Proposal for the Chatham Islands Pest Management Plan

Chatham Islands Council

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Part One

Plan Establishment

1 Introduction

1.1 Proposal for the Chatham Islands Pest Management Plan

Chatham Islands Council has a regional leadership role under the Biosecurity Act 1993 (the Act) and intends to establish a regional pest management plan (RPMP). The first formal step is notification of the Proposed Regional Pest Management Plan for the Chatham Islands Territory for 20 years. The proposed Plan builds on the previous Regional Pest Management Strategy 2008-18.

This document has been prepared in accordance with the Act. It forms “the Proposal" required to be developed by Chatham Islands Council to “make” the Chatham Islands Regional Pest Management Plan (“the Plan”). When the new Plan commences it will replace the existing Strategy, which will has ceased to have effect.

The Council will consider this Proposal and the process of developing the Plan, prior to making a final decision.

1.2 Purpose

The purpose of the proposed RPMP is to outline the framework to manage specified organisms efficiently and effectively in the Chatham Islands Territory. Doing so will:

- minimise the actual or potential adverse or unintended effects associated with those organisms; and
- maximise the effectiveness of individual actions in managing pests through a regionally coordinated approach.

Many organisms in the Chatham Islands Territory are considered undesirable or a nuisance. Yet, only where individual action or inaction in managing pests imposes undue effects on others is regional management needed.

The Biosecurity Act 1993 (the Act) has prerequisite criteria that must be met to justify such intervention. This Proposal identifies those organisms classified as pests to be managed through the RPMP.

Once operative, the RPMP will empower Chatham Islands Council to exercise the relevant advisory, service delivery, regulatory and funding provisions available under the Act to deliver the specific objectives identified in Part Two: Pest Management.

1.3 Coverage

The proposed RPMP will operate within the administrative boundaries of the Chatham Islands Territory (Figure 1), which comprises the islands known as the Chatham Islands and the area of the territorial sea adjoining those islands, as defined by the Chatham Islands Council Act 1995. There is a total land area of about 97,000 hectares, which is spread unevenly amongst some 40 different islands, the largest of which are the main Chatham Island/Rēkohu/Wharekauri (90,000 hectares) and Pitt Island/Rangihaute/Rangiauria (6,190 hectares).

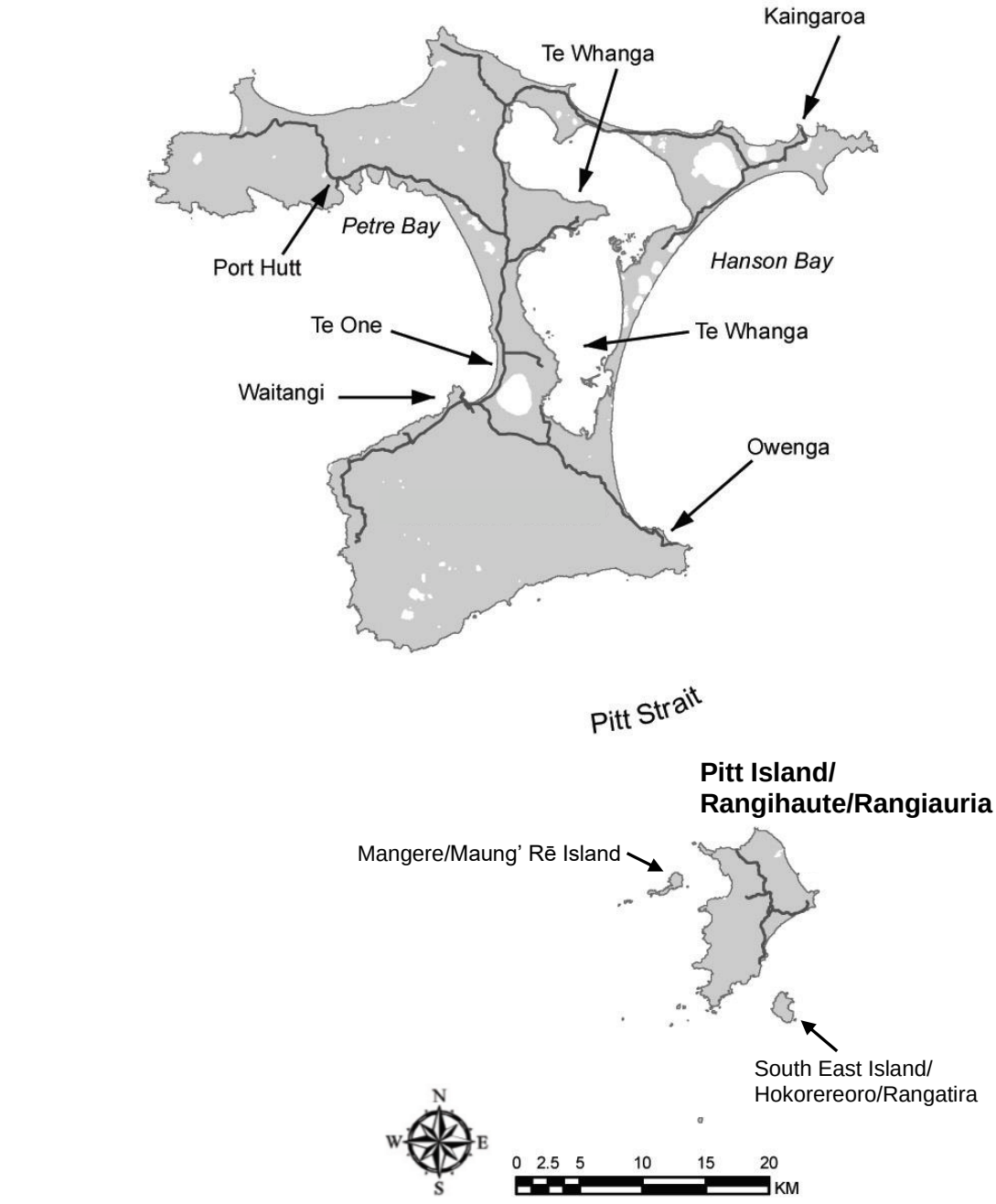

Figure 1 - The Chatham Islands

1.4 Plan duration

The RPMP will take effect on the date it commences as a Regional Pest Management Plan under s77 of the Act. It is proposed to remain in force for a period of 20 years, with a full review taking place after 10 years, or prior if Council considers it necessary. The RPMP may cease at an earlier date if Chatham Islands Council declares by public notice that the RPMP has achieved its purpose. It may also cease at an earlier date if, following a review, it is revoked.

2 Planning and statutory background

2.1 Strategic background

Pest management influences, or is influenced by, how land and water are used and managed. Several planning or operational activities contribute to the overall efficiency in reducing the impact from pests on the region's economic, environmental, social, and cultural values. Such activities are both within and external to the Council.

Figure 2 describes how Chatham Island Council's biosecurity framework sits within the New Zealand biosecurity system as a whole.

Council's biosecurity framework

Pest management in the Chatham Islands sits within a biosecurity framework that includes this plan and a biosecurity strategy entitled Chatham Islands Council Biosecurity Strategy 2020-2040. The framework is underpinned by a number of supporting actions (which we have categorised as: direct action; the provision of local leadership; and collaboration and support), which either provide inputs into regional pest management, or result from their activity. Key partners include land occupiers and the wider community, either as beneficiaries or exacerbators or both, and other agencies.

Biosecurity framework outside Council

An effective biosecurity framework works both within a region and at a national level. Neighbouring regional pest plans and pathway management plans and national legislation, policy and initiatives influence the RPMP. As a result, an RPMP is an integral cog in a secure biosecurity framework to protect New Zealand's environmental, economic, social and cultural values from pest threats.

Legislative background

Local government activities and actions are undertaken under several legislative mandates. While managing pests is not dependent on one particular statute, its effectiveness is connected to the purpose of the particular statute. The Biosecurity Act 1993 provides for the eradication and effective management of harmful or potentially harmful organisms. It empowers regional and unitary authorities (like Chatham Islands Council) to have a significant statutory role in implementing the Act through the implementation of RPMPs.

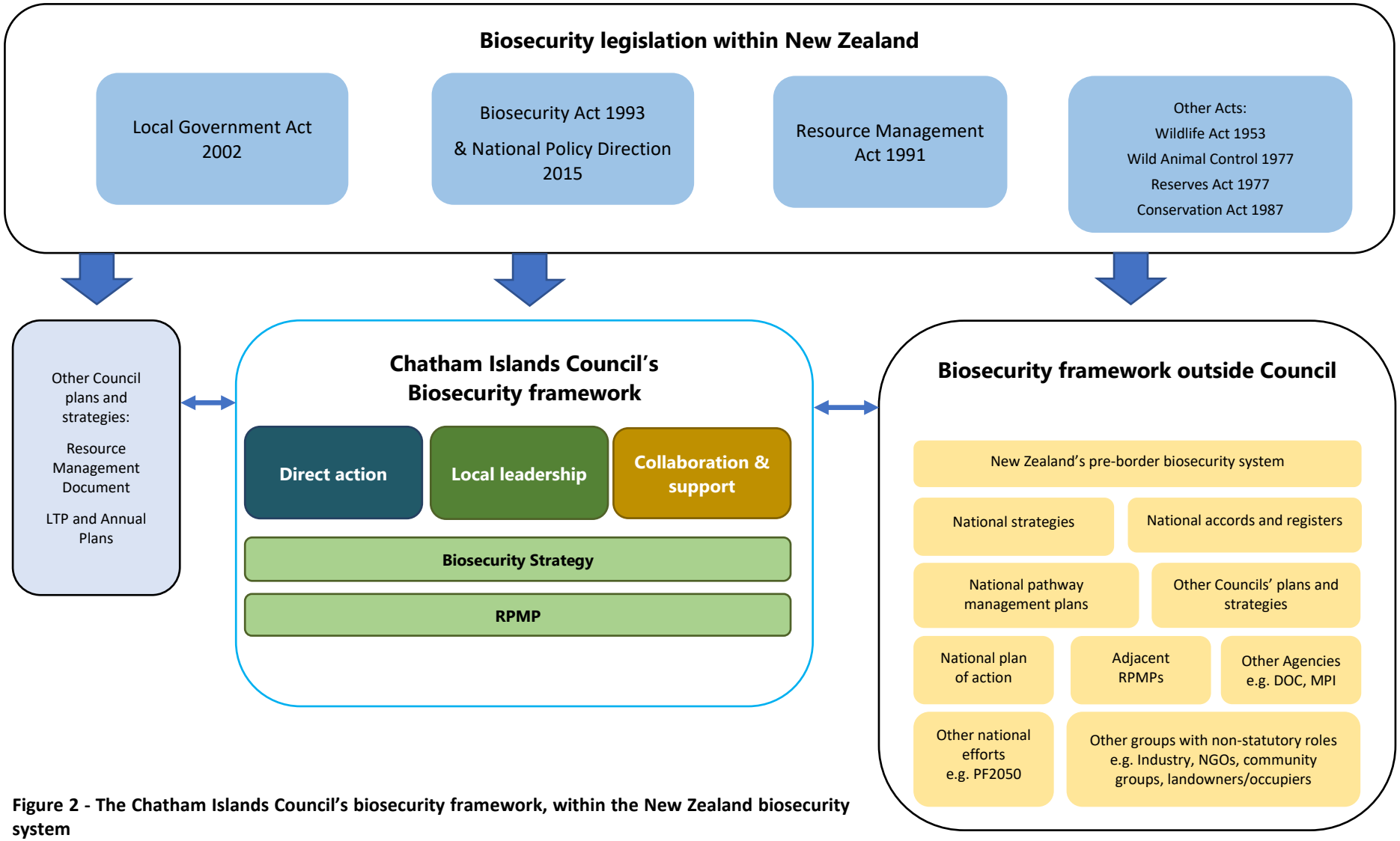

Figure 2 - The Chatham Islands Council's biosecurity framework, within the New Zealand biosecurity system

Biosecurity Act 1993

The Biosecurity Act can be used by a regional council (which includes the Chatham Islands Council as a unitary authority with the powers of a regional council), to exclude, eradicate or effectively manage pests in a region, including unwanted organisms. A regional council is not legally obliged to manage a pest or other organism to be controlled under the Biosecurity Act, unless it chooses to do so[1]. As such, the Act's approach is enabling rather than prescriptive. It provides a framework to gather intervention methods into a coherent system of efficient and effective actions. Indeed, Section 71 of the Act has prerequisite criteria that must be met to justify such intervention.

These criteria include that each subject:

- is capable of causing at some time an adverse effect on certain values[2]; and

For each subject:

- the benefits of the Plan must outweigh the costs after taking account of the likely consequences of inaction, or other courses of action;
- persons who are required to pay some or all of the costs of implementation must either be beneficiaries of the Plan or exacerbators of the problems proposed to be resolved by the Plan;
- there is likely to be adequate funding for the Plan's implementation for five years;
- that each rule helps to achieve the Plan's objectives and does not trespass unduly on individual rights;
- that the Plan is not frivolous or vexatious, is clear enough to be easily understood; and
- that if the council has rejected a similar proposal within the last 3 years, new material information answers the previous objections.

Part 5: Managing pests and harmful organisms

Part 5 of the Act specifically covers pest management. Its primary purpose is to provide for harmful organisms to be managed effectively or eradicated. A harmful organism is assigned pest status if included in a pest management plan (also see the prerequisites in s69–78 of the Act). Part 5 includes the need for ongoing monitoring to determine whether pests and unwanted organisms are present and to keep them under surveillance. Part of this process is to develop effective and efficient measures (such as policies and plans) that prevent, reduce, or eliminate the adverse effects of pests and unwanted organisms on land and people including Moriori and Māori, their tchiekitanga/kaitiakitanga and miheke/taonga. Part 5 also addresses the issue of who should pay for the cost of pest management.

Part 2: Functions, powers and duties in a leadership role

Regional councils are mandated under Part 2 (functions, powers and duties) of the Act to provide regional leadership for biosecurity activities, primarily within their jurisdictional areas.

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[1] *Council officers may also enforce sections 52 and 53 of the BSA, which relate to the sale, propagation or spread of "unwanted organisms".*

[2] *That is, on one or more of the following: economic wellbeing; the viability of threatened species; the survival and distribution of indigenous plants and animals; the sustainability of natural and developed ecological systems and processes and biological diversity; soil resources; water quality; human health; social and cultural wellbeing; recreational enjoyment of the natural environment; the relationship of Moriori and Māori with their cultures and traditions and their ancestral lands, waters and other miheke/taonga; and animal welfare.*

Section 12B(1) sets out how regional councils provide leadership. It includes ways that leadership in pest management issues can help to prevent, reduce or eliminate adverse effects from harmful organisms. Some of these activities include helping to develop and align RPMPs and regional pathway management plans in the region, promoting public support for managing pests, and helping those involved in managing pests to communicate and cooperate so as to make programmes more effective, efficient, and equitable.

Section 13(1) sets out powers that support regional councils in this leadership role. These include:

- Monitor and survey pests, pest agents, and unwanted organisms;
- Provide for the assessment and eradication or management of pests in accordance with relevant pest management plans;
- Prepare proposals for, "make" and implement regional pest management plans;
- Appoint a management agency for a plan;
- Disallow an operational plan or part of it;
- Review, amend, revoke and replace, or revoke a plan;
- Declare and implement small-scale management programmes; and
- Gather information, keep records and undertake research.

Part 6: Administering an RPMP

Once an RPMP has commenced, the management agency specified in the plan may exercise the powers in Part 6 to implement the plan where the plan provides for the agency to exercise the power. These powers include the necessary regulatory powers, instruments and cost recovery mechanisms needed for administering a plan. The Council, as management agency must prepare an operational plan for any RPMP and must prepare an annual report on the operational plan.

Changes to the Act since 1993

The Act has been amended since 1993, including through the Biosecurity Law Reform Act 2012. Important changes are:

- legislative (e.g. being able to bind the Crown to stated Good Neighbour Rules (GNR) within a pest management plan, or to rules within a pathway management plan);
- structural (e.g. giving regional councils a clear regional leadership role in managing pests; adding pathway management to the suite of pest management programmes; linking programmes with stated intermediate outcomes and programme objectives; using consistent terms in pest management programmes);
- compliance related (e.g. setting out the extra requirements under the NPD that must be complied with; introducing greater transparency of risk assessment in the analysis of benefits and costs);
- procedural (e.g. allowing funding, roles, and responsibilities related to small-scale management programmes to be delegated; allow a partial review (including adding a pest or pathway management plan) to be done at any time); and
- consultative (e.g. increasing the flexibility in public consultation).

Resource Management Act 1991

Regional councils (which includes the Chatham Islands Council as a unitary authority with the powers of a regional council) also have responsibilities under the Resource Management Act 1991 (RMA) to sustainably manage the natural and physical resources of the region, including the Coastal Marine Area (CMA). These responsibilities include the sustainable management of natural and physical resources (section 5), recognising and providing for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (section 6(c) and having particular regard to the intrinsic values of ecosystems (section 7(d)).

The RMA sets out the functions of regional councils in relation to the maintenance and enhancement of ecosystems in the CMA of the region (s30(1)(c)(iiia)), the control of actual or potential effects of use, development or protection of land (s30(1)(d)(v)) and the establishment, implementation and review of objectives, policies and methods for maintaining indigenous biological diversity (s30(1)(ga)).

The focus of the RMA is on managing adverse effects on the environment through regional policy statements, regional and district plans, and resource consents. The RMA, along with regional policies and plans can be used to manage activities so that they do not create a biosecurity risk, or those risks are minimised. While the Biosecurity Act is the main regulatory tool for managing pests, there are complementary powers within the RMA that can be used to ensure the problem is not exacerbated by activities regulated under the RMA.

The Biosecurity Act cannot over-ride any controls imposed under the RMA, for example, bypassing resource consent requirements.

Local Government Act 2002

The purpose of the Local Government Act 2002 (LGA) includes to provide *"a framework and powers for local authorities to decide which activities they undertake and the manner in which they will undertake them".*

The LGA (together with its companion Act, the Local Government (Rating) Act 2002) currently underpins biosecurity activities through the collection of both general and targeted rates. While planning and delivering pest management objectives could fall within powers and duties under the LGA, accessing legislation focused on managing pests at the regional level is the most transparent and efficient approach. The Council is mandated under s11(b) of the LGA to perform the funding function, and s11(b) provides for Council to perform duties under Acts other than the LGA.

Wild Animal Control Act 1977 (and Wild Animal Control Amendment Act 1997) and the Wildlife Act 1953

Activities in implementing this Plan must comply with other legislation. Two such Acts are the Wild Animal Control Act 1977 (and Wild Animal Control Amendment Act 1997) and the Wildlife Act 1953. Particular relevant requirements are noted below.

(a) The Wild Animal Control Act controls the hunting and release of wild animals such as deer, goats and pigs as well as regulates deer farming and the operation of safari parks. It also gives local authorities the power to destroy wild animals under operational plans that have the Minister of Conservation's consent. Control of wild animals under this RPMP has this consent.

(b) The Wildlife Act 1953 controls and protects wildlife not subject to the Wild Animal Control Act 1977. It defines wildlife that are not protected (e.g. feral cattle, feral cats, feral dogs), are to be game (e.g. mallard ducks, black swans), partially protected or are injurious. It authorises that certain unprotected wildlife may be kept and bred in captivity even if they are declared pests under a pest management plan (e.g. ferret, stoat, weasel, polecat). The Director-General of Conservation must approve any plans to control injurious birds (e.g. rooks).

Other legislation

Other legislation (such as the Reserves Act 1977 and the Conservation Act 1987) does contain provisions that support pest management within a specific context. The role of regional councils (including unitary authorities) under such legislation is limited to advocacy. As regional councils have a specific role under the Biosecurity Act, only taking on an advocacy role would be of little use.

2.2 Relationship with other plans and regulations

An RPMP must not be inconsistent with:

(i) any national pest management plan or RPMP that is focused on the same organism;

(ii) any pathway management plan;

(iii) a regional policy statement or regional plan prepared under the Resource Management Act 1991; or

(iv) any regulation.

To ensure consistency with other pest management plans, those pests that are frequently listed in other regional pest management plans but not in the Chatham Islands RPMS (2008-2018) or in the National Pest Plant Accord, were considered for inclusion during the RPMP review.

Coordination with other pest management plans, and pest control operations undertaken by the Department of Conservation and others will be achieved through a process based on consultation, collaboration, and communication between the Chatham Islands Council and the relevant agency. Alternative pest management arrangements or memoranda of understanding will be developed as required.

The Proposal must not be inconsistent with the Chatham Islands Resource Management Document (December 2017) or any regional plan developed in accordance with the RMA. The Resource Management Document signals that Chatham Islands Council will address pest management issues through implementation of their Pest Management Strategy/Plan developed under the Act. There is no inconsistency between the Proposal and the Resource Management Document.

There are no known inconsistencies with any regulations.

2.3 Relationship with the National Policy Direction

The National Policy Direction (NPD) took effect in 2015. The stated purpose of the NPD is to ensure that activities under Part 5 of the Act (Pest Management) provide the best use of

available resources for New Zealand's best interests, and align with each other (when necessary), to help achieve the purpose of Part 5.

Table 1 below sets out the NPD requirements and the steps taken to comply with them.

Table 1 - NPD requirements and steps taken to comply with them

NPD requirements	Steps taken to comply
Programme is described	The types of programmes (described in section 5.2 of the Proposal) comply with clause 5 of the NPD.
Objectives are set	The structure of the objectives in section 6 of the Proposal complies with clause 4 of the NPD.
Benefits and costs are analysed	An analysis of the costs and benefits has been undertaken in accordance with clause 6 of the NPD. That analysis is presented in the Cost Benefit Analysis to support the Proposed Chatham Islands Regional Pest Management Plan (September 2020).
Funding rationale is noted	The funding rationale described in section 9 of the Proposal has been developed in line with clause 7 of the NPD.
Good Neighbour Rules (GNRs) are described	The GNR has been developed in line with clause 8 of the NPD.

2.4 Relationship with Moriori and Māori

One specific purpose of an RPMP under the Act is to provide for the protection of the relationship of Moriori and Māori with their cultures, their traditions and their ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga , and to protect those aspects from the adverse effects of pests. Moriori and Māori involvement in biosecurity is an important part of exercising tchiekitanga/kaitiakitanga. Moriori and Māori also carry out significant pest management through their primary sector economic interests and as landowners and/or occupiers.

The Local Government Act (2002) requires Council to recognise and respect the Crown's responsibilities under the Tiriti o Waitangi - Treaty of Waitangi. It also requires councils to maintain and improve opportunities for Moriori and Māori to contribute to decision-making processes. This includes considering ways to help Moriori and Māori to contribute. These responsibilities and requirements were met while preparing this plan and will continue after it takes effect.

Moriori and Ngāti Mutunga are the recognised imi/iwi, with the Hokotehi Moriori Trust and Ngāti Mutunga o Wharekauri Iwi Trust the respective mandated bodies representing imi/iwi. Moriori and Ngāti Mutunga are both regarded as Treaty partners by Chatham Islands Council and their relationship with these islands is a matter of national importance to be recognised

and provided for through the Council planning processes. They have a special status in local government planning and resource management activities. Chatham Islands Council acknowledges that these two groups have distinct cultures and practices.

2.5 Consultation overview

In September 2020, a series of targeted discussion sessions were run on the future of pest management on the Chatham Islands. Key stakeholders were invited to attend these sessions, with the purpose of providing an overview of the Proposal and review process and to seek their views on the best approaches to be taken in a new RPMP.

Nine sessions were held between 22nd and the 24th September 2020, with representatives from the community, the Hokotehi Moriori Trust, Ngāti Mutunga, Department of Conservation, relevant on-island management agencies, and industry. There was good engagement and interest from participants, who are generally very supportive of the Chatham Islands Biosecurity Programme. Key discussion points were recorded for consideration and minor amendments were made to the draft Proposal in response to their feedback.

In October 2020, the draft Proposal was provided to all attendees of the discussion sessions, as well as some additional interested parties. The cost benefit analysis report was made available at their request. Feedback was received from four groups (Hokotehi Moriori Trust, Chatham Islands Conservation Board, Taiko Trust and Department of Conservation).

The outcome of this consultation process was general support for the Proposal and the pests proposed for inclusion, and no significant opposition over any part of the Proposal. However, a number of additional organisms were requested for inclusion.

Other feedback on the Proposal fell into the following main areas:

- Alignment with the currently-in-development Predator Free programme
- Changes to the management programme proposed for some pests
- The inclusion of a list of "Organisms of Interest" in the Proposal
- The inclusion of site-led programmes in the Proposal
- Shortening of the Plan review period, specifically from 10 years to 5 years
- Minor modifications to the text

All consultation feedback was considered, and amendments were made to the Proposal where this was considered appropriate.

3 Responsibilities and obligations

3.1 The management agency

Chatham Islands Council is the management agency responsible for implementing the RPMP. The Council is a unitary authority, with both territorial local authority and regional council responsibilities. Chatham Islands Council is satisfied that it meets the requirements of s100 of the Act in that it:

(a) is accountable to the Plan funders, including Crown agencies, through the requirements of the LGA 2002;

(b) is acceptable to the funders and those persons subject to the RPMP's management provision because it implemented previous Regional Pest Management Strategies; and

(c) has the capacity, competency and expertise to implement the proposed RPMP[3].

How Chatham Islands Council will undertake its management responsibilities is set out in Section 5 (Pest Management framework) and in Part Three (Procedures) of this Proposal.

3.2 Compensation and disposal of receipts

The proposed RPMP does not provide for compensation to be paid to any persons meeting their obligations under its implementation. However, should the disposal of a pest or associated organism provide any net proceeds, a person will be paid disbursement in the manner noted under section 100I of the Act.

3.3 Affected parties

Responsibilities of owners and/or occupiers

Pest management is an individual's responsibility in the first instance because generally occupiers contribute to the pest problem and in turn benefit from the control of pests. The term 'occupier' has a wide definition under the Act and includes:

- the person who physically occupies the place; and
- the owner of the place; and
- any agent, employee, or other person acting or apparently acting in the general management or control of the place.

Under the Act, 'place' includes: any building, conveyance, craft, land or structure and the bed and waters of the sea and any canal, lake, pond, river or stream.

Occupiers must manage pests in accordance with the rules. If they fail to meet the rules' requirements, they may be subject to legal action. For example, some rules specify that a contravention of the rule creates an offence under section 154N(19) of the Act. Occupiers (and other persons) must not sell, propagate, breed or distribute pests.

An authorised person may enter and inspect any place, at any reasonable time, to –

- find out whether pests are on the property;
- manage pests; or
- ensure the owner and/or occupier is complying with biosecurity law.

While the owner and/or occupier may choose the methods they will use to control any pests, they must also comply with the requirements under other legislation (e.g. Resource Management Act and/or the Hazardous Substances and New Organisms Act 1996).

This Proposal treats all private land equitably and emphasises the responsibilities and obligations of all landowners and/or occupiers.

[3] Environment Canterbury provides resources to Chatham Islands Council to support implemenetation of biosecurity functionsHowever, Chatham Islands Council remains responsible for implementing the Plan.

Crown agencies

Under section 69(5) of the Act, all land occupiers, including the Crown, must meet 'Good Neighbour Rules' within regional pest management plans. A Good Neighbour Rule addresses the situation where a pest may spread across a property boundary due to the land occupier failing to undertake sufficient management of the pest, thus imposing unreasonable costs on an adjacent land owner who is actively managing that pest.

This is an opportunity for the Council to promote more integrated and effective pest management, regardless of land tenure, and develop equity across occupiers. In common with other land occupiers, however, the Council may exempt the Crown from any requirement in a plan rule upon written request (refer section 8.3 of this Plan).

Department of Conservation

The Department of Conservation manages 7,129 hectares of Crown land within the Chatham Island Territory (about 4% of total land area), with managed areas ranging in size from 4 to 1,300 ha, under the Reserves Act, the National Parks Act, and the Conservation Act.

The Department also has particular responsibilities and expertise in the management and prevention of spread of pest plants and pest animals that pose a threat to indigenous biodiversity under the Wild Animal Control Act, the Wildlife Act (see section 2.2.4), and the Freshwater Fisheries Regulations 1983.

As there is no Fish and Game Council present on the Chatham Islands with the statutory authority to manage game, wildlife is administered by DOC through the Chatham Islands (Wildlife) Notice 1977. In administering the Wildlife Notice, DOC issues hunting permits and sets a hunting season for black swan, weka, pukeko, mallard duck and grey duck.

DOC undertakes pest control through the Conservation General Policy (2005) formed under the Conservation Act 1987. The Lower North Island Region of the Department of Conservation administers the Chatham Islands Conservation Management Strategy (1999), which includes policies on pest management, including the management of some freshwater fish. The Conservancy oversees all pest control programmes, including quarantine and contingency plans, undertaken by the Rēkohu/Wharekauri/Chatham Islands' District Office.

Road reserves

Road reserves include the land on which the formed road lies and the verge area that extends to adjacent property boundaries. The Act allows the option of making either roading authorities (NZ Transport Agency and district/city councils) or adjoining land occupiers responsible for pest management in road reserves (see s6(1) of the Act).

As such, the Chatham Island Council has decided that, for the purposes of this plan, land occupiers are not legally responsible for the control of pest plants on adjacent formed roads or roadside reserves. The Council is responsible for the control of pest plants on formed roads and road reserves. If a land occupier wishes to control pests on adjacent formed roads or roadside reserves, they may do so, providing that they meet the requirements of the RPMP.

Part Two

Pest Management

4 Organisms declarations

4.1 Organisms declared as pests

The organisms listed in Table 2 are classified as pests. The table also indicates what management programme or programmes will apply to the pest and if a good neighbour rule (GNR) applies. Detailed descriptions of pest characteristics and impacts are available in Appendix 2.

Attention is also drawn to the **statutory obligations** of any person under s52 and s53 of the Act. Those sections prevent anyone from selling, propagating or distributing any pest, or part of a pest, covered by the RPMP. Not complying with s52 and s53 is an offence under the Act and may result in the penalties noted in s157(1).

Table 2 - Organisms classified as pests

Common Name	Scientific Name	Programme	GNR	Section
Animal organisms classified as pests				
Ant (Argentine ant; Darwin's ant)	*Linepithema humile; Doleromyrma darwiniana*	Exclusion[i]	-	6.1
Asian paddle crab	*Charybdis japonica*	Exclusion[i]	-	6.1
Australian droplet tunicate	*Eudistoma elongatum*	Exclusion[i]	-	6.1
Canada geese	*Branta canadensis*	Eradication	-	6.2
Clubbed tunicate*	*Styela clava*	Exclusion[i]	-	6.1
Feral goat	*Capra aegagrus hircus*	Eradication	-	6.2
Hedgehog	*Erinaceus europaeus*	Exclusion[ii]	-	6.1
Mediterranean fanworm*	*Sabella spallanzanii*	Exclusion[i]	-	6.1
Mustelid (ferret; stoat; weasel)	*Mustela furo; Mustela erminea; Mustela nivalis*	Exclusion[i]	-	6.1
Plague skink*	*Lampropholis delicata*	Exclusion[i]	-	6.1
Possum	*Trichosurus vulpecula*	Exclusion[ii]	-	6.1
Pyura	*Pyura doppelgangera*	Exclusion[i]	-	6.1
Rabbit[iii]	*Oryctolagus cuniculus*	Exclusion[i]	-	6.1
Rat (kiore; Norway rat; ship rat)	*Rattus exulans; Rattus norvegicus; Rattus rattus*	Exclusion[ii]	-	6.1
Varroa bee mite*	*Varroa destructor*	Exclusion[i]	-	6.1
Wallaby (Bennett's wallaby; brush-tailed rock wallaby; dama wallaby; parma wallaby; swamp wallaby)*	*Macropus rufogriseus rufogriseus; Petrogale penicillate; Macropus eugenii; Macropus parma; Wallabia bicolour*	Exclusion[i]	-	6.1

Wasp (common wasp; German wasp)	*Vespula vulgaris; Vespula germanica*	Exclusion[i]	-	6.1
Plant organisms classed as pests				
African club moss*	*Selaginella kraussiana*	Progressive containment	-	6.3
Banana passionfruit*	*Passiflora tripartita* and *P.tarminiana*	Eradication	-	6.2
Boneseed*	*Chrysanthemoides monilifera subspecies monilifera*	Exclusion[i]	-	6.1
Broom (common broom; white broom; Montpellier broom)	*Cystisus scoparius; Cytisus multiflorus; Teline monspessulana*	Eradication	-	6.2
Buddleia	*Buddleja davidii*	Progressive containment	-	6.3
Chilean guava	*Ugni molinae*	Eradication; Sustained control[iv]	-	6.2; 6.4
Chilean needlegrass*	*Nassella neesiana*	Exclusion[i]	-	6.1
Chilean rhubarb*	*Gunnera tinctoria*	Eradication	-	6.2
Gorse	*Ulex europaeus*	Sustained control	✓	6.4
Ice plant*	*Carpobrotus edulis* (and hybrids)	Progressive containment	-	6.3
Old man's beard*	*Clematis vitalba*	Eradication	-	6.2
Ragwort	*Jacobaea vulgaris*	Progressive containment	-	6.3
Reed sweet-grass	*Glyceria Maxima*	Eradication	-	6.2
Sycamore	*Acer pseudoplatanus*	Progressive containment	-	6.3
Wild ginger (kahili ginger*; yellow ginger*)	*Hedychium gardnerianum*; *Hedychium flavescens*	Eradication	-	6.2
Willow (crack willow*; grey willow*)	*Salix fragilis; Salix cinerea*	Eradication	-	6.2
Pathogens described as pest organisms				
American foulbrood (AFB)*	*Histolysis infectiosa perniciosa larvae apium, Pestis americana larvae apium*	Exclusion[i]	-	6.1

* Classified as an "Unwanted Organism" at the time the Plan was established

[i] Exclusion from all Chatham Islands Territory

[ii] Exclusion from Pitt Island/Rangihaute/Rangiauria only

[iii] Note that this includes domestic and feral rabbits

[iv] Note that Chilean guava is included in two management programmes, which apply to two different locations on the main Chatham Island/Rēkohu/Wharekauri.

4.2 Other organisms that may be controlled

The organisms specified as pests under the Proposal are those that are capable of causing adverse effects of harmful organisms on economic wellbeing, the environment, human health, enjoyment of the natural environment, and the relationship of Moriori and Māori, with their culture, their traditions and their ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga[4].

Section 70(2)(d) of the Act also provides for the specification of 'any other organisms intended to be controlled' but not accorded pest status. There are many further organisms capable of causing some adverse effects, particularly to biodiversity values. A number pose a sufficient future risk to warrant being watch-listed for ongoing surveillance or future control opportunities. Therefore, their placement in an 'Organisms of Interest' (OoI) category is considered prudent.

Public feedback during the development of the Proposal suggested that there were a number of organisms that needed either surveillance or control, therefore they have been placed in the OoI category. Likewise, a number of organisms declared as 'unwanted organisms' (see 4.3 below) have also been placed in the OoI category.

OoIs are not accorded pest status but future control of them could arise, for example through Site-led programmes. A review of the Plan may be necessary to include them as pests.

Table 3 lists those organisms included in the category of 'Organisms of Interest'.

Table 3 - Organisms of Interest

Common Name	Scientific Name
Animals	
Frog (southern bell frog; whistling frog)	*Litoria raniformis; Litoria ewingii*
Feral cat	*Felis catus*
Feral cattle	*Bos taurus*
Feral horse	*Equus ferus*
Feral pig	*Sus scrofa*
Feral sheep	*Ovis aries*
Mouse	*Mus musculus*
Southern black-backed gull	*Larus dominicanus*
Plants	
Bishops pine	*Pinus muricata*
Boxthorn	*Lycium ferocissimum*
Contorta pine (lodgepole pine)*	*Pinus contorta*
Corsican pine	*Pinus nigra*

[4] Section 54(a) of the Act

Cotoneaster	*Cotoneaster franchetii; C. glaucophyllus; C. horizontalis; C. microphyllus; C. ovata; C, lacteus*
Douglas fir	*Pseudotsuga menziesii*
European larch	*Larix decidua*
Heather*	*Calluna vulgaris*
Male fern	*Dryopteris filix-mas*
Maritime pine	*Pinus pinaster*
Mountain pine; dwarf mountain pine	*Pinus mugo; Pinus uncinata*
Pampas (common pampas; purple pampas)*	*Cortaderia selloana; C. jubata*
Ponderosa pine	*Pinus ponderosa*
Radiata pine	*Pinus radiata*
Scots pine	*Pinus sylvestris*
Sea spurge*	*Euphorbia paralias*
Spanish heath	*Erica lusitanica*
Spartina	*Spartina alterniflora; S. anglica; S. gracilis; S. maritime; S. townsendii*
Sweet briar	*Rosa rubiginosa*
Tradescantia*	*Tradescantia fluminensis*
Veldt grass	*Ehrharta erecta*
Wattle (brush wattle; coastal wattle)	*Paraserianthes lophantha; Acacia sophorae*
Yellow flag iris*	*Iris pseudacorus*
Pathogens	
Mycobacterium bovis (agent of bovine tuberculosis)*[i]	*Mycobacterium bovis*
*Mycoplasma bovis**[i]	*Mycoplasma bovis*
Myrtle rust*[i]	*Austropuccinia psidii*

* Unwanted organism

[i] These organisms are subject to national management strategies and/or programmes.

Note 1: The above organisms are not declared pests under this Proposal and occupiers or other persons will not be subject to any obligations under the Plan or under the Act. However, those above that have unwanted organism status are subject to statutory obligations already in place under the Act (section 52 and section 53) that prevent the sale, propagation and distribution of unwanted organisms by any person.

Note 2: All organisms with 'unwanted organism' status, including those not listed above but contained in the Unwanted Organism Register administered by Ministry for Primary Industries (see www.mpi.govt.nz) may be considered as OoI and could be candidates for control under future site-led programmes.

4.3 Unwanted Organisms

A number of species have been declared nationally as Unwanted Organisms. For the most up-to-date list of Unwanted Organisms, visit the MPI website at https://www.mpi.govt.nz

Some of those organisms are subject to national action under the National Interest Pest Response (NIPR) programme managed by Ministry for Primary Industries (MPI). None of the nine species subject to the NIPR are known to be present in Chatham Islands.

The National Pest Plant Accord (NPPA) is a cooperative agreement between the Nursery and Garden Industry Association, regional councils and government departments with biosecurity responsibilities. All plants on the Accord list are Unwanted Organisms under the Biosecurity Act 1993. It seeks to prevent the sale and/or distribution of the specified plants where either formal or casual horticultural trade is the most significant way of spreading the plants in New Zealand. The most up-to-date list of Accord species is also available on the MPI website.

Unwanted Organism status means that such an organism is prohibited from sale, propagation and distribution in accordance with sections 52 and sections 53 of the Act. Where this restriction is considered sufficient for their management they are not included as pests in this Proposal. However, in the future these organisms may be reconsidered for inclusion, for example under a Site-led programme.

5 Pest management framework

5.1 Objectives

Objectives have been set for each pest or class of pests. As required by the NPD, the objectives include:

- the particular adverse effect/s (s54(a) of the Act) to be addressed;
- the intermediate outcomes of managing the pest;
- the geographic area to which the outcome applies;
- the extent to which the outcome will be achieved, if applicable;
- the period for achieving the outcome; and
- the intended outcome in the first 10 years of the Plan (if the period is greater than 10 years).

5.2 Pest management programmes

One or more pest management programmes will be used to control pests and any other organisms covered by this RPMP. The types of programme are defined by the NPD and reflect outcomes in keeping with:

- the extent of the invasion; and
- whether it is possible to achieve the desired control levels for the pests.

The intermediate outcomes for four programmes are described below.

1. Exclusion Programme: to prevent the establishment of the subject, or an organism being spread by the subject, that is present in New Zealand but not yet established in an area.
2. Eradication Programme: to reduce the infestation level of the subject, or an organism being spread by the subject, to zero levels in an area in the short to medium term.
3. Progressive Containment Programme: to contain or reduce the geographic distribution of the subject, or an organism being spread by the subject, to an area over time.
4. Sustained Control Programme: to provide for ongoing control of the subject, or an organism being spread by the subject, to reduce its impacts on values and spread to other properties.

5.3 Principal measures to manage pests

The principal measures used in the RPMP to achieve the objectives are in four main categories. Each category contains a suite of tools to be applied in appropriate circumstances[5].

1. Requirement to act

[5] *Where it is stated in the following sections that Chatham Islands Council may undertake, facilitate or assist additional approaches to control work, this will not generally include work on Crown or public conservation land. The reason for this is that it is not considered an effective or cost efficient use of Chatham Islands Council's resources to undertake control works on Crown or public conservation land when those entities receive funding for control works from other sources.*

Landowners and/or occupiers or other persons may be required to act where RPMP rules dictate:

(a) pests are to be controlled;
(b) management plans are to be prepared and submitted;
(c) the presence of pests is to be reported;
(d) actions are to be reported (type, quantity, frequency, location, programme completion); or
(e) pests are not to be spread (propagated, sold, distributed), and pathways are to be managed (e.g. machinery, gravel, animals).

2. Council inspection

Inspection by Council may include staff:

(a) visiting properties or doing surveys to determine whether pests are present, or rules and management programmes are complied with, or to identify areas that control programmes will apply to (places of value, exclusion zones, movement control areas);
(b) managing compliance to regulations (rule enforcement, action on default, prosecution, exemptions);
(c) taking limited control actions, where doing so is effective and cost efficient; or
(d) monitoring effectiveness of control.

3. Service delivery

Council may deliver the service:

(a) where it is funded to do so within a rating district;
(b) on a user pays basis;
(c) by providing control tools, including sourcing and distributing biological agents, or provisions (e.g. traps, chemicals).

4. Advocacy and education

Council may:

(i) provide general purpose education, advice, awareness and publicity activities to landowners and/or occupiers and the public about pests and pathways (and control of them);
(ii) encourage landowners and/or occupiers to control pests;
(iii) facilitate or fund community and landowners and/or occupier self-help groups and committees;
(iv) help other agencies with control, advocacy, and the sharing or sourcing of funding;
(v) promote industry requirements and best practice to contractors and landowners and/or occupiers;
(vi) encourage landowners and/or occupiers and other persons to report any pests they find or to control them; or
(vii) facilitate or commission research.

5.4 Alternative pest management arrangements

Council may develop alternative management arrangements (i.e. management plans or memoranda of understanding (MOUs)) with agencies to establish agreed levels of service with those agencies, to act to control pests on their land, or to defer enforcement actions on rules

in this Plan, in preference for pragmatic levels of service that achieve the objectives of the Plan.

5.5 Rules

Rules play an integral role in securing many of the pest management outcomes sought by the proposed RPMP. They create a safety net to protect landowners and/or occupiers from the effects of the actions or inactions of others where non-regulatory means are inappropriate or do not succeed.

Importantly, amendments to the Act arising from the Biosecurity Law Reform Act 2012 now make the Crown bound by those rules identified as Good Neighbour Rules (GNRs) in RPMPs.

Section 73 of the Act prescribes the matters that may be addressed by rules, and the need to:

(i) specify if the rule is to be designated as a 'Good Neighbour Rule';
(ii) specify if breaching the rule is an offence under the Act; and
(iii) explain the purpose of the rule.

Rules can apply to owners and/or occupiers or to a person's actions in general.

The NPD and accompanying guidance notes provide extra requirements to include in the rules of a new GNR. Of particular note, the GNR will:

(a) identify who the GNR applies to—either all owners and/or occupiers, or a specified class of owner and/or occupier;
(b) identify the pest to be managed;
(c) state that the pest must already be present on the owner's and/or occupier's land;
(d) state that the owner and/or occupier of the adjacent or nearby land must, in the view of the management agency, be taking reasonable measures to manage the pest on their land; and
(e) (if relevant) state the particular values or uses of the neighbouring land that the pest's spread affects, and that the GNR is intended to address.

Gorse is the only pest subject to a GNR.

Some pests do not have specific rules, this is because Chatham Islands Council will undertake control operations. These pests are included in the Proposal to ensure Chatham Islands Council Officers have the powers (under Part 6 of the Act) to ensure effective management can occur. These powers can be relied upon irrespective of whether a rule exists for the pest or not. Inclusion in the Proposal also provides restrictions under sections 52 and 53 of the Biosecurity Act 1993, including, preventing the communication, release, spread, sale, and propagation of pests.

6 Pest programmes, objectives and rules

Section 6 lists the pests to be managed under the Plan under the programmes to which they are assigned. The Proposal is required to describe for each pest listed:

- Its adverse effects (see Appendix 2 for the characteristics and adverse effects posed by the pests named in this section);
- The reasons for a plan (See Appendix 2 and Sections 6.1 to 6.4 below);
- The objectives to be included in the Plan (see Section 5.1 above);
- The principal measures (including rules) to be used to achieve the objectives (see Section 5.3 and 5.5 above)[6]; and
- Any other measures that would be reasonable to take to achieve the objectives (see Section 5.4 above)

6.1 Pests to be managed under exclusion programme

The pests listed in Table 4 will be managed under an exclusion programme.

The exclusion programme for pests listed in part A of Table 4 applies to the entire Chatham Islands Territory. These pests are currently present within New Zealand, although at the date of the Plan are not known to be present anywhere in the Chatham Islands Territory.

The exclusion programme for pests listed in part B of Table 4 applies to Pitt Island/Rangihaute/Rangiauria only. These pests are currently present on the main Chatham Island/Rēkohu/Wharekauri, although at the date of the Plan are not known to be present on Pitt Island/Rangihaute/Rangiauria.

The pests listed in Table 4 are included in the Proposal because they have the potential to become established and may cause adverse effects on production (economic wellbeing) and environmental values. Potential adverse effects include the displacement of valuable species, impacting on pasture and/or native biodiversity and ecosystems. These impacts warrant the prevention of their establishment.

See Appendix 2 for the characteristics and adverse effects posed by the pests named in Table 4.

Where an exclusion pest is found to be present, an incursion response will be undertaken, and a management plan will be developed. This includes assessment of response actions and timeframes for the removal/destruction of the pest. Factors determining the feasibility of immediate removal/destruction include the level and distribution of infestation, the ability, and options available for control. If a newly detected pest is found to be widespread, it may not be feasible to eradicate.

[6] *Where it is stated in the following sections that Chatham Islands Council may undertake, facilitate or assist additional approaches to control work, this will not generally include work on Crown or public conservation land. The reason for this is that it is not considered an effective or cost efficient use of Chatham Islands Council's resources to undertake control works on Crown or public conservation land when those entities receive funding for control works from other sources.*

Table 4 - Pests to be managed in the exclusion programme

Common Name	Scientific Name
(A) Exclusion from Chatham Islands Territory	
American foulbrood (AFB)	*Histolysis infectiosa perniciosa larvae apium, Pestis americana larvae apium*
Ant (Argentine ant; Darwin's ant)	*Linepithema humile; Doleromyrma darwiniana*
Asian paddle crab	*Charybdis japonica*
Australian droplet tunicate	*Eudistoma elongatum*
Boneseed	*Chrysanthemoides monilifera subspecies monilifera*
Chilean needlegrass	*Nassella neesiana*
Clubbed tunicate	*Styela clava*
Mediterranean fan worm	*Sabella spallanzanii*
Mustelids (ferret; stoat; weasel)	*Mustela furo; Mustela erminea; Mustela nivalis*
Plague skink	*Lampropholis delicata*
Pyura	*Pyura doppelgangera*
Rabbit[i]	*Oryctolagus cuniculus*
Varroa bee mite	*Varroa destructor*
Wallaby (Bennett's wallaby; brush-tailed rock wallaby; dama wallaby; parma wallaby; swamp wallaby)	*Macropus rufogriseus rufogriseus; Petrogale penicillate; Macropus eugenii; Macropus parma; Wallabia bicolour*
Wasp (common wasp; German wasp)	*Vespula vulgaris; Vespula germanica*
(B) Exclusion from Pitt Island/Rangihaute/Rangiauria only	
Hedgehog	*Erinaceus europaeus*
Possum	*Trichosurus vulpecula*
Rat (Kiore; Norway rat; ship rat)	*Rattus exulans; Rattus norvegicus; Rattus rattus*

[i] note that this includes domestic and feral rabbits

Objectives and principal measures to be used in the exclusion programme

Plan Objective 1	**Principal measures to be used**
Over the duration of the Plan, preclude the establishment of **American foulbrood, ant (Argentine ant; Darwin's ant), Asian paddle crab, Australian droplet tunicate, boneseed, Chilean needlegrass, clubbed**	**Council inspection**, **service delivery** and **advocacy and education** described in section 5.3 of the Plan will be used by

tunicate, Mediterranean fan worm, mustelids (ferret; stoat; weasel), plague skink, pyura, varroa bee mite; **rabbit, wallaby (Bennett's wallaby; brush-tailed rock wallaby; dama wallaby; parma wallaby; swamp wallaby)** and **wasp (common wasp; German wasp)** within the Chatham Island Territory, to prevent adverse effects on economic well-being and environmental values[7]. **Plan Objective 2** Over the duration of the Plan, preclude the establishment of **hedgehog, rat (kiore, Norway rat, ship rat)** and **possum** on Pitt Island/Rangihaute/Rangiauria, to prevent adverse effects on economic well-being and environmental values.	Chatham Islands Council to achieve Plan Objective 1 and 2. **Alternatives considered** Excluding establishment of pests is a specialised activity involving surveillance systems and the capacity to act quickly to destroy any incursions. Chatham Islands Council and its contracted specialists have better access to the necessary skills and resources for this than individual people do. Therefore, relying on or requiring individual voluntary action as a means of achieving Objectives 1 & 2 would not prevent the adverse effects on the economic well-being and environmental values of pests under the Exclusion programme.
Plan Rule 1 No person shall transport any risk goods into the Chatham Islands Territory or within the Chatham Islands. Any person transporting potential risk goods into the Chatham Islands must hold a record confirming that the goods are free of any pest named in Table 3. A breach of this rule creates an offence under section 154N(19) of the Act.	**Explanation of rule** The transport, movement or distribution of exclusion pests to and within the Chatham Islands islands is seen as an activity that can affect measures taken to implement the RPMP and achieve Objectives 1 & 2. There is a high risk associated with the assisted introduction of these pests through the import and movement of goods, equipment and vehicles. The rule regulates the movement of goods that may contain or harbour a pest and pose a risk of spreading a pest.
Advice Note Sections 52 and 53 of the Biosecurity Act 1993, which prevent the communication, release, spread, sale and propagation of pests, must be complied with. These sections should be referred to in full in the Biosecurity Act 1993. A person may make an application to the Council for an exemption from the rules under section 78 of the Biosecurity Act 1993. This section should be referred to in full in the Act. Refer also to section 8.3 of this Plan.	

[7] For a definition see glossary in Appendix 1

6.2 Pests to be managed in the eradication programme

There are a number of pests present on the Chatham Islands where the infestation levels are low enough to make eradication possible within the proposed 20-year duration of the Plan. These pests are listed in Table 5 below.

These pests have been included in the Proposal because they cause adverse effects on production (economic wellbeing) and/or environmental values. Potential adverse effects include the displacement of valuable species, impacting on pasture and/or native biodiversity and ecosystems. These impacts warrant their eradication from the Chatham Islands.

See Appendix 2 for the characteristics and adverse effects posed by the pests named in Table 5.

Table 5 - Pests to be managed in the eradication programme

Common Name	Scientific Name
Banana passionfruit	*Passiflora tripartita* and *P.tarminiana*
Broom (common broom; white broom; Montpellier broom)	*Cystisus scoparius; Cytisus multiflorus; Teline monspessulana*
Canada geese	*Branta canadensis*
Chilean guava*	*Ugni molinae*
Chilean rhubarb	*Gunnera tinctoria*
Feral goat	*Capra aegagrus hircus*
Old man's beard	*Clematis vitalba*
Reed sweet grass	*Glyceria Maxima*
Wild ginger (kahili ginger; yellow ginger)	*Hedychium gardnerianum*; *Hedychium flavescens*
Willow (crack willow; grey willow)	*Salix fragilis; Salix cinerea*

* Chilean guava is included in two management programmes. The area to be managed in the eradication programme is shown in Map 5 in Appendix 2.

Objectives and principal measures to be used in the eradication programme

Plan Objective 3	**Principal measures to be used**
Over the next 5 years, reduce the infestation levels of **banana passionfruit, broom (common broom, white broom, Montpellier broom), Canada geese, Chilean guava, Chilean rhubarb, feral goat, old man's beard, reed sweet grass, wild ginger (kahilil ginger, yellow ginger)** and **willow (crack willow, grey willow)** to zero	Chatham Islands Council will take responsibility for delivering the eradication programme. The **council inspection, service delivery** and **advocacy and education** described in section 5.3 of the Plan will be used to achieve Plan Objective 3 and 4.

levels within the Chatham Islands Territory, by destroying all infestations known at the commencement date of the Plan, and, where practicable, destroy any new infestations that are identified, to prevent adverse effects on economic well-being and the environment. **Plan Objective 4** Over the next 10 years, reduce the infestation levels of **Chilean guava** to zero levels within the area shown on Map 4, by destroying all infestations known at the commencement date of the Plan, and, where practicable, destroy any new infestations that are identified, to prevent adverse effects on economic well-being and the environment.	**Alternatives considered** Relying on occupiers to undertake voluntary action or requiring them to act to prevent adverse effects for the pests listed in Table 4 is not considered viable. This is because the plants in particular are difficult to identify and the low levels of infestations may result in many plants not being removed in a timely manner. The uneven spread of invasions places an inequitable burden on those occupiers whose property are infested. Similarly, an inequitable burden exists for Canada geese because of their dispersibility, the need for coordinated control techniques and the uneven distribution of habitat. It is therefore preferable for beneficiaries (the wider community) rather than exacerbators to bear the responsibility for eradication.
Advice Note There are no proposed plan rules for pests in the eradication programme. Sections 52 and 53 of the Biosecurity Act 1993, which prevent the communication, release, spread, sale and propagation of pests, must be complied with. These sections should be referred to in full in the Biosecurity Act 1993.	

6.3 Pests to be managed in the progressive containment programme

There are a number of pests that are well established in the Chatham Islands, but their present infestation levels are still low enough for those levels to be reduced region-wide through the progressive containment programme. In some cases, it will result in fewer sites infested or in others the overall density of the pest will reduce over the 20-year duration period of the Plan. These pests are listed in Table 6 below.

These pests have been included in the Proposal because they cause adverse effects on production (economic wellbeing) and/or environmental values. Potential adverse effects include the displacement of valuable species, impacting on pasture and/or native biodiversity and ecosystems. These impacts warrant their management on the Chatham Islands.

See Appendix 2 for the characteristics and adverse effects posed by the pests named in Table 6.

Table 6 - Pests to be managed in the progressive containment programme

Common Name	Scientific Name
African club moss	*Selaginella kraussiana*
Buddleia	*Buddleja davidii*
Ice plant	*Carpobrotus edulis* (and hybrids)
Ragwort	*Jacobaea vulgaris*
Sycamore	*Acer pseudoplatanus*

Objectives and principal measures to be used in the progressive containment programme

Plan Objective 5	**Principal measures to be used**
Within 5 years of the commencement date of the Plan, progressively contain and reduce the geographic distribution of **African club moss, buddleia, ice plant, ragwort** and **sycamore** within the Chatham Islands Territory by 50% and continue to reduce the extent over the duration of the Plan, to prevent adverse effects on economic well-being and the environment.	Chatham Islands Council will take responsibility for delivering the progressive containment programme. The **council inspection, service delivery** and **advocacy and education** described in section 5.3 of the Plan will be used to achieve Plan Objective 5. **Alternatives considered** Relying on occupiers to undertake voluntary control to prevent adverse impacts of pests in the progressive containment programme is not considered viable. The plants are not always readily recognised, and the low levels of infestations may result in many plants not being removed in a timely manner. The uneven spread of invasions places an inequitable burden on those occupiers whose property is infested. It is therefore preferable for beneficiaries (the wider community) rather than exacerbators to bear the responsibility for progressive containment. Eradication over the 20-year time period of the Plan is not technically possible and the costs to achieve eradication are likely to be high.
Advice Note There are no proposed plan rules for pests in the progressive containment programme. However, Sections 52 and 53 of the Biosecurity Act 1993, which prevent the	

communication, release, spread, sale and propagation of pests, must be complied with. These sections should be referred to in full in the Biosecurity Act 1993.

6.4 Pests to be managed in the sustained control programme

The sustained control programme covers pests that, because of their biological and pest characteristics, need to be controlled to levels where their impacts on the economic, environmental, or social values are reduced cost-effectively and on an ongoing basis. The programme involves the obligation of rules and associated costs on organisations and individuals to maintain pest numbers below, or at, a level that addresses the negative impacts of the species on their neighbours. The effect of the rules may apply to the whole property, parts of the property (i.e. on its boundaries), the whole region, or parts of the region. The sustained control programme will at least hold populations to current levels over the proposed 20-year duration of the Plan. The identified pests are listed in Table 7 below.

These pests have been included in the Proposal because they cause adverse effects on production (economic wellbeing) and/or environmental values. Potential adverse effects include the displacement of valuable species, impacting on pasture and/or native biodiversity and ecosystems. These impacts warrant their management on the Chatham Islands.

See Appendix 2 for the characteristics and adverse effects posed by the pests named in Table 7.

Table 7 - Pests to be managed in the sustained control programme

Common Name	Scientific Name
Chilean guava*	*Ugni molinae*
Gorse	*Ulex europaeus*

* Chilean guava is included in two management programmes. This species will be managed in the sustained control programme, except for in the area shown in Map 4 in Appendix 2, which will be managed in the eradication programme.

Objectives, rules, and principal measures to be used in the sustained control programme

Plan Objective 6	**Principal measures to be used**
Over the duration of the Plan, sustainably control **Chilean guava** in all areas within the Chatham Islands Territory, with the exception of the area shown on Map 4, to ensure at a minimum there is no increase in extent, to avoid or minimise adverse effects on environmental and production values.	CIC will take responsibility for delivering the Chilean guava sustained control programme. The **council inspection, service delivery, advocacy and education** described in section 5.3 of the Plan will be used to achieve Plan Objective 6. **Alternatives considered** Relying on occupiers to voluntarily control Chilean guava to prevent adverse effects on

	environmental, landscape and production values is not considered equitable or likely to result in efficient levels of control. Many of the benefits of control accrue to persons other than to the occupiers of land with Chilean guava. It is therefore preferable for beneficiaries to fund Chatham Islands Council to undertake the control programme. There are no alternative measures that provide for satisfactory inspection, education, or advocacy measures.
Plan Objective 7 Over the duration of the Plan, sustainably control **gorse** in the Chatham Islands Territory, to ensure at a minimum there is no increase in extent and that boundaries are kept clear where the neighbouring property boundary is clear, to avoid or minimise adverse effects on environmental, recreational and production values.	**Principal measures to be used** Generally, landowners or occupiers will carry out the necessary control work to remove gorse plants. In addition, Chatham Islands Council may facilitate or assist additional community initiative approaches. The **requirement to act, council inspection, service delivery, advocacy and education** described in section 5.3 of the Plan will be used to achieve Plan Objective 7. **Alternatives considered** Relying on voluntary action to achieve Plan Objective 7 is not considered viable due to the wide distribution of gorse and the need for all occupiers to act in order to prevent further spread. Chatham Islands Council could take on the responsibility for controlling the spread of gorse. However, the extent of gorse infestation is such that the logistics of carrying out the control programme would be difficult to integrate with individual property occupier management requirements. It is also unlikely to be cost effective. Furthermore, the consequences of occupiers no longer owning the problem could lead to overoptimistic expectations on the part of both occupiers and the wider community and adverse effects to economic well-being may occur. This alternative is therefore rejected. There are no alternative measures that provide for satisfactory inspection, education, or advocacy measures.

Plan Rule 2 **Note: This is designated a Good Neighbour Rule** All occupiers within the Chatham Islands region shall on receipt of a written direction from an Authorised Person, eliminate **gorse** infestations on their land within 15 metres of the adjoining property boundary where the occupier of the adjoining property is eliminating gorse infestations within 15 metres of that boundary with the intention of protecting their economic well-being. For the purpose of this rule, eliminate means the permanent preclusion of the plant's ability to set viable seed. A breach of this rule creates an offence under section 154N(19) of the Act.	**Explanation of rule** The purpose of this rule is to manage the spread of gorse causing unreasonable costs to an adjacent occupier where active gorse management is being undertaken by that land occupier.
Plan Rule 3 Occupiers shall destroy all gorse present on land they occupy prior to viable seed set, if – (a) The gorse is located within an area that has had control operations carried out to destroy gorse; and (b) The control operations were publicly funded (either in full or in part). A breach of this rule creates an offence under section 154N(19) of the Act.	**Explanation of rule** The purpose of this rule is to ensure that over the duration of the Plan, new infestations of gorse are prevented at sites where gorse has previously been destroyed through control operations entirely funded or assisted by public funding.
Advice Note Sections 52 and 53 of the Biosecurity Act 1993, which prevent the communication, release, spread, sale and propagation of pests, must be complied with. These sections should be referred to in full in the Biosecurity Act 1993. A person may make an application to the Council for an exemption from the rules under section 78 of the Biosecurity Act 1993. This section should be referred to in full in the Act. Refer also to section 8.3 of this Plan.	

7 Monitoring

7.1 Measuring achievement of the objectives

Table 8 - Monitoring to be undertaken on specified pests

Anticipated result	Indicator	Method of monitoring	Frequency of monitoring	Frequency of reporting to Council
Exclusion programme				
Absence of **American foulbrood, ant (Argentine ant; Darwin's ant), Asian paddle crab, Australian droplet tunicate, boneseed, Chilean needlegrass, clubbed tunicate, Mediterranean fan worm, mustelids (ferret; stoat; weasel), plague skink, pyura, varroa bee mite**; **rabbit, wallaby (Bennett's wallaby; brush-tailed rock wallaby; dama wallaby; parma wallaby; swamp wallaby)** and **wasp (common wasp; German wasp)** within the Chatham Island Territory	Absence in the Chatham Island Territory	Surveillance and pathway management programmes coordinated by Chatham Island Council	Twice annual	Annual
		As reported from occupiers or other persons	As reported	Annual
Absence of **rat (kiore, Norway rat, ship rat)** on Pitt Island/Rangihaute/Rangiauria	Absence on Pitt Island/Rangihaute/Rangiauria	Surveillance and pathway management programmes coordinated by Chatham Island Council	Four times per year	Annual
		As reported from occupiers or other persons	As reported	Annual

Absence of **hedgehog and possum** on Pitt Island/Rangihaute/Rangiauria	Absence on Pitt Island/Rangihaute/Rangiauria	Surveillance and pathway management programmes coordinated by Chatham Island Council	Twice annual	Annual
		As reported from occupiers or other persons	As reported	Annual
Eradication programme				
All **Canada geese** and **feral goats** destroyed	Absence in the Chatham Island Territory	Sightings through general surveillance programme	Twice annual	Annual
		As reported from occupiers or other persons	As reported	Annual
All **banana passionfruit, broom (common broom, white broom, Montpellier broom), old man's beard, reed sweet grass, wild ginger (kahilil ginger, yellow ginger)** and **willow (crack willow, grey willow)** removed	Absence in the Chatham Island Territory	Sightings through general surveillance programme	Twice annual	Annual
		As reported from occupiers or other persons	As reported	Annual
All **Chilean rhubarb** removed	Absence in the Chatham Island Territory	Sightings through general surveillance programme	Annual	Annual
		As reported from occupiers or other persons	As reported	Annual
All **Chilean guava** removed from control site (see Map 4 in Appendix 2)	Absence in control site	Sightings through general surveillance programme	Twice annual	Annual
		As reported from occupiers or other persons	As reported	Annual

Progressive containment programme				
Reduction in the extent of **African club moss, buddleia, ice plant, ragwort** and **sycamore** by 50%.	Annual decrease in plant population	Sightings through general surveillance programme	Annual	Annual
		As reported from occupiers or other persons	As reported	Annual
Sustained control programme				
Chilean guava is restricted to its current spatial extent	At least no increase in extent	Sightings through general surveillance programme	Annual	Annual
		As reported from occupiers or other persons	As reported	Annual
Gorse is restricted to its current spatial extent (from 2013 baseline)	Absence adjacent to boundary fences	Property inspection	Annual	Annual
	At least no increase in extent	Population assessment	Annual	Annual
		Aerial inspection	Annual	Annual

7.2 Monitoring the management agency's performance

The Chatham Islands Council is the management agency. As the management agency responsible for implementing the Plan, the Chatham Islands Council will:

(a) prepare an operational plan within three months of the Plan being approved;

(b) review the operational plan, and amend it if needed;

(c) report on the operational plan each year, within five months after the end of each financial year; and

(d) maintain up-to-date databases of complaints, pest levels and densities, and responses from Chatham Islands Council and landowners and/or occupiers.

7.3 Monitoring plan effectiveness

Monitoring the effects of the Plan will ensure that it continues to achieve its purpose. It will also check that relevant circumstances have not changed to such an extent that the Plan requires review. A review may be needed if:

(a) the Act is changed, and a review is needed to ensure that the Plan is not inconsistent with the Act;

(b) other harmful organisms create, or have the potential to create, problems that can be resolved by including those organisms in the Plan;

(c) monitoring shows the problems from pests or other organisms to be controlled (as covered by the Plan) have changed significantly; or

(d) circumstances change so significantly that Chatham Island Council believes a review is appropriate.

If the Plan does not need to be reviewed under such circumstances, it will be reviewed in line with s100D of the Act. Such a review may extend, amend or revoke the Plan, or leave it unchanged.

The procedures to review the Plan will include officers of Chatham Islands Council and/or their contracted representatives.

(i) assessing the efficiency and effectiveness of the principal measures (specified for each pest and other organism (or pest group or organisms) to be controlled to achieve the objectives of the Plan;

(ii) assessing the impact the pest or organism (covered by the Plan) has on the region and any other harmful organisms that should be considered for inclusion in the Plan; and

(iii) liaising with Crown agencies, imi/iwi authorities and key interest groups, on the effectiveness of the Plan.

7.4 Plan review

The Chatham Islands Council may review the Plan or any part of it if it believes circumstances or management objectives have changed sufficiently. For example, where national or local pest management programmes are undertaken (e.g. Predator Free 2050), Council may wish to review the plan to align objectives with these programmes. However, where the Plan has been in force for ten years or more and the Plan has not been reviewed within the last ten years, then the Chatham Islands Council must review the Plan. A review may also become

necessary if the Chatham Islands Council or the Environment Court considers the Plan is inconsistent with any requirements of an operative NPD.

A Council can make minor amendments to the Plan without needing a review. Any minor amendment:

(i) Must not significantly affect any person's rights and obligations; and

(ii) Must not be inconsistent with the NPD.

A review may result in no change to the Plan or may extend its duration.

Part Three

Procedures

8 Powers conferred

8.1 Powers under Part 6 of the Act

The Principal Officer (Chief Executive) of Chatham Islands Council may appoint authorised persons to exercise the functions, powers and duties under the Act in relation to a RPMP.

Chatham Islands Council will use those statutory powers of Part 6 of the Act as shown in Table 9, where necessary, to help implement this Plan.

Table 9 - Powers from Part 6 to be used

Administrative provisions	Biosecurity Act Reference
The appointment of authorised and accredited persons	Section 103(3) & (7)
Delegation to authorised persons	Section 105
Power to require assistance	Section 106
Power of inspections and duties	Section 109, 110, 111 & 112
Power to record information	Section 113
General powers	Section 114 & 114A
Use of dogs and devices	Section 115
Power to seize evidence	Section 118
Power to seize abandoned goods	Section 119
Power to intercept risk goods	Section 120
Power to examine organisms	Section 121
Power to apply article or substance to place	Section 121A
Power to give directions	Section 122
Power to act on default	Section 128
Liens	Section 129
Declaration of restricted areas	Section 130
Declaration of controlled areas	Section 131 & 133
Options for cost recovery	Section 135
Failure to pay	Section 136

8.2 Powers under other sections of the Act

Any person in breach of a rule in the Plan that specifies that a contravention of the rule creates an offence under section 154N(19) of the Act, can be prosecuted and is liable on conviction under section 157(4) of the Act to a fine.

A Chief Technical Officer (employed under the State Sector Act 1988) may appoint authorised people to implement other biosecurity law considered necessary. One example is where restrictions on selling, propagating and distributing pests (under s52 and s53 of the Act) must be enforced. Another example is where owners and/or occupiers of land are asked for information (under s43 of the Act).

8.3 Power to issue exemptions to plan rules

Any landowner and/or occupier or other person may write to Chatham Islands Council to seek an exemption from any provision of a plan rule set out in Part Two of the RPMP.

The requirements in section 78 of the Act must be met for a person to be granted an exemption. These include:

(a) the council is satisfied that granting the exemption will not significantly prejudice the attainment of the plan's objectives; and

(b) the council is satisfied that 1 or more of the following applies:

> *(i) the requirement has been substantially complied with and further compliance is unnecessary:*
>
> *(ii) the action taken on, or provision made for, the matter to which the requirement relates is as effective as, or more effective than, compliance with the requirement:*
>
> *(iii) the requirement is clearly unreasonable or inappropriate in the particular case:*
>
> *(iv) events have occurred that make the requirement unnecessary or inappropriate in the particular case.*

Chatham Islands Council will keep and maintain a register that records the description, reasons and period of each exemption granted. The public will be able to inspect this register during business hours.

9 Effects and funding analysis

9.1 Introduction

The Act requires that funding be thoroughly examined. For a Proposal, this includes (in respect of each pest):

- analysing the costs and benefits of the plan and any reasonable alternative measures;
- noting how much any person will likely benefit from the plan;
- noting how any person's actions or inactions may contribute to creating, continuing, or making worse the problems that the plan proposes to resolve;
- noting the reason for allocating costs; and
- noting whether any unusual administrative problems or costs are expected in recovering the costs from any person who is required to pay under the Plan.

The Proposal is also required to specify:

a. the effects that, in the opinion of the person making the proposal, implementation of the plan would have on—

i. economic wellbeing, the environment, human health, enjoyment of the natural environment, and the relationship of Moriori and Māori with their cultures, their traditions and their ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga;

ii. the marketing overseas of New Zealand products; and

b. if the plan would affect another pest management plan or a pathway management plan, how it is proposed to coordinate the implementation of the plans.

9.2 Analysis of benefits and costs

The Act and its accompanying NPD demand a rigorous analysis of benefits and costs. In order to satisfy the requirements, the Chatham Islands Council commissioned a report, *Cost Benefit Analysis to support the Proposed Chatham Islands Regional Pest Management Plan, October 2020* (the CBA Report). A copy of the report is available from the Chatham Islands Council website.

In some situations, it is not always possible or cost effective to accurately monetise benefits and costs. Examples of these non-quantified benefits include enhanced biodiversity, cultural values, and recreational use. Non-quantified costs include reduced hunting opportunities or loss of carbon sequestration. These non-quantified costs and benefits were considered as part of the CBA report.

Analysis is largely undertaken at a low level due to the small scale of the wider Chatham Islands biosecurity programme and the RPMP. Each pest is considered against two management options, 'do nothing' and either Exclusion, Eradication, Progressive Containment or Sustained Control. It is considered that benefits exceed costs in all cases when the planned intervention is compared with doing nothing.

The key outcomes derived from the quantitative analysis of benefits and costs are shown in Table 10 below.

Table 10 - Summary of proposed pests, management objectives and costs

Pest	Recommended objective	Annual programme cost and responsibility for delivery	Recommended cost allocation
American foulbrood (AFB) Ant (Argentine ant; Darwin's ant) Asian paddle crab Australian droplet tunicate Boneseed Chilean needlegrass Clubbed tunicate Hedgehog Mediterranean fan worm Mustelid (ferret; stoat; weasel) Plague skink Possum Pyura Rabbit Rat (kiore; Norway rat; ship rat) Varroa bee mite Wallaby (Bennett's wallaby; brush-tailed rock wallaby; dama wallaby; parma wallaby; swamp wallaby) Wasp (common wasp; German wasp)	Exclusion	The total expenditure on these pests is expected to be $145,000 per year, delivered by the border biosecurity programme. Council will take responsibility for delivery of programmes to manage these pests.	**100% Council funded** – the proposed pests predominantly affect values of interest to the wider community, including biodiversity, landscape, social and cultural values. The wider island community benefits from their control.
Banana passionfruit Old man's beard Reed sweet grass Wild ginger (kahili ginger; yellow ginger) Willow (crack willow; grey willow)	Eradication	The total expenditure on these pests is expected to be $26,000 per year for the first 5 years of the Plan, then reducing to $10,000 per year from year 6 onwards. Council will take responsibility for delivery of programmes to manage these pests.	
Broom (common broom; white broom; Montpellier broom) Canada geese		The total expenditure on these pests is expected to be $95,000 per year for the first	**100% Council funded** – the proposed pests affect both biodiversity and production values. The wider island community and private land occupiers benefit

Pest	Recommended objective	Annual programme cost and responsibility for delivery	Recommended cost allocation
Feral goat Chilean rhubarb Chilean guava*		5 years of the Plan, then reducing to $10,000 per year from year 6 onwards. Council will take responsibility for delivery of programmes to manage these pests.	from their eradication. The infestations are small and would require targeted control by some landowners/occupiers and not others. Council will take responsibility for delivery of programmes to manage these pests to achieve a better result and it would be administratively ineffective to target a small number of landowners/occupiers. Land occupiers will contribute through the General Rate.
Buddleia Ragwort Sycamore African club moss Ice plant	Progressive containment	The total expenditure on these pests is expected to be $7,000 per year throughout the life of the Plan. Council will take responsibility for delivery of programmes to manage these pests.	**100% Council funded** – the proposed pests predominantly affect values of interest to the wider community, including biodiversity, landscape, social and cultural values. The wider island community benefits from their control. Ragwort can affect production values, but infestations are small and would require targeted control by some landowners/occupiers and not others. Council will take responsibility for delivery of programmes to manage these pests.
Chilean guava*	Sustained control	The total expenditure on this programme is expected to be $2,000 per year throughout the life of the Plan. Council will take responsibility for delivery of programmes to manage these pests.	
Gorse		The total expenditure on gorse is expected to be $40,000 per year throughout the life of the Plan. Land occupiers will take responsibility for control of gorse on their properties, which is conservatively estimated at $150,000 each year. Council will maintain responsibility for inspection and monitoring and will offer	For inspection and monitoring costs to prevent spread onto neighbouring properties – **100% Council funded** Control costs to prevent spread – **100% land holder-funded as exacerbators** The control of gorse primarily provides production benefits, and the prevention of any spread is of benefit to the rural land. Therefore, land occupiers should bear the majority of any costs to control it.

Pest	Recommended objective	Annual programme cost and responsibility for delivery	Recommended cost allocation
		discretionary non-regulatory support as part of the wider biosecurity programme.	Because land holders are able to determine whether control is worthwhile on their own property, in the absence of any wider benefit the major gains will come from preventing spread. Council will fund and provide inspection and monitoring of control actions by land occupiers.

* Note that Chilean guava is included in two management programmes, Eradication and Sustained Control, for two separate locations

9.3 Consideration of effects

Chatham Islands Council considers that implementing the Plan will deliver positive outcomes for the community. The effects of implementing the Plan (in relation to each pest) on: the relationship of Moriori and Ngāti Mutunga with their cultures, traditions, ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga; environment; human health; the enjoyment of the natural environment; economic well-being; and the marketing overseas of New Zealand products are described in this section of the Proposal.

Effects on Moriori and Māori

The Plan is expected to have overall beneficial effects for Moriori and Māori cultures and traditions. Specifically, this Plan will prevent or reduce plant pest infestations, invasion and consequential degradation of waahi tchap'/wāhi tapu and miheke/taonga sites. Destruction of indigenous flora by animal pests will be prevented or reduced.

The majority of pests that have been declassified are already covered in other documents, such as the National Pest Plant Accord. It was determined that there was no benefit in replicating this information in the new Regional Pest Management Plan. Where declassified pests pose a threat to sites of particular Moriori or Ngāti Mutunga value, the Chatham Islands Council has the ability to establish a site-led programme to protect or mitigate adverse effects.

A beneficial effect of value to Moriori or Ngāti Mutunga will be the exclusion of pests from terrestrial and coastal marine areas, including sites of cultural gathering and spiritual significance.

General benefits to the natural environment will arise from the control of gorse, broom, and other plant pests. These benefits will have a positive effect on the relationship of Moriori and Māori with their cultures, their traditions and their ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga generally.

Effects on the environment

The successful implementation of this Proposal will result in enhanced conservation, production, recreation and aesthetic values in the region by avoiding or minimising the adverse effects that animal and plant pests may have on the environment.

Mitigating the adverse effects from pests named in this plan can benefit native ecosystems as well as production and pastoral environments. The specific effects being avoided or mitigated, on a pest-by-pest basis, are identified in Appendix 2.

The use of control tools such as toxins or traps can negatively affect indigenous wildlife. Chatham Islands Council adopts current research and training that aims to minimise the non-target effects of pest control, and readily adopts best practice methods for poisoning and trapping operations.

Effects on human health

Some control methods, such as the use of chemicals and toxins, have the potential to adversely affect human health. The methods described above for minimising the risk to the environment also apply to minimising potential effects on human health. Concerns to human health are also addressed by the Hazardous Substances and New Organisms Act 1996. No other significant adverse effects on human health are anticipated.

Effects on enjoyment of the environment

Enjoyment of the environment may be impacted directly and indirectly by the Proposal. The Proposal benefits biodiversity, which is appreciated and enjoyed by many people. Some pests, such as gorse, can have very significant visual impacts, affecting people's appreciation of the environment.

Control may also affect enjoyment of the environment by negatively impacting on recreational opportunities. Examples include reduced hunting opportunities for feral goat or possums or inhibiting the use of some plants in gardens or areas where they may provide visual or aesthetic amenity.

Effects on economic well-being

The proposal will have a significant impact on economic well-being. The adverse effects of pests on production are described elsewhere in this Proposal and in some instances are the primary reason for intervention. For each pest, the overall benefits have been assessed as greater than the costs of control. Full details of the production benefits and costs of control are provided in the CBA Report.

Effects on the marketing overseas of New Zealand products

The control of animal and plant pests will increase agricultural production in some cases. Consequently, this Proposal is expected to have some beneficial effects for the marketing overseas of New Zealand products. The control of plant pests could also further enhance New Zealand's reputation as a "clean green" nation.

In the future, however, there could be increasing concerns from international markets and consumers regarding the use of chemical and biological control. These concerns would largely involve residues and product purity.

9.4 Beneficiaries and exacerbators

The extent to which any person benefits or is likely to benefit from a pest management plan depends on the organism to be controlled and the area for which expenditure is being incurred. Beneficiaries include occupiers and the community as a whole. Occupiers may benefit from increased productivity as a result of the effects of the Plan on their own property and from reduced risk of spill-over effects from other properties. The community as a whole may obtain non-producer benefits from the implementation of the Plan.

Non-producer benefits include a reduction in the actual and potential effects of pests and other organisms to be controlled on one or more of the following:

(a) the viability of rare or endangered species or organisms;

(b) the survival and distribution of indigenous plants or animals;

(c) the sustainability of natural and developed ecosystems, ecological processes and biological diversity;

(d) soil resources or water quality;

(e) human health or enjoyment of the recreational value of the natural environment;

(f) the relationship of Moriori and Māori with their cultures, their traditions and their ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga;

(g) New Zealand's international obligations, assurances and reputation; and

(h) other aspects of the environment including amenity and landscape values.

Spill-over (externality) effects result in costs or benefits to people other than the land occupier on whose property the pests are located. They include the effects of the spread of plant or animal pests onto neighbouring properties and environmental effects that have costs or benefits to the community as a whole. For example, the spread of seeds of plants onto neighbouring properties or damage to indigenous biodiversity are spill-over effects. The reduced risk of spill-over occurs because the Plan brings about the control of pests, thereby reducing the risk to neighbouring properties and the risk of non-producer values being affected.

The non-spill-over benefit (producer benefit) that producers receive by way of extra production and lower control costs, when they control pests on their property, occurs regardless of whether a plan is in place.

The extent to which persons contribute to the problems to be resolved by the Plan for each depends on whether their inaction has the potential to result in spill-over effects that cause significant harm to other persons or to the environment generally. Table 11 provides a summary of identified beneficiaries and exacerbators which are evaluated in full in the CBA Report.

Table 11 below shows two groups of people: those who benefit from controlling pests (beneficiaries); and those who contribute to the pest problem (exacerbators).

9.5 Cost allocation and funding rationale

The Biosecurity Act 1993 and the NPD require an analysis of the costs of implementing the Plan. The Council's decision on cost allocation is also subject to the funding analysis required under the Local Government (Rating) Act 2002. When determining the appropriate cost allocation for the Plan, Chatham Islands Council must consider how the costs will be shared amongst:

- Those people who have an interest in the Plan;
- those who benefit from the Plan (beneficiaries); and
- those who contribute to the pest problem and who pose a risk of spreading a pest through their activities (exacerbators).

Funding must be sought in a way that reflects economic efficiency and equity. Those seeking funds should also target those funding the Plan and the costs of collecting funding.

In general, efficiency is best achieved by targeting costs to those closest to a particular work where those paying can act in respect of those works. If the person deciding has to pay for the results of their action or inaction, they may change their behaviour to minimise costs. Doing so would lead to the least-cost outcome for society. But if another person pays those costs, the incentive to change behaviour is minimal. This may lead to a higher cost for society. Efficiency includes close targeting of costs to benefits and to those contributing to the problem (exacerbators). Equity is difficult to establish, particularly if a "public good" component exists. In general, no relevant guidelines are available.

Chatham Islands Council are the smallest council in New Zealand and the most isolated. The local community contributes rates and county dues in the order of $700,000 per year. Yearly operational costs for the Council are approximately $4M, which funds core activities, including the biosecurity programme. The Council has a funding agreement with the Department of Internal Affairs and receives Crown Appropriation to ensure that the Council is able to meet its statutory obligations and maintain essential services.

Chatham Islands Council consider the provision of biodiversity and biosecurity activities as a public good. However, there can be a private element of benefit where Council-funded work reduces risks for private landowners/occupiers. In previous years, biosecurity activities have been funded equally from a mix of the Crown contribution, general rates, and landowner contributions. This funding arrangement is expected to continue for the duration of the next Plan.

Table 11 presents recommended cost allocation to fund RPMP activities.

Table 11 - Beneficiaries and exacerbators

Pest	Beneficiaries	Exacerbators	Recommended cost allocation
American foulbrood (AFB) Ant (Argentine ant; Darwin's ant) Asian paddle crab Australian droplet tunicate Boneseed Chilean needlegrass Clubbed tunicate Hedgehog Mediterranean fan worm Mustelid (ferret; stoat; weasel) Plague skink Possum Pyura Rabbit Rat (kiore; Norway rat; ship rat) Varroa bee mite Wallaby (Bennett's wallaby; brush-tailed rock wallaby; dama wallaby; parma wallaby; swamp wallaby) Wasp (common wasp; German wasp)	The islands-wide community for the protection of biodiversity, landscape and recreational values. Private land occupiers for the long-term protection of economic values.	These pests are not present on the Chatham Islands so there are no known exacerbators. Poor delivery of Council exclusion programme.	**100% Council funded** – the proposed pests predominantly affect values of interest to the wider community, including biodiversity, landscape, social and cultural values. The wider island community benefits from their control. Council will take responsibility for delivery of programmes to manage these pests.
African club moss Banana passionfruit Buddleia Ice plant Old man's beard Reed sweet grass Sycamore Wild ginger (kahili ginger; yellow ginger) Willow (crack willow; grey willow)	The islands-wide community for the protection of biodiversity, landscape and recreational values.	Occupiers who fail to control these organisms where they occur on their properties. Persons who knowingly sell, propagate, or distribute these organisms. Poor delivery of Council programmes.	

Pest	Beneficiaries	Exacerbators	Recommended cost allocation
Broom (common broom; white broom; Montpellier broom) Canada geese Chilean guava Chilean rhubarb Feral goat Ragwort	Rural occupiers for the long-term protection of economic values. Neighbouring properties for the prevention of spill-over. The islands-wide community for the protection of biodiversity, landscape and recreational values.	Occupiers not controlling these organisms on their properties. Persons who knowingly sell, propagate, or distribute these organisms. Poor delivery of Council programmes.	**100% Council funded** – the proposed pests affect both biodiversity and production values. The wider island community benefits and private land occupiers from their eradication. The infestations are small and would require targeted control by some landowners/occupiers and not others. Council will take responsibility for delivery of programmes to manage these pests as a better result is expected and it would be administratively ineffective to target a small number of landowners. Landowners will contribute through the General Rate.
Gorse	Rural occupiers for the long-term protection of economic values.	Occupiers not controlling these organisms on their properties. Persons who knowingly sell, propagate, or distribute these organisms.	For inspection and monitoring costs to prevent spread onto neighbouring properties – **100% Council funded** Control costs to prevent spread – **100% land holder-funded as exacerbators** The control of gorse primarily provides production benefits, and the prevention of any spread is of benefit to the rural land. Therefore, land occupiers should bear the majority of any costs to control it. Because land holders are able to determine whether control is worthwhile on their own property, in the absence of any wider benefit the major gains will come from preventing spread. Council will fund and provide inspection and monitoring of control actions by land occupiers.

9.6 Anticipated costs of implementing the Plan

The anticipated costs of implementing the proposed RPMP reflect a best estimate of expenditure levels. However, if circumstances change (for example pest levels alter), the funding levels may need to be adjusted accordingly. Any amendments to the proposed funding of the Plan will be made in accordance with the provisions of the Biosecurity Act 1993 and Local Government (Rating) Act 2002. Funding levels will be further examined and set during subsequent Long-Term Plan and Annual Plan processes.

The funding of the implementation of the proposed Plan is from a region-wide general rate and Crown Appropriation, set and assessed under the Local Government (Rating) Act 2002, and in determining this, Chatham Islands Council has had regard to those matters outlined in Section 100T of the Biosecurity Act.

The Proposal differs from the previous Regional Pest Management Strategy 2008-18 (RPMS) in that, rather than representing the entire Chatham Islands Council biosecurity programme, it is limited to the pests for which powers under the Biosecurity Act may be required. The Council's wider programme encompasses a suite of regulatory and non-regulatory tools that the Council can deploy to achieve their biosecurity outcomes. Therefore, RPMP implementation costs comprise only a portion of the full biosecurity programme cost.

Table 12 provides the estimated annual expenditure and revenue source for the implementation of the Plan. The expenditure and revenue estimates are expressed in present value terms. Some cost escalation may be unavoidable, but the annual planning process undertaken by Chatham Islands Council should serve to constrain any significant increase in the scale of activity authorised under this Plan.

Table 12 – Estimated total cost of implementing the Plan

	Expenditure	**Revenue by source**
Application of principal measures across all programmes	$315,000	Combination of general rates and Crown contribution
Landowner control of gorse	$150,000	User pays
Total	**$465,000**	

The Council expects that the relative cost of pest management will be similar for the duration of the Plan.

9.7 Funding limitations

There are no unusual administrative problems or costs expected in relation to recovering costs from any of the persons who are required to pay. It is recognised that there may be a need to recover enforcement costs for some exacerbators through the courts. In some cases, for example where not all exacerbators can be identified, full cost recovery will not be realised, and a rating contribution will be required.

Appendices

Appendix 1: Glossary of terms

The use of italics indicates meanings taken from section 2 of the Biosecurity Act 1993.

Act	means the Biosecurity Act 1993
Adjacent	means, for the purpose of this Plan, a property that is next to, or adjoining, another property.
Animal	means any mammal, insect, bird or fish, including invertebrates, and any other living organism except a plant or a human.
Artificial watercourse	means a watercourse that is created by human action. It includes an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal channel. It does not include artificial swales, kerb and channelling or other watercourses designed to convey stormwater.
Authorised Person	*means a person for the time being appointed an authorised person under section 103 of the Biosecurity Act 1993.*
Beneficiaries	means the receivers of benefits accruing from the implementation of a pest management measure or plan.
Craft	*(a) means an aircraft, ship, boat, or other machine or vessel used or able to be used for the transport of people or goods, or both, by air or sea.* *(b) includes:* *(i) an oil rig; and* *(ii) a structure or installation that is imported by being towed through the sea.*
Destroy	means pull, breakdown, demolish, make useless, kill, cause to cease to exist.
Direction	In relation to Part 6 powers under the Act means a notice issued in accordance with section 122 of the Biosecurity Act 1993 requesting a person, owner or occupier to carry out certain work or measures.
Distribute	means to transport or spread a pest in any way.
Ecosystem	means a dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functioning unit.
Effect	*(a) includes the following, regardless of scale, intensity, duration, or frequency:*

	(i) a positive or adverse effect; and *(ii) a temporary or permanent effect; and* *(iii) a past, present, or future effect; and* *(iv) a cumulative effect that arises over time or in combination with other effects;* *(b) and also includes the following:* *(i) a potential effect of high probability; and* *(ii) a potential effect of low probability that has a high potential impact.*
Environment	*includes—* *(a) ecosystems and their constituent parts, including people and their communities; and* *(b) all natural and physical resources; and* *(c) amenity values; and* *(d) the aesthetic, cultural, economic, and social conditions that affect or are affected by any matter referred to in paragraphs (a) to (c).*
Environmental values	means the environment, human health, enjoyment of the natural environment, and the relationship of Moriori and Māori with their cultures, their traditions and their ancestral lands, waters, sites, waahi tchap'/wāhi tapu and miheke/taonga.
Exacerbator	means the person creating, aggravating or contributing to a particular pest management problem that the Plan proposes to resolve, by action or inaction.
Feral	means wild or otherwise unmanaged.
Good Neighbour Rule	*means a rule to which the following apply:* *(a) it applies to an occupier of land and to a pest or pest agent that is present on the land; and* *(b) it seeks to manage the spread of a pest that would cause costs to occupiers of land that is adjacent or nearby; and* *(c) it is identified in a regional pest management plan as a Good Neighbour Rule; and* *(d) it complies with the directions in the national policy direction relating to the setting of Good Neighbour Rules.*
Good	*means all kinds of moveable personal property.*
Habitat	means the place or type of site where an organism or population normally exists.

Indigenous	means produced by, or naturally belonging to, a particular region or area.
Management agency	*means the body specified as the management agency in a pest management plan or a pathway management plan.* For the purposes of this Plan, Chatham Island Council is the management agency.
Monitoring	in relation to a pest or other organisms to be controlled means to observe and measure the presence or distribution of a pest or other organism to be controlled.
National Policy Direction	in respect of this Plan, means the National Policy Direction for Pest Management 2015 made under sections 56 – 58 of the Biosecurity Act 1993.
Occupier	*(a) in relation to any place physically occupied by any person, means that person; and* *(b) in relation to any other place, means the owner of the place; and* *(c) in relation to any place, includes any agent, employee, or other person, acting or apparently acting in the general management or control of the place.*
Organism	*(a) does not include a human being or a genetic structure derived from a human being:* *(b) includes a micro-organism:* *(c) subject to paragraph (a) of this definition, includes a genetic structure that is capable of replicating itself (whether that structure comprises all or only part of an entity, and whether it comprises all or only part of the total genetic structure of an entity):* *(d) includes an entity (other than a human being) declared by the Governor-General by Order in Council to be an organism for the purposes of the Biosecurity Act 1993t:* *(e) includes a reproductive cell or developmental stage of an organism:* *(f) includes any particle that is a prion.*
Person	*includes the Crown, a corporation sole, and a body of persons (whether corporate or unincorporate).*
Pest	*means an organism specified as a pest in a pest management strategy.*
Pest Management Plan	*means a plan, made under Part 5 of the Biosecurity Act 1993, for the management or eradication of a particular pest or pests.*

Plant	means any plant, tree, shrub, herb, flower, nursery stock, culture, vegetable, or other vegetation; and also includes fruit, seed, spore and portion or product of any plant; and also includes all aquatic plants.
Propagation	means to multiply or reproduce by sowing, grafting, breeding or any other way.
Risk goods	*means any organism, organic material, or other thing, or substance, that (by reason of its nature, origin, or other relevant factors) it is reasonable to suspect constitutes, harbours, or contains an organism that may—* *(a) cause unwanted harm to natural and physical resources or human health in New Zealand; or* *(b) interfere with the diagnosis, management, or treatment, in New Zealand, of pests or unwanted organisms*
River	means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity generation, and farm drainage canal).
Sale	includes bartering; attempting to sell; having in possession for sale; sending or delivery for sale; causing or allowing to be sold, offered, or exposed for sale. “Sell” has a corresponding meaning.
Subject	in relation to a Proposal for a pest management plan, means the organism or organisms proposed to be specified as a pest or pests under the plan; and in relation to a pest management plan, means the pest to which the plan applies.
Wild	means any plant or animal not subject to husbandry management and living in a wild state.

Appendix 2: Pest characteristics and impacts

Pests in Exclusion programme

American foulbrood (AFB)

AFB is a highly infectious and destructive honeybee disease caused by the spore-forming bacteria *Paenibacillus larvae spp. larvae*. Honeybee larva up to 3 days old become infected by being fed food contaminated with AFB spores. The spores germinate in the larval gut and turn into the vegetative form of the bacterium, eventually killing the developing bee. The vegetative form of the bacterium will die, but not before it has produced many millions of spores. A single diseased larva may contain more than 2.5 billion spores. House bees in the colony try to remove diseased larvae and pupae and in so doing become contaminated with spores. New larvae are then infected when they too are fed contaminated food. Spores are the only form of the disease that can infect healthy larvae, and they can only increase in number by infecting a larva, they do not multiply in any other environment (e.g. honey or beekeeping equipment).

Test for American foulbrood
Photo by Pollinator. Licence: CC BY-SA 3.0

Most hives become infected because bees, honey or equipment have been put into a hive from another hive that is infected with AFB. Spores of *Paenibacillus larvae larvae* can survive outside a honeybee colony for more than 35 years, and are able to withstand very high temperatures, including boiling water.

AFB is the most serious honeybee disease in New Zealand and controlling this disease can be costly to beekeepers. There is no cure for AFB. Infections will spread throughout the hive, affecting most of the brood, severely weakening the colony and eventually killing it. Once a hive is infected with AFB, beekeepers are legally obligated to destroy the colony and all contaminated beekeeping equipment to prevent it spreading to other hives.

AFB is present in New Zealand, although has not spread to the Chatham Islands. There is a risk that AFB could be spread to hives in the Chatham Islands via the import of infected honeybees and contaminated apiary equipment.

Ant (Argentine ant (*Linepithema humile*); Darwin's ant (*Doleromyrma darwiniana)*

Argentine ant
Photo by Philip Herbst. https://www.antweb.org/

Argentine ants are 2-3 mm long, honey-brown in colour and often move in large, distinctive trails of five or more ants wide. They are aggressive and destructive, and one of the world's most invasive species. Besides being a major household and garden pest, Argentine ants pose a serious threat to natural areas and biodiversity. They kill and displace native invertebrates, which many indigenous species depend on, and will also eat lizards, bird eggs and newly hatched chicks, potentially threatening endangered populations. As their diet spans all food types, from insects to nectar, they take food sources away from birds, skinks and native invertebrates.

Argentine ants are found on mainland New Zealand, in many parts of Auckland, Northland, Waikato, Bay of Plenty, Hawke's Bay, Wellington, Nelson and Christchurch.

Darwin's ants are similar in appearance to Argentine ants, to whom they are closely related, although they give off a strong odour when crushed. They are not capable of stinging, although can become a major pest to householders by entering houses in large numbers to forage for sweet foods. They can form extremely large colonies and may displace native invertebrates. Darwin's ants are found around the northern and easter parts of the North Island, and in the upper South Island.

There is a risk that these ant species could spread to the Chatham Islands via craft, people, and goods. A particular risk is posed by the nursery/gardening industry, specifically the importation and movement of potted plants, garden plants and potting mix.

Asian paddle crab (*Charybdis japonica*)

The Asian paddle crab is a relatively large swimming crab, with paddle-like hind legs. Its colour ranges from off-white and pale green, through olive-green to a deep chestnut brown with purplish markings. It inhabits intertidal to subtidal estuarine habitats, from fine muds to reefs. Adult Asian paddle crabs can produce hundreds of thousands of larvae, which are relatively long-lived and can survive for three to four weeks. Adults are also capable of swimming large distances.

The Asian paddle crab is an aggressive predator and will compete with native crabs and other benthic species for habitat and food. They can inflict a vicious bite when disturbed, posing a nuisance to water users. They can also be detrimental to aquaculture, fishing and harvesting activities, by displacing fishery species and consuming shellfish species that are culturally and economically important. They may also carry diseases that affect crab, lobster, shrimp, and prawn fisheries.

Asian paddle crab
Photo by Serena Wilkens (NIWA). License: CC BY-NC-SA 3.0 NZ

The Asian paddle crab is currently known to be present in Northland. There is a risk of this species being spread to the Chatham Island Territory via vessels (both national and international), either as lavae entrained in ballast water or as hull fouling.

Australian droplet tunicate *(Eudistoma elongatum)*

Australian droplet tunicate
Photo by Sean Handley (NIWA). License: CC BY-NC-SA 3.0 NZ

The Australian droplet tunicate is an ascidian (sea squirt) that forms long cream-coloured cylindrical tubes or "tunics" (generally 5-30cm in length, although can reach 1.5m) that attach to hard marine surfaces. It is generally found in muddy-bottomed tidal habitats or on man-made structures (e.g. wharf piles and aquaculture equipment), commonly submerged just below the waterline but can often be seen at low tide. It decreases in size over winter months, but rapidly re-grows to its full size once summer arrives.

It forms dense colonies that smother beaches, rocks, and tide-pools, and displaces native and fishery species. These colonies can also cause a nuisance to economic and recreational activities, by growing on boats, aquaculture, fishing and harvesting equipment and other marine structures, increasing maintenance and fuel costs.

This species is currently established in some parts of Northland. There is a risk it could be spread to the Chatham Island Territory via vessels (both national and international), or the movement of contaminated marine equipment or structures.

Boneseed (*Chrysanthemoides monilifera* subspecies *monilifera*)

Boneseed is an evergreen shrub reaching up to 3 m tall. The leaves are dull green, toothed and covered with a cottony down. Daisy-like flowers are produced in bright yellow clusters from late winter until late summer. Boneseed gets its name from its hard, bone-coloured seed, which has a thin, fleshy cover - initially green but changing to black upon ripening. Up to 50,000 seeds per plant can be produced in one year and can remain viable for up to 10 years. Seeds are spread by water, birds, and possums, as well as natural spread down cliffs below parent plants. It is tolerant of dry, infertile soils, allowing it to colonise and establish easily in coastal areas. While thought to be restricted to frost-free areas, that may not be the case. Absence of grazing animals also aids its establishment.

Boneseed flowers
Photo by Jeremy R. Rolfe. License: CC BY 4.0

Boneseed's vigorous growth will displace desirable plants, shade out native seedlings and reduce or prevent public access to coastal and beach areas. It will colonise disturbed sites faster than native species and creates heavy shade where high light levels should occur. It is highly flammable and will regenerate prolifically after fire.

Boneseed is not currently known to be present in the Chatham Islands. There is the potential for it to spread to the Chathams via craft, people, goods, and livestock. Should it arrive, there is the risk it could easily establish in coastal areas.

Chilean needlegrass (*Nassella neesiana*)

Chilean needlegrass
Photo by Harry Rose. Licence: CC BY 2.0

Chilean needle grass is a tufted perennial plant that will grow to 1 m in the absence of grazing. Its leaves are bright green and harsh to the touch. Identification within grazed pasture is difficult prior to flower emergence in October. The flowers have a purple tinge and ripen into hard, sharp seeds with long twisting tails. The point of the seed is extremely sharp and hairy, which enables it to catch onto passing animals, humans, and vehicles, and allows it to be transported considerable distances to new sites. It also produces viable seeds in its mid and basal stem regions.

Chilean needle grass can cause adverse effects to pastoral production and economic well-being. Plants will grow into dense stands and exclude other indigenous and exotic grassland species. It reduces the livestock carrying capacity of pastures due to the production of masses of unpalatable flower stalks. The sharp penetrating seeds injure livestock and result in the downgrading of wool, skins and hides. The seed can move through an animal's skin into body muscles, causing abscesses and the downgrading of carcasses. Lambs are particularly vulnerable to seeds penetrating their eyes, causing blindness.

It is not currently present in the Chatham Islands, but is present in other parts of New Zealand, including Canterbury. There is a risk it could be spread via craft, people, goods and livestock arriving on the island. If it should become established on the Chatham Islands, it could significantly impact on pastoral production.

Clubbed tunicate *(Styela clava)*

The clubbed tunicate is an ascidian with a long, tough, leathery, brown, lumpy cylindrical form that tapers to a woody stalk that attaches onto hard marine surfaces. It can be found on wharf pilings, aquaculture structures, ropes, and vessel hulls, as well as attached to rocks, seaweed and on shellfish. Underwater it is often coated in secondary growth, which makes it appear fuzzy. It looks similar to native New Zealand species *Pyura pachydermatina*, although the clubbed tunicate has a shorter stalk.

It can outcompete native species both for food and space, due to its tolerance of a wide range of physiological environments, its ability to reach high densities (500-1500 individuals per m^2) and its efficiency as a suspension feeder. It also causes a nuisance by fouling boats, marine equipment and structures. This leads to higher fuel and maintenance costs of vessels and can adversely affect aquaculture, fishing and harvesting activities.

The clubbed tunicate is currently present in some areas of New Zealand. There is a risk it could be spread to the Chatham Island Territory via vessels (both national and international), or the movement of contaminated marine equipment or structures.

Clubbed tunicate
Photo by Chris Woods (NIWA). License: CC BY-NC-SA 3.0 NZ

Hedgehog (*Erinaceus europaeus*)

European hedgehog
Photo: Ngā Manu Images

The European hedgehog is a spiny, grey-brown insect eater. They are nocturnal and hibernate during the winter. They occur in densities of 1-3 per hectare and are most commonly found in lowland pastoral areas, becoming less common with increasing altitude. Feral pigs are their main predator and weka also prey upon them.

Hedgehogs find much of their prey by smell. They are mainly insectivorous but will eat almost any animal substance and some plant material. They pose a serious threat to indigenous invertebrates, such as slugs, snails, and larger insects. They will also eat the eggs and chicks of ground-nesting birds and lizards.

Hedgehogs occur on Chatham Island/Rēkohu/ Wharekauri, and are abundant throughout the lowland districts, especially near the coast, in sand dune country where frosts are few and mild, and snails, worms and grass grubs are common. They are not currently present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands. There is a risk that hedgehogs could spread to these hedgehog-free islands via craft, people, and goods.

Mediterranean fan worm (*Sabella spallanzanii*)

Mediterranean fan worm
Photo: Serena Wilkens (NIWA). License: CC BY-NC-SA 3.0 NZ

The Mediterranean fan worm is a sessile organism, with a long, flexible, leathery, pale brown tube, from which it extends a spiral fan of yellow-orange filaments. It attaches to solid structures, such as wharf pilings and shells, or small, hard substrata in soft sediments. It is commonly found in subtidal habitats (up to a depth of 30 m) that are protected from wave exposure. They are filter feeders, consuming nutrients and plankton, as well as fish larvae. It is larger than other native fan worms in New Zealand.

The Mediterranean fan worm can form dense colonies, containing up to 1,000 individuals per m^2. These colonies can outcompete native species for space and food. Their high filtering ability can influence the composition and abundance of planktonic communities. They also cause a nuisance to human activities, by attaching to vessels, increasing fuel and maintenance costs, and aquaculture, fishing and harvesting equipment, reducing productivity, and increasing costs.

This species is currently present in a number of New Zealand harbours. There is a risk it could be spread to the Chatham Island Territory via vessels (both national and international), or the movement of contaminated marine equipment or structures.

Mustelids (ferret (*Mustela furo);* stoat *(Mustela erminea);* weasel *(Mustela nivalis*))

Stoat
Photo: Steve Hillebrand, USFWS

Mustelids are a family of carnivorous mammals, three of which are present on mainland New Zealand - ferrets, stoats and weasels.

The ferret is the largest of these three mustelid species, with a body length of 320-460 mm and tail of 110-180 mm, and an overall stockier build. Their colour is variable, with a dark mask across the eyes and above the nose.

Stoats are characterised by reddish-brown fur on their back and a clear line where this meets a white or cream underbelly. They have a longer tail than weasels, with a distinctive bushy black tip. An adult male can measure 390 mm from nose to tip. They are agile climbers, hunting both during the day and night. They have been known to swim up to 1.5km across water, or "raft" further distances on floating material, to reach islands.

Weasels are the smallest of these three mustelid species, varying in length from 173-217 mm. Similar to stoats, weasels have reddish-brown fur on their back and a white or cream underbelly, although there is variable line where these colours meet.

Mustelids are found in a range of habitats and can have a major impact on native biodiversity. They predate on birds, eggs, lizards, frogs, and insects, and have caused the decline and loss of many populations of native species across mainland New Zealand. Ferrets have also been found to carry bovine tuberculosis.

Mustelids are not currently present in the Chatham Island Territory. There is a risk that mustelids could spread to the islands via craft, people, and goods.

Plague skink (*Lampropholis delicata*)

Plague skink
Photo by Xander T. License: CC0 1.0

The plague skink, also known as the rainbow skink, is a small (3-4cm) brown lizard, with a dark brown stripe down each side, and an iridescent rainbow or metallic sheen when seen in bright light. They look similar to native skinks but are smaller.

Plague skinks pose a threat to native lizards and other fauna by competing directly for food and habitat. They reproduce rapidly (more than five times as fast as most native lizards) and mature in less than half the time of native lizards. They can therefore reach high population densities in a relatively short time. They also increase predation pressure on native invertebrates.

Plague skinks are found throughout New Zealand's North Island, although are not present on the South Island. There is a risk of this species spreading to the Chatham Islands via craft, people, and goods. A particular risk is posed by the nursery/gardening industry, specifically the importation and movement of potted plants, garden plants and potting mix.

Possum (*Trichosurus Vulpecula*)

The brushtail possum is an introduced marsupial animal. It is a nocturnal, small- to medium-sized omnivore, with large ears, pointed face, close woolly fur, and bushy tail.

Possums cause substantial damage to indigenous biodiversity by feeding on a variety of leaves, flower buds, fruit, ferns, fungi, invertebrates and bird eggs and nestlings. In the long-term this leads to a reduction in the vigour, density and diversity of native flora and fauna species and changes the forest composition.

Possums also compete directly with livestock, by grazing on pasture, and are a potential vector for Bovine Tuberculosis (the Chatham Islands are currently free of Bovine Tuberculosis).

Possum
Photo: Ngā Manu Images

Possums were introduced to Chatham Island to establish a fur trade in 1911, when five or six were released at Kaingaroa. Possums are now widespread on Chatham Island/Rēkohu/Wharekauri but are absent from Pitt Island/Rangihaute/Rangiauria. This is a risk that possums could spread to Pitt Island/Rangihaute/Rangiauria via craft and goods.

Pyura (*Pyura doppelgangera*)

Pyura are sessile ascidians that live in coastal waters attached to hard surfaces. They have a short (25-50mm), tough, leathery brown tunic, which often has sand embedded in it. They are filter feeders, consuming mainly plankton, suspended particulate matter, diatoms, and bacteria.

Pyura colonies form dense mats that can completely cover considerable areas of rock, outcompeting native organisms (such as mussels) for space and food. Large colonies can therefore have a significant impact on the native community structure of an area and displace species important for their economic and/or cultural value.

This species has become established in several locations in the Northland region. There is the risk of this species spreading to the Chatham Islands Territory via vessels (both national and international) and transfer of aquaculture, fishing and harvesting equipment.

Pyura doppelgangera
Photo by Roger Grace. Licence: CC BY-NC-SA 3.0 NZ

Rabbit (*Oryctolagus cuniculus)*

Wild European rabbit (feral rabbit)
Photo by David Iliff. License: CC BY-SA 3.0

The European rabbit is a small mammalian herbivore, grey-brown (or sometimes black) in colour, ranging in length from 34 to 50 cm and weighing approximately 1.1 to 2.5 kg. The domesticated rabbit is a subspecies of the European rabbit (*Oryctolagus cuniculus domesticus)*.

Rabbits have a high capacity for reproduction and female rabbits (does) may be pregnant for 70% of a year. Early born does may breed in their natal year. They can produce a total of 20 – 50 young per adult doe. Females are also capable of adjusting litter sizes to food supply, so rabbit populations are capable of rebounding quickly from natural disasters or control pressures. Feral rabbits' preferred habitat is grassland below about 1,000 m altitude, with free draining soils, sunny aspect, and less than 1,000 mm annual rainfall.

Rabbits can cause a number of adverse effects on economic well-being and environmental values, particularly in more rabbit-prone lands. At high numbers, the control costs can be prohibitively expensive. Their impact reduces available grazing for domestic stock and subsequently decreases the financial returns to landowners and their ability to fund control. High rabbit numbers also assist in maintaining high predator numbers (e.g. feral cats). On highly rabbit-prone land, and to a lesser extent on moderately prone land, rabbits, often in conjunction with other grazing animals, cause a number of environmental effects, including: (i) the depletion of many plant communities and species diversity; (ii) an increase in areas of bare ground as well as physical disturbance of the soil, both of which increase the risk of erosion; (iii) a reduction in soil organic matter through overgrazing, which, in turn, results in deterioration in the physical and nutrient properties of the soil; and (iv) adverse effects on indigenous and other fauna, when rabbit predators target alternative prey.

Feral rabbits are currently widespread in mainland New Zealand, although absent from the Chatham Islands. There is the potential for feral rabbits to spread to the Chatham Islands via craft, people and goods. There are currently no domestic rabbits kept as pets in the Chatham Islands.

Rat (kiore (*Rattus exulans*), Norway rat (*Rattus norvegicus*) and ship rat (*Rattus rattus*))

Three rat species have been introduced to New Zealand. Kiore (also known as Polynesian rat), is the smallest of these, with a tail shorter than its body. Kiore have cultural significance through their association with the migration of Polynesians through the Pacific and are regarded as miheke/taonga by some imi/iwi.

The Norway rat (also known as water rat) is the largest rodent species found in New Zealand, and has a shorter, thicker tail than the ship rat. They are widespread, although are more commonly found in urban environments and next to water bodies. They swim well and can reach up to 500m in sea conditions.

The ship rat (also known as roof rat or black rat) is the smaller of the two European species, with a tail longer than its body. It is the most common rat in New Zealand and is found in a variety of different habitats.

On Chatham Island/Rēkohu/Wharekauri, harrier hawks and cats are the main rodent predators.

All three rat species pose a threat to native biodiversity. They are omnivorous, eating a wide variety of foods, including birds, eggs, chicks, snails, lizards, insects and larvae, as well as seeds, fruit and flowers. In addition to competing with native species for food sources, predation by rats has caused local extinctions and permanent reductions in populations of native wildlife across New Zealand, including land snails, weta, beetles, frogs, and native birds. Ship rats climb trees well, and are therefore the most frequent predator of birds, eggs and chicks. Norway rats prey on ground-nesting birds and are large enough to kill burrow-nesting adult seabirds and eat their eggs and chicks.

Rats also pose a nuisance to humans by damaging buildings, machinery, and equipment. On farms they damage crops and infest storage areas – feeding and urinating on stored produce. They can also carry diseases such as salmonella, contaminating food products and posing a health risk.

All three species are present on Chatham Island/Rēkohu/Wharekauri, although are currently absent from Pitt Island/Rangihaute/Rangiauria and the outer islands. There is a risk these species could spread to Pitt Island/Rangihaute/Rangiauria via craft and goods.

Kiore
Photo by Forest and Kim Starr. Licence: CC BY 3.0 US

Norway rat
Photo by AnemoneProjectors. Licence: CC BY-SA 2.0

Ship rat
Photo by Kilessan. Licence: CC BY-SA 3.0

Varroa (*Varroa destructor*)

Varroa is a tiny (1.8-2mm) external parasitic mite that attacks honeybees. The adult female is reddish-brown in colour, while the male is white. The varroa mite can only reproduce in a honeybee colony. The female mite enters a brood cell and lays eggs on the larva. The young mites hatch in about the same time that a young bee develops, so when the young bee emerges, the varroa mites also leave and spread to other bees and larvae. The female mites attach themselves to the bee and suck on their fat bodies, weakening the bee, leaving open wounds and introducing various viruses including *deformed wing virus*.

Varroa bee mite
Photo by Pavel Klimov (USDA)

The infestation and disease caused by varroa mites is called varroosis. A significant mite infestation can lead to the death of a honeybee colony. Varroa is reducing the number of bees in many countries around the world, both in managed hives as well as wild native bee colonies. This has an impact not only on the beekeeping industry but also on crop pollination.

Varroa is now distributed throughout the North and South Island although is currently absent from the Chatham Islands. There is a risk of it spreading to the Chatham Islands through transfer of honeybees and apiary equipment.

Wallaby (Bennett's wallaby (*Macropus rufogriseus rufogriseus)*; brush-tailed rock wallaby (*Petrogale penicillate);* dama wallaby (*Macropus eugenii)*; parma wallaby (*Macropus parma)*; swamp wallaby (*Wallabia bicolour))*

Bennett's wallaby
Photo by JJ Harrison. License: CC BY-SA 3.0

Wallabies are small- to medium-sized marsupials. There are two types of wallaby present on mainland New Zealand: Bennett's wallaby (centred on the Hunter Hills in south Canterbury, on the South Island); and dama wallaby (found around Rotorua, on the North Island). Populations of brush-tailed rock, dama, parma, and swamp wallaby can also be found on certain offshore islands (e.g. Kawau Island in the inner Hauraki Gulf).

Bennett's wallaby, often called red-necked wallaby, stand up to 80 cm with a tail length around 62 cm. Males can reach over 20 kg in weight with females reaching 14 kg. They have a greyish-brown upper body, pale grey chest and belly and reddish-brown (rufous) colour on the shoulders. Their hind feet and tail are black tipped.

Dama wallaby, also known as tammar wallaby, is among the smallest of the wallabies, with head and body length reaching 53 cm in males and 49 cm in females, and tail lengths 38 to 42 cm. Average weights are 5 to 6 kg for males and 4 to 5 kg for females. They have grey brown upper bodies with paler grey undersides and rufous shoulders. Their tail is a uniform grey.

Wallabies can cause significant adverse environmental effects. These include preventing the regeneration of native bush, depletion of forest understorey and possible impacts on water quality. They also damage tall tussock grasslands, including the inter-tussock vegetation, which can become depleted with a consequent increase in bare ground and higher risk of soil erosion. Adverse economic effects include damage to pasture with anecdotal evidence of complete clearance of cover in places. There is evidence of wallabies grazing on green feed crops particularly where they border suitable cover. Wallabies also damage exotic forests, particularly at the establishment stage, with damage being more serious in areas bordering native bush or scrub areas.

Wallabies are currently absent from the Chatham Islands, although there is the risk of people importing wallaby for hunting.

Dama wallaby
Photo by Diverdave. License: CC BY-SA 3.0

Wasp (common wasp (*Vespula vulgaris); German wasp* (*Vespula germanica*))

Both common and German wasps have characteristic black and yellow colouring. They live as colonies, in nests of honeycomb-like cells – common wasp nests are brown and German wasp nests are grey. Their nests tend to be the size of a football, although can grow to huge sizes. They sting to defend their nests and to take food from other insects and birds.

German wasp

Wasps are a nuisance to the general public and are of particular concern to those working in forestry or the tourism industries. The venom from a wasp sting contains several toxins that can cause a hypersensitive or allergic reaction in some people.

Wasps also eat huge numbers of native insects and have even been seen killing newly hatched birds. They are a significant problem in the beech forests of mainland New Zealand, where they consume huge amounts of honeydew, an important food for many species of native bird, bats, insects, and lizards.

New Zealand has some of the highest densities of common and German wasp in the world. There is a risk that wasps could be spread to the Chathams Islands via craft, people, and goods, as demonstrated by a recent incursion when a wasp nest was discovered nearby the main wharf, and subsequently controlled.

Pests in the Eradication programme

Banana passionfruit (*Passiflora tripartita* and *P.tarminiana*)

Banana passionfruit is a tall, climbing vine that grows in forest and shrubland margins, stream-sides, coastline cliffs, consolidated sand dunes and in domestic gardens. The plants produce large pink tubular flowers throughout the year. These develop into oval fruit that turn yellow to orange-yellow when ripe. The fruit are eaten and spread by animals, birds, and humans.

It poses a threat to indigenous biodiversity due to its ability to grow rapidly, forming large masses that dominate and smother the canopy and prevent native plants from establishing. It spreads readily across the canopy by stem layering.

Banana passionfruit is known to occur in five sites on Chatham Island/Rēkohu/Wharekauri, over a total area of less than 0.5ha (see Map 1). It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Passiflora tripartita

Map 1 - Distribution of banana passionfruit on Chatham Island/Rēkohu/Wharekauri

Broom (common broom (*Cystisus scoparius*); Montpellier broom (*Teline monspessulana*) and white broom (*Cytisus multiflorus*))

Common broom is a branched perennial shrub up to 2.5 m tall with bright yellow flowers. Montpellier broom and white broom are very difficult to distinguish from common broom, although are somewhat smaller in stature and have slightly smaller yellow or red-flecked white flowers, respectively. Broom is a prolific seed producer, with ballistic seed dispersal mostly within 10m of the parent plant unless assisted by other agents such as stock or water. Seed can remain viable in the soil for more than 50 years. Broom is commonly found in developed pasture, river gravels, coastal dunes, tussock grasslands, road verges, and in domestic gardens.

Broom grows rapidly, establishing dense stands that shade out other species. It can invade and modify semi-open indigenous ecosystems, such as riparian areas, reducing indigenous biodiversity values and significantly effecting aesthetic or recreational values, by inhibiting access to riparian margins. It poses a problem in pastoral situations, where it forms thickets and shades out pasture grasses, affecting agricultural production and imposing costs of control on the occupier.

Broom is currently known to be present at 13 locations on Chatham Island/Rēkohu/Wharekauri (see Map 2), and 1 known site on Pitt Island/Rangihaute/Rangiauria (see Map 3).

Montpellier broom

Map 2 - Distribution of common broom, Montpellier broom and white broom on Chatham Island/Rēkohu/Wharekauri

Map 3 - Distribution of common broom, Montpellier broom and white broom on Pitt Island/Rangihaute/Rangiauria

Canada geese (*Branta canadensis*)

Canada geese are a large species of waterfowl, with brown and grey plumage, a black head and neck, and white patches on their faces. They are largely herbivorous, eating a range of grasses and grains, although will also consume small fish and insects.

Their preferred habitat is pastoral land adjacent to a lake or large pond, but geese may also be found in well-forested valleys and around alpine tarns. Communal moult gatherings are at secluded or very large lakes with grazing available at the immediate margins.

Canada geese adversely impact farming by competing with livestock for food, and damaging crops and pasture through grazing and fouling. It has been estimated that five geese can eat the same amount of grass as one sheep. Fouling of recreational areas can also be an issue.

Canada goose

Canada geese compete with native waterfowl for wetland resources and during the breeding season will aggressively protect their nests and chase other bird species away. Large numbers of birds defecating fouls the water, introducing bacteria and nutrients into waterways. They may also contribute to the introduction of new weeds to riparian areas by transporting seeds in their droppings or caught on feathers.

Canada geese were first reported on the Chatham Islands in 2013. It is estimated that there are currently 40-50 birds, mostly on Chatham Island/Rēkohu/Wharekauri (see Map 4 for locations where Canada geese have been observed/controlled), although there has been one report on Pitt Island/Rangihaute/Rangiauria.

Map 4 - Distribution of Canada geese on Chatham Island/Rēkohu/Wharekauri

Chilean guava (*Ugni molinae*)

Chilean guava is an aromatic, bushy perennial shrub, 1-2 m tall. Shoots are often reddish when young, then deep brown later with shiny green leaves, ovate in shape with reddish margins. Small pale pink flowers hang singly or in small clusters from November to April. The round fruit can reach 14mm in diameter and become purplish red when ripe. The flesh is white and sweet. It is often marketed as the "New Zealand Cranberry" and planted in gardens for its fruit. Seeds are spread by birds.

Chilean guava
Photo by MPF. Licence: CC BY-SA 3.0

Chilean guava poses a threat to native biodiversity by out-competing low growing native species and altering native ecosystems. It establishes and spreads quickly, producing many seeds in each fruit, suckering readily and rapidly re-sprouting after damage, including fire. It will also spread readily through pasture, reducing the area available for grazing, and devaluing the land.

Chilean guava is predominantly present in the north of Chatham Island/Rēkohu/Wharekauri, in low shrub and fern lands on peaty soils. There is additionally some localised incidence of this species around Owenga in the south-east of the island, at levels that make it appropriate for inclusion in the Eradication programme. Map 5 shows the area to be controlled under the Eradication programme. Control of Chilean guava elsewhere on the island (excluding the area shown in Map 5) falls under the Sustained Control programme.

Map 5 - Management area for Chilean guava under Eradication programme on Chatham Island/Rēkohu/Wharekauri

Chilean rhubarb (*Gunnera tinctoria*)

Chilean rhubarb is a large clump-forming perennial herb with large leaves (up to 1m x 1m) that are hairy on the underside. The stout stems are covered in rubbery red prickles. Tiny, densely packed green flowers are produced in summer on long erect conical spikes, which can be up to 1 m long. They develop into reddish oblong fruit, each containing a single oval orange seed. Seeds are spread by water, birds, soil movement and deliberate planting. The plant also spreads vegetatively, by rapid rhizome growth, making it difficult to control. It prefers moist leached soils in high rainfall areas, in full sun or dappled shade. It inhabits forest and forest margins, wetlands and drains, unfertilised farmland, stream sides and bluffs, and coastal cliffs.

Chilean rhubarb

Chilean rhubarb grows into large plants that form dense stands. They have an adverse effect on indigenous biodiversity by shading out and suppressing native vegetation, and altering the habitats of birds, insects, and lizards. It can also spread rapidly on wet pasture, reducing the area of productive land. Large plants may also block drains and streams, obstruct access to natural and recreational areas and contribute to erosion on slip-prone banks.

Chilean rhubarb is known to occur at multiple sites in the south of Chatham Island/Rēkohu/Wharekauri (see Map 6 and 1 known site on Pitt Island/Rangihaute/Rangiauria (see Map 7).

Map 6 - Distribution of Chilean rhubarb on Chatham Island/Rēkohu/Wharekauri

Map 7- Distribution of Chilean rhubarb on Pitt Island/Rangihaute/Rangiauria

Feral goat (*Capra aegagrus hircus*)

Feral goat
Photo by Joe King. License: CC BY-SA 3.0

Feral goats can be white, brown, or black, or any combination of these colours, and both sexes have horns. All males and some females are bearded as adults. Their habitat ranges from sea level to the alpine zone, and they can be found in introduced and native grasslands, scrub, and forest. They are agile and able to reach areas deer cannot reach and prefer sunny sides of slopes close to the shelter of forest or scrub.

Herding browsers such as goats cause two-fold damage by eating native plants and by trampling large areas of vegetation and compactable soils. They will eat the foliage of most trees and plants and quickly destroy all vegetation within their reach, eating seedlings, saplings, and litter fall, and will strip bark from trees. This can adversely alter the composition and structure of forests, resulting in the loss of canopy trees and the local extinction of threatened plants. Loss of vegetation can also lead to increased erosion. They also contribute to the decline of native birds by decreasing habitat quality and destroying plant species that birds rely on for food.

Feral goats can prove a nuisance to farmers by destroying farm infrastructure, such as fencing. They can compete with sheep for feed and have a wide range of parasites and diseases in common with sheep.

There are currently 3 known locations of feral goats on Chatham Island/Rēkohu/Wharekauri (see Map 8). They are not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Map 8 - Distribution of feral goats on Chatham Island/Rēkohu/Wharekauri

Old man's beard (*Clematis vitalba*)

Old man's beard is a deciduous, woody, perennial climber that may reach 25 m in height. In summer it has creamy white flowers followed by 'fluffy' seed heads in autumn and winter. The plant grows in well-drained alluvial soils and can occupy a wide range of habitats including riparian margins, forest remnants, gardens, and hedgerows. Wind, water, and birds disperse the seeds, and both seed and stem fragments can be spread in dumped vegetation.

Old man's beard is recognised as the most damaging pest climber in New Zealand and it is a significant threat to indigenous biodiversity values. One plant is capable of blanketing an area up to 180 m^2. The plant grows rapidly, climbing high into the canopy, forming a thick blanket of growth that prevents light reaching the support trees, eventually smothering, and killing them. It also prevents the establishment of native seedlings.

Old man's beard
Photo by Alan Liefting.

This pest plant is currently found at two sites, in the northeast of Chatham Island/Rēkohu/Wharekauri (see Map 9). It has the potential to spread and infest most lowland forested areas and can be particularly troublesome in second growth or damaged indigenous forests. It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Map 9 - Distribution of old man's beard on Chatham Island/Rēkohu/Wharekauri

Reed sweet-grass (*Glyceria Maxima*)

Reed sweet-grass is a bright green mat-forming, rhizomatous perennial aquatic grass up to 2 m tall with shiny hairless leaves and rough leaf edges. It produces a multi-branched flowerhead with numerous spikelets containing many seeds that can be spread by water, in eel nets, boats and trailers, machinery, livestock, or in soil and dumped vegetation. It can inhabit wetlands, bogs, freshwater margins, lakes, streams, and open, frost-free areas, and is tolerant of damage and grazing.

Reed sweet-grass
Photo by Harry Rose. Licence: CC BY 2.0

Reed sweet grass poses a threat to indigenous biodiversity as it grows rapidly to maturity, forming dense mats on water and in damp areas, replacing most other species. It also degrades habitat for native flora and fauna and can cause silt accumulation and flooding.

It is currently present at one known site, in the southeast of Chatham Island/Rēkohu/Wharekauri (see Map 10). It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Map 10 - Distribution of reed sweet-grass on Chatham Island/Rēkohu/Wharekauri

Wild ginger (kahili ginger *(Hedychium gardnerianum*) and yellow ginger *(Hedychium flavescens*))

Kahili and yellow ginger are non-woody, ginger scented perennials. Yellow ginger produces cream flowers from May to June, but these do not bear fruit. Kahili ginger produces many fragrant, lemon-yellow flowers with red stamens from January to March, which develop into fleshy orange fruits containing bright scarlet seeds. Both varieties can grow up to 2 m or more and produce many branching rhizomes, which spread outwards and over themselves to create a rhizome bed a metre or more deep. In addition to branching rhizomes, Kahili ginger produces up to 100 seeds per flower head, making it a more prolific spreader than yellow ginger. Seeds are spread by birds and possibly possums. Ginger grows best in open, warm, moist sites, but can grow in shade beneath the forest canopy.

Yellow ginger

Kahili and yellow ginger are ecologically versatile plants that are extremely difficult to control or eradicate once established. They are long-lived and fast-growing, forming dense mats in native forests and other habitats, smothering seedlings, and suppressing indigenous regeneration by up to 90%. They can eventually lead to the total death of a forest. Kahili ginger is the more invasive of the two, given its seeding ability, although new plants of both species can sprout from any rhizome fragments. Rhizome fragments can survive years away from soil, crushing and immersion in the sea. New plants can also establish from rhizome fragments within dumped vegetation and fill and by soil movement, flooding, and contaminated machinery.

These plants can also block streams and drains and obstruct walking tracks, reducing access to some recreational and conservation areas, and impacting on the aesthetic appeal of such areas.

Kahili and yellow ginger are currently known at one location on Chatham Island/Rēkohu/Wharekauri (see Map 11). It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Map 11 - Distribution of kahili ginger and yellow ginger on Chatham Island/Rēkohu/Wharekauri

Willow (crack willow (*Salix fragilis*) and grey willow (*Salix cinerea*))

Crack willow are deciduous trees (<25m), occasionally shrub sized, with spreading branches and rough, fissured bark. They have lance-shaped leaves with small serrations that are shiny on top and bluish underneath. Shoots and leaves are silky when young, although become hairless when they mature. Narrow, downward curving catkins (40-75mm long) are produced from September to October.

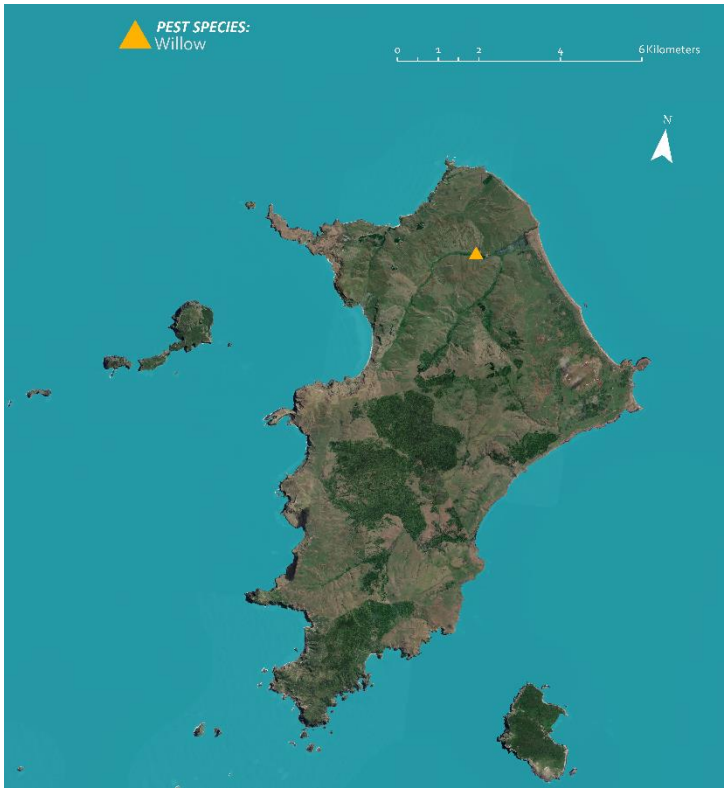
Grey willow is spreading or thicket-forming deciduous shrubs or small trees (<7 m). It has oval serrated leaves, which are shiny on top and grey or bluish with dense, soft, grey (occasionally reddish-brown) hairs underneath. Erect, cylindrical catkins (15- 35 mm long) are produced from September to October.

Both willow species replace native species in riparian zones and can form dense stands and thickets along channels that can cause blockages, flooding, and structural changes in waterways.

Crack willow

Willow is becoming more widespread on Chatham Island/Rēkohu/Wharekauri, with 11 sites currently known (see Map 12), and there is 1 known site on Pitt Island/Rangihaute/Rangiauria (see Map 13).

Map 12 - Distribution of crack willow and grey willow on Chatham Island/Rēkohu/Wharekauri



Map 13 - Distribution of crack willow and grey willow on Pitt Island/Rangihaute/Rangiauria

Pests in the Progressive Containment programme

African club moss (*Selaginella kraussiana*)

African club moss
Photo by Chhe

African club moss, also known as selaginella, is a small, carpet-forming, groundcover with long, fine roots and creeping, slender, irregularly branched stems that root at nodes. Leaves (2-4 mm) are in rows and spore cones (10 mm long) are rounded. Its appearance is similar to many native mosses and leafy liverworts. It grows on the ground or on the trunks of other plants, and can tolerate hot or cold temperatures, and light to deep shade, but requires reasonably damp to wet substrate. It spreads through spores and stem fragments carried on boots, by livestock, water movement, dumped vegetation and in contaminated soil. Tracks, streams, contaminated plants and potting mix in nurseries and shops, and gardens are all sources of new infestations.

This species has the potential to disperse quickly and widely. It will invade the forest floor, preventing the establishment of native plant seedings, which consequently leads to higher light levels and succession by more aggressive weeds, such as vines, changing the composition of the native ecosystem.

It is currently known to be present at 3 locations on Chatham Island/Rēkohu/Wharekauri although may be present elsewhere and yet to be detected. It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Buddleia (*Buddleja davidii*)

Buddleia is a large, deciduous woody shrub, growing over 3 m tall with long, dark, silvery green weeping leaves and distinctive, dense, cone-shaped clusters of fragrant purple or white flowers with orange insides that appear from December to February. Seeds are spread by wind and water, soil movement, and dumped vegetation.

Buddleia

Buddleia is extremely versatile, tolerating a wide range of soils (especially poor), hot to cold temperatures, wet to moderately dry conditions, deep shade or open areas, damage and wind. It can be found in riverbeds, along stream sides, in disturbed forest and shrubland margins, in short tussock land and stony, bare ground. It is also popular as a garden plant and wind break.

Buddleia negatively impacts on indigenous ecosystems by establishing and growing rapidly, forming self-replacing thickets and displacing native plants. In riverbeds, buddleia can alter water flow, changing the aquatic environment, causing silt build up and flooding.

It is relatively widespread in pockets on Chatham Island/Rēkohu/Wharekauri, with 9 sites currently known (see Map 14). It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Map 14 - Distribution of buddleia on Chatham Island/Rēkohu/Wharekauri

Ice plant *(Carpobrotus edulis* and hybrids)

This invasive species of ice plant is a creeping, low-growing, mat-forming perennial with fleshy, succulent leaves (7-12 cm long). They form many-petalled yellow flowers (<10 cm diameter) mostly between October and February, that turn pinkish-orange with age and develop into fleshy fruit containing seed. It spreads by seed and stem fragments. It is found on coastal cliffs and sand dunes, and open (but frost-free) areas such as roadsides.

This species competes aggressively with native species, and spreads rapidly, due to its ability to root at each node (stem joint). It forms impenetrable mats (up to 50m in diameter and over 50cm deep) that displace other vegetation and alters the structure and natural dynamics of sand dune environments. It can also lead to a build-up of organic matter in normally sandy soils, which enables other non-native species to establish.

This invasive ice plant also hybridises with, and replaces, the native ice plant (*Disphyma australe*). These hybrid species produce smaller plants (leaves 2-6 cm long) with orange-pink or yellow-whitish flowers (4.5-6cm diameter), turning pink with a yellow base with age. They do not develop fruit but spread by stem fragments.

This pest species is currently known to be present in only one area on Chatham Island/Rēkohu/Wharekauri (see Map 15), although may be present in more locations. It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands

Ice plant

Map 15 - Distribution of ice plant on Chatham Island/Rēkohu/Wharekauri

Ragwort (*Jacobaea vulgaris*)

Ragwort is a herbaceous biennial or perennial with conspicuous yellow flowers during summer. The majority of plants flower in their second season, from December to March, followed by mature seeds a few weeks after the first appearance of flowers. A large plant can produce 150,000 seeds in one season. It commonly grows 45 to 60 cm high. It is commonly found in pasture, riparian margins, open forests, swamps, and other habitats.

Ragwort poses a threat to indigenous ecosystems, as well as being a serious pasture weed. Once established, these plants have the ability to spread rapidly and form dense stands. It seeds freely and is dispersed principally by wind and, to a lesser extent, by water and animals and in hay. It can prevent the establishment of seedlings of native plant species and out-competes pasture grasses and reduces production. It also contains alkaloids, toxic to cattle, horses and deer, meaning they avoid the plant and pasture nearby. This enhances the smothering effects of the plant and further reduces pasture utilisation.

Ragwort is becoming established in the Chatham Islands, although is currently absent from some areas and in low incidence in others. It is known to be present in 7 locations on Chatham Island/Rēkohu/Wharekauri (see Map 16). It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands at this time.

There is the potential for it to cause significant adverse effects on all islands, due to extensive areas of suitable habitat.

Ragwort
Photo by Christian Fischer. Licence: CC BY-SA 3.0

Map 16 - Distribution of ragwort on Chatham Island/Rēkohu/Wharekauri

Sycamore (*Acer pseudoplatanus*)

Sycamore is a long-lived, deciduous tree up to 20m high, with smooth grey bark, and winged (helicopter) fruits. It grows in a variety of places, including roadsides, rivers, and regenerating forest.

Sycamore grows rapidly, forming dense stands that out-compete native plants and prevent natural regeneration of desirable species. It produces many long-lived, well dispersed seeds that are shade tolerant.

Sycamore is relatively widespread on Chatham Island/Rēkohu/Wharekauri, with 6 known sites across the island (see Map 17). It is not known to be present on Pitt Island/Rangihaute/Rangiauria or the Outer Islands.

Sycamore leaves

Map 17 - Distribution of sycamore on Chatham Island/Rēkohu/Wharekauri

Pests in the Sustained Control programme

Chilean guava (*Ugni molinae*)

Chilean guava is now widespread on Chatham Island/Rēkohu/Wharekauri, predominantly in the north of the island. This invasive shrub will be managed under the Sustained Control programme, apart from the area in Map 5, which will be managed under the Eradication programme. This species is now too widespread to be mapped accurately.

For description of Chilean guava and details on its potential adverse effects, refer to page 71.

Gorse (*Ulex europaeus*)

Gorse is a deep-rooted, woody perennial shrub with sharp spikes. The plant may grow up to 4 m in height and has yellow flowers, which can appear all year, followed by black seed pods. Gorse seeds are primarily dispersed ballistically and can be ejected up to 5 m from their pods. However, the seeds can also be spread by water or animals, or via human activities such as road works and gravel extraction and distribution. Gorse seeds can remain viable in the soil for many decades. The plant's biological characteristics and its ability to grow almost anywhere mean that the plant can be a serious problem over large areas, including pasture, riparian zones, roadside margins, scrub-land, forest margins and coastal habitats.

Gorse

The impact of gorse is principally on agricultural production. Gorse forms dense spiny thickets, capable of totally suppressing pasture or restricting stock grazing in affected areas. Although gorse does have benefits as a nursery plant for native species, the impacts on farm productivity, and the cost to land occupiers to control gorse may be significant. This is particularly the case on properties that are only marginally financially sustainable.

Gorse is a predominant and noticeable pest plant in the Chatham Islands, covering an estimated 4,500 hectares. It is now widespread on Chatham Island/Rēkohu/Wharekauri and establishing on Pitt Island/Rangihaute/Rangiauria, occurring across large areas of production land. It is not currently known to occur on the Outer islands. This species is too widespread to be mapped accurately.