability. Many prospective importers, comprising 30 percent of the sample, perceived submitting an application under HSNO “takes too much effort,” with 69 percent of this group citing this as a reason for not applying to ERMA. For the remainder of the sample only 36 percent felt that applying under HSNO requires too much effort. The most common explanation given for the 108 smuggling incidents was that the importer had viewed the application process as “too bureaucratic.” This was given as the primary reason for 45 percent of smuggling incidents and the secondary reason for an additional 16 percent of incidents. Prospective importers’ concerns about application fees and lack of protection for first movers reported in the discussion of calculated motivations may undermine perceptions of HSNO as practicable and fair. Practicability may be jeopardised by nursery operators’ perceptions of the PBI. Omissions from the list were seen as frustrating because these omissions created work for nursery operators if they wished to get a species added to the permitted list.
Indications that some nursery operators may assess HSNO’s fairness negatively can be observed in respondents’ views about how agents treat the nursery industry. Many of these sentiments extended beyond HSNO, applying to MAF and the importation system as a whole. A sense of alienation was evidenced in comments that MAF had ignored submissions from nursery operators and that plant specialists’ knowledge had been “relegated to the sidelines”. ERMA was described as insular, arrogant, uncooperative, and lacking understanding or support for the nursery industry. One respondent suggested that ERMA had alienated importers to the extent that they were likely to smuggle out of “contempt for the system.” Interactions with MAF while complying with importation regulations led some operators to comment that they felt penalised for their honesty by being treated with suspicion and scrutiny by MAF officials, which one respondent described as “being dragged through hell.” Some nursery operators expressed frustration that while they had chosen the arduous route of compliance, smugglers were treated with a slap on the hand.

Thirty-two percent of the sample was aware of incidents where new plant species or those not listed on the PBI came into NZ illegally. Respondents who were members of plant enthusiast groups were more likely to indicate awareness of specific incidents of smuggling than other nursery operators. Thirty-nine percent of those who are members of plant enthusiasts groups reported incidents of smuggling while 23 percent of non-members reported incidents of smuggling. It is possible that awareness of others smuggling could make this behaviour seem more common and acceptable.

The results indicate strong support for the values HSNO seeks to protect and provide for. However a mixed message can be observed about nursery operators’ perceptions of the importance of HSNO. Many respondents indicated that it is important that ERMA screens plants for their potential adverse effects on a variety of values while approximately half of the sample suggested that New Zealand was better off with the prohibited list, an approach that allowed all species into the country unless they were known agricultural weeds. The analysis above suggests that nursery operators may have normative concerns about the fairness and practicability of HSNO. The degree to which the presence of one aspect of normative motivations is likely to affect the absence of another cannot be determined in this analysis. The theory of compliance behaviour does not provide guidance on how to view the possible interaction between the components of normative motivations. This makes it challenging to take a comprehensive view of the observations shared above. However,
it can be concluded that the questionnaire results raise concerns about normative motivations for compliance.

**Social Motivations**

Social motivations are present when an individual desires to please others. Groups or individuals who are important to the target can prompt compliance if the target expects this behaviour to generate respect or approval (Winter & May, 2001, p. 678). Whether or not the regulation resonates with the target’s values is unimportant. Rather, compliance is attractive because it results in favourable feedback from others (Burby & Paterson, 1993, p. 756). The concept of social motivations logically supports the assumption that if nursery operators desire approval from a particular group or individual then they will be more likely to comply with the Act. It is possible that peers within the nursery industry provide social motivation either supporting or detracting from compliance. However, my research focuses on targets’ understandings of HSNO’s policy design and does not include examination of nursery operators’ perceptions of their peers. ERMA and MAF could also provide social pressure for compliance or noncompliance. However, this seems unlikely as there appears to be little opportunity for ERMA or MAF to offer respect and approval to nursery operators for their compliance, especially for those nursery operators whose compliance consists of choosing not to import new plant species rather than choosing to go through the HSNO process.

In the sections above the ability to comply and the three motivations for compliance have been considered in relationship to nursery operators’ socially constructed understandings of HSNO. Lack of awareness of HSNO was not viewed as a problem area because most nursery operators indicated awareness of the Act. Further, the position of HSNO within the overall system for importing plants makes it likely that MAF will inform those unaware of the Act if they attempt to import a species not listed on the PBI. Indications of financial capacity did raise concern because a majority of nurseries perceive that making a profit from new plants is unlikely after paying the low-risk application fees. This issue was further explored in considering calculated motivations for compliance. Evidence that the cost of complying may be perceived to exceed the benefits raises concern about calculated motivations for compliance. Regarding normative motivations, results relevant to internal values and principles suggested a moderate level of support of the concept of complying with HSNO because it is the “right” thing to do. Strong support was observed for HSNO’s values among nursery operators. Results relevant to the importance and appropriateness of HSNO
raised the possibility that views about the Act’s impact on the nursery industry undermine the perceived importance of HSNO. Furthermore, concerns about practicability and fairness of HSNO’s design and implementation may detract from normative motivations for compliance. Findings relevant to social motivations were not included in targets’ understandings of HSNO’s elements of policy design.

A limitation of the theory of compliance behaviour is that it does not offer insights into the relative importance of a given motivation nor does it attempt to describe how the degree to which a given motivation is present or absent will affect the others. In Winter's research (2001) this short-coming was compensated for by quantifying incidents of noncompliance with an environmental regulation and examining how the four factors for compliance were associated with these behaviours. In my research it was not possible to quantify noncompliance and subsequently uncover the motivations for these incidents. While I was still able to use the theory of compliance behaviour to identify issues of concern to compliance, my conclusions must be cast as possible risks to compliance rather than factors that have been empirically verified to trigger noncompliance.

Further analysis of the possible risks to compliance identified in the analysis will be undertaken below. What do the issues raised suggest about the effectiveness of HSNO’s policy design? The causal links between the elements of design, targets’ understandings of the policy, and policy participation make it possible to relate risks to compliance to the appropriateness of the policy design. The theory of policy design establishes causal links between policy design, targets’ understandings of policy, the effect this has on their behaviour, and the subsequent impact of their behaviour on policy outcomes. This understanding of relationships binds the aims of the quantitative research to the overall concern of this thesis: to explore the effectiveness of HSNO in addressing the problem of future undesirable plant introductions by regulating the importation of new plant species.

Implications for the Effectiveness of HSNO's Policy Design

Policy Design and Risks Related to Calculated Motivations

Perceptions regarding the likelihood of detection, severity of sanctions, and costs of compliance raise the concern that nursery operators may perceive the costs of compliance to exceed the benefits. These concerns are relevant to HSNO’s rules concerning fees and sanctions for noncompliance.
Concerns about the level of fees and the lack of protection for first movers directs attention to s 21 of HSNO and ERMA’s resultant decisions on fee levels and parties liable for these charges. S 21 requires that ERMA recover costs of application processing by deciding how much to charge for these services and deciding who to charge (Anonymous, 1996).

Examining the assumptions and rationales underlying HSNO’s and ERMA’s approach to fees sheds light on the appropriateness of this rule. The contention that the prospective importer should pay application fees appears to be built upon the rationale that the importer is the sole beneficiary of the new plant species they wish to import and should therefore bear the cost of application processing. However, this rationale is illogical because the initial importer does not retain exclusive commercial rights to the new plant species. Plants are a commodity within a free market. Once the plant is added to the permitted list all nursery operators who subsequently import the species benefit from its inclusion on the PBL. The current rules penalize initial importers.

Furthermore, the rationale underlying the ‘user pays’ approach overlooks the benefits that New Zealanders collectively enjoy from having a robust system in place that ensures species enter the country only if they are unlikely to adversely affect the environment, people, and communities. In this sense the services that ERMA provides are a public good. In contrast, the previous prohibited list system did not require consideration of possible adverse effects and charged the importer nothing. In this scenario the importer enjoyed the benefits of importing the species without paying fees while the New Zealand public bore the risk of adverse effects with no assurance that these had been assessed and weighed against the probable benefits.

Regarding the level of fees charged it appears that the financial capacity of nursery operators was not taken into account when determining this level. One of HSNO’s purposes is to allow for the importation of new organisms which are likely to bring economic benefits and unlikely to adversely harm the environment, people, and communities (Anonymous, 1996, s 6). If fees make applications under the Act prohibitive for nursery operators then HSNO poses a barrier to nurseries, making them unable to pursue the economic benefits of new organisms. However, the argument could be made that in order to give adequate consideration to the possible adverse effects of a new species ERMA must undertake a costly process. If the economic benefits do not exceed the cost of taking into account the ‘externalities’ of plant importation then perhaps it does not make economic sense to import the species. Another possible explanation for the high level of application fees is the approach
ERMA has taken to reviewing applications. Nahkies (2003b, pp. 44, 59) raises the criticism that ERMA has taken a prescriptive, legalistic approach to their duties under the HSNO Act. This approach not only increases the complexity of the application process for prospective importers but it may also increase ERMA’s costs.

The view of approximately 40 percent of nursery operators that MAF is unlikely to detect smuggled plant materials directs attention to MAF’s enforcement operations at the border as well as ERMA’s role in publicising seizures of plant materials. These same aspects of policy design and implementation are relevant to the view of half of the sample that fines of $4,000 are an ineffective deterrent to smuggling. While HSNO has provisions for detecting and punishing noncompliance, the current approach to enforcement may be too weak thus decreasing the perceived costs of compliance.

**Mitigating the Risk**

One way to improve the cost-benefit ratio within calculated motivations is to reduce the costs of compliance. The user pays approach taken under HSNO is likely to be resistant to change; however, sharing fees between the plant importer and the government may be feasible. The strategy for funding the operation of biosecurity systems currently adheres to a ‘user pays’ approach. This approach, called the “cascading decision rule,” states that agencies should first seek funding by recovering costs from individual users of their services. If this is not possible then levies should be imposed on groups who are the beneficiaries of the services provided. Tax payer funding should be sought if neither of these options can be pursued (Biosecurity Council, 2003, p. 32). By retaining user fees HSNO would be in adherence to the first priority of the cascading decision rule. By increasing government support to make the fees more affordable for applicants HSNO could simultaneously recognise the importance of considering financial capacity to comply with regulation.

Persuading ERMA to make significant reductions in fees without providing the agency alternative financial support may not be feasible. Although ERMA is currently aware of applicant concerns about application fees they have indicated it is not possible to reduce low risk application fees significantly at this time (Champion & Clayton, 2001, p. 25; ERMA, 2003a, p. 35; Nahkies et al., 2003a, pp. 64, 66).

An alternate strategy to make compliance more affordable would be to encourage the nursery industry to share the costs of importation. This could entail joint research on commercially desirable plant species and cost sharing of application fees.
Nurseries who contribute to the importation of a given species could then share the commercial rights to the species for a specified time period.

This would require that the industry become more cohesive than at present. The industry is known to be diverse and fragmented (D. Shillito, personal communication, 24 March 2004). There is wide variation in the types of plants sold as well as nursery size. A nursery with gross annual revenue of less than $50,000 that specialises in rare alpine species is likely to have different importation interests from an operation grossing several million dollars and selling a diverse range of ornamentals. Despite these differences, a cooperative approach has the potential to ease some of the barriers and frustrations the industry is currently experiencing. My research indicated that forty-four percent of nursery operators are currently members of professional bodies within the industry. However this membership is spread among a range of groups. One potential strategy for cost sharing would be to build a committee consisting of representatives from each of these groups with leadership assumed by the group with greatest capacity. This committee could address common concerns about fees while accommodating the independent nature of the industry. If possible it would be advisable to include plant enthusiast groups in the committee as this would capture many of the smaller operators who do not belong to professional bodies. Membership in these types of groups among nursery operators is currently at 56 percent.

**Policy Design and Risks Related to Normative Motivations**

Perceptions of HSNO as unfair and impracticable raised the concern that some nursery operators may lack adequate normative motivations for compliance. The strong support expressed for HSNO’s values suggests that if concerns about the Act’s fairness and practicability were addressed it would be likely that normative support for HSNO would be strong.

Concerns about fairness and practicability relate to the requirements of HSNO’s application process and the interaction between agent and targets. HSNO’s ambitious goal to balance economic and ecological/social values seems partially responsible for the complexity of HSNO’s application requirements. The possible adverse effects and benefits of a species on the values HSNO seeks to protect must be considered. The provision of robust information covering each aspect of these risks and benefits enables ERMA to make good decisions.

While recognising the complex and challenging nature of the decisions ERMA and the Authority are required to make, it is possible that their approach makes the
process more complex than necessary. Nahkies et al. (2003, pp. 64, 66) is critical of the extremely prescriptive approach taken by ERMA in administering HSNO and points out that this prescription may be due to ERMA’s fear that they will be legally challenged on a decision they make. The Wilsonian approach to implementation evidenced in HSNO makes ERMA accountable for their implementation efforts. It is possible that the pressure placed on ERMA by this accountability stifles their capacity for flexibility.

Respondents’ concerns about the effort of applying related not only to the application process, but also to omissions from the PBI. Implementing HSNO with the PBI incomplete and requiring nursery operators to provide evidence of a species’ presence in New Zealand has frustrated nursery operators. DoC, MAF, and ERMA have all indicated that they do not have the resources to complete the PBI in the near future (Nahkies et al., 2003a, p. 52). This is unfortunate because HSNO’s credibility has been undermined by the problems with the permitted list.

Poor rapport between targets and ERMA and MAF appear to relate in part to the wider context of plant importation regulation which is outside the influence of HSNO’s policy design. However, specific criticisms of ERMA were made describing the agency as insular and lacking respect and regard for the nursery industry. HSNO provides ERMA a tool for addressing problems with rapport by requiring that the agency build public awareness and appreciation for HSNO’s purpose and requirements (Anonymous, 1996).

**Mitigating the Risks**

Perceptions that HSNO is unfair and impracticable could be dealt with in a variety of ways. One way to address the perception that applying is arduous and improve rapport between targets and agent would be to undertake a stakeholder familiarisation process as suggested by Nahkies et al (2003, p. 46). One objective of this process could be to communicate application procedures as clearly as possible to potential applicants. A second objective could be to clarify why HSNO is important to New Zealand’s biosecurity. A final objective, and possibly the most important, would be to develop better rapport between ERMA and the nursery industry by encouraging dialogue.
Conclusions

The intent of this research was to improve understanding of HSNO’s effectiveness in regulating the importation of new plant species by exploring the response of the nursery industry to the regulations. Pursuing this objective entailed two phases of research. An inductive enquiry sought to answer the following questions:

- Why do nursery operators wish to import new plant species into New Zealand?
- What experiences have nursery operators had with HSNO?
- How do nursery operators view HSNO’s requirements and the Act’s implementation by ERMA and MAF?

Qualitative semi-structured interviews conducted with nursery operators, policy implementers, and other stakeholders provided answers to these questions. A passion for plants and economic motivations were found to underlie new species importation. Nursery operators and policy implementers alike spoke of nursery industry discontent with HSNO. The cost, complexity and effort of applying to import a new plant species were identified as possible prompts for noncompliance. A lack of respect and flexibility from agents towards nursery operators as well as inadequate enforcement were also connected with noncompliance by those I interviewed.

To investigate the possible problems with compliance a second stage of research was undertaken. Data were gathered from a representative sample of wholesale nursery operators throughout New Zealand via a quantitative questionnaire. The following research questions were the focus of the second stage of the research:

- What are nursery operators’ interpretations of HSNO’s elements of design?
- How are these interpretations likely to affect compliance?
- What are the implications of the findings for the effectiveness and appropriateness of HSNO’s policy design?

A conceptual framework incorporating a theory of policy design and a theory of compliance behaviour was employed to structure the research and analysis. ‘Policy design’ refers to a response to a problem in society that is crafted by individuals or groups whose social constructions of the problem, its causes, and its possible solutions shape the elements included in the design. These elements and their implementation affect those targeted by the policy who in turn produce policy outcomes which may affect society as a whole (Ingram & Schneider, 1990, p. 72; Schneider & Ingram,

46 Although primarily quantitative, the questionnaire also included several open response items. The resultant qualitative data was incorporated in the subsequent analysis.
The theory of policy design describes the elements and dynamics that generate policy designs and that produce outcomes from these designs. Target group behaviour in response to a policy, or policy participation, can be best understood by examining the elements of design, how these elements are understood by targets and how, in turn, these understandings influence policy participation such as compliance or noncompliance (Schneider & Ingram, 1997, p. 79). While the theory of policy design provided a meta-perspective for my research, the theory of compliance behaviour specifically addressed individual decision-making in response to a policy (Winter & May, 2001). I used this theory to analyse the data describing nursery operators’ understandings of HSNO in order to determine if the way targets perceive the policy posed any risks to compliance.

Conclusions about the Conceptual Framework

The conceptual framework I used was both appropriate and useful for my research. The framework incorporated two complementary theories that addressed different levels of analysis. The policy design theory provided the ‘big picture.’ The causal relationships it described illustrated the impact that policy design has on policy effectiveness through the vehicle of targets and their behaviour. The links between the elements of design, targets’ understandings of these elements, and their ensuing behaviour provided a means to identify factors that influence compliance behaviour without actually measuring incidents of noncompliance. This was an essential feature of the framework as it was not possible for me to quantify noncompliance given the clandestine nature of plant smuggling.

One minor challenge I encountered in using the theory of policy design was that my research concern was quite different to Schneider and Ingram’s thus offering me few insights into applying the theory. Schneider and Ingram are interested in how policy design impacts on a wide range of values important to democracy (Schneider & Ingram, 1997, p. 82). Their work is concerned particularly with the social construction of target groups and knowledge and how these constructions affect democratic values (Schneider & Ingram, 1997, p. 191).

On its own the theory of policy design would have been inadequate as its broad perspective did not offer me the detail I needed for identifying risks to compliance. The theory of compliance behaviour offered insight into what individuals consider when deciding whether to comply with a policy or not.
In retrospect, an alternative way of using the theory of compliance behaviour might be worthwhile. As has been noted earlier in this chapter, the theory does not offer insight into the relative importance of each motivation for compliance nor does it attempt to explain how interactions between the motivations might affect will and ability to comply. Winter's (2001) use of the theory was able to overcome these limitations by collecting empirical data about incidents of noncompliance and testing the influence of each motivation on these behaviours. However, my research did not offer that possibility. If research similar to mine is undertaken in the future I recommend incorporating the assumptions of the theory of compliance behaviour into the design of the research instrument rather than using them as a tool for data analysis. The comprehensive approach I took to investigating nursery operators' understandings of HSNO's design was valuable given the dearth of information on this industry and the fact that no one to date has looked at the reactions of this key target group to HSNO. However, a narrower approach that tested each assumption of the theory of compliance behaviour might make analysis less cumbersome.

Key Findings and Future Research Priorities

The analysis identified issues that may undermine calculated motivations for compliance. These issues suggest that nursery operators may perceive the costs of compliance to outweigh the benefits. Issues were also identified that may undermine normative motivations for compliance. While strong support for HSNO’s values was evident, views of HSNO as impracticable and unfair appeared likely to detract from normative motivations.

The implications of concerns identified in the analysis were considered in regards to the effectiveness of HSNO’s policy design. Two key limitations of the design were identified. Firstly, HSNO’s fee rules are based on the illogical assumption that the first importer of a plant species benefits most from importing the species. This ‘first mover pays’ approach overlooks the benefits enjoyed by subsequent importers from that species. Further, it ignores the contribution ERMA makes to the public good by ensuring species likely to be deleterious to New Zealand are not imported. The level of fees was also seen to be problematic as it appears likely that the financial capacity of nursery operators was not taken into account when determining how much ERMA should charge applicants. The costs of compliance could be decreased either by cost sharing between the applicant and the Government or by cooperation within the
industry to share costs among nursery operators. Future research exploring the feasibility and desirability of these means of mitigating the costs to compliance would be beneficial.

Concerns about the fairness and practicability of HSNO relate to the application process and the rapport between agents and nursery operators. The complex and challenging nature of achieving HSNO’s goals to balance ecological/social and economic values may explain the complexity of the application process. However, evaluations of ERMA have suggested that the agency takes an unnecessarily prescriptive and legalistic approach to implementing the Act. This may make unnecessary work for HSNO applicants. The poor rapport between nursery operators and agents appears to be caused in part by problems with plant importation regulations under the Biosecurity Act and MAF. HSNO’s policy design is not culpable for these tensions. However, comments directly criticising ERMA suggest that steps could be taken by the agency to improve rapport. A stakeholder familiarisation process as recommended by Nahkies (2003) could be structured to address both the effort of applying and the rapport between the regulator and those regulated. A priority for future research would be to explore the benefits of conducting stakeholder familiarisation. Finding ways of addressing the concerns about compliance raised in this thesis could bring New Zealand a step closer to a more effective approach to regulating the importation of new plant species.
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Appendices

Appendix A: Qualitative Research Methods

Nonprobability sampling entails identifying ‘essential cases,’ or respondents whose roles or perspectives are relevant to the focus of the research (Davidson & Tolich, 2003, p. 119). Theoretical sampling is useful for inductive research where validity is more important than reliability (Davidson & Tolich, 2003, p. 118) and where the population is small, unevenly dispersed, and diverse (Swaffield, 1998, p. 498). My two initial contacts, a weed ecologist and a leader of one of New Zealand’s professional bodies for the nursery industry, were aware of who the ‘players’ were in regards to HSNO’s plant import regulations and the nursery industry. They suggested a range of people to include in the sample. Once interviews were arranged with these essential cases the snowball technique was used to identify additional respondents. This technique involves asking respondents to recommend others whose perspectives they think are important to include in the research (Swaffield, 1998, p. 498). This approach led to interviews with a total of 24 people from the nursery industry and the public sector located in various towns and cities throughout New Zealand.

After potential respondents had been identified as described above, initial interview schedules were developed based upon informal interviews with a nursery owner and a weed ecologist. The interview questions addressed motivations for importing plants, the respondent’s experiences with ERMA and HSNO, and the respondent’s assessment of the Act’s strengths and weaknesses. The interview schedule evolved as unanticipated themes arose. These emergent themes included the issue of smuggling, perceptions of plants’ invasive potential, and frustration with the Plant Biosecurity Index (the interview schedules are presented in Appendix B).

The interviews ranged in length from 20 to 90 minutes and took place in the respondents’ offices or by telephone. Two-thirds of the respondents were interviewed by phone because they were located throughout New Zealand and extensive travel was unaffordable. I tape recorded the interviews and took written notes. After each interview, I transcribed the recorded dialogue so that I could reflect on the content and

47 Research techniques that have high reliability are those that generate consistent results when the technique is replicated (Davidson & Tolich, 2003, p. 32).

48 In qualitative, semi-structured interviewing the interview questions are provisional and may be modified based upon what is learned in each interview (Glesne & Peshkin, 1999, p. 64). This flexibility is important in inductive research.
make necessary changes to the interview schedule. Transcribing also enabled me to note my strengths and weaknesses as an interviewer.

Qualitative methodology emphasises the role of the researcher as a research instrument (Gillham, 2000, p. 25). Reflection on this role helped me become more proficient in conducting interviews. I was aware that to develop good rapport with respondents it was important to have a professional and appreciative attitude. I found that listening attentively and expressing shared appreciation for the points my respondents were making encouraged them to talk. In my early interviews, upon reflection, I think I sometimes spoke too much and struggled to refocus the conversation if my respondent deviated from the topic. I also encountered difficulty in allowing silences in the conversation to linger in order to encourage the respondent to expand further on their answers.

Once all the interviews were completed the data were analysed. This process, which Strauss and Corbin (1998, p. 13) describe as “the interplay between researchers and data,” entailed interpreting the data and imposing a structure upon it that made sense to me. After reading the transcriptions several times I highlighted text that appeared relevant to my research. I next developed themes and sub-themes to describe the content of the highlighted dialog and displayed the identified themes in a diagram. The diagram depicted the relationship between themes and noted which respondent expressed each theme (interview transcripts were differentiated by a letter and number label). As new insights about how best to interpret and categorize the data came to mind, the themes were revised.

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49 I followed the data analysis steps described by Gillham (2000, p. 63 – 66).
Appendix B: Cover Letter and Questionnaire

Dear «First_Name»:

I am a Master of Resource Studies student at Lincoln University. I am interested in the perspectives of nursery owners and managers on the current regulations for importing new plant species into New Zealand.

I appreciate that this is a busy time of year for you, but would be very grateful if you could complete the enclosed questionnaire and post it to me in the reply paid envelope provided. Your nursery was selected through a random sample of wholesale nurseries throughout New Zealand. Filling in the questionnaire should take approximately 20 minutes. Please sign the consent form at the end of the questionnaire.

To express my thanks for your help, all respondents will enter a draw to win a mixed case of wine from Giesen. To enter the draw, fill out the enclosed reply paid postcard and post it to me separately from the questionnaire.

Your responses to the questionnaire will be completely confidential. Your name, nursery name, or contact details will not be recorded on the questionnaire. Upon receiving your completed questionnaire I will detach the consent form. All questionnaire responses will be combined and this body of information will be used only for statistical analysis.

The research results will be included in my thesis and a summary of the results will be forwarded to the Nursery and Garden Industry Association of New Zealand. If you would like to receive a summary of the research results please tick the box on the enclosed postcard.

Feel free to contact me if you have any questions. Thank you very much for your help.

Yours sincerely,

Sarah Clinehens
Environment, Society and Design Division
Lincoln University, Canterbury
P. O. Box 84
03-325-3838 ext. 8449
03-325-3328 (home)
clinehs1@lincoln.ac.nz

My thesis supervisor is:
Simon Kerr
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P.O. Box 84
Lincoln University, Canterbury
03-325-2811 ext. 8781
kerrs@lincoln.ac.nz
Section A

Please respond to the following questions by ticking the response that best represents your answer.

1. Have you ever imported seeds or nursery stock into New Zealand?

   YES ☐
   NO ☐

2. Would you like to import seeds or nursery stock into New Zealand in the future?

   YES ☐
   NO ☐

3. Have you ever imported new plant species into New Zealand? ‘New plant species’ refer to species that are entering New Zealand for the first time.

   YES ☐
   NO ☐
   UNSURE ☐

If you answered NO to all of the above questions, you do not need to answer any further questions. However, please return the questionnaire in the reply paid envelope provided so I know that you are not interested in importing plant material. Thank you for your assistance.

Otherwise, please continue filling in the questionnaire.
Please respond to the following statements by ticking the response that best represents your answer.

4. I would like to import new plant species into New Zealand in the future.

   STRONGLY AGREE ........................................
   AGREE ................................................................
   NEUTRAL ....................................................
   DISAGREE ....................................................
   STRONGLY DISAGREE ......................................

5. I am interested in importing new plant species for the economic benefits they offer me.

   STRONGLY AGREE ........................................
   AGREE ................................................................
   NEUTRAL ....................................................
   DISAGREE ....................................................
   STRONGLY DISAGREE ......................................

6. I am interested in importing new plant species because I am keen on plants.

   STRONGLY AGREE ........................................
   AGREE ................................................................
   NEUTRAL ....................................................
   DISAGREE ....................................................
   STRONGLY DISAGREE ......................................
7. I work in the nursery industry **primarily** to make a living.

   STRONGLY AGREE .....................  □
   AGREE ............................................  □
   NEUTRAL .......................................  □
   DISAGREE ......................................  □
   STRONGLY DISAGREE  ..............  □

8. I work in the nursery industry **primarily** because I am passionate about plants.

   STRONGLY AGREE .....................  □
   AGREE ............................................  □
   NEUTRAL .......................................  □
   DISAGREE ......................................  □
   STRONGLY DISAGREE  ..............  □

*Please respond to the following questions by ticking the response that best represents your answer.*

9. Do you manage or own a nursery?

   MANAGE  □
   OWN  □
   BOTH  □
   NEITHER  □

10. How many years have you worked in the nursery industry?

    _______ years.
11. What is the end-use of the plants which your nursery sells? ‘Your nursery’ refers to the nursery that you own or the nursery where you currently work.

You may tick more than one.
- Agriculture/horticulture crops
- Erosion control
- Forestry crops
- Home garden/amenity
- Shelter belts
- Other (Please specify) ________________

12. What is your nursery’s market?
- Domestic market
- Export market
- Both

13. Which of the following best describes the gross annual revenue of your nursery?
- Less than $50,000
- $50,000 – $149,000
- $150,000 – $499,000
- $500,000 – $999,000
- $1 m (million) to $1.9 m
- $2 m to $4.9 m
- $5 m and above

14. Do you collect and/or breed plants in your leisure time?
- YES
- NO

15. Are you a member of any plant societies, garden clubs, or other plant enthusiast groups?
- YES
- NO

16. Are you a member of any professional bodies related to the nursery industry? (e.g. NGIA, IPPS, etc.)
- YES
- NO

Section B
Questions in this section explore the nursery industry's familiarity with importing new plant species.

17. The Hazardous Substances and New Organisms Act (HSNO) is a law that came into effect in 1998. If a person wants to import a plant species that is not yet present in New Zealand, HSNO requires that they submit an application outlining the risks and benefits of importing the species.

Before reading this questionnaire, had you heard of HSNO's rules for importing new plant species?

YES ☐ Go to Question 18
NO ☐ Go to Question 19

18. How did you hear about HSNO? (e.g. from MAF, NGIA, a friend, etc.)

19. The government created an agency called the Environmental Risk Management Authority (ERMA) to run the HSNO Act. ERMA assesses applications for importing new plant species and decides if the species may be imported or not.

Before reading this questionnaire, had you heard of ERMA?

YES ☐
NO ☐

20. The Plant Biosecurity Index (also called the 'permitted plants list') is a list of plant species that are not considered prohibited plants and were present in New Zealand prior to 1998. Species on this list may be imported without having to apply to ERMA.

Before reading this questionnaire, had you heard of the Plant Biosecurity Index?

YES ☐
NO ☐

21. Please write any comments you would like to make about HSNO, ERMA, or the Plant Biosecurity Index below. You may also comment about other aspects of the import process. (e.g. import health standards, MAF etc.)

22. Have you ever wanted to import a plant species that was not listed on the Plant
Biosecurity Index or the list of prohibited plants?

YES □ Go to Question 23
NO □ Go to Question 27

23. Have you ever submitted an “application to determine if an organism is present in New Zealand” (also called a ‘Section 26 determination’ under the HSNO Act)?

YES □ Go to Question 24
NO □ Go to Question 27

*Please indicate whether you agree or disagree with the following statements by ticking the response that best represents your answer.*

24. The ‘Section 26’ application process was easy to understand.

- STRONGLY AGREE  □
- AGREE  □
- NEUTRAL  □
- DISAGREE  □
- STRONGLY DISAGREE  □

25. The ‘Section 26’ application process took too much effort.

- STRONGLY AGREE  □
- AGREE  □
- NEUTRAL  □
- DISAGREE  □
- STRONGLY DISAGREE  □

26. Overall, the effort involved in submitting the application was worth the benefit of having the species added to the Plant Biosecurity Index.

- STRONGLY AGREE  □
- AGREE  □
- NEUTRAL  □
- DISAGREE  □
- STRONGLY DISAGREE  □

27. Have you ever submitted an application to ERMA to import a new plant species?
Please indicate whether you agree or disagree with the following statements by ticking the response that best represents your answer.

28. I have not submitted an application to import a new plant species because the cost of submitting an application was too high.

STRONGLY AGREE .............................................
AGREE .........................................................
NEUTRAL ......................................................
DISAGREE .....................................................
STRONGLY DISAGREE ........................................

29. I have not submitted an application to import a new plant species because the application process takes too much effort.

STRONGLY AGREE .............................................
AGREE .........................................................
NEUTRAL ......................................................
DISAGREE .....................................................
STRONGLY DISAGREE ........................................

30. I have not submitted an application to import a new plant species because the rights of the 'first mover' are not protected.

STRONGLY AGREE .............................................
AGREE .........................................................
NEUTRAL ......................................................
DISAGREE .....................................................
STRONGLY DISAGREE ........................................
31. I have not submitted an application to import a new plant species because I knew that the species was already present in New Zealand although it was not on the Plant Biosecurity Index.

STRONGLY AGREE  □
AGREE  □
NEUTRAL  □
DISAGREE  □
STRONGLY DISAGREE  □

Please indicate whether you agree or disagree with the following statements by ticking the response that best represents your answer

32. I feel that the concerns of the nursery industry were overlooked when HSNO's plant importation regulations were designed.

STRONGLY AGREE  □
AGREE  □
NEUTRAL  □
DISAGREE  □
STRONGLY DISAGREE  □

33. It is important to screen plants coming into New Zealand to determine what harmful effects they may have on New Zealand.

STRONGLY AGREE  □
AGREE  □
NEUTRAL  □
DISAGREE  □
STRONGLY DISAGREE  □

34. New Zealand was better off with the 'prohibited list approach' that allowed plant species to be imported unless they were included on the prohibited list.

STRONGLY AGREE  □
AGREE  □
NEUTRAL  □
DISAGREE  □
STRONGLY DISAGREE  □
35. With HSNO in place I feel confident that plants and diseases that could harm primary industry will be kept out of New Zealand.

STRONGLY AGREE .......... □
AGREE ........................................................... □
NEUTRAL .......................................................... □
DISAGREE ........................................................ □
STRONGLY DISAGREE .............. □

36. The application fees for a rapid assessment application ($1,500 – $3,000) make it unlikely that I could make a profit from bringing in a new plant species.

STRONGLY AGREE .......... □
AGREE ........................................................... □
NEUTRAL .......................................................... □
DISAGREE ........................................................ □
STRONGLY DISAGREE .............. □

37. The application fees for a full assessment application ($30,000 – $45,000) make it unlikely that I could make a profit from bringing in a new plant species.

STRONGLY AGREE .......... □
AGREE ........................................................... □
NEUTRAL .......................................................... □
DISAGREE ........................................................ □
STRONGLY DISAGREE .............. □

38. With HSNO in place I feel confident that plants which could become environmental weeds will be kept out of New Zealand.

STRONGLY AGREE .......... □
AGREE ........................................................... □
NEUTRAL .......................................................... □
DISAGREE ........................................................ □
STRONGLY DISAGREE .............. □
39. HSNO is restricting the development of the nursery industry in New Zealand.

   STRONGLY AGREE .................................................. □
   AGREE .................................................................. □
   NEUTRAL ............................................................... □
   DISAGREE .................................................................. □
   STRONGLY DISAGREE .................................................. □

40. Commercial nurseries are more likely to smuggle plants into New Zealand than home gardeners.

   STRONGLY AGREE .................................................. □
   AGREE .................................................................. □
   NEUTRAL ............................................................... □
   DISAGREE .................................................................. □
   STRONGLY DISAGREE .................................................. □

41. MAF Quarantine Service is unlikely to detect smuggled plant material.

   STRONGLY AGREE .................................................. □
   AGREE .................................................................. □
   NEUTRAL ............................................................... □
   DISAGREE .................................................................. □
   STRONGLY DISAGREE .................................................. □
Section C

Biosecurity in New Zealand focuses on protecting many aspects of New Zealand life from animal pests, plant pests, and diseases. How important are the following to you? Please tick the responses that best represent your answers.

42. Protecting human health from diseases.

   VERY IMPORTANT .......................................................... □
   IMPORTANT ............................................................... □
   NEUTRAL ................................................................. □
   UNIMPORTANT ........................................................... □
   VERY UNIMPORTANT .................................................. □

43. Protecting native plants, animals, and ecosystems from pests and diseases.

   VERY IMPORTANT .......................................................... □
   IMPORTANT ............................................................... □
   NEUTRAL ................................................................. □
   UNIMPORTANT ........................................................... □
   VERY UNIMPORTANT .................................................. □

44. Protecting primary industry from pests and diseases.

   VERY IMPORTANT .......................................................... □
   IMPORTANT ............................................................... □
   NEUTRAL ................................................................. □
   UNIMPORTANT ........................................................... □
   VERY UNIMPORTANT .................................................. □

45. Protecting New Zealand from bioterrorism.

   VERY IMPORTANT .......................................................... □
   IMPORTANT ............................................................... □
   NEUTRAL ................................................................. □
   UNIMPORTANT ........................................................... □
   VERY UNIMPORTANT .................................................. □

46. Protecting resources important to Maori from pests and diseases.
ERMA assesses the negative effects that new plant species might have on New Zealand. How important do you think it is that ERMA consider the following in their assessments? Please tick the responses that best represent your answers.

47. Risks to human health.

48. Risks to native ecosystems.

49. Risks to primary industry.

50. Risks to resources important to Maori.
<table>
<thead>
<tr>
<th>Importance Level</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY IMPORTANT</td>
<td>0</td>
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<tr>
<td>IMPORTANT</td>
<td>0</td>
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<tr>
<td>NEUTRAL</td>
<td>0</td>
</tr>
<tr>
<td>UNIMPORTANT</td>
<td>0</td>
</tr>
<tr>
<td>VERY UNIMPORTANT</td>
<td>0</td>
</tr>
</tbody>
</table>
Section D

This section concerns plant smuggling. Some people are concerned that plant importers who are frustrated with HSNO might smuggle plant material into New Zealand. Others do not think this is happening.

51. In your opinion what most discourages people from smuggling plant material into New Zealand? If you tick more than one, please rank in order of importance with ‘1’ being ‘most important’.

- Desire to ‘do the right thing’ ................................................ 
- Embarrassment of being caught smuggling ........................ 
- Financial penalties for smuggling ....................................... 
- Other (Please specify) .....................................................

52. Are you aware of instances where new plant species or species not listed on the Plant Biosecurity Index have come into New Zealand illegally?

- YES □ Go to Question 53
- NO □ Go to Question 54

53. What do you think were the main reasons that these plant species were imported illegally? If you tick more than one, please rank in order of importance with ‘1’ being ‘most important’.

- Importer did not know that they needed to declare the plant material □
- Importer felt the application fees were too high ............................ □
- Importer felt the application process would be too bureaucratic □
- Don’t know ........................................................................................................ □
- Other (Please specify) ....................................................................................

54. Persons who intentionally smuggle new plant species into New Zealand may be fined up to $500,000. Do you view this penalty as:

- A good deterrent against smuggling .......................... □
- An ineffective deterrent ............................................. □
- Too severe .......................................................... □

55. So far, prosecutions for smuggling plant materials have resulted in fines ranging from several hundred dollars to several thousand dollars. For example, one
person was fined $4,000 for smuggling seeds into New Zealand. Do you view this penalty as:

A good deterrent against smuggling  ..........  ☐
An ineffective deterrent ...........................................  ☐
Too severe ..........................................................  ☐

56. If you have any additional comments that relate to any portion of this questionnaire please write them below:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
CONSENT FORM

Importing “new” plant species:
Nursery industry responses to New Zealand’s approach

I have read and understood the description of this research project. I understand that participation in the research is voluntary. I agree to fill in a questionnaire, and I consent to publication of the research results in a thesis with the understanding that my responses will be kept completely confidential.

Signed: ____________________________ Date: ______________

Thank you for your time and effort!

Please return your questionnaire in the reply paid envelope provided.

If the envelope has been mislaid, please forward the questionnaire to:

Freepost 36
Sarah Clinchens
Environment, Society and Design Division
P.O. Box 84
Lincoln University
Canterbury
Appendix C: Quantitative Research Methods

A quantitative, postal questionnaire was developed for the second phase of the thesis research (the questionnaire is displayed in Appendix B). This approach was suitable because accurate responses to sensitive questions and an affordable means of data collection were important. Respondents are more likely to provide accurate answers rather than socially desirable ones when filling in a postal questionnaire (de Vaus, 1995, p. 110). Because the sample was dispersed throughout New Zealand, a postal questionnaire was the most affordable way to reach the sample (Sapsford, 1999, p. 108).

In many circumstances postal questionnaires result in lower response rates than telephone interviews (Sapsford, 1999, p. 110). However, researchers have found that postal questionnaire response rates are competitive with telephone interviews if the research topic is germane to the sample being surveyed and the sample is from a homogenous population (de Vaus, 1995, p. 107). As my sample met both of these criteria it was appropriate to use postal questionnaires.

I constructed the set of measures contained in the questionnaire because none were available from the literature that suited my research questions. The questionnaire included 53 structured questions and two open-ended questions. The structured questions consisted of Likert-style statements and dichotomous, categorical questions. The questionnaire explored motivations for importing plants and the industry's familiarity with the plant importation process under HSNO and ERMA. Attitudes and beliefs towards the design and delivery of HSNO were investigated by focusing on relevant aspects of HSNO's values, rules, and tools identified in my qualitative research. Several questions dealt with smuggling and penalties for noncompliance. Relevant demographic data describing the respondent and the nursery they represented were also collected. After pre-testing the questionnaire on ten of the respondents interviewed during my qualitative research I made final modifications and posted the questionnaire to my sample.50

The population from which I drew a probability sample consisted of wholesale nursery owners and/or managers throughout New Zealand. I used the New Zealand Nursery Register (2003) as my sample frame because it provided the most comprehensive list of wholesale nurseries available (J.F. Kennerley, personal

50 Pre-testing helps the investigator to identify problems with the research instrument (Meredith & Lawley, 2000, p. 33).
communication, 15 August 2003). Unfortunately, the nursery register gave no indication of which wholesale nurseries were plant importers. A second limitation of the sample frame was that inclusion in the register was voluntary; it is possible that some wholesale nurseries in New Zealand were not listed in the sample frame.

The sample frame contained 1,035 wholesale nurseries. I generated a systematic sample with a random start from my sample frame. A power calculation was used to determine my targeted sample size of 210 cases (parameters used were: $\alpha = .05$, $1 - \beta = .95$, effect size = .5). Questionnaires were posted to 950 potential respondents to ensure that I would achieve my sample size. Over-sampling was necessary to compensate for nurseries that would have to be excluded because they were not importers, and to compensate for the response rates typical of postal questionnaires. The literature reported response rates ranging from 30 percent to 75 percent (Alreck & Settle, 1995, p. 35; Babbie, 2001, p. 256; Dillman, 1978, p. 5; Miller, 1991, p. 152, 155).

In order to reduce non-response bias I sought to maximise incentives to respond while minimising costs. This tactic is premised on the theory of social exchange; namely that people will perform a particular action when the benefits of such action appear greater than the costs (Dillman, 1978, p.12). To reduce the costs of responding the cover letter and questionnaire were designed to be clear, concise, and aesthetically pleasing, and designed to ensure confidentiality. To provide incentives to respond I explained the purpose and importance of the research, offered a summary of research results to respondents, and offered respondents an opportunity to enter a draw to win a case of wine. A reminder postcard and a ‘thank you’ followed the questionnaire mail out.

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51 Generating a systematic sample with a random start entails randomly selecting an element within the sample frame and subsequently selecting every kth element for inclusion in the sample. The interval for selection is determined by dividing the total population by the sample size (Babbie, 2001, p. 197). Because the sample frame was alphabetically ordered I used Excel to randomly shuffle the cases in the sample frame before I generated the systematic sample.

52 The sample size nearly includes the entire sample frame. It was not advantageous to incorporate the remaining 85 nurseries because this marginal increase in sample size would not affect the standard error (accuracy) of the sample while adding extra cost. See Rowntree (1981, p.94, 100).

53 ‘Nonresponse bias’ occurs when respondents choose not to fill in a questionnaire for reasons related to the research topic (Oppenheim, 1992, p. 106). If it is difficult to obtain information about nonrespondents, the researcher cannot be certain that the sample is representative.

### Appendix D: Qualitative Data Themes

<table>
<thead>
<tr>
<th>Views of HSN0's Goals/Values</th>
<th>Views of Agents</th>
<th>Motivations for Importation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery Operators feel their imports pose little/no risk to NZ (T 11, p. 3; T19, p. 7, T3, p. 3; T24, p. 4)</td>
<td>Want more respect from Agents. Noted incidents of disrespect (T12 p. 4; T 13, p. 8; A 14, p. 2)</td>
<td>Consumers desire new types of plants T 3-4, A1-3, A 9-3, T 11-9</td>
</tr>
<tr>
<td>Nursery operator identified risk of bringing in weed seed as contaminant T 13-5</td>
<td>ERMA should value plant enthusiasts’ expertise and consult them (16 p. 9; T 13 p. 6, 8; T 22 p. 2; T 3 p. 2)</td>
<td>T 16-3,4, T 19-7, T 21-1,</td>
</tr>
<tr>
<td>HSNO is result of “greenies” pressure T 12, p.3, T 13 p. 2</td>
<td>ERMA should encourage, teach, be more friendly T 19 p. 3</td>
<td>Gardeners love plants, love collecting new species T 12-1,3, 9, T 22-5, T 23-1, 9</td>
</tr>
<tr>
<td>NZ has many species already, many with weed potential. NZ does not need any new species A 5, p. 3</td>
<td>ERMA unconcerned about plant importers’ problems T 18-2, T 23-2</td>
<td>Plant societies depend on international contributions of seed. T 10-1, T 12-2</td>
</tr>
<tr>
<td>Agree with HSN0’s goals to keep environment, primary industry safe, protect New Zealand (T 16, p. 5,6, 7; 20 p. 1, 6, T 22, p. 1 ; T 23 p. 6 T 11 p. 5; T 24 p. 3)</td>
<td>Weeds low on ERMA’s list of priorities A 1-6, A 2-10</td>
<td>Importers usually have economic motive import (can charge more T 16-5) T 10-1, T 13-1, T 24-2</td>
</tr>
<tr>
<td>Plants should be screened for weed potential T 11-6, T 12-4</td>
<td>Negative views of ERMA - focuses too much on details, not able to get important stuff done quickly. A 1-11</td>
<td>Growers - new species for production efficiencies A 16-4</td>
</tr>
<tr>
<td>Shipping containers much bigger threat than plant imports 24-4</td>
<td>ERMA should be realistic, not idealistic when pursuing HSN0 goals T 13-2</td>
<td>Growers – want to develop new variety T 20-1</td>
</tr>
</tbody>
</table>

**Frustrations with MAF, hassles, delays with plant import standards, no flexibility (agar mixed in tissue culture), better testing finds more viruses etc.**

T 13-4, T 16-2, T 21-7, 21-13, T 23-3, T 24-1, 5

People at top in MAF are good, but inspectors not T 21-5
<table>
<thead>
<tr>
<th>Respondents’ views about Rules</th>
<th>Respondents’ views about Tools</th>
<th>Perceived Outcomes of HSNO/ MISC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of application fees (may) discourage compliance A 1-8, A 2-5, A 4-6, A 5-3, T 10-4, T 11-2, A 14-4, T 16 p. 3, 6, 17-2, T 21-11, T 23-6</td>
<td>‘Doing the right thing’ is the only incentive to comply. A 2-7, 4-8, 5-9 If you want a plant badly enough you might go through the HSNO application process T 10-5</td>
<td>Restricting development of nursery industry T 22-6</td>
</tr>
<tr>
<td>Costs make it difficult for researchers to import A 4-11, T 11-9, T12-2, T13-3, T16-5, T19-2, T 20-1, T 22-3, T 23-2</td>
<td>HSNO is hard to enforce A 2-7 Enforce penalties on a few smugglers in order to boost compliance A 9-3, T 24-6</td>
<td>Loss of market opportunities for nurseries A 4-11, 7-4</td>
</tr>
<tr>
<td>High cost of applying under HSNO will limit amount of new material coming in, damage industry b/c consumers want new plants – plant fashions T 16-3</td>
<td>Concerned about smuggling A 1-9, 5-3, 10-4, T 16-6</td>
<td>Hard for small grower to import under HSNO T 12-1 Growers experimenting less T 24-6</td>
</tr>
<tr>
<td>Can afford HSNO fees – for low risk apps T 21-10</td>
<td>Nurserymen worried that disease may enter NZ on smuggled material A 4-6, T 16-6, T 22-4</td>
<td>Plant enthusiasts find it more difficult to get new species A 7-4, T 16-8, 9</td>
</tr>
<tr>
<td>Should not be user pays A 2-7, T 10-4, 11-5 T 13-3 (unless fees lower), T 20-1, T 24-3 (unless first mover protected) User should pay because user benefits from import A 7-4, 9-3, T 12-4 A 14-4, T 19-4, T 21-14, T 22-3, T 23-6 (but fees too high)</td>
<td>Larger nurseries likely to comply because if they got caught smuggling this would damage their business, harm their industry 7-5, T 13-8, T 19-8, 17-6, T 24-6</td>
<td>HSNO is working well T 14-2</td>
</tr>
<tr>
<td>PBI is incomplete T 3-1, T 10-2, T 11-3, 5, T 12-7 T 16-3, T 20-1, T 22-2, T 23-5</td>
<td>Easiest to smuggle seeds A 5-3 People will hide/mislabel seeds A 5-9, 7-3, T 23-8</td>
<td>Prohibited list did not consider risks to environment – ag focused. A 1-2, A 2-1</td>
</tr>
<tr>
<td>PBI has mistakes in it. No authorities A 4-2 BPI made in a rush T 20-1</td>
<td>Keen plant people most likely to smuggle T 16-6, T 24-6</td>
<td>Plant exports should also be screened A 1-4</td>
</tr>
<tr>
<td>Access to PBI – must buy, this is expensive. T 10-4</td>
<td>Reports of smuggling I only smuggle plants that I know pose no risk T 10-4, T 12-5</td>
<td>‘Rough and ready’ interim system worked well to screen out weeds A 2-2</td>
</tr>
<tr>
<td>Need better mechanism for</td>
<td></td>
<td>Risk assessment involves biology. Considering benefits is a political decision and should be kept separate. A 1-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nursery was consulted during HSNO design process T 11-2, T 20-1</td>
</tr>
<tr>
<td>Updating BPI than S 26</td>
<td>Knows of smuggling – rare cycads in contravention of CITES T 21-9</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Process is not ‘user friendly’</td>
<td>Smuggling happens (but very hard to quantify how much smuggling is going on A 17-5, 6) T 24-6, A 25-7</td>
<td></td>
</tr>
<tr>
<td>Too complex T 13-3, T 19-2, 3, T 22-3, T 23-3, 4, 5</td>
<td>Dishonest behaviour when plant society members asked to record species they had to update the PBI T 12-8</td>
<td></td>
</tr>
<tr>
<td>Too much bureaucracy T 3-6, T 13-2, T 19-3</td>
<td>More smuggled plant material entering NZ 7-3</td>
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<tr>
<td>Process is a lot of work for applicant T 21-12</td>
<td>Would be difficult to smuggle and sell widely commercially T 21-14</td>
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<tr>
<td>App requires lots of research – and it should –</td>
<td>MAF border security does good job – is hard to smuggle A 14-4</td>
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<tr>
<td>We’ve had too many mistakes in the past A 14-3</td>
<td>Dogs good at detecting A 25-2</td>
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<td><strong>Confusion about rules and roles</strong> of ERMA, MAF – told respondent incorrect information T 13-4, T 17-1, T 18-1, T 23-2, A 4-6, 7-9</td>
<td>A 25 gives excellent description of how border security works for passengers and mail</td>
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<tr>
<td>Low awareness of HSNO may be reducing compliance A 5-9, 7-6</td>
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<tr>
<td>Plant importers not like other targets – often small scale nursery people, plant enthusiasts – don’t know about HSNO and not likely to comply T 20-1, A 7-1, T 24-6</td>
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<tr>
<td><strong>First mover</strong> should be protected T 3-8, A 4-7 T 11-2, 5, T 21-11, T 23-6, T 24-3</td>
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<tr>
<td>Notified apps take time – may be deterrent to applying A 7-6</td>
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<tr>
<td>Plants should be approved at species level, not genus A 4-5, 9-1, T 12-7</td>
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<tr>
<td>Some plants should be approved at genus level T 3-6, T 12-2</td>
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<tr>
<td>Including Maori perspective into decision making is</td>
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<tr>
<td>Nursery industry is getting smaller as consumers are attracted to other hobbies and middle size companies finding it harder to compete – need to produce plants more and more cheaply T 11-7</td>
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<tr>
<td>We were not consulted when HSNO was designed – not a lot of commercial input T 12-2, T 13-2, T 17-1</td>
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<tr>
<td>Should return to prohibited list approach T 12-4, 7, T 18-3</td>
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<tr>
<td>Acceptance may come with time. Big change from the old regulations. 6-3, 7-3</td>
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</tbody>
</table>
difficult because corporate culture and Maori culture clash
A 8-10

ERMA demands expertise that is not available – get taxonomist to prove species in NZ T 12-8

Effort of applying may deter people – prompt them to smuggle.
A 14-3
Cost, bureaucracy etc. increases risk of noncompliance
T 13-3, 17-2, 23-8
HSNO is “inviting” smuggling T 22-2