



**Meeting the requirements of the Biosecurity Act 1993 and
National Policy Direction for Pest Management 2015:
Qualitative analysis of costs and benefits for pests**

*Report prepared by Environment Southland
as part of the preparation of a Southland Regional Pest Management Plan*

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Executive Summary

This report is the second part of the cost-benefit analysis work providing the information required for Environment Southland to determine whether options for management of pests in the region are likely to meet the requirements of the Biosecurity Act 1993 and the National Policy Direction for Pest Management (NPD). This report analyses suitable management options for each pest candidate against a do-nothing approach.

The costs, benefits and risks for each pest candidate in this report are largely based on qualitative assessment (intangible/descriptive costs and benefits – as permitted by the NPD), but are supplemented by basic economic assumptions where these are known.

Where significant risk with a pest candidate was identified as part of the pest evaluation process that analysis has been undertaken by an independent economist. The report is available as a separate attachment. Some findings from the independent report have general relevance to the qualitative analysis undertaken below. That is:

- *Exclusion pests* – these are considered likely to be of net benefit because of the small costs involved and the potential costs of establishment of the Exclusion pests, which are known to have had impacts elsewhere.
- *The Site led pests programme* - is considered likely to have a net benefit because of the requirement for land holder agreement, which suggests that the costs of control will be exceeded by the benefits to the parties involved.

The results of this analysis are reflected in the proposed management options for each pest candidate in the Proposal for the Southland Regional Pest Management Plan.

EXCLUSION ANIMALS

Rook

Description

Rooks are large, glossy, purplish-black birds and members of the crow family. The rook has a prominent, powerful bill and whitish patches of skin show around the base of its pale beak. Larger than a magpie, it weighs around 400 grams and is 45 centimetres long. Rooks announce their presence with a distinctive 'kaah', and as they fly they 'caw' to keep in contact with each other.

The rook is a highly gregarious bird species, foraging daily from either rookeries or communal winter roosts. During breeding (August-January), all birds live in rookeries, often the same sites used in previous breeding seasons. The males who forage for the family group make numerous individual forays, averaging less than one kilometre, to communal feeding grounds. At other times of the year, birds spend each night in communal roosts. Feeding forays at such times range up to 20 kilometres.

Rooks show a strong preference for foraging in fields of cereals at all stages of the crop, in recently cultivated land, and in stands of walnut trees. Feeding ranges are influenced by the occurrence of highly preferred foods, with extensive flights being made to walnut trees and to recently tilled fields. Large flocks of rooks can severely damage or destroy newly emerging crops or pasture.

Rooks can adversely impact production and economic well-being.

Proposed programme

Environment Southland is proposing an exclusion programme for rooks.

Level of analysis

Rooks are considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken. Costs and benefits for exclusion programmes generally have also been considered in Section 12 of the cost benefit analysis undertaken by an independent economist.

NPD section 6 - assessment

Options for response

The analysis considers two options for rooks:

1. do nothing;
2. exclusion.

Benefits and costs of options for management of rooks

Benefits and costs of rook management options

Option	Costs	Benefits
Do nothing	Rooks will colonise and increase. Rooks will establish and cause economic impacts to occupiers and become a nuisance pest due to the noise they make. Occupiers may use ineffective control options.	None identified.
Exclusion	Currently low cost for staff time, inspections, communication and engagement.	No impacts on crops and pasture by excluding rooks from the region. Rookeries will not be able to establish.

Risks of rook exclusion programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Unable to control rook populations, i.e. control methods are limited in number and effectiveness and relatively expensive.	Low - given successful reduction of population since 2002.	High - if rook incursion from Otago increased dramatically.	Crop damage would be high. Control costs would be high.	Ensure that Otago controls rooks to low levels. Communications and engagement.
Extent to which the option will be implemented and complied with	Occupiers do not comply and attempt control unsuccessfully.	Low - given recent history of occupier cooperation.	Low.	Control costs would increase.	Awareness programmes to educate occupiers.
Risk that compliance with other legislation will adversely affect implementation	Animal welfare.	Low - given recent control history.	Low.	Inability to use current control tools.	Ensure that all animal welfare standards are observed.
Risk that public or political concerns will adversely affect implementation	Opposition to rook management.	Low - but animal welfare groups may object.	Low.	Inability to use current control tools.	Ensure that all animal welfare standards are observed.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of rooks

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - the Southland community by protection of biodiversity from rook impacts;
 - occupiers – economic impacts protected;
- active exacerbators: occupiers who knowingly see, harbour and disturb rooks;
- passive exacerbators: occupiers with crops, young grass, and other habitat favourable (tall trees).

Matters for consideration in allocation of costs of proposed rook programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed rook programme

Legislative rights and responsibilities	None known.
Management objectives	Exclusion.
Stage of infestation	Low - occasional cross regional boundary sightings.
Most effective control agents	Environment Southland staff and/or approved contractors using recognised and effective methods i.e. poisoning, shooting.
Urgency	High.
Efficiency and effectiveness	High - if undertaken in an effective and timely manner by Environment Southland there will be no need for occupier costs and agreements.
Practicality of targeting beneficiaries	Low - rooks are transient and may frequent several properties. Immediate, timely control is priority.
Practicality of targeting exacerbators	Low - rooks are transient and may frequent several properties which limits timeframes for control options.
Administrative efficiency	High - if resources are available to Environment Southland and were to include ongoing liaison with Otago Regional Council. Efficiency would be lost if responsibility was on occupiers who may choose less effective control methods (or none).
Security	High for Environment Southland with funding available for an exclusion pest.
Fairness	Timely control, effective results, wider community benefit.
Reasonable	Environment Southland has more resources available than occupiers, more effective outcomes.
Parties bearing indirect costs	Not applicable.
Transitional cost allocation arrangements	Not applicable.
Mechanisms available	Not applicable.

Proposed allocation of costs

It is proposed that costs of undertaking the Exclusion programme for rooks be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	-	-	-

Wallaby

(Bennett's, Dama, Parma, Brushtail Rock and Swamp)

Description

Wallaby is a kangaroo-like marsupial animal standing 0.5 (Dama) -1.5 (Bennett's) metres tall with tails as long as half their height. They range in weight from approximately five kilograms to in excess of twenty kilograms. Their fur colour varies from grey to reddish brown.

Wallabies are capable of causing significant adverse environmental effects. These include preventing the regeneration of native bush, depletion of forest under storey 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 these 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.

Proposed programme

Environment Southland is proposing an exclusion programme for wallaby.

Level of analysis

Wallaby are considered to require a medium level of analysis when assessed according to the NPD guidance document. Costs and benefits for exclusion programmes generally have also been considered in Section 12 of the cost benefit analysis undertaken by an independent economist.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for wallaby:

1. do nothing;
2. exclusion.

Benefits and costs of options for management of wallaby

Benefits and costs of wallaby management options

Option	Costs	Benefits
Do nothing	Low costs unless wallabies are released in Southland, then high costs (If occupiers choose to control). Occupiers unlikely to use effective methods if populations establish. Many ideal habitat areas in Southland. Economic and environmental impacts would be high.	None identified.
Exclusion	Currently low costs in staff time, communications and engagement to meet exclusion objectives.	Environment Southland able to act immediately to any incursion at a relatively low cost preventing environmental and economic impacts from occurring.

Risks of wallaby exclusion programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Illegal releases.	Low.	Providing people can be informed, educated and understand impact consequences.	High - risk of environmental damage and impacts.	Communication and engagement. Inspections, encourage reports.
Extent to which the option will be implemented and complied with	Non-reporting of wallaby sightings.	Low.	Relies on community support and reporting sightings.	Population may become established or spread before control.	Communication and engagement. Use contractors to assist in sightings.
Risk that compliance with other legislation will adversely affect implementation	Need for poisoning operation.	Low.	Timeframe for VTA MOH approvals.	Population spread, impacts on habitat.	
Risk that public or political concerns will adversely affect implementation	Hunting fraternity pressure to change status.	Low.	Unlikely to gain traction or favour with the Southland community	Damage and environmental issues well documented.	High – Communication and engagement.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of wallaby

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - the Southland community through protection of environmental impacts;
 - occupiers with potential habitat through protection of economic values;
- active exacerbators: illegal releases;
- passive exacerbators: occupiers who allow releases or harbour known populations or allow increases.

Matters for consideration in allocation of costs of proposed wallaby programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed wallaby programme

Legislative rights and responsibilities	None once unknown organism status removed.
Management objectives	Exclusion of wallaby from Southland, currently not present.
Stage of infestation	Nil.
Most effective control agents	Environment Southland approved contractors.
Urgency	High - to prevent releases, populations establishing.
Efficiency and effectiveness	Preventing introduction and establishment is the most cost effective form of management.
Practicality of targeting beneficiaries	Occupiers of land containing potential wallaby habitat will be the principal beneficiaries. The Southland community will indirectly benefit by not having wallaby present on either private or Crown land in Southland and the freedom from economic and environmental impacts.
Practicality of targeting exacerbators	The principal exacerbators are any person who would seek to illegally introduce wallaby. If caught they could be prosecuted and any fines collected could be used to fund the exclusion programme.
Administrative efficiency	High for Environment Southland, low for occupiers who may use ineffective control methods or fail to do timely control.
Security	High for Environment Southland with funding available for an exclusion pest.
Fairness	Timely control, effective results, community benefit.
Reasonable	Environment Southland has more resources available than occupiers, more effective outcomes.
Parties bearing indirect costs	Not applicable.
Transitional cost allocation arrangements	Not applicable.
Mechanisms available	Not applicable.

Proposed allocation of costs

It is proposed that costs for undertaking the exclusion programme for Wallaby be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	-	-	-

EXCLUSION PLANTS

Boneseed

Description

Boneseed is an evergreen shrub reaching up to three metres 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.

The plant gets its name from its hard, bone-coloured seed. They have 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. Seed dispersal occurs locally by birds and by water.

A tolerance of dry, infertile soils allows boneseed 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's vigorous growth will displace desirable plants, shade out native seedlings and reduce or prevent public access to coastal and beach areas. It is highly flammable and will regenerate prolifically after fire. It can cause adverse effects to environmental and recreational values.

Proposed programme

Environment Southland is proposing an exclusion programme for boneseed.

Level of analysis

Boneseed is considered to require a low level when assessed according to the NPD guidance document. Costs and benefits for exclusion programmes generally have also been considered in Section 12 of the cost benefit analysis undertaken by an independent economist.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for boneseed:

1. do nothing;
2. exclusion.

Benefits and costs of options for management of boneseed

Benefits and costs of boneseed management options

Option	Costs	Benefits
Do nothing	No costs associated with this option unless boneseed establishes. Costs incurred will be to ecosystems and biodiversity in coastal areas.	None identified.
Exclusion	Low costs for raising awareness and responding to reports of boneseed in the region.	Protection of environmental, economic and social values as described in impact assessment.

Risks of boneseed exclusion programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk of boneseed entering the region and not being reported. Potential to establish in isolated coastal locations.	Low – unwanted organism so prevented from human-assisted dispersal. Known distribution suggests low risk of entering region from dispersal by birds and animals.	Medium – due to uncertainty of achieving early detection of boneseed.	Prevention of loss of ecosystem function and reduction in biodiversity.	Raise awareness about boneseed. Investigate any potential reports of boneseed.
Extent to which the option will be implemented and complied with	Presence of boneseed not reported.	Medium.	High.	As above.	Encourage reports of boneseed.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of boneseed as being of community benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of boneseed

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: none as boneseed is not present in the region;
- passive exacerbators: any person who does not report the presence of boneseed.

Matters for consideration in allocation of costs of proposed boneseed programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed boneseed programme

Legislative rights and responsibilities	None known.
Management objectives	Exclusion.
Stage of infestation	Not present in region.
Most effective control agents	Not required.
Urgency	Low – boneseed is an unwanted organism. Knowingly spreading boneseed is prohibited. Dispersal into region by birds or animals unlikely based on known distribution.
Efficiency and effectiveness	Exclusion programme is efficient and effective given boneseed is not present in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended for exclusion pests.
Practicality of targeting exacerbators	None – there are no exacerbators as boneseed is not present in the region.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and monitoring costs.
Security	General rate will secure funding for inspections and monitoring for boneseed over five years.
Fairness	It is considered fair to fund inspection and monitoring costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and monitoring costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an exclusion plan. Transitional costs may be needed if boneseed does establish in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the exclusion programme for boneseed be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	-	-	-

Chilean needle grass

Description

Chilean needle grass is a tufted perennial plant growing to one metre 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. These aid the seed in the penetration of the animal's skin and the soil. It also produces viable seeds in its mid and basal stem regions (cleistogenes).

Plants will grow into dense stands and exclude other indigenous and exotic grassland species. Chilean needle grass 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.

The point of the seed is extremely sharp and hairy so catches onto passing animals, vehicles, and humans. As a result it can be transported considerable distances to new sites. Chilean needle grass can cause adverse effects to pastoral production and economic well-being.

Proposed programme

Environment Southland is proposing an exclusion programme for Chilean needle grass.

Level of analysis

Chilean needle grass is considered to require a medium level of analysis when assessed according to the NPD guidance document. Costs and benefits for exclusion programmes generally have also been considered in Section 12 of the cost benefit analysis undertaken by an independent economist.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for Chilean needle grass:

1. do nothing;
2. exclusion.

Benefits and costs of options for management of Chilean needle grass

Benefits and costs of Chilean needle grass management options

Option	Costs	Benefits
Do nothing	No costs associated with this option unless Chilean needle grass establishes. Costs to pastoral production and animal welfare will be incurred.	None identified.
Exclusion	Low costs for raising awareness and responding to reports of Chilean needle grass in the region.	Prevention of damage to pastoral production and animal welfare.

Risks of Chilean needle grass exclusion programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Major risk if Chilean needle grass is brought into region via animal or stock feed movements. Chilean needle grass can be difficult to identify.	Medium – stock from Chilean needle grass affected areas are moved into the region at times.	High – due to uncertainty of achieving early detection of Chilean needle grass.	Prevention of damage to pastoral production and animal welfare.	Raise awareness about Chilean needle grass. Investigate any potential reports of Chilean needle grass. Ensure stock and feed from affected areas are inspected prior to entering the region.
Extent to which the option will be implemented and complied with	Unknown movement of Chilean needle grass via animals or stock feed. Presence of Chilean needle grass not reported.	Medium.	High.	As above.	Encourage reports of Chilean needle grass.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Social stigma of being a Chilean needle grass-infested property may deter reporting.	Low.	Low.	As above.	Encourage reports of Chilean needle grass as being of personal and community benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Chilean needle grass

The beneficiaries and exacerbators of the programme are:

- beneficiaries: all pastoral farmers;
- active exacerbators: none as Chilean needle grass is not present in the region;
- passive exacerbators: any person who does not report the presence of Chilean needle grass.

Matters for consideration in allocation of costs of proposed Chilean needle grass programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed Chilean needle grass programme

Legislative rights and responsibilities	None known.
Management objectives	Exclusion.
Stage of infestation	Not present in region.
Most effective control agents	Not required.
Urgency	Low – Chilean needle grass is an unwanted organism. Knowingly spreading Chilean needle grass is prohibited.
Efficiency and effectiveness	Exclusion programme is efficient and effective given Chilean needle grass is not present in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended for exclusion pests.
Practicality of targeting exacerbators	None – there are no exacerbators as Chilean needle grass is not present in the region.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and monitoring costs.
Security	General rate will secure funding for inspections and monitoring for Chilean needle grass over five years.
Fairness	It is considered fair to fund inspection and monitoring costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and monitoring costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an exclusion plan. Transitional costs may be needed if Chilean needle grass does establish in the region.
Mechanisms available	General rate, targeted rate on productive land and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the Exclusion programme for Chilean needle grass be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	-	-	-

Nassella tussock

Description

Nassella tussock is a tufted, perennial, tussock grass with fine, tightly rolled, light green or yellowish-green leaves. The plants are erect when young but slightly drooping with age and grow up to 70 centimetres tall and 80 centimetres wide. When fingers are run down the leaf, they feel needle-like and very tough. The stem is swollen just above ground level, like a shallot.

Flowering usually commences in October and is characterised by a purplish tinge that enhances the plant's visibility. Flower heads are open, with a branched seed head 25-95 centimetres long, and produced between November and January. Each mature plant can produce up to 100,000 seeds per year. Ripe seeds are purplish with a three centimetre long bristle.

Roots are deep, matted and fibrous. They have been found growing 1.7 metres below the soil surface.

Nassella tussock adversely affects production values due to reduced pasture quality and it also affects environmental values by displacing native species in tussock grassland.

Nassella tussock is not known to occur in Southland but it is known to occur in Otago near Roxburgh, Alexandra and in the Cardrona Valley.

Proposed programme

Environment Southland is proposing an exclusion programme for nassella tussock.

Level of analysis

Nassella tussock is considered to require a medium level of analysis when assessed according to the NPD guidance document. Costs and benefits for exclusion programmes generally have also been considered in Section 12 of the cost benefit analysis undertaken by an independent economist.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for nassella tussock:

1. do nothing;
2. exclusion.

Benefits and costs of options for management of nassella tussock

Benefits and costs of nassella tussock management options

Option	Costs	Benefits
Do nothing	No costs associated with this option unless nassella tussock establishes. Costs to pastoral production and loss of biodiversity in tussock grasslands will be incurred.	None identified.
Exclusion	Low costs for raising awareness and responding to reports of nassella tussock in the region.	Prevention of damage to pastoral production and loss of biodiversity values.

Risks of nassella tussock exclusion programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Potential risk of nassella tussock entering the region if it becomes more widespread in Otago, possibly as a contaminant in stock feed.	Low – control programme in Otago has ensured this is a low risk.	High - due to uncertainty of achieving early detection of nassella tussock.	Prevention of damage to pastoral production and loss of biodiversity.	Raise awareness about nassella tussock. Investigate any potential reports of nassella tussock.
Extent to which the option will be implemented and complied with	Presence of nassella tussock not reported.	Medium.	High.	As above.	Encourage reports of nassella tussock.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Social stigma of being a nassella tussock infested property may deter reporting.	Low.	Low.	As above.	Encourage reports of nassella tussock as being of personal and community benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of nassella tussock

The beneficiaries and exacerbators of the programme are:

- beneficiaries: all pastoral farmers and the Southland community;
- active exacerbators: none as nassella tussock is not present in the region;
- passive exacerbators: any person who does not report the presence of nassella tussock.

Matters for consideration in allocation of costs of proposed nassella tussock programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed nassella tussock programme

Legislative rights and responsibilities	None known.
Management objectives	Exclusion.
Stage of infestation	Not present in region.
Most effective control agents	Not required.
Urgency	Low – nassella tussock is an unwanted organism. Knowingly spreading nassella tussock is prohibited.
Efficiency and effectiveness	Exclusion programme is efficient and effective given nassella tussock is not present in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended for exclusion pests.
Practicality of targeting exacerbators	None – there are no exacerbators as nassella tussock is not present in the region.
Administrative efficiency	General rate considered most efficient method of cost allocation for inspection and monitoring costs.
Security	General rate will secure funding for inspections and monitoring for nassella tussock over five years.
Fairness	It is considered fair to fund inspection and monitoring costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and monitoring costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an exclusion plan. Transitional costs may be needed if nassella tussock does establish in the region.
Mechanisms available	General rate, targeted rate on productive land and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the exclusion programme for nassella tussock be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	-	-	-

ERADICATION PLANTS

Boxthorn

Description

Boxthorn is a dense, spiny evergreen shrub with white flowers and scarlet berries growing up to six metres tall, with many stems emanating from ground level. The plant is particularly invasive in coastal areas on sand dunes, cliffs, and islands. It over-tops native plant species and can become the only woody plant species at a site. Seabirds can become entangled in its tough spiny thorns, often causing their deaths.

The Department of Conservation is working towards eradication of boxthorn in Southland.

Proposed programme

Environment Southland is proposing an eradication programme for boxthorn.

Level of analysis

Boxthorn is considered to require a medium level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for boxthorn:

1. do nothing;
2. eradication.

Benefits and costs of options for management of boxthorn

Benefits and costs of boxthorn management options

Option	Basic economic assumptions	Costs	Benefits
Do nothing		Replacement of native plant species in coastal areas. Increase in death of seabirds. Increased injury to grazing animals from spines.	None identified.
Eradication	Six hours staff time and less than \$50 for herbicide	Low costs for raising awareness and responding to report of boxthorn.	Prevention of replacement of native plants in coastal areas. Prevention of injury or death to seabirds and grazing animals.

Risks of boxthorn eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that search and control programme for boxthorn is discontinued by Department of Conservation.	Low.	Medium.	Prevention of replacement of native plants in coastal areas. Prevention of injury or death to seabirds and grazing animals.	Ensure continuity of the programme remains a priority for Department of Conservation.
Extent to which the option will be implemented and complied with	Presence of boxthorn not reported.	Low.	Medium.	As above.	Encourage reports of boxthorn.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Not considered to be a risk factor if boxthorn is specified as a pest.				
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of boxthorn

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community through prevention of loss of public good benefits;
- active exacerbators: any person who knowingly does not report the presence of boxthorn;
- passive exacerbators: any person who unknowingly does not report the presence of boxthorn.

Matters for consideration in allocation of costs of proposed boxthorn programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed boxthorn programme

Legislative rights and responsibilities	None known.
Management objectives	Eradication.
Stage of infestation	Lag.
Most effective control agents	Department of Conservation.
Urgency	High.
Efficiency and effectiveness	An eradication programme is efficient and effective given boxthorn is only known at one site in the region.
Practicality of targeting beneficiaries	It is considered more practical for the Department of Conservation to fund the programme as there is only one site.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	It is considered more efficient for the Department of Conservation to administer the programme as there is only one site.
Security	Funding is considered secure as long as it remains a priority for the Department of Conservation.
Fairness	It is considered fair for the Department of Conservation to fund programme costs due to public good benefits.
Reasonable	It is considered reasonable for the Department of Conservation to fund programme costs due to public good benefits.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an eradication plan. Transitional costs may be needed if boxthorn is found at other locations in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the eradication programme for boxthorn be covered by the Department of Conservation.

Field horsetail

Description

Field horsetail is an herbaceous perennial plant with deep growing rhizomes and tends to grow in damp places. Fertile (reproductive) stems are produced in early spring and are non-photosynthetic. They are whitish to light brown, hollow, cylindrical, jointed, unbranched, leafless, about eight millimetres in diameter and 15-20 centimetres long. Tips of fertile stems end in a yellowish to brownish cone (strobilus) about 12-30 millimetres long, which produces spores. Once spores have been produced, fertile stems wither and die, usually in early summer.

Sterile (vegetative) stems start to grow after the fertile stems have wilted, and persist through summer until the first autumn frosts. These stems are green, either erect or somewhat prostrate, 15-60 centimetres tall and composed of slender, grooved, hollow joints, which are 1-1.5 millimetres in diameter. Sterile stems look like miniature pine trees with their plume-like branches. Their appearance also explains the plant's common name of 'horsetail'.

The plant is toxic to horses, sheep and cattle, according to overseas reports, and its high silica content can adversely affect teeth and gums of grazing stock. It can cause milk taint in dairy pastures. While it can reduce crop yields drastically, if present in sufficient quantity, it will not compete well with healthy pasture.

Invasive in wet places, it forms dense stands which can prevent the regeneration of other species, block waterways, contributing to flooding and siltation.

Proposed programme

Environment Southland is proposing an eradication programme for field horsetail.

Level of analysis

Field horsetail is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for field horsetail:

1. do nothing;
2. eradication.

Benefits and costs of options for management of field horsetail

Benefits and costs of field horsetail management options

Option	Costs	Benefits
Do nothing	Costs to the economy and environment will be incurred if field horsetail is allowed to spread further in the region.	None identified.
Eradication	Low costs for monitoring and control at one known site in the region. Additional costs expected for raising awareness and responding to reports of field horsetail in the region.	Protection of economic and environmental values.

Risks of field horsetail eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that control measures for field horsetail are not completely effective. Risk that field horsetail is already established at other unknown locations.	Medium - field horsetail has proven difficult to control once established.	Medium – due to uncertainty that only one site is present in the region.	Prevention of loss of ecosystem function and reduction in biodiversity. Prevention of loss of production and blockage of waterways.	Investigate control options for field horsetail. Raise awareness about field horsetail. Investigate any potential reports.
Extent to which the option will be implemented and complied with	Presence of field horsetail not reported.	Medium – difficulty with identification may prevent reports.	High.	As above.	Encourage reports of field horsetail.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of field horsetail as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of field horsetail

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of field horsetail through their actions;
- passive exacerbators: any person who does not report the presence of field horsetail.

Matters for consideration in allocation of costs of proposed field horsetail programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed field horsetail programme

Legislative rights and responsibilities	None known.
Management objectives	Eradication.
Stage of infestation	Lag.
Most effective control agents	Environment Southland.
Urgency	High.
Efficiency and effectiveness	An eradication programme is efficient and effective given field horsetail is only known at one site in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs.
Security	General rate will secure funding for inspections and control costs for field horsetail over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an eradication plan. Transitional costs may be needed if field horsetail is found at other locations in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the eradication programme for field horsetail be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

German ivy

Description

German ivy is a scrambling perennial vine growing up to more than three metres high. It has thin, broad leaves and produces yellow flowers in dense clusters, from May to October.

The plant is invasive in a wide range of habitats, including coastal areas and lowland forest margins, shrubland, roadsides, quarries, swamps and other damp areas. It smothers small trees and lower vegetation. Once present at a site it often leads to the invasion of more aggressive plant species.

Proposed programme

Environment Southland is proposing an eradication programme for German ivy.

Level of analysis

German ivy is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for German ivy:

1. do nothing;
2. eradication.

Benefits and costs of options for management of German ivy

Benefits and costs of German ivy management options

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No costs associated with this option.	Costs to environmental values will be incurred if German ivy is allowed to spread further. Impacts upon ecological processes and biological diversity.	None identified.
Eradication	Eradication programme has cost on average \$3200/year over the last three years (excludes Department of Conservation funded programme on Stewart Island/Rakiura).	No qualitative costs associated with an eradication programme.	Protection of environmental values – scrubland and forest edges in coastal areas in particular.

Risks of German ivy eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that control measures for German ivy are not completely effective. Risk that German ivy is already established at other unknown locations.	Low – control measures have proven effective. Awareness over recent years has not generated new sites.	Low.	Prevention of loss of ecosystem processes and reduction in biodiversity.	Continue to raise awareness about German ivy, and investigate any potential reports.
Extent to which the option will be implemented and complied with	Presence of German ivy is not reported.	Medium – difficulty identifying German ivy may prevent reports.	High.	As above.	Encourage reports of German ivy.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of German ivy as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of German ivy

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of German ivy through their actions;
- passive exacerbators: any person who does not report the presence of German ivy.

Matters for consideration in allocation of costs of proposed German ivy programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed German ivy programme

Legislative rights and responsibilities	None known.
Management objectives	Eradication.
Stage of infestation	Lag – largely due to control programme.
Most effective control agents	Environment Southland (mainland Southland) and the Department of Conservation (Stewart Island/Rakiura).
Urgency	Medium.
Efficiency and effectiveness	An eradication programme is efficient and effective given German ivy is only known at 22 sites in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs.
Security	General rate will secure funding for inspections and control costs for German ivy over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an eradication plan. Transitional costs may be needed if German ivy is found at other locations in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the eradication programme for German ivy be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Parrots feather

Description

Parrots feather is a bottom-rooted, perennial floating and emergent plant with stolons, fibrous roots, and stems (five millimetres diameter) that grow to two metres long (three to four metres in flowing water) emerging 10 centimetres above water and rooting at lower nodes, with submerged parts become bare. Feather-like blue-green leaves (25-45 x 7-15 millimetres) are in whorls of five or six, and are each divided into 25-30 leaflets (seven millimetres long). From September to February, minute female flowers are produced, but no seed is set in New Zealand.

It is spread by flowing water, and new water bodies are infested by fragments spread by boats and trailers, eel nets, diggers, and people 'liberating' fish.

The plant forms dense mats, shading out existing native species and preventing new seedlings of native species from establishing, and replaces species that usually grow on the margins of waterbodies. Large clumps dislodge, causing flooding, and rotting vegetation stagnates water, killing fauna and flora.

Proposed programme

Environment Southland is proposing an eradication programme for parrots feather.

Level of analysis

Parrots feather is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for parrots feather:

1. do nothing;
2. eradication.

Benefits and costs of options for management of parrots feather

Benefits and costs of parrots feather management options

Option	Costs	Benefits
Do nothing	Costs to the economy and environment will be incurred if parrots feather is allowed to spread further in the region.	None identified.
Eradication	Low costs for monitoring and control at one known site in the region. Additional costs expected for raising awareness and responding to reports of parrots feather in the region.	Protection of economic and environmental values, as well as social and cultural wellbeing.

Risks of parrots feather eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that control measures for parrots feather are not completely effective. Risk that parrots feather is already established at other unknown locations.	Medium – control options for aquatic plants are limited.	Medium – due to uncertainty that only one site is present in the region.	Prevention of loss of ecosystem function and reduction in biodiversity. Prevention of loss of recreational activities and blockage of waterways.	Investigate control options for parrots feather. Raise awareness about parrots feather, and investigate any potential reports.
Extent to which the option will be implemented and complied with	Presence of parrots feather not reported.	Medium	Medium	As above.	Encourage reports of parrots feather.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of parrots feather as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of parrots feather

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community
- active exacerbators: any person who contributes towards the spread of parrots feather through their actions
- passive exacerbators: any person who does not report the presence of parrots feather

Matters for consideration in allocation of costs of proposed parrots feather programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed parrots feather programme

Legislative rights and responsibilities	None known.
Management objectives	Eradication.
Stage of infestation	Lag.
Most effective control agents	Environment Southland.
Urgency	High.
Efficiency and effectiveness	An eradication programme is efficient and effective given parrots feather is only known at one site in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs.
Security	General rate will secure funding for inspections and control costs for parrots feather over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an eradication plan. Transitional costs may be needed if parrots feather is found at other locations in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for parrots feather be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Purple loosestrife

Description

Purple loosestrife is an erect, hairy summer-green perennial herb. It has many-branched stems that grow to one to two metres tall, are pink at the base and die off in winter. The leaves occur opposite each other along the stems. Its flower head is a terminal spike 20 to 25 centimetres long with many purple-magenta flowers found from December to February. Mature plants are capable of producing more than two million seeds in one growing season.

The plant is invasive along the margins of wetlands, lakesides, streams, ditches and other damp areas. It can form large impenetrable stands that exclude all other species. It destroys wetland habitat for fish and bird species and can cause blockages to waterways which can contribute to flooding.

Global Invasive Species Database lists purple loosestrife in the worse 100 most invasive species worldwide. Climex models for purple loosestrife in Southland show the climate is suitable for the spread of this plant here. Purple loosestrife invades a variety of wetland habitats, including marshes, river and stream riparian, pond edges, lakes, roadside ditches, and reservoirs. This plant forms dense thickets, outcompetes and replaces native grasses, sedges and other flowering plants that provide a higher quality food source and habitat for wildlife. It destroys wetland habitat for fish and bird species and can cause blockages, which can contribute to flooding. It is only known at a few low incidence sites known, mainly in domestic gardens.

Proposed programme

Environment Southland is proposing an eradication programme for purple loosestrife.

Level of analysis

Purple loosestrife is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers four options for purple loosestrife:

1. do nothing;
2. eradication;
3. progressive containment;
4. site-led.

Benefits and costs of options for management of purple loosestrife

Benefits and costs of purple Loosestrife management options

Option	Basic economic assumptions	Costs	Benefits
Do nothing		Low.	Low - because of the potential to spread into and dominate sensitive wetland environments.
Eradication	\$5000/year.	Low.	High - if eradication at few known low incidence sites is achieved.

Option	Basic economic assumptions	Costs	Benefits
Progressive containment		Low.	Medium – leaving any plants will lead to further spread.
Site-led		Low.	Not applicable.

Risks of purple loosestrife eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Low – eradication should be possible at a few low incidence sites mainly in gardens.	Medium.	High.	Infestation of sensitive areas, mainly wetland, by a highly invasive exotic weed and loss of biodiversity values. Restriction of waterways.	
Extent to which the option will be implemented and complied with	If designated as an eradication pest – surveillance, control and compliance measures will achieve the goal.	Low.	Low.	As above.	
Risk that compliance with other legislation will adversely affect implementation	Purple loosestrife is on the National Pest Plant Accord which bans sale of the plant. This reinforces the eradication goal.	Low.	Low.	As above.	
Risk that public or political concerns will adversely affect implementation	Unlikely although some occupiers may object to removal.	Low.	Low.	As above.	
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of purple loosestrife

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who propagates and transports purple loosestrife;
- passive exacerbators: occupiers who have purple loosestrife on their land.

Matters for consideration in allocation of costs of proposed purple loosestrife programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed purple loosestrife programme

Legislative rights and responsibilities	Purple loosestrife is designated as an unwanted organism under the Pest Plant Accord which bans sale, propagation and distribution but does require control of plants that have already established.
Management objectives	To eradicate purple loosestrife from Southland.
Stage of infestation	A small number of low incidence sites known.
Most effective control agents	A regional pest management plan with an eradication objective for purple loosestrife under which a programme of surveillance, control and compliance can be delivered.
Urgency	Medium - experience from other countries has shown that purple loosestrife can spread quickly when conditions are favourable.
Efficiency and effectiveness	A funded work programme under the proposed Regional Pest Management Plan is the most cost effective approach.
Practicality of targeting beneficiaries	Occupiers are the beneficiaries who could contribute to a regional work programme via a targeted council rate.
Practicality of targeting exacerbators	Those who cultivate or spread purple loosestrife may be targeted by the compliance provisions of the Plan.
Administrative efficiency	As above.
Security	As above.
Fairness	A regionally funded programme under the proposed Regional Pest Management Plan is considered the fairest approach.
Reasonable	As above.
Parties bearing indirect costs	Southland ratepayers.
Transitional cost allocation arrangements	Not applicable.
Mechanisms available	Regional rating under the Local Government Act.

Proposed allocation of costs

It is proposed that costs for undertaking the eradication programme for purple loosestrife be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
-	100%	-	100%	-

Smilax

Description

Smilax is a scrambling, slightly woody perennial vine. It has slender wiry stems that can climb up to three metres high. The leaves are an ovalish, flat shape, with a pointed tip and have approximately seven veins, evident on the upper surface. Small greenish-white flowers appear in July and August, followed by round red berries. The plant produces tubers near the surface that allow it to survive and re-sprout after stems have been cut or the foliage sprayed with herbicide.

Smilax smothers low growing plants and seedlings, usually in low canopy habitats such as coastal and estuarine areas, roadsides, hedgerows and bare sites.

Proposed programme

Environment Southland is proposing an eradication programme for smilax.

Level of analysis

Smilax is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for smilax:

1. do nothing;
2. eradication.

Benefits and costs of options for management of smilax

Benefits and costs of smilax management options

Option	Costs	Benefits
Do nothing	Loss of biodiversity will be incurred if smilax is allowed to spread further in the region.	None identified.
Eradication	Low costs for monitoring at five known sites in the region. Additional costs expected for raising awareness and responding to reports of smilax in the region.	Protection of environmental values in the region.

Risks of smilax eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that control measures for smilax are not completely effective. Risk that smilax is already established at other unknown locations.	Medium - due to uncertainty that smilax is only known at five sites in the region.	Medium.	Protection of environmental values in the region.	Raise awareness about smilax, and investigate any potential reports.
Extent to which the option will be implemented and complied with	Presence of smilax not reported.	Medium.	Medium.	As above.	Encourage reports of smilax.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of smilax as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of smilax

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who propagates and transports smilax;
- passive exacerbators: occupiers who have smilax on their land.

Matters for consideration in allocation of costs of proposed smilax programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed smilax programme

Legislative rights and responsibilities	None known.
Management objectives	Eradication.
Stage of infestation	Lag.
Most effective control agents	Environment Southland.
Urgency	High.
Efficiency and effectiveness	An eradication programme is efficient and effective given smilax is only known at five sites in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs.
Security	General rate will secure funding for inspections and control costs for smilax over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the Southland region.
Reasonable	As above.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an eradication plan. Transitional costs may be needed if field horsetail is found at other locations in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the Eradication programme for smilax be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Spartina

Description

Spartina is a perennial estuarine sward grass, commonly one metre tall and growing in shallow saltwater. It has stiff, upright stems, originating from thick rhizomes. The stems have broad, pointed leaves from their base to the top, where several long fingers contain the seed. New growth occurs from either root pieces or seed. Shoots rapidly sprout from underground rhizomes, while the seed falls into the water and floats away.

Colonies of spartina form dense grassy clumps, and these can spread laterally from underground rhizomes, or by overground side shoots (tillers). Within the estuarine area, vast meadows can form causing a build-up of sediment. This can increase the risk of flooding and also alter the habitat for wading bird species and other estuarine flora and fauna.

The Department of Conservation is working towards the eradication of spartina in Southland.

Proposed programme

Environment Southland is proposing an eradication programme for spartina.

Level of analysis

The assessment of spartina is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken. The qualitative assessment is supplemented by inputting basic economic assumptions.

NPD section 6 - assessment

Options for response

The analysis considers three options for spartina:

1. do nothing;
2. eradication;
3. progressive containment.

Benefits and costs of options for management of spartina

Benefits and costs of spartina management options

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No costs associated with this option.	Increased risk of flooding due to build-up of sediment in estuaries. Reduced habitat for wading birds and reduced diversity of estuarine flora and fauna.	None identified.
Eradication	Current budget is \$20,000 for eradication.	Low costs for raising awareness and responding to reports of spartina.	Reduced risk of flooding. Protection of habitat for wading birds, and estuarine flora and fauna.
Progressive containment	Estimate of \$20,000 based on current budget.	Low costs for raising awareness and responding to	Reduced risk of flooding. Protection of habitat for wading birds, and estuarine

Option	Basic economic assumptions	Costs	Benefits
		reports of spartina.	flora and fauna.

Risks of spartina eradication programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Lack of experienced personnel to complete search and control. Risk that all plants are not found.	Medium - currently using detection dog.	High.		Ensure there are sufficient personnel trained to search. Ensure dog and handler are trained and available for detection.
Extent to which the option will be implemented and complied with	Presence of spartina not reported.	Low.	High.		Encourage reports of spartina.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Not considered to be a risk factor if spartina is specified as a pest.				
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of spartina

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community through prevention of loss of community benefits;
- active exacerbators: any person who knowingly does not report the presence of spartina;
- passive exacerbators: any person who unknowingly does not report the presence of spartina.

Matters for consideration in allocation of costs of proposed spartina programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed spartina programme

Legislative rights and responsibilities	None known.
Management objectives	Eradication.
Stage of infestation	Lag.
Most effective control agents	Department of Conservation.
Urgency	High.
Efficiency and effectiveness	An eradication plan is effective and efficient given spartina is at low levels due to the success of the long-term control programme.
Practicality of targeting beneficiaries	It is considered more practical for the Department of Conservation to fund the programme rather than target beneficiaries as the Department of Conservation have managed the spartina programme over a long-term.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	It is considered more efficient for the Department of Conservation to administer the programme.
Security	Funding is considered secure as long as it remains a priority for the Department of Conservation.
Fairness	It is considered fair for the Department of Conservation to fund programme costs due to public good benefits.
Reasonable	It is considered reasonable for the Department of Conservation to fund programme costs due to public good benefits.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for an eradication plan. Transitional costs may be needed if spartina is found at other locations in the region.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the eradication programme for spartina be covered by the Department of Conservation.

PROGRESSIVE CONTAINMENT PLANTS

Bengal cat

Description

Bengal cats are an artificially created hybrid (F5) between the Asian leopard cat and the domestic cat. It was first introduced into New Zealand before 1998 when import restrictions were put in place.

The hybrid is a relatively large (4 to 9 kilograms), strong, agile animal with distinctive spotted markings which has, in recent times, made it a popular cat breed. It is well documented that some Bengal cats have behaviours which make them unattractive as pets and increases the risk of owners wishing to get rid of them at worst by release into the wild. There has been wide concern expressed internationally and in New Zealand the 'wild genetic' traits in the hybrid will make it a very successful and dangerous predator if it became established in the wild and interbred with the feral cat population. The wild ancestor Leopard cats are carnivorous, feeding on a variety of small prey including mammals, lizards, amphibians, birds and insects. In most parts of their range, small rodents such as rats and mice form the major part of their diet, which is often supplemented with grass, eggs, poultry, and aquatic prey. Bengal cats may predate on a wider range of native species than feral cats because of their larger size. For example, adult kiwi and weka would be at risk from a cat of this size.

They are active hunters, dispatching their prey with a rapid pounce and bite. Unlike many other small cats, they do not "play" with their food, maintaining a tight grip with their claws until the animal is dead. This may be related to the relatively high proportion of birds in their diet, which are more likely to escape when released than are rodents. While there is no direct evidence that Bengal cats or other hybrid cats have become wildlife predators in New Zealand or elsewhere their strong hunting traits, their size and intelligence suggests that they could become so if allowed.

In the last 150 years there have been numerous biosecurity mistakes made in New Zealand through introduction of exotic animals which established in the wild and have devastated native wild life, e.g. mustelids, rodents, possums, cats. On this basis there is a strong rationale for continuing to maintain a precautionary approach here in Southland. Bengal cats may predate on a wider range of native species than feral cats because of their larger size, e.g. adult kiwi and weka. It is also possible that Bengal cats could also predate small farmed livestock such as lambs and chickens. Accordingly there would be at significant risk from a cat of this size and its adverse effects on matters mentioned in s54a Biosecurity Act.

Proposed programme

Environment Southland is proposing a progressive containment programme for Bengal cats.

Level of analysis

The assessment of Bengal cat is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken. The qualitative assessment is supplemented by inputting basic economic assumptions.

NPD section 6 - assessment

Options for response

The analysis considers three options for Bengal cats:

1. do nothing;
2. exclusion - currently in the Regional Pest Management Strategy, now with exemptions issued for 20 owned Bengal cats;
3. progressive containment.

Benefits and costs of options for management of Bengal cat

Benefits and costs of Bengal cat management options

Option	Basic economic assumptions	Costs	Benefits
Do nothing	There is only a small potential regional trade in Bengal cat breeding.	High, determinably effect native biodiversity.	Low. Some benefits to people whole like to keep domestic cats as companion animals.
Progressive containment		Low: costs associated with maintaining a database of registered animals.	High, prevents the establishment of wild Bengal cat populations and the interbreeding of Bengal cats with other feral cat population, reducing the impacts on indigenous biodiversity values.

Risks of Bengal cat progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Some cat owners choose not to neuter, microchip or register their Bengal cats and these escape into the wild.	Low.	High.	Native birds and reptiles and potentially small livestock e.g. lambs, hens.	Low.
Extent to which the option will be implemented and complied with	It is expected that most Bengal cat owners will comply.	Low.	Low.	Native birds and reptiles and potentially small livestock e.g. lambs, hens.	
Risk that compliance with other legislation will adversely affect implementation	None known.				
Risk that public or political concerns will adversely affect	Possible push back from cat fanciers. Breeders outside	Medium.	Medium.	Native birds and reptiles and potentially small livestock e.g.	Medium – through effective communication.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
implementation	of Southland likely to support to eliminate possible competition from breeders in Southland.			lambs, hens.	
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Bengal cats

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: owners of Bengal cats;
- passive exacerbators: breeders and sellers of Bengal cats outside of Southland.

Matters for consideration in allocation of costs of proposed Bengal cat programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed Bengal cat programme

Legislative rights and responsibilities	Able to own, keep and sell Bengal cats in New Zealand.
Management objectives	To contain owned Bengal cats to prevent their establishment in the wild and interbreeding with the feral cat population to produce a more effective predator.
Stage of infestation	Low – currently no record of escapes or interbreeding in Southland.
Most effective control agents	Retain in captivity and prevent breeding by neutering.
Urgency	Medium – current controls under the Regional Pest Management Strategy need to be maintained.
Efficiency and effectiveness	The costs of owners neutering, micro-chipping and registering their Bengal cats will significantly reduce the risks to native wildlife and small farmed animals.
Practicality of targeting beneficiaries	The Southland community will benefit from the reduced risk of another threat to native wildlife and livestock.
Practicality of targeting exacerbators	Owners of Bengal cats will be required to comply with the proposed Regional Pest Management Plan rules at the risk compliance action if they do not.
Administrative efficiency	The management of a register, undertaking inspections and checks can be done at a low cost.
Security	Environment Southland will be responsible for compliance with the proposed Regional Pest Management Plan rules.
Fairness	The owners of Bengal cats will bear the costs of managing the risks

	associated with their animals.
Reasonable	As above.
Parties bearing indirect costs	None.
Transitional cost allocation arrangements	Not applicable – existing regime will continue.
Mechanisms available	Not applicable.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for Bengal cats be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Bomarea

Description

Bomarea is a shade tolerant, multi-stemmed vine that arises from short underground rhizomes, which bear numerous tubers. The flowers are clumped in a dense pendulous bunch of 15 to 20. The flowers are reddish on the outside and yellow with red spots on the inside, they develop into capsules about two centimetres in diameter. When these are ripe they split open to reveal bright fleshy orange seeds, which can be dispersed over long distances by birds.

An ornamental garden escapee, it invades alongside streams and river banks, shrublands, forest edges, forest remnants and intact low canopy forest. The vines grow into the forest canopy, forming large masses, which overtop and smother supporting trees. Large infestations can alter light levels in forests, kill mature trees and prevent seedlings from establishing.

Proposed programme

Environment Southland is proposing a progressive containment programme for bomarea.

Level of analysis

Bomarea is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for bomarea:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of bomarea

Benefits and costs of bomarea management options

Option	Costs	Benefits
Do nothing	Costs to environmental values described in impact assessment for bomarea.	None identified.
Progressive containment	No qualitative costs associated with a progressive containment programme.	Protection of environmental values described in impact assessment.

Risks of bomarea progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that bomarea is already established at other unknown locations.	High – reports from Stewart Island/Rakiura indicate bomarea is more widespread previously thought. Only one	High.	Prevention of loss of ecosystem processes and reduction in biodiversity.	Raise awareness about bomarea and investigate any potential reports.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
		site identified in mainland Southland but awareness of bomarea is low.			
Extent to which the option will be implemented and complied with	Presence of bomarea is not reported.	Medium.	High.	As above.	Encourage reports of bomarea.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of bomarea as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD Section 7 - Allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of bomarea

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of bomarea through their actions;
- passive exacerbators: any person who does not report the presence of bomarea.

Matters for consideration in allocation of costs of proposed bomarea programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed bomarea programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag phase on mainland Southland. Later lag phase – explosion phase on Stewart Island/Rakiura.
Most effective control agents	Environment Southland for mainland Southland, potential for the Department of Conservation on Stewart Island/Rakiura.
Urgency	High.
Efficiency and effectiveness	A progressive containment programme is efficient and effective for bomarea on mainland Southland given there is only one known site. The full extent on Stewart Island/Rakiura is yet to be determined.
Practicality of targeting beneficiaries	Funding from general rate recommended for bomarea on mainland Southland.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs.
Security	General rate will secure funding for inspections and control costs for bomarea over five years.
Fairness	It is considered fair to fund inspection and control costs for mainland Southland through a general rate as there is benefit to the Southland region.
Reasonable	As above.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for bomarea on mainland Southland be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Buddleja

Description

Buddleja is a multi-stemmed shrub growing up to three metres tall. It has willow-shaped leaves that are white or grey on the underside. The flower head is a distinctive, dense, cone-shaped panicle with small fragrant purple or white flowers found from December to February.

It forms dense, self-replacing thickets along forest margins, areas of revegetation, riverbeds and plantation forests (especially following disturbance) and waste ground. In riverbeds, buddleja can cause a build-up of material and increase the risk of flooding.

Proposed programme

Environment Southland is proposing a progressive containment programme for buddleja.

Level of analysis

Buddleja is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD Section 6 - assessment

Options for response

The analysis considers two options for buddleja:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of buddleja

Benefits and costs of buddleja management options

Option	Costs	Benefits
Do nothing	Costs to environmental values, forestry and water quality will be incurred if buddleja is spread further outside of cultivation and spread.	None identified.
Progressive containment	No qualitative costs associated with a progressive containment programme.	Protection of environmental, economic and social values described in impact assessment.

Risks of buddleja progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that buddleja establishes outside cultivation.	High – new sites outside cultivation have been found in recent years.	High.	Prevention of loss of environmental, economic and social values.	Raise awareness about buddleja and investigate any potential reports of buddleja establishing outside of cultivation.
Extent to which the option will be implemented and complied with	Presence of buddleja not reported.	Medium.	High.	As above.	Encourage reports of buddleja.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Buddleja is regarded as desirable by some people. This may prevent reporting of locations.	Low.	Low.	As above.	Encourage reports of buddleja outside cultivation as being of public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of buddleja

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of buddleja through their actions;
- passive exacerbators: any person who does not report the presence of buddleja outside of cultivation.

Matters for consideration in allocation of costs of proposed buddleja programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed buddleja programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag.
Most effective control agents	Environment Southland. Central government agencies (for Crown managed land).
Urgency	High.
Efficiency and effectiveness	A progressive containment programme is efficient and effective given buddleja is only known at a few sites outside cultivation.
Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs where buddleja is found outside cultivation.
Security	General rate will secure funding for inspections and control costs for buddleja over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	As above.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for buddleja be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Contorta pine and mountain pine

Description

Contorta pine is a small to medium sized pine tree, usually with twisted branches and paired needles. It is monoecious (both female and male parts on the same tree). Trees mature at approximately five years of age, though peak seed production occurs after eight to ten years. The seed cones take 15 months to mature and can contain up to 300,000 seeds/kilogram.

Mountain pine is a small-to-medium sized, multi-stemmed tree with dark brownish-grey bark, which peels in small thin flakes. The foliage is often dense with needle-like leaves occurring in bundles of two. The needles are dark green, rigid and curved.

The seeds are very small and light and are capable of spreading long distances with the wind. As a result, wilding offspring are capable of rapid invasion of land with low grazing intensity. This leads to significant impacts on native ecosystems, particularly those with low-stature vegetation¹. Existing plantings act as seed sources for ongoing wilding spread.

It can be difficult to successfully control or manage the spread of these species over the long-term if the seed source is not removed or appropriately managed and contained.

These two conifers have very limited commercial value. It is therefore appropriate to specify these organisms as pests in their own right.

Proposed programme

Environment Southland is proposing a progressive containment plan for contorta and mountain pine to reduce wilding tree spread from Mid Dome and surrounding land. This will allow ES and other agencies to continue to support the Mid Dome Wilding Trees Charitable Trust's programme to remove seed sources from Mid Dome and surrounding lands.

Level of analysis

Contorta pine is considered to require a medium level of analysis when assessed according to the NPD guidance document. The qualitative assessment is supplemented by inputting basic economic assumptions.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers six options for contorta pine:

1. do nothing;
2. eradication;
3. progressive containment.

¹ Indigenous ecosystems at particular risk from wilding conifer invasion include: tussock and other indigenous grasslands, alpine ecosystems, subalpine and dryland scrub and shrublands, frost-flats, wetlands, turf communities, geothermal areas, dunelands, ultramafic/serpentine areas, rockfields and herbfields, riparian areas, coastal margins, bluffs and cliffs.

Benefits and costs of options for management of contorta and mountain pine

Benefits and costs of contorta and mountain pine management options

Option	Basic economic assumptions	Costs	Benefits
Do nothing		High ecological and social impacts on the Mid Dome Wilding Tree Programme Area	Low – because of high impacts of wilding tree spread onto vulnerable land in terms of pastoral production, water yield, biodiversity, social and cultural values.
Eradication	High, control methods to achieve eradication are expensive.	Low, some short term by-kill caused by control methods	High if eradication can be achieved.
Progressive containment	Environment Southland contribution of \$100,000/year to the \$700,000-\$1,000,000/year Mid Dome Trust programme.	Medium continued re-invasion, re-establishment	Medium – by protecting the most vulnerable land from unwanted spread.

Risks of contorta and mountain pine progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks.	Inability to complete the Mid Dome programme due to lack of funds.	Medium.	High.	Severe impacts on pastoral production, water yield, biodiversity over 100,000 hectares of vulnerable land as well as social and cultural values.	High if funding can be maintained.
Extent to which the option will be implemented and complied with.	Wilding contorta and mountain pine can be contained if not eradicated through the Mid Dome programme.	Medium.	Medium.	As above.	High.
	Occupiers will assume responsibility for ongoing maintenance under the proposed Regional Pest Management Plan once the control programme objectives are	Low.	Low.	As above.	High.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
	achieved.				
Risk that compliance with other legislation will adversely affect implementation.	None known.			As above.	
Risk that public or political concerns will adversely affect implementation.	Government support for continued national funding is critical.	Medium.	High.	As above.	Medium.
Any other material risk.	Loss of social licence to use herbicides or other key tools.	Low.	High.	As above.	High.

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of contorta and mountain pine

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - pastoral farmers with affected land;
 - downstream water users;
 - public users of the affected conservation estate;
 - private land for recreational and other social and cultural purposes.
- active exacerbators: occupiers whose land is infested which provides a seed source for fringe and distant spread. Note that the original contorta and mountain pine was introduced by the Crown for soil conservation purposes.
- passive exacerbators: occupiers of land vulnerable to wilding spread.

Matters for consideration in allocation of costs of proposed contorta and mountain pine programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed contorta pine programme

Legislative rights and responsibilities	There is no legislative responsibility or requirement to control contorta and mountain pine.
Management objectives	To prevent the further spread of P contorta/mugo from existing sites by progressively containing it at its major source at Mid Dome. This is currently being achieved through the Mid Dome Trust's programme. The management objective will be met by maintaining and completing this programme.
Stage of infestation	Advanced and potentially deteriorating.
Most effective control agents	Given the scale of the infestation, after 50 years of spread from the original sources, effective control is beyond the means of individually affected occupiers. Therefore a collaboration/ consortium of affected parties including occupiers, agencies and stakeholders is needed.
Urgency	Low - but important to continue the Mid Dome programme to protect expenditure to date and to minimise the total cost of achieving effective management.
Efficiency and effectiveness	The costs of the principal management tool, the Mid Dome programme, are currently shared between agencies with land management responsibilities by mutual agreement under a Memorandum of Understanding.
Practicality of targeting beneficiaries	The funding method above has worked very successfully since 2008. Occupiers contribute in kind.
Practicality of targeting exacerbators	As above. The Crown is making the largest contribution to the Mid Dome programme.
Administrative efficiency	A collective approach led by a community based trust with strong support from central and local government agencies has worked well over the last decade.
Security	The programme and its intended outcomes are secure as long as the parties continue to support the Memorandum of Understanding.
Fairness	The programme at Mid Dome is considered to be fair at this stage by the affected parties.
Reasonable	As above.
Parties bearing indirect costs	The taxpayer and Southland ratepayers are bearing the indirect costs.
Transitional cost allocation arrangements	Respective occupiers will take over responsibility for ongoing wilding maintenance control once seed sources are eliminated.
Mechanisms available	The proposed Regional Pest Management Plan will provide the regulatory framework for long-term management of Contorta and Mountain pine.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for contorta and mountain pine be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
-	100%	-	5%	95%

Cotoneaster

Description

Cotoneasters are long-lived shrubs that grow to three to four metres high, producing clusters of small flowers over summer that are white or pinkish in colour. These are followed by clusters of fruit that vary in colour from scarlet to orange-red.

They invade a wide range of habitats including forest margins and gaps, coastal areas and roadsides. The plants will out-compete native shrub species, form dense understorey stands and completely prevent other species from growing.

Proposed programme

Environment Southland is proposing a progressive containment programme for cotoneaster.

Level of analysis

Cotoneaster is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for cotoneaster:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of cotoneaster

Benefits and costs of cotoneaster management options

Option	Costs	Benefits
Do nothing	Costs to environmental and social values will be incurred if cotoneaster is allowed to spread further.	None identified.
Progressive containment	Cotoneaster is regarded as a desirable garden plant by some. A progressive containment programme may impact on amenity values associated with cotoneaster.	Protection of environmental, and social values described in impact assessment.

Risks of cotoneaster progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Cotoneaster can be difficult and costly to control. Given it is well-established in the proposed containment area, a Progressive containment programme could fail due to cost and practicality.	High.	High.	Protection of environmental and social values.	Within the proposed containment area, target high risk areas where Cotoneaster could impact on values at risk.
Extent to which the option will be implemented and complied with	High – costs of achieving initial control and achieving compliance of follow up control in proposed containment area may be impractical.	High.	High.	Protection of environmental and social values.	As above.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Cotoneaster is regarded as desirable by some people. This may affect implementation and compliance with a progressive containment programme.	Medium.	High.	Protection of environmental and social values.	As above.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of cotoneaster

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: occupiers who contribute towards the spread of cotoneaster;
- passive exacerbators: occupiers who allow cotoneaster to grow on their property.

Matters for consideration in allocation of costs of proposed cotoneaster programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed cotoneaster programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Explosion.
Most effective control agents	Environment Southland (rateable land only) for initial control. Central government agencies (for Crown managed land).
Urgency	Low.
Efficiency and effectiveness	A progressive containment programme throughout the proposed containment area may not be efficient or effective.
Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	Passive exacerbators can be targeted. It is not practical to target active exacerbators.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and initial control costs.
Security	General rate will secure funding for inspections and control costs for cotoneaster over five years.
Fairness	It is considered fair to fund inspection and initial control costs through a general rate as there is benefit to the entire region
Reasonable	It is considered reasonable to fund inspection and initial control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for cotoneaster be covered in the following way.

Funding of inspection and monitoring costs – initial control		Funding of control costs – initial control		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-
Funding of follow up inspection and monitoring costs		Funding of follow up control costs		
100%	-	-	-	100%

Darwin's barberry

Description

Darwin's barberry is an evergreen, spiny, yellow-wooded shrub (less than four metres tall) with woody and densely hairy stems that have tough, five-pronged, needle-sharp spines. Hairless, glossy, dark green leaves (10-30 by 5-15 millimetres) are usually spiny-serrated along edges. Hanging clusters (seven centimetres long) of deep orange-yellow flowers (five to seven millimetres diameter) appear from July to February followed by oval purplish-black berries (five to seven millimetres diameter) with a bluish-white surface.

This long-lived plant tolerates moderate to cold temperatures, damp to dry conditions, high wind, salt, shade, damage, grazing (not browsed), and a range of soils. Birds and possibly possums eat the berries and subsequently spread the seeds. Berries are also occasionally spread by soil and water movement.

It is capable of invading pasture, disturbed forest, shrubland, tussockland, along roadsides and other sparsely vegetated sites. The plant form dense colonies that replace existing vegetation and prevent the establishment of desirable plants. Darwin's barberry will also establish under canopy in forest and shrubland. It can grow more rapidly than native species when suitable conditions arise, allowing it to dominate sites where it establishes.

Proposed programme

Environment Southland is proposing a progressive containment programme for Darwin's barberry.

Level of analysis

Darwin's barberry is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for Darwin's barberry:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of Darwin's barberry

Benefits and Costs of Darwin's barberry management options

Option	Costs	Benefits
Do nothing	Costs to economic, environmental and social values will be incurred if Darwin's barberry is allowed to spread further.	None identified.
Progressive containment	No qualitative costs associated with a progressive containment programme.	Protection of economic, environmental, and social values described in impact assessment.

Risks of Darwin's barberry progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Darwin's barberry can be difficult and costly to control. Given it is well-established in the proposed containment area, a progressive containment programme could fail due to cost and practicality.	High.	High.	Protection of economic, environmental and social values.	Within the proposed containment area, target high risk areas where Darwin's barberry could impact on values at risk.
Extent to which the option will be implemented and complied with	High – costs of achieving initial control and achieving compliance of follow up control in proposed containment area may be impractical.	High.	High.	As above.	
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	There may be some public concern about requiring occupiers to control Darwin's barberry once initial control is completed. This may affect implementation and levels of compliance with a progressive containment programme.	Medium.	High.	As above.	
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Darwin's barberry

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: occupiers who contribute towards the spread of Darwin's barberry;
- passive exacerbators: occupiers who allow Darwin's barberry to grow on their property.

Matters for consideration in allocation of costs of proposed Darwin's barberry programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed Darwin's barberry programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Explosion.
Most effective control agents	Environment Southland (rateable land only) for initial control. Central government agencies (for Crown managed land).
Urgency	Low.
Efficiency and effectiveness	A progressive containment programme throughout the proposed containment area may not be efficient or effective.
Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	Passive exacerbators can be targeted. It is not practical to target active exacerbators.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and initial control costs.
Security	General rate will secure funding for inspections and control costs for Darwin's barberry over five years.
Fairness	It is considered fair to fund inspection and initial control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and initial control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for Darwin's barberry be covered in the following way.

Funding of inspection and monitoring costs – initial control		Funding of control costs – initial control		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-
Funding of follow up inspection and monitoring costs		Funding of follow up control costs		
100%	-	-	-	100%

Giant buttercup

Description

Giant buttercup is a perennial plant up to a metre tall with multiple branches. Its leaves are highly variable in size (can be as big as an outstretched hand), hairy and the three primary lobes are highly dissected. Yellow glossy flowers (15 to 25 millimetres across) with five petals appearing, mainly between November and April.

The plant has a short rhizome (horizontal underground stem up to about 100 millimetres long) with fibrous remains of old leaves, axillary buds and fleshy roots. Genetically, it is a highly diverse with up to six different chloroplast cytotypes from Europe coexisting in swamp and wasteland areas, river flats and dairy pastures.

Giant buttercup is very free seeding, with the seeds being spread by water, animals and in silage and hay. Sheep will eat it, however the plant is seasonably unpalatable to cattle. It therefore has the potential to quickly overwhelm other pasture species in dairying areas thereby reducing pasture and dairy production. Once well established in pasture, the plant is costly and difficult to control.

In dairy farming in New Zealand it is estimated to reduce milk solid revenue by \$150 million annually. It can also outcompete desirable pasture species.

Giant buttercup is known to be established on farms and roadside verges in four localised areas of Southland. It has probably been present there for several decades but has the potential to spread onto dairy farms throughout the region if allowed.

Proposed programme

Environment Southland is proposing a progressive containment programme for giant buttercup.

Level of analysis

Giant buttercup is considered to require a medium level analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers six options for giant buttercup:

1. do nothing;
2. eradication;
3. progressive containment.

Benefits and costs of options for management of giant buttercup

Benefits and costs of giant buttercup management options

Option	Costs	Benefits
Do nothing	Low.	Low – increasing production losses due to increasing spread of giant buttercup in dairy pastures.
Eradication	High.	High – if eradication can be achieved.
Progressive containment	Low – medium.	Medium to high if spread can be contained and incidence and distribution decreased.

Risks of giant buttercup progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Occupiers do not recognise/report/control/prevent spread of giant buttercup. Control tools are limited and not fully effective (i.e., herbicide resistance).	High.	High.	Dairy production due to loss of grazeable pasture.	High – through a regional pest management plan with regulatory back up. New tools may be found.
Extent to which the option will be implemented and complied with	Medium - Environment Southland will create awareness and liaise with occupiers. Occupiers will be encouraged to self-help and prevent spread.	Medium.	High.	As above.	
Risk that compliance with other legislation will adversely affect implementation	None known.				
Risk that public or political concerns will adversely affect implementation	occupiers should welcome encouragement and assistance to control giant buttercup.	Low.			
Any other material risk	Further spread from within and outside of Southland – imported stock food i.e.				

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential mitigation for
	hay/baleage.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of giant buttercup

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: occupiers who do not control or contribute to the spread giant buttercup;
- passive exacerbators: occupiers whose land is suitable for giant buttercup to grow.

Matters for consideration in allocation of costs of proposed giant buttercup programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed giant buttercup programme

Legislative rights and responsibilities	There are no statutory requirements to manage giant buttercup.
Management objectives	Progressive containment.
Stage of infestation	Low - but has the potential to spread to all dairy land in Southland.
Most effective control agents	A pest management programme to raise awareness and encourage occupiers to control and prevent the spread of giant buttercup.
Urgency	Medium.
Efficiency and effectiveness	A programme to encourage occupier responsibility/self-help to manage the impacts of giant buttercup is considered the most cost effective option.
Practicality of targeting beneficiaries	Affected dairy farming occupiers will bear the control costs and targeted ratepayers the costs of awareness, advice and regulatory.
Practicality of targeting exacerbators	This will be more difficult and may rely on reports of bad practice or use of stock or stock food imported from risk areas.
Administrative efficiency	A ratepayer funded programme to encourage occupier self-help is considered the most efficient approach.
Security	As above.
Fairness	As above.
Reasonable	As above.
Parties bearing indirect costs	Ratepayers.
Transitional cost allocation arrangements	Not applicable.
Mechanisms available	Not applicable

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for giant buttercup be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General Rate	Targeted rate on productive land	General Rate	Targeted rate on productive land	Occupier control or contribution
-	100%	-	-	100%

Heather

Description

Heather is a bushy, evergreen tough shrub (less than 90 centimetres tall) with woody, wiry stems and densely hairy young shoots becoming hairless as they mature. Its long, dark green to brown leaves (1.5-3.5 millimetres long) are in opposite pairs on the stem, overlapping in four vertical rows. Bell-shaped, pink to pale purple flowers (two to four millimetres long) on narrow, leafy, elongated, upright clusters (two to nine centimetres long) appear from December to March and are followed by tiny, round, hairy seed capsules.

The plant forms dense stands and suckers and seeds profusely, and is faster growing than its subalpine competitors. It tolerates cold, high to low rainfall, semi-shade, and poor soils, but is intolerant of heavy shade. Suckers are spread in soil and seed is spread by wind, water and soil movement.

Heather is capable of rapidly forming dense stands in low-growing habitats in shrubland, short tussockland, herbfield, bare land, montane wetlands, and riverbeds. As a result, heather can prevent the establishment of native species.

Proposed programme

Environment Southland is proposing a progressive containment programme for heather. This programme will not apply to the Stewart Island/Rakiura site-led area as heather is managed differently at that site.

Level of analysis

Heather is considered to require a medium level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for heather:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of heather

Benefits and costs of options for management of heather

Option	Costs	Benefits
Do nothing	Costs to environmental values, forestry and water quality will be incurred if heather is allowed to spread further outside of cultivation.	No benefits associated with this option.
Progressive containment	No costs associated with a progressive containment programme.	Protection of environmental and social values described in impact assessment.

Risks of heather progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that heather establishes outside cultivation.	High – number of sites outside cultivation known in Te Anau area, and one on Stewart Island/Rakiura in recent times.	High.	Prevention of loss of environmental and social values.	Raise awareness about heather and investigate any potential reports of it establishing outside of cultivation.
Extent to which the option will be implemented and complied with	Presence of heather not reported.	Medium.	High.	As above.	Encourage reports of heather.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Heather is regarded as desirable by some people. This may prevent reporting of locations.	Low.	Low.	As above.	Encourage reports of heather outside cultivation as being of public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of heather

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of heather through their actions;
- passive exacerbators: any person who does not report the presence of heather outside of cultivation.

Matters for consideration in allocation of costs of proposed heather programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocating costs of proposed heather programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag.
Most effective control agents	Environment Southland (rateable land only). Central government agencies (for Crown managed land).
Urgency	High.
Efficiency and effectiveness	A progressive containment programme is efficient and effective given heather is only known at a few sites outside cultivation.
Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs where heather is found outside cultivation.
Security	General rate will secure funding for inspections and control costs for heather over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for heather be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Japanese honeysuckle

Description

Japanese honeysuckle is an evergreen or semi-evergreen climber with a smothering growth habit. Its leaves occur in opposite pairs with tubular, sweetly scented white-yellow flowers. The plant was originally introduced as an ornamental hedging plant and is found in many gardens in Southland.

The plant invades disturbed forest and forest margins, shrubland, coastal areas and river margins. Japanese honeysuckle grows rapidly smothering shrub and small tree species. It blocks light, breaks branches and its presence can lead to other pest plant species invading an area.

Proposed programme

Environment Southland is proposing a progressive containment programme for Japanese honeysuckle.

Level of analysis

Japanese honeysuckle is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for Japanese honeysuckle:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of Japanese honeysuckle

Benefits and costs of options for management of Japanese honeysuckle

Option	Costs	Benefits
Do nothing	Costs to environmental values will be incurred if Japanese honeysuckle is allowed to spread further outside of cultivation.	No benefits associated with this option.
Progressive containment	No costs associated with a progressive containment programme.	Protection of environmental and social values described in impact assessment.

Risks of Japanese honeysuckle progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that Japanese honeysuckle establishes outside cultivation.	Medium – some reports of Japanese honeysuckle establishing outside cultivation.	High.	Prevention of loss of environmental and social values.	Raise awareness about Japanese honeysuckle and investigate any potential reports of it establishing outside of cultivation.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Extent to which the option will be implemented and complied with	Presence of Japanese honeysuckle not reported.	Medium.	High.	As above.	Encourage reports of Japanese honeysuckle.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Japanese honeysuckle is regarded as desirable by some people. This may prevent reporting of locations.	Low.	Low.	As above.	Encourage reports of Japanese honeysuckle outside cultivation as being of public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Japanese honeysuckle

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of Japanese honeysuckle through their actions;
- passive exacerbators: any person who does not report the presence of Japanese honeysuckle outside of cultivation.

Matters for consideration in allocation of costs of proposed Japanese honeysuckle programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed Japanese honeysuckle programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag.
Most effective control agents	Environment Southland (rateable land only). Central government agencies (for Crown managed land).

Urgency	High
Efficiency and effectiveness	A progressive containment programme is efficient and effective given Japanese honeysuckle is only known from a few sites outside cultivation.
Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs where Japanese honeysuckle is found outside cultivation.
Security	General rate will secure funding for inspections and control costs for Japanese honeysuckle over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for Japanese honeysuckle be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Lagarosiphon

Description

Lagarosiphon is a rhizomatous perennial freshwater herb. The plant has spiralled leaves on a much-branched stem. The stems can be up to five metres long and form large interwoven mats below the water surface in depths to six and a half metres. It was introduced from southern Africa as an aquarium plant and grows wholly submerged in fresh water ponds, lakes and slow moving streams, with silty or sandy bottom mud.

Lagarosiphon forms vast, deep meadows in still and slow moving water that shade out other species. Large clumps can dislodge, causing blockages and flooding. It can restrict recreational activities such as boating and fishing on affected water bodies.

Lagarosiphon is known in a small number of small waterways in the lower plains. Initial infestations are thought to have resulted from releasing pet fish into waterways including 'oxygen weed'. A localised infestation in ponds and oxbows in the Ōreti River eel fishing may be related to eel fishing activities there.

Proposed programme

Environment Southland is proposing a progressive containment programme for lagarosiphon.

Level of analysis

Lagarosiphon is considered to require a medium level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers three options for lagarosiphon:

1. do nothing;
2. eradication;
3. progressive containment.

Benefits and costs of options for management of lagarosiphon

Benefits and costs of options for management of lagarosiphon

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	High if lagarosiphon spreads and infests all suitable waterways.	Low.
Eradication	No quantitative costs.	High – control techniques to achieve eradication are expensive to implement and may not be technically feasible.	High – if eradication could be achieved.
Progressive containment	\$5000/year Cost of existing programme.	Medium, lagrosphison continues to negatively impact in areas with an established population.	High – prevent further spread and reduce distribution where possible.

Risks of lagarosiphon progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential mitigation for
Technical and operational risks	Lack of effective control tools. Lagarosiphon may be spread accidentally on machinery, water activities.	Medium.	High.	Freshwater biodiversity and natural function of waterways.	Medium – develop new tools.
Extent to which the option will be implemented and complied with	Lagarosiphon has not spread significantly in the last decade under a containment approach.	Low.	High.	As above.	
	Difficult to identify any person who may accidentally be spreading it.	Medium.	High.	As above.	
Risk that compliance with other legislation will adversely affect implementation	None known – lagarosiphon is banned from sale, propagation distribution under the National Pest Plant Accord which complements the RPMP.				
Risk that public or political concerns will adversely affect implementation	None known.				
Any other material risk	None known.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of lagarosiphon

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community and users of waterways;
- active exacerbators: any person who actively causes lagarosiphon to spread either accidentally or deliberately;
- passive exacerbators: owners of the beds of waterways (generally the Crown).

Matters for consideration in allocation of costs of proposed lagarosiphon programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed lagarosiphon programme

Legislative rights and responsibilities	The only legislative provision is lagarosiphon's status as an unwanted organism under the National Pest Plant Accord.
Management objectives	To prevent the further spread of lagarosiphon.
Stage of infestation	Early – established in a few small streams on the lower plains and in the mid reaches of one large river.
Most effective control agents	A work programme of surveillance, control and compliance delivered under a Regional Pest Management Plan.
Urgency	Low – as there is little evidence of rapid spread over the last decade.
Efficiency and effectiveness	A regional work programme is considered the most effective and efficient approach to contain lagarosiphon.
Practicality of targeting beneficiaries	The Southland community as beneficiaries can contribute via a regional targeted rate.
Practicality of targeting exacerbators	Difficult to monitor those inadvertently spreading lagarosiphon, e.g. machinery operators, eel fishers.
Administrative efficiency	As above.
Security	As above.
Fairness	As above.
Reasonable	As above.
Parties bearing indirect costs	Regional ratepayers.
Transitional cost allocation arrangements	Not applicable.
Mechanisms available	As above.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for Lagarosiphon be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
-	100%	-	100%	-

Old man's beard

Description

Old man's beard is a deciduous, woody, perennial climber that can grow up to 25 metres in height. It has conspicuous small fragrant flowers from December to May, followed by silky seed balls. Individual plants reach maturity in four to five years and have a life span of more than 30 years.

Old man's beard invades forest margins, disturbed bush, shrubland, riverbeds, cliffs, hedgerows and gardens. It grows quickly and produces heavy permanent tangled masses of vines that kill host plants and prevent the regeneration of other species. Each plant produces a prolific amount of viable seed, estimated to be more than 10,000 seeds per square metre, which are dispersed primarily by wind and water.

Proposed programme

Environment Southland is proposing a progressive containment programme for Old man's beard.

Level of analysis

Old man's beard is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - Assessment

Options for response

The analysis considers three options for Old man's beard:

1. do nothing;
2. eradication;
3. progressive containment.

Benefits and costs of options for management of Old man's beard

Benefits and costs of options for management of Old man's beard

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	Costs to environmental values will be incurred if Old man's beard is allowed to spread further – i.e. sustainability of ecological processes and biological diversity.	No benefits associated with this option.
Eradication	Eradication programme has cost on average \$17,000/year over the last three years (excludes Department of Conservation-funded programme on Stewart Island/Rakiura).	No qualitative costs associated with an eradication programme.	Protection of environmental values described in impact assessment.
Progressive containment	Progressive containment programme is expected to incur similar costs to the eradication programme over	No qualitative costs associated with a progressive containment programme.	Protection of environmental values described in impact assessment.

Option	Basic economic assumptions	Costs	Benefits
	the past three years.		

Risks of Old man's beard progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential mitigation for
Technical and operational risk	Risk that Old man's beard is already established at other unknown locations.	High – new sites are usually found each year.	High.	Prevention of loss of ecosystem processes and reduction in biodiversity.	Continue to raise awareness about Old man's beard, and investigate any potential reports.
Extent to which the option will be implemented and complied with	Presence of Old man's beard is not reported.	Medium – difficulty with identification may prevent reports.	High.	As above.	Encourage reports of Old man's beard.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	As above.	Encourage reports of Old man's beard as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Old man's beard

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community
- active exacerbators: any person who contributes towards the spread of Old man's beard through their actions
- passive exacerbators: any person who does not report the presence of Old man's beard,

Matters for consideration in allocation of costs of proposed Old man's beard programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown in below.

Matters for consideration in allocation of costs of proposed Old man's beard programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag phase – due to control programme over last 17 years.
Most effective control agents	Environment Southland (mainland Southland) and Department of Conservation (Stewart Island/Rakiura).
Urgency	High.
Efficiency and effectiveness	A progressive containment programme is efficient and effective given Old man's beard is known from over 150 sites in the region.
Practicality of targeting beneficiaries	Funding from general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs.
Security	General rate will secure funding for inspections and control costs for Old man's beard over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for Old man's beard be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Reed sweet grass

Description

Reed sweet grass is an aggressive perennial mat-forming grass that grows to almost two metres tall. It has fibrous roots, rhizomes and an erect or lax stem. Soft, light green leaves (30-60 x 2 centimetres) have a membranous ligule. Its much-branched flowerhead has numerous spikelets containing many seeds.

The plant grass establishes along the margins of lakes, streams, ditches, and other waterways. It can also form dense mats on top of the water as well as survive and persist in damp pasture areas. Reed sweet grass replaces nearly all other species where it establishes and degrades the habitat for aquatic fauna and flora. The grass can cause a build-up of silt and other material leading to an increase in flooding. In wetland areas, cattle are attracted to it for grazing, causing further degradation in such areas.

Proposed programme

Environment Southland is proposing a progressive containment programme for reed sweet grass.

Level of analysis

Reed sweet grass is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken. The qualitative assessment is supplemented by inputting basic economic assumptions.

NPD section 6 - assessment

Options for response

The analysis considers two options for reed sweet grass:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of reed sweet grass

Benefits and costs of options for management of reed sweet grass

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	Costs to economic, environmental and social values will be incurred if reed sweet grass is allowed to spread further.	Reed sweet grass is used as stock feed.
Progressive containment	Containment programme has cost on average \$7,700/year over the last three years. Costs have increased due to more reed sweet grass being found.	Loss of grazing due to control of reed sweet grass.	Protection of economic, environmental and social values.

Risks of reed sweet grass progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that reed sweet grass is already established at other unknown locations.	High – new sites have been found in the past two years outside of the known distribution.	High.	Prevention of loss of economic, environmental and social benefits.	Raise awareness about reed sweet grass and investigate any potential reports.
Extent to which the option will be implemented and complied with	Presence of reed sweet grass is not reported.	Medium – difficulty with identification may prevent reports.	High.	As above.	Encourage reports of reed sweet grass.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely.	Low.	Low.	Low.	Encourage reports of reed sweet grass as being of personal and public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of reed sweet grass

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - any person outside the reed sweet grass containment area with the pest on their property;
 - the wider Southland community;
- active exacerbators: any person who contributes towards the spread of reed sweet grass through their actions;
- passive exacerbators: any person who does not report the presence of reed sweet grass.

Matters for consideration in allocation of costs of proposed reed sweet grass programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed reed sweet grass programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Explosion.
Most effective control agents	Environment Southland for initial control to achieve zero density. Occupiers should then carry out any further control required.
Urgency	Moderate.
Efficiency and effectiveness	A progressive containment programme is efficient and effective to prevent further spread of reed sweet grass.
Practicality of targeting beneficiaries	Funding from general rate is recommended for initial control to achieve zero density of reed sweet grass. Beyond this stage, beneficiaries should fund any further control required.
Practicality of targeting exacerbators	Not considered reasonable to target exacerbators as may result in behaviour that causes the spread or non-reporting of reed sweet grass.
Administrative efficiency	General rate is considered the most efficient method for inspection and initial control costs.
Security	General rate will secure funding for inspections and initial control costs over five years.
Fairness	It is considered fair to fund initial control costs and inspection costs from the general rate.
Reasonable	It is considered reasonable to fund initial control costs and inspection costs from the general rate.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for reed sweet grass be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Rough horsetail

Description

Rough horsetail is an erect, colony-forming, summer-green perennial, growing to two metres tall with extensive, deep, freely branching rhizomes. It has ridged, hollow stems that occasionally branch and feel hard and rough. The stems are jointed and break easily at this point. Leaves are reduced to toothed sheaths that encircle the joints along the stems, with a black ring at the base. The stems have a distinctive black collar at the joints. It has extensive underground rhizomes (underground stems). Spores are produced in cone-like structures on fertile stems (rather than flowers and seed heads) giving it a look of a strange asparagus spear. It is sometimes kept as an ornamental plant due to its unusual appearance.

This plant prefers moist areas such as gravel areas and pond/lake margins but once it is well established it will adapt to a wide range of conditions. It can even be found growing through the cracks in concrete.

Rough horsetail spreads rapidly, re-sprouting from underground stems, and displacing desirable plant species once established in an area. It is resistant to most herbicides and underground rhizomes make it hard to control.

The plant is capable of forming pure stands in a wide range of damp habitats, preventing the seedlings of native species from establishing. It blocks and alters watercourses, causing flooding.

Underground rhizomes are spread by movement of soil or through deliberate planting.

Proposed programme

Environment Southland is proposing a progressive containment programme for rough horsetail.

Level of analysis

Rough horsetail is considered to require a medium level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for rough horsetail:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of rough horsetail

Benefits and costs of options for management of rough horsetail

Option	Costs	Benefits
Do nothing	Costs to environmental values will be incurred if rough horsetail is allowed to spread further outside of cultivation.	No benefits associated with this option.
Progressive containment	No qualitative costs associated with a progressive containment programme.	Protection of environmental and social values described in impact assessment.

Risks of rough horsetail progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that rough horsetail establishes outside cultivation.	Low.	High.	Prevention of loss of environmental, and social values.	Raise awareness about rough horsetail and investigate any potential reports of it establishing outside of cultivation.
Extent to which the option will be implemented and complied with	Presence of rough horsetail not reported.	Medium.	High.	As above.	Encourage reports of rough horsetail.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Rough horsetail is used in floral displays. This may discourage reporting of locations outside cultivation.	Medium.	High.	As above.	Encourage reports of rough horsetail outside cultivation as being of public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of rough horsetail

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of rough horsetail through their actions;
- passive exacerbators: any person who does not report the presence of rough horsetail outside of cultivation.

Matters for consideration in allocation of costs of proposed rough horsetail programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed rough horsetail programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag.
Most effective control agents	Environment Southland (rateable land only). Central government agencies (for Crown managed land).
Urgency	Low.
Efficiency and effectiveness	A progressive containment programme is efficient and effective given rough horsetail is not known to occur outside cultivation.
Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs where rough horsetail is found outside cultivation.
Security	General rate will secure funding for inspections and control costs for rough horsetail over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for rough horsetail be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

Siberian lyme grass

Description

Siberian lyme grass is a perennial grass with stout rhizomes and very robust tufts, growing up to 1.5 metres tall. The leaves are strongly ribbed and are almost entirely without hairs. It was introduced into New Zealand for agriculture and was first reported growing outside cultivation in 1895.

The plant invades coastal dunes, foreshore areas and other sandy places forming a dense monoculture, completely replacing desirable species in these areas.

Proposed programme

Environment Southland is proposing a progressive containment programme for Siberian lyme grass.

Level of analysis

Siberian lyme grass is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers two options for Siberian lyme grass:

1. do nothing;
2. progressive containment.

Benefits and costs of options for management of Siberian lyme grass

Benefits and costs of options for management of Siberian lyme grass

Option	Costs	Benefits
Do nothing	Costs to environmental values will be incurred if Siberian lyme grass is allowed to spread further.	No qualitative benefits associated with this option.
Progressive containment	No qualitative costs associated with a progressive containment programme.	Protection of environmental values described in impact assessment.

Risks of Siberian lyme grass progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Risk that Siberian lyme grass establishes beyond the two known locations given difficulty of identification and therefore reporting of it.	High.	High.	Prevention of loss of environmental values.	Raise awareness about Siberian lyme grass and investigate any potential reports of it establishing outside of known locations.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Extent to which the option will be implemented and complied with	Presence of Siberian lyme grass not reported.	Medium.	High.	As above.	Encourage reports of Siberian lyme grass.
Risk that compliance with other legislation will adversely affect implementation	None identified.				
Risk that public or political concerns will adversely affect implementation	Unlikely – Siberian lyme grass was introduced for agriculture prior to 1985, but not aware it is still valued as a pasture species.	Low.	Low.	As above.	Encourage reports of Siberian lyme grass outside cultivation as being of public benefit.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Siberian lyme grass

The beneficiaries and exacerbators of the programme are:

- beneficiaries: the Southland community;
- active exacerbators: any person who contributes towards the spread of Siberian lyme through their actions;
- passive exacerbators: any person who does not report the presence of Siberian lyme outside of cultivation.

Matters for consideration in allocation of costs of proposed Siberian lyme grass programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed Siberian lyme grass programme

Legislative rights and responsibilities	None known.
Management objectives	Progressive containment.
Stage of infestation	Lag.
Most effective control agents	Environment Southland.
Urgency	Medium.
Efficiency and effectiveness	A progressive containment programme is efficient and effective given Siberian lyme grass is not known to occur outside cultivation.

Practicality of targeting beneficiaries	Funding from the general rate recommended.
Practicality of targeting exacerbators	There are currently no known exacerbators to target.
Administrative efficiency	General rate is considered the most efficient method of cost allocation for inspection and control costs where Siberian lyme grass is found outside cultivation.
Security	General rate will secure funding for inspections and control costs for Siberian lyme grass over five years.
Fairness	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Reasonable	It is considered reasonable to fund inspection and control costs through a general rate as there is benefit to the entire region.
Parties bearing indirect costs	No indirect costs are expected.
Transitional cost allocation arrangements	None for the proposed progressive containment programme.
Mechanisms available	General rate and occupier contributions are the most readily available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the progressive containment programme for Siberian lyme grass be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Occupier control or contribution
100%	-	100%	-	-

MARINE EXCLUSION

Marine pests not yet present in Southland

Description

Asian paddle crab is a large crab with six prominent spines on each side of the carapace, which is up to 12 centimetres across, and five prominent spines on the upper surface of each claw. The swimming paddles on the back legs are flattened. Colour ranges from off-white and pale green, through olive-green to a deep chestnut brown with purplish markings.

They inhabit the sand and mud of coastal estuaries and harbours from the low tide mark out to 15 metres depth.

It is highly detrimental to shellfish aquaculture, is an aggressive predator and displaces native and fisheries species. Also, it can carry diseases that affect crab, lobster, shrimp and prawn fisheries.

Sabella (Mediterranean fanworm) is a large tube worm that prefers sheltered, shallow subtidal areas (1-30 metres deep). It attaches to hard substrates such as shells, jetty pylons, wrecks and rocks, but can also be found in sand.

Sabella secretes a tough, flexible tube up to 40 centimetres long. Tentacles at the top form a spiralled fan, up to 15 centimetres across. Fans vary in colour, from dull white, to brightly banded with stripes of orange, purple and white.

These fast-growing worms can form vast, dense meadows and are likely to compete with native suspension feeders for food and interfere with their lifecycle. It is known to be present in New Zealand marine waters and in a number of ports outside of Southland.

Sea squirts are marine invertebrates.

Styela (clubbed tunicate) has a long, club-shaped body on a tough stalk. Its surface is leathery, rumpled, and knobbly. They can be brownish-white, yellowish-brown, or reddish-brown and ugly in appearance. Styela is sometimes referred to as a 'solitary' sea squirt because each individual has its own stalk and adheres separately to a substrate.

Styela is known to grow rapidly overseas, reaching densities of up to 500-1500 individuals per square metre. They can live for up to two years and grow up to 160 millimetres long.

In October 2005 styela was discovered in Auckland's Viaduct Basin, and in Lyttelton Harbour. It was found soon after on the hull of a vessel that had sailed from Auckland to Picton, and in the Hauraki Gulf and Northland.

Styela multiplies rapidly in suitable sites, spawning every 24 hours in water temperatures above 15°C. It competes with other filter feeders for food and space. As a result it disrupts native ecosystems and aquaculture.

The eudistoma sea squirt is also known as the Australian droplet tunicate. It forms large colonies that attach to hard surfaces and look like clusters of white or cream-coloured cylindrical tubes. Each colony

contains numerous small individuals and they can appear orange flecked due to the colour of the larvae within them. The species is firm and gelatinous to the touch and the cylindrical colonies are generally 5-30 centimetres long, but can occasionally reach 1.5 metres in length. Colonies are generally 5-20 millimetres in diameter and regress and over-winter as small (approx. 10 millimetres) cream buds, re-growing the following spring to larger colonies.

This species is generally found in soft-bottomed tidal habitats and on hard structures such as wharf piles, aquaculture equipment and mangrove roots. It prefers submerged habitats just below the waterline, but can be found out of the water for periods during low tide.

Eudistoma competes with native species for both space and food. Due to its rapid growth rate, it can inhabit a wide range of habitats, and can reach high abundances. It is also possible that it can ingest and kill the eggs and larvae of native species. However, some of the competitive ability of this species is minimised by the fact that it is only present in large numbers during summer months and dies down during rain events and winter months.

Pyura is a large, solitary, stumpy, chalice-shaped sea squirt with two large mounds representing siphons set in the depressed upper surface of the body. When the pyura is inflated, cruciform or cross-shaped siphons are visible by the bright reddish orange body wall visible from the exterior. Individuals can be very large and often form dense aggregates on intertidal platforms, sometimes occupying 100 percent cover. Pyura may be found sub-tidally down to 12 metres. It is capable of displacing important native New Zealand species, including green shell mussels. At present pyura are restricted to the Far North.

Didemnum colonies form extensive sheets on vertical surfaces. Cylindrical or frond-like outgrowths can often arise off the main colony. These can form extremely long dripping tendrils, sometimes metres long. Outgrowths of the colony encrust algae, hydrozoans, tube worms and mussels. The colonies are pale yellow to cream coloured and firm yet gelatinous to the touch. Common exhalant openings are obvious at the end of lobes and a fine open network of canals can be seen below the surface.

Dense colonies of didemnum displace native and fisheries species and smother beaches, rocks and tidepools. They also foul boat hulls, the undersides of floating structures, marine farm lines and sea cages.

Proposed programme

Environment Southland is proposing an exclusion programme for the Asian paddle crab, Mediterranean fanworm and four sea squirt species.

Level of analysis

Exclusion marine pest species are considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken. The qualitative assessment is supplemented by inputting basic economic assumptions.

NPD section 6 - assessment

Options for response

The analysis considers two options for marine pests (not yet present in Southland):

1. do nothing
2. exclusion

Benefits and costs of options for management of marine pests not yet present in Southland

Benefits and costs of options for management of marine pests not yet present in Southland

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	Low cost until pests establish and compete with natives, which could impact fisheries or foul aquaculture equipment.	Economic and environmental impacts would be high if any of the exclusion marine pests established in Southland. Would be harmful to High Value Areas such as Fiordland and Stewart Island/Rakiura, but also aquaculture and other coastal areas could be modified.
Exclusion	Difficult to quantify – however there are clear benefits to commercial ventures such as aquaculture by preventing or delaying the arrival of a pest such as Mediterranean fanworm. Additionally, the practice of excluding these marine pests e.g. clean vessel hull and gear may prevent the establishment of a pest that could have catastrophic consequences.	Currently low cost in staff time. Some costs for surveillance and compliance.	Council and supporting agencies able to act immediately to any incursion at a moderate cost which could prevent significant environmental and economic damages.

Risks of marine pests not yet present in Southland exclusion programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Accidental release and natural spread.	Medium.	High.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Also, risks to aquaculture industry – fouling of equipment or outcompeting value species for food/space.	Education. Pathway Management Plan. Surveillance for early detection.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Extent to which the option will be implemented and complied with	Vessel owners generally comply with biofouling maintenance best practice. Additionally regulations regarding marine biosecurity are increasing e.g. the Craft Risk Management Standard. Top of North Pathway Plan, Fiordland Pathway Plan.	Low-medium.	High.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Also, risks to aquaculture industry – fouling of equipment or outcompeting value species for food/space.	Education. Pathway. Management Plan. Surveillance for early detection.
Risk that compliance with other legislation will adversely affect implementation	Marine pollution regulations regarding antifoul paint. In-water cleaning regulations etc. making it difficult for vessel owners to mitigate biosecurity risk.	Low.	Medium-high.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Also, risks to aquaculture industry – fouling of equipment or outcompeting value species for food/space.	Regional councils have similar rules for marine pests. CRMS also promoting high hull fouling standards to meet making it unlikely marine pollution regulations would move towards less effective paints. Additionally in-water cleaning restrictions likely to change due to push for better marine biosecurity.
Risk that public or political concerns will adversely affect implementation	New to region pest arrives and 'horse has bolted' attitude takes place.	Medium.	High.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Also, risks to aquaculture	Education. Surveillance for early detection and response.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
				industry – fouling of equipment or outcompeting value species for food/space.	
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of Marine Pests not yet present in Southland

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - Southland community;
 - commercial fishing sector;
 - recreational fishing sector;
 - tourism sector;
 - aquaculture sector;
- active exacerbators:
 - all vessel owners and aquaculture farm operators not following marine biosecurity best practice when moving from one location to another e.g. poor antifoul condition, not inspecting hull, equipment, stock transfers etc;
- passive exacerbators:
 - all vessel owners and aquaculture farm operators adhering to marine biosecurity best practice. Best practice may still promote the transport of marine pest species from one region to another;
 - aquaculture farms, marinas, ports not controlling marine pests on structures and equipment.

Grouping of subjects

These organisms fall within the exclusion marine pests group of subjects. These exclusion pests satisfy the criteria under paragraph 119 of the National Policy Direction guidance document.

Matters for consideration in allocation of costs of proposed marine pests not yet present in Southland programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed marine pests not yet present in Southland programme

Legislative rights and responsibilities	None.
Management objectives	Exclusion from Southland coastal marine area.
Stage of infestation	Not present in Southland.
Most effective control agents	Surveillance, early detection, and manual removal, chemical, freshwater or heat treatment.
Urgency	Medium – there is a high level of domestic vessel traffic including from regions infested with the identified ‘exclusion’ marine pests.
Efficiency and effectiveness	Preventing establishment of these species is the most efficient and effective form of management.
Practicality of targeting beneficiaries	Can target some of the beneficiaries, however, recreational sector is difficult to target.
Practicality of targeting exacerbators	Potential to target through cost-recovery, prosecution, instant fines (when adopted) if fouled with one or more of the exclusion marine pests. Many of the beneficiaries are also the exacerbators.
Administrative efficiency	Generally low cost and efficient, but will rely on support from Department of Conservation and Ministry for Primary Industries.
Security	High – funding available. Continuing exclusion programme is low cost, high reward.
Fairness	Cost allocation is fair, i.e. targeting the marine fee reserve.
Reasonable	Costs of exclusion programme fairly low and Environment Southland contributes towards this.
Parties bearing indirect costs	None.
Transitional cost allocation arrangements	Not applicable.
Mechanisms available	General biosecurity rate and marine fee.

Proposed allocation of costs

It is proposed that costs for undertaking the exclusion programme for the exclusion marine pests be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs	
General rate	Marine fee reserve	General rate	Marine fee reserve
-	100%	-	100%

MARINE PROGRESSIVE CONTAINMENT

Undaria

Description

Undaria is a golden brown seaweed with a central midrib, divided frond and a fleshy, frilly reproductive structure at the base of the seaweed. These characteristics help differentiate *Undaria* from native seaweed species. *Undaria* was accidentally introduced into New Zealand in the early 1980s, and has now spread to many parts of the coastline, including Southland. It is known to occur in parts of Stewart Island/Rakiura, Waikawa, in Bluff harbour, and has recently established in Breaksea Sound where it is closely monitored.

Undaria is a winter annual laminarian kelp that first appears in early spring in its native home range. *Undaria* has a high growth rate with sporophytes reaching maturity in 40 to 50 days with the potential to release up to 700 million zoospores. With its high growth and reproductive output, and the ability to tolerate wide ranging temperatures, substrates and sheltered to exposed conditions, *Undaria* is a hardy invasive species.

Undaria can substantially modify natural habitats impacting on the native ecology of those areas. Invasion can result in an addition to canopy cover, or it can result in dense mono-specific stands of *Undaria*. These dense stands can reduce the presence and diversity of smaller understorey algal species and out-compete marine macro algae canopy species.

Proposed programme

Environment Southland is proposing a progressive containment programme for *Undaria*.

Level of analysis

Undaria is considered to require a medium level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken.

NPD section 6 - assessment

Options for response

The analysis considers three options for *Undaria*:

1. do nothing;
2. progressive containment;
3. site-led.

Benefits and costs of options for management of *Undaria*

Benefits and costs of options for management of *Undaria*

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	Low cost until pests establish and compete with natives which could impact fisheries and natural environment. Most aquaculture is on Stewart Island/Rakiura or in Bluff and already heavily infested as are the port areas.	Economic, environmental and political impacts would be high if <i>Undaria</i> was to establish throughout Fiordland. Would be harmful to High Value Areas such as Fiordland and parts of Stewart Island/Rakiura, but also aquaculture and other coastal areas could be modified.
Progressive Containment	Difficult to quantify biodiversity benefits – the practice of excluding this marine species e.g. clean vessel hull and gear may prevent the establishment of <i>Undaria</i> in other High Value Areas.	High cost to control un <i>Undaria</i> in Fiordland and contain it to Bluff, Stewart Island/Rakiura areas.	Would reduce ecological and potential fisheries impacts in Fiordland and would help to prevent its spread from Breaksea to other Fiords.
Site-led	Difficult to quantify biodiversity benefits – the practice of excluding this marine species e.g. clean vessel hull and gear may prevent the establishment of <i>Undaria</i> in other High Value Areas.	High cost to control <i>Undaria</i> in Fiordland.	Would reduce ecological and potential fisheries impacts in Fiordland and would help to prevent its spread from Breaksea to other Fiords.

Risks of *Undaria* progressive containment programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Accidental release and natural spread.	Medium.	High.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Competition with native species for light and space.	Education. Pathway Management Plan. Surveillance for early detection. Direct control in Breaksea Sound and other infested sites. Could reduce population in port areas to prevent spread to other High Value Areas.
Extent to which the option will be implemented and complied with	Vessel owners generally comply with biofouling maintenance best practice.	Low-medium.	High.	High ecological values in many coastal areas of Southland e.g. Stewart	Education. Pathway Management Plan. Surveillance for early

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
	Additionally regulations regarding marine biosecurity are increasing e.g. Craft Risk Management Standard (CRMS), Top of North Pathway Plan, Fiordland Pathway Plan.			Island/Rakiura and Fiordland. Competition with native species for light and space.	detection. Direct control in Breaksea Sound and other infested sites. Could reduce population in port areas to prevent spread to other High Value Areas.
Risk that compliance with other legislation will adversely affect implementation	Marine pollution regulations regarding antifoul paint. In-water cleaning regulations etc. making it difficult for vessel owners to mitigate biosecurity risk.	Low.	Medium-high.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Competition with native species for light and space.	Regional councils have similar rules for marine pests. CRMS also promoting high hull fouling standards to meet making it unlikely marine pollution regulations would move towards less effective paints. Additionally in-water cleaning restrictions likely to change due to push for better marine biosecurity.
Risk that public or political concerns will adversely affect implementation	‘Horse has bolted’ attitude. It’s everywhere, why worry about it. However, if nothing is done there will be further public and political pressure from the other side of the argument.	Low.	High.	High ecological values in many coastal areas of Southland e.g. Stewart Island/Rakiura and Fiordland. Competition with native species for light and space.	Education. Surveillance. Direct control.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of *Undaria*

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - Southland community;
 - commercial fishing sector;
 - recreational sector;
 - tourism industry;
 - tourists;
- active exacerbators:
 - all vessel owners and aquaculture farm operators not following marine biosecurity best practice when moving from one location to another e.g. poor antifoul condition, not inspecting hull, equipment, stock transfers etc;
- passive exacerbators:
 - all vessel owners and aquaculture farm operators adhering to marine biosecurity best practice. Best practice may still promote the transport of marine pest species from one region to another;
 - aquaculture farms, marinas, ports not controlling marine pests on structures and equipment.

Matters for consideration in allocation of costs of proposed *Undaria* programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed *Undaria* programme

Legislative rights and responsibilities	Fiordland Marine Regional Pathway Management Plan, Fiordland Marine Reserve (Marine Reserves Act 1971).
Management objectives	Contain <i>Undaria</i> current populations and reduce its density in Fiordland.
Stage of infestation	Widespread.
Most effective control agents	Environment Southland/Department of Conservation/Ministry for Primary Industries/Contractors manual removal, heat or chemical treatment.
Urgency	High.
Efficiency and effectiveness	Protecting High Value Areas is the most efficient and effective.
Practicality of targeting beneficiaries	Can target some of the beneficiaries, however, recreational sector is difficult to target.
Practicality of targeting exacerbators	Potential to target through cost-recovery, prosecution, instant fines (when adopted) if fouled with one or more of the exclusion marine pests. Many of the beneficiaries are also the exacerbators.
Administrative efficiency	Generally low cost and efficient, but will rely on support from Department of Conservation and Ministry for Primary Industries.
Security	High – funding available.
Fairness	Cost allocation is fair i.e. targeting the marine fee reserve.
Reasonable	Cost likely to be high however, Fiordland has very high biodiversity values and stakeholders (through Fiordland Marine Guardians) deemed very important.
Parties bearing indirect costs	None.
Transitional cost allocation arrangements	Not applicable.

Mechanisms available	General biosecurity rate and marine fee.
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Proposed allocation of costs

It is proposed that costs for undertaking the containment programme for *Undaria* be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs	
General rate	Marine fee reserve	General rate	Marine fee reserve
-	100%	-	100%

SUSTAINED CONTROL ANIMALS

Possum

Description

Possums are marsupials and the males and females are similar in size; between 650 and 930 millimetres, including a tail of 250 to 405 millimetres. They are about the size of a cat. Adults weigh between 1.4 and 6.4 kilograms and have a furry body, with a long prehensile bushy tail for climbing. These animals have a pointed snout with a pink nose and long dark whiskers and brown eyes. The large pointed ears are furless on the inside. Fur is fluffy grey or dark brown on the head, back and tail and white or dirty yellow on the belly and there are several colour forms. Mature possums have a brown stain (the sternal gland) between their front legs. The front legs are shorter than the hind legs. Front paws are rather hand-like, and rear paws rather longer with a pair of fused digits.

Possums begin breeding at one to two years of age, and populations are capable of increasing at a rate of 22-30 percent per year, indicating that a population at 20 percent of its carrying capacity is capable of recovering to its full carrying capacity within ten years. Juvenile possums disperse an average of six kilometres from their home range into suitable adjacent habitat, but can move up to 30 kilometres per year.

Primarily herbivores, possums feed on a variety of leaves, flower buds, fruit, ferns, and fungi. They feed also on invertebrates and opportunistically on the eggs and nestlings of birds. As a result a very large range of both indigenous and introduced flora and fauna are affected. Despite this wide range, possums are strongly selective browsers and the majority of the diet in any one location consists of only a few species. The species most common in a habitat are not necessarily those most frequently eaten, therefore, possums cause extensive defoliation of favoured plant species and progressive change in forest composition to less favoured species occurs. Damage is not however uniform across habitats.

Possum damage appears to be variable within and between plant populations, communities and ecosystems, and is influenced by a range of biotic and abiotic (living and non-living) factors. These factors may predispose plant communities to possum damage, trigger damage episodes, or accelerate the rate of vegetation change. Within forest communities, possum browsing is frequently concentrated on a few trees that may be defoliated or killed, while neighbouring trees may be unaffected. At a regional scale plant species such as mistletoe or fuchsia can coexist with long-established possum populations, while other populations of the same species can be threatened with extinction. Possums can also impact native animals by predation of insect species, snails, and birds.

Possums cause economic effects by damaging exotic forests, eating pasture, and through the spread of bovine TB. However, the possum browsing on pasture is likely to be a minor problem apart from pasture/bush margins. Possums can also damage winter feed and other crops especially on bush/pasture margins. The damage to exotic forests tends to be limited but they are known to damage tree crops and domestic gardens.

Possums are included in the programme to address adverse effects to conservation values and to protect the past economic investment in Bovine Tb control. There is evidence to support the link between possums and TB in farmed animals. Recent studies show that cattle and deer may lick and nuzzle TB infected possums in the terminal stages of the disease as the possums wander around open ground in daylight. Sheep do not appear to exhibit this level of curiosity, and to date have remained relatively free of the disease.

Proposed programme

Environment Southland is proposing a sustained control programme for possum. This programme will also apply to the Stewart Island/Rakiura site-led area; however additional rules for possums will apply at that site.

Level of analysis

Possum is considered to require a medium level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken for possums.

NPD section 6 - assessment

Options for response

The analysis considers three options for possum:

1. do nothing;
2. eradication;
3. sustained control.

Benefits and costs of options for management of possum

Benefits and costs of options for management of possum

Option	Costs	Benefits
Do nothing	Low cost – only what occupiers would spend voluntarily to reduce losses to production.	Nil or negative with respect to the economy and environment. Some benefits for possum fur harvesting.
Eradication	Very high costs and probably not economically and technically feasible with existing tools and reinvasion from adjacent uncontrolled land.	High benefits to economy and environment. Loss of the possum fur industry.
Sustained control	The cost of delivering a sustained control programme for possums to reduce impacts and cross boundary effects (based on the current Possum Control Area) is \$813,000/year.	Moderate to high with reduction of TB risk and production loss and to the improved protection of biodiversity values. A fur recovery industry could be retained.

Risks of sustained control programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Control techniques are not applied or maintained to a standard that achieves the required RTC.	Low	Medium	Disease vector management (TB) Biodiversity values Agricultural values	Possum Control Programme provides support to occupiers carrying out possum control.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
	Reduction in funding to support occupiers	Low	High	As above	Provisions of adequate funding through the Long Term Plan and Annual Plan processes.
Extent to which the option will be implemented and complied with	Occupiers do not carry out control.	Low	Medium	As above	As above
Risk that compliance with other legislation will adversely affect implementation	None known.				
Risk that public or political concerns will adversely affect implementation	Public concerns around the use of toxins (sodium fluoroacetate and brodifacoum) and animal welfare issues may result in a reduction of available control methods.	Medium	High	Ability to effectively control possums to required RTC levels.	Education, advocacy, strict management of toxins and well trained staff and contractors.
Any other material risk	None known.				

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of possum

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - the Southland community – by protection of biodiversity from possum impacts;
 - occupiers – primarily economic in protection from TB;
 - and other diseases carried by possums and also production loss;
- active exacerbators:
 - occupiers that allow spread from their land;
 - Crown as a landowner that allows spread from its land;
- passive exacerbators: as for active exacerbators.

Matters for consideration in allocation of costs of proposed possum programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed possum programme

Legislative rights and responsibilities	There are currently no legislative requirements on occupiers to control possums. The Department of Conservation may have conservation responsibilities on some High Value Areas of Crown land.
Management objectives	To reduce possum impacts and prevent spread across boundaries.
Stage of infestation	Possums occupy all favourable habitats in the region, i.e. the infestation is at its maximum extent.
Most effective control agents	Occupiers with assistance from ES.
Urgency	Medium.
Efficiency and effectiveness	Cost sharing between occupiers and Environment Southland with assistance to incentivise and coordinate occupiers is considered an efficient and effective method to facilitate occupier self-help programmes.
Practicality of targeting beneficiaries	Costs will be shared by beneficiaries. Estimate over 10 years at a ratio 75% private/25% public. \$10/hectare for initial control in first year. The Southland community will contribute a significant portion of the cost to set up occupier self-help control programmes and provide ongoing assistance to occupiers to undertake ongoing maintenance.
Practicality of targeting exacerbators	Occupiers as principal exacerbators will be responsible for achieving Regional Pest Management Plan objectives on their land. This will cost \$3-5/hectare/annum to maintain on an ongoing basis.
Administrative efficiency	Occupiers as principal exacerbators will be responsible for achieving Regional Pest Management Plan objectives on their land. This will cost \$3-5/hectare/annum to maintain on an ongoing basis. Has worked well in practice and has been supported by the community since 2008 (290,000 hectares under PCAs).
Security	As above.
Fairness	As above.
Reasonable	As above.
Parties bearing indirect costs	Possum fur harvest may be reduced.
Transitional cost allocation arrangements	None required as the current programme is being extended.
Mechanisms available	Not applicable.

Proposed allocation of costs

It is proposed that costs for undertaking the sustained control programme for possums be covered in the following way.

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Land holder control or contribution
-	100%	-	30%	70%

SITE-LED PROGRAMMES - Stewart Island/Rakiura

Stewart Island/Rakiura site-led programme includes multiple pests.

African club moss

Description

African club moss is a fern ally or club moss – a primitive type of plant that evolutionally fits between mosses and ferns. It produces cones with spores rather than flowers. African club moss has creeping and irregularly branched stems that root at the nodes, forming a loose mat. The leaves are small and in four rows on the stem. African club moss grows on damp forest floors and stream banks. It can be found in gardens, shade houses, nurseries and ferneries.

African club moss reproduces both vegetatively and sexually. Pieces less than one centimetre long are capable of establishing new plants and spores can be picked up on clothing and footwear and carried into new areas.

Once established in an area, African club moss excludes desirable species from co-existing with it.

African club moss is only known from a few locations on Stewart Island/Rakiura. If it encroached further it could put forest regeneration at risk. The Department of Conservation operates a control programme for African club moss on Stewart Island/Rakiura.

Gunnera

Description

Gunnera is a summer green herb with leaves up to two metres long with five to seven lobes. Flower panicles extend up to one metre in length and contain hundreds of fruits that are dispersed by birds and water. It has been planted as an amenity plant around ponds and streams in gardens and parks throughout New Zealand.

The plant forms dense patches that exclude almost all other plant species. It is invasive in damp coastal bluffs, riparian margins and disturbed ground. Herbfields, turf communities and other low stature vegetation are also susceptible to invasion.

Gunnera has been part of a ten year eradication programme on the Stewart Island/Rakiura it is found in approximately 165 locations.

Hawthorn

Description

Hawthorn is a thorny much-branched, deciduous shrub or small tree growing up to ten metres tall. This plant has been widely planted throughout Southland, often as a hedgerow. It produces many long-lived seeds that are spread by birds.

The plant can form dense thickets, blocking access and replacing desirable species along forest margins, shrubland, short tussock grasslands and other low-growing habitats. It can also be found

along roadsides and in deserted habitations, where it acts as a seed source for invasion into areas of native vegetation.

Although common in regional Southland, hawthorn is only localised on Stewart Island/Rakiura to the area around Halfmoon Bay.

Heather

Description

Heather – see description under progressive containment programme.

Although common in regional Southland, heather is only localised on Stewart Island/Rakiura to the area around Halfmoon Bay. If it encroached further it could put the significant wetland complexes and alpine areas at risk.

The Department of Conservation is working towards eradication of heather on Stewart Island/Rakiura.

Knotweed

Description

Knotweed is a multi-stemmed, thicket-forming, rhizomatous perennial shrub. Stems are slender and hollow and zig-zag from leaf node to leaf node, up to 1.8 metres high. The leaves are heart to lancet-shaped, alternating, up to 40 centimetres long. Stems die in autumn and re-grow in spring from woody rhizomes. Flowers small, white or pink, clustered along short branches.

Knotweed is capable of excluding other species and prevents native seedlings establishing. They tolerate wet to moderately dry conditions and warm to cold temperatures, but are intolerant of shade. Shrublands and waterways are vulnerable to invasion. The plants adversely impact amenity and conservation values in riparian margins and other disturbed areas.

Spanish heath

Description

Spanish heath is a brittle and erect woody perennial shrub growing up to two metres high, establishing in habitats from near sea level up to 1,000 metres. It is densely covered in small, needle-like leaves, arranged in groups of three or four. The plant produces masses of snowy white flowers from March to December. Seeds are very small and light, and are contained within smooth capsules about three millimetres long. They are readily dispersed by wind.

This plant can form dense stands on disturbed and bare sites. These stands can be persistent in short vegetation types such as herb fields, tussockland and fernland, preventing the recruitment of desirable species. It is usually succeeded in taller growing plant communities.

The Department of Conservation is working towards eradication of Spanish heath of Stewart Island/Rakiura.

Willows (crack and grey)

Description

Crack willow is a deciduous tree growing to 25 metres tall. It has a spreading crown and multiple trunks. Bright red rootlets are present when the plant is in or near water. The shoots are dark-brownish green and snap with a characteristic “crack” when bent.

Grey willow is a small tree growing up to seven metres high, although it often only grows to one to two metres high. The leaves are shiny on the upper surface and covered with soft grey hairs underneath. It is often found growing in swamps, riverbanks and wet areas behind coastal dunes.

The roots of crack willow provide protection from flooding by holding banks in place. However, it can form large, dense stands along river and stream channels, displacing native species, choking waterways and increasing the risk of flooding. The branches are very fragile and fragments break off readily. The smallest of fragments will root in mud and produce mature trees wherever conditions are favourable. Its growth and spread is exponential - slow to start with, then very rapid as the population grows.

Grey willow replaces native species in wetlands and forms vast dense stands. It can also cause blockages, flooding and structural changes in waterways even though it has been widely planted in many wet areas for soil reclamation and stabilisation purposes.

Although common in regional Southland, willows are only localised on Stewart Island/Rakiura to the area around Halfmoon Bay. If it encroached further it could put the significant wetland complexes and alpine areas at risk.

Feral cat

Description

Feral cats resemble domestic cats in both size and colouration. Coat colours vary from pure black to orange tabby and some resemble the striped dark and pale grey of the true European wild cat. They commonly revert to black, tabby or tortoiseshell with varying extents of white starting from the belly and breast. Adult male cats are generally larger than the females and can weigh up to five kilograms.

Feral cats tend to be solitary and territorial compared to domestic stray or unwanted cats that tend to form colonies. Territory is marked by scent secreted from anal glands and by spraying urine. Feral cats are mainly active at night. Their vision and hearing are acute.

Feral cats inhabit a wide range of urban, rural and forest habitats. They are found from sea level to alpine habitats. The diet of a feral cat is wide-ranging and includes small mammals, fish, birds and invertebrates. They produce two to three litters per year with an average of four young in each.

Feral cats have been branded as ‘the ultimate predators’ in New Zealand and have been nominated as amongst the “100 World's Worst” invaders. New Zealand’s unique native wildlife is particularly vulnerable to predation by cats. Feral cats kill young and adult birds and occasionally take eggs, prey on native lizards, fish, frogs and large invertebrates. Cats are highly efficient predators, and have been known to cause local extinctions of seabird species on islands around the world. Both sea and land birds are at risk, particularly those that nest or feed on or near to the ground.

Feral cats are implicated in a small way in the spread of bovine tuberculosis, with the potential to infect cattle. They also carry parasites and toxoplasmosis that causes abortions in sheep and illness in humans. Feral and domestic stray cats can be aggressive towards pet cats. Through fighting they cause severe injuries sometimes resulting in the pet cat having to be put down. Feral cats are likely to interbreed with the un-neutered domestic cat population and may spread infectious diseases.

Feral goat

Description

Feral goats vary in size and their colour can be white, black, brown or a combination of colours. Both sexes have horns. Adult males stand approximately 70 centimetres high and weigh 50-60 kilograms. Females are smaller and begin breeding at six months old. They can breed twice a year and twins are common. Males can mate from six months old but are usually excluded by other males until three to four years of age.

Feral goats are absent from Stewart Island/Rakiura, although there have been pet animals present on the Island in the past. Escapees (feral goats) are extremely damaging to native vegetation. They prevent seedling regeneration and in partnership with possums can cause complete forest collapse.

Feral pig

Description

Feral pigs can measure 90 to 200 centimetres in length, and weigh 50-90 kilograms. Their colour varies from dark grey to brown or black. Adult males develop tusks that protrude from their mouth. Sexually mature at two years of age, they breed once per year with litter size ranging from four to six piglets. The piglets are weaned at three to four months of age. Vegetation forms 70 percent of a pig's diet. Pig rooting can reduce the diversity of seedlings and saplings and cause a dramatic reduction in leaf cover on the forest floor.

Feral pigs are scattered throughout Southland but are not found on Stewart Island/Rakiura. Their distribution is assisted by people who continue to release pigs into the wild, despite this being an illegal activity. The pigs cause a number of impacts including rooting up pasture and eating forest seedlings, insects and scavenging nests. The scavenging habit of feral pigs contributes to their tendency to carry TB.

Hedgehog

Description

Hedgehogs are nocturnal insectivores. Their back and sides are completely covered with spines and they roll into a prickly ball when disturbed, or when hibernating. They are widespread through lowland Southland, occupying a wide range of habitats. On Stewart Island/Rakiura, they are less widespread and are found mainly around Halfmoon Bay.

These animals eat mainly insects, however they eat a wide range of food if the opportunity presents itself. They are a potentially serious predator of native invertebrates, lizards, and ground nesting birds.

House mouse

Description

House mice are small, omnivorous generalists that reach approximately 30 grams in weight and measure around 115 millimetres (without tail). They have a dull grey-brown back and a uniform grey belly with a very thin, grey-brown tail and large black eyes.

These animals can be found throughout Southland, except on Stewart Island/Rakiura, from the coast to high altitude (1,200-1,300 metres), predominantly in temperate forest (native and exotic), croplands and pasture, and subalpine tussock. They also occur in various urban habitats. House mice are very well adapted to dry conditions due to their ability to concentrate their urine, and as most of their water requirements can be taken from the moisture of their food.

Caterpillars, spiders and weta are a major part of the mouse's invertebrate diet. Additionally a range of seeds, including hard beech, mountain beech, kauri and rimu are consumed. Mice are agile climbers, good jumpers and can swim.

Consumption of seeds may alter the regeneration of these species. Prey on invertebrates may also have secondary effects on the vegetation due to changes in ecosystem processes.

They are not currently present on Stewart Island/Rakiura.

Mustelid (ferret, stoat, weasel)

Description

Ferrets, stoats, weasels are part of the mustelid family, which is a group of small to medium sized carnivores. Mustelids have large home ranges and are active day and night. They are opportunistic predators and have a strong musk odour. Ferrets are the largest mustelid in New Zealand. Male ferrets grow up to 44 centimetres and females up to 37 centimetres in length. The undercoat is creamy yellow with long black guard hairs that give the ferret a dark appearance. A characteristic black face mask occurs across the eyes and above the nose. Stoats have long, thin bodies with smooth pointed heads. Ears are short and rounded. They are smaller than ferrets. Males grow up to 30 centimetres and females up to 25 centimetres in length. Their fur is reddish-brown above with a white to yellowish underbelly. Stoats have relatively long tails with a distinctive bushy black tip. Weasels are the smallest and least common mustelid in New Zealand. Males grow to about 20 centimetres long. Their fur is brown with white undercoat, often broken by brown spots. Their tails are short, brown and tapering.

Mustelids inhabit a wide range of urban, rural and forest habitats.

Although habitat loss and modification remains a threat to native biodiversity, a more equally serious threat is from invasive introduced species. Introduced predators, such as ferrets, stoats, weasels and feral cats, pose a significant threat to our remaining natural ecosystems and habitats and threatened native species and can have a considerable negative impact on primary production. Ferrets, stoats, weasels and feral cats are distributed throughout the Southland region.

Mustelids were introduced in New Zealand in the 1880's in an attempt to manage growing rabbit populations. This had minimal impact on rabbit densities but had a significant impact on New Zealand's biodiversity. Mustelids are implicated in the extinction of some indigenous bird species and as the major cause of decline of many others. Ferrets are also a threat to agriculture, particularly

through their role as a carrier of bovine tuberculosis. Mustelids are a threat to poultry farms and carry parasites and toxoplasmosis, which can cause illness in humans and livestock.

Possum

Description

Possum – see description under sustained control animals.

Rat (Norway, ship and kiore)

Description

Ship rats are slender with large hairless ears, grey-brown on the back with a similarly coloured or creamish-white belly, or black all over. The uniformly-coloured tail is always longer than the head and body length combined. Adults usually weigh 120-160 grams but can exceed 200 grams. The Norway rat has brown fur on its back and pale grey fur on its belly. Adults normally weigh 150-300 grams but may reach up to 500 grams, and are up to 390 millimetres long. They have relatively small ears which usually do not cover the eyes when pulled forward. Their tail is shorter than their head to body length.

Breeding commences in rats as early as three to four months of age and female rats can produce 15-20 young per year. Mortality can be high.

Kiore have brown fur, with white-tipped grey fur on the belly, pale feet with a dark mark on the outer edge of the hind feet. Their ears cover the eyes when pulled forward and they have a thin tail, about the same length as body. They are smaller than other rats in New Zealand, with a maximum body length of 180 millimetres without the tail, and they usually weigh 60-80 grams, but can weigh up to 180 grams.

Rats inhabit a wide range of urban, rural and forest habitats. Ship rats are more common within forest areas.

Rats are omnivorous and opportunistic feeders eating 10 percent of their body weight per day. This makes them a competitor for food with many species and predators of others. They eat a variety of native flora and fauna, in particular native birds (eggs and fledglings), lizards, and invertebrates. They eat large quantities of native seeds, which reduces regeneration of native plants.

Proposed programme

Environment Southland is proposing a site-led programme for Stewart Island/Rakiura that will include the plant and animal species listed above.

Level of analysis

All of the pests included in the programme scored either a low or medium on the when assessed according to the guidance document 'Meeting the requirements of the National Policy Direction for Pest Management 2015'.

The assessment of species within the Stewart Island/Rakiura Site-Led Programme has been combined and has a medium level of analysis.

Costs and benefits for site-led programmes generally have also been summarised in Section 13 of the cost benefit analysis undertaken by an independent economist.

Method

A qualitative assessment of the costs and benefits has been undertaken. Due to the specific values at Stewart Island/Rakiura, the intangible nature of the environmental and community benefits has been given additional weight for this analysis.

NPD section 6 - assessment

Options for response

The analysis considers two options for pest species at Stewart Island/Rakiura:

1. do nothing;
2. site-led.

Benefits and costs of options for management of pest species at Stewart Island/Rakiura

Benefits and costs of options for management of pest species at Stewart Island/Rakiura

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	<p>Doing nothing represents a significant risk to the values at Stewart Island/Rakiura. The high and unique biodiversity values at the site would be severely compromised.</p> <p>Stewart Island/Rakiura comprises multiple complex ecosystems and is home to many threatened and endemic species that would be put at risk by a do nothing approach.</p> <p>The economy of Stewart Island/Rakiura relies on ecotourism to support its residents and would also be compromised by a do nothing approach.</p> <p>The values at Stewart Island/Rakiura extend beyond the local community due to its international significance.</p>	None known.
Site-led pest plants	Control of plants during initial stages of infestation will be cheaper than control once the plant gets more widespread.	<p>Some pest plants provide food and habitat for native species, including birds, reptiles and invertebrates.</p> <p>Controlling pest plants risks creating light wells that could promote the establishment of other pest plant species.</p>	<p>Pest plant control prevents monocultures from establishing and disrupting ecosystems.</p> <p>Pest plant control protects native species and preserves the integrity of the islands ecological values.</p>

Option	Basic economic assumptions	Costs	Benefits
		<p>Controlling pest plants around waterways may result in raised water temperatures until native plant cover has re-established.</p>	<p>Pest plant control will contribute to keeping Stewart Island/Rakiura a high quality natural environment.</p> <p>Control programmes are supported by community groups.</p> <p>Pest plant control programmes supports Department of Conservation's programmes in the area.</p> <p>Targeting species that are low on the infestation curve is more cost effective than dealing with a widespread incursion.</p>
<p>Site-led pest animals</p>	<p>Costs for managing site-led animal species at Stewart Island/Rakiura are limited to costs associated with education, information and reducing the feral cat population.</p> <p>Max \$18,000 (year 1) Max \$2,000 (annual enforcement/education costs)</p>	<p>Reducing cat numbers would relieve predation pressure on rats and rat numbers may increase.</p> <p>Increasing rat numbers may increase the risk of leptospirosis</p> <p>Continued risk of cats transmitting toxoplasmosis</p>	<p>The main benefit of declaring and controlling pest animals at Stewart Island/Rakiura is preventing the transport and spread of species throughout the island and islets.</p> <p>Controlling pest animals will contribute to the high quality natural environment and experience of Stewart Island/Rakiura.</p> <p>Preventing the spread of pest animal species will protect a large range of native threatened species and ecosystems.</p> <p>Success of the site-led programme will also help to protect pest free islands such as Ulva Island and Whenua Hou.</p> <p>Removing the ability for domestic cats to interbreed with feral or stray cat populations will increase the effectiveness of feral cat control programmes by reducing the speed of population growth or recovery.</p> <p>Management of pest animal species will improve the natural</p>

Option	Basic economic assumptions	Costs	Benefits
			environment, leading to a better experience for visitors and keeping the tourism industry viable.

Risks of Stewart Island/Rakiura site-led programme (animals) not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Biosecurity border is unable to prevent the transportation of species between islands.	Low-medium depending on the species.	High.	High ecological values on pest free islands and predation by mustelids/mice on Stewart Island/Rakiura.	Education. Biosecurity Pathways plan.
	Not all domestic cats are neutered or microchipped.	Low-medium.	Medium.	Domestic cats interbreed with feral cats keeping feral cat population high.	Education. Subsidies for microchipping.
	Hard to police car rules compliance as no Environment Southland staff on Stewart Island/Rakiura.	High.	Medium.	Domestic cats interbreed with feral cats keeping feral cat population high.	Education. Subsidies for microchipping. Work with SDC and SPCA animal officers.
	Failure to detect incursions of new species.	High.	High.	High ecological values on pest free islands and predation by mustelids/mice on Stewart Island/Rakiura.	Education. Biosecurity Pathways plan.
	Failure to eradicate an incursion.	High.	High.	High ecological values on pest free islands and predation by mustelids/mice on Stewart Island/Rakiura.	Education. Biosecurity Pathways plan.
Extent to which the option will be implemented and complied with	Stewart Island/Rakiura community have been complying with similar rules during the last programme with only limited incursions. In general they are supportive and	Low.	High.	High ecological values on pest free islands and predation by mustelids/mice on Stewart Island/Rakiura.	Education. Biosecurity Pathways plan.

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
	comply with the rules.				
Risk that compliance with other legislation will adversely affect implementation	None known.				
Risk that public or political concerns will adversely affect implementation	None known.				
Any other material risk	None identified.				

Residual risks

None identified.

Risks of Stewart Island/Rakiura site-led programme (Plants) not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Plant control goals are not met due to: <ul style="list-style-type: none"> the infestation is more widely spread than thought. the seed bank is larger than thought. the seed life is longer than thought. the environment and terrain makes it hard to reach all target plants. 	Low-medium. The distribution and lifecycle of site-led programmes species is reasonably well known.	High.	High ecological values of Stewart Island/Rakiura.	Use of technology to find and control all locations. Education. Encourage the reporting of new infestations.
Extent to which the option will be implemented and complied with	Stewart Island/Rakiura community have been complying with similar rules during the last plan. Most occupiers allow access.	Low.	Low.	High ecological values of Stewart Island/Rakiura.	Education. Use biosecurity act for access if required.
Risk that compliance with other legislation will adversely affect	None known.				

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
implementation					
Risk that public or political concerns will adversely affect implementation	Public in some areas of New Zealand are pushing for a ban on some herbicides. This may reduce the effectiveness of control.	Low.	Medium.	High ecological values of Stewart Island/Rakiura.	Education. Herbicides only used following best practise.
Any other material risk	None identified.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of pest species at Stewart Island/Rakiura

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - Stewart Island/Rakiura community
 - Stewart Island/Rakiura Community and Environment Trust
 - Titi Island committees and beneficiaries
 - Southland community
 - national community
 - tourists
 - tourism operators
 - Department of Conservation
 - Southland District Council
- active exacerbators:
 - cat colony advocates or any person who feeds colony cats within the Stewart Island/Rakiura area
 - cat owners who have not already, at the time the Regional Pest Management Plan becomes operative, microchipped and neutered their domestic cats.
 - non-compliant cat owners including holiday makers
 - any person who actively dumps unwanted domestic cats within the Stewart Island/Rakiura area
 - non-compliant pig or goat owners
 - occupiers who dislike the use of herbicide control on their property
- passive exacerbators:
 - occupiers who do not control site-led species on their land within the Stewart Island/Rakiura area
 - any person who does not remove pests from boats or planes travelling to or between the Islands of Stewart Island/Rakiura

Grouping of subjects

For the site two groups of subjects have been identified, feral cats will be addressed as an individual species because the management of that species will require direct costs to be covered by cat owners. All other Stewart Island/Rakiura site-led pests will be grouped together for the purposes of determining the appropriate cost allocation as they satisfy the criteria under paragraph 119 of the guidance document.

The cost allocations for the site-led species are shown below and are split by the same groupings.

Matters for consideration in allocation of costs of proposed Stewart Island/Rakiura site-led programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed Stewart Island/Rakiura site-led programme

Site-Led Species	Legislative rights and responsibilities	Management objectives	Stage of infestation	Most effective control agents	Urgency	Efficiency and effectiveness
African club moss	None.	Ongoing control to reduce impacts of known infestations.	Lag.	Department of Conservation	Moderate.	Moderate.
Gunnera	None.	Reduce the geographic distribution.	Lag/Explosion	Environment Southland	Moderate.	Moderate.
Hawthorn	None.	Reduce the infestation to zero.	Lag.	Environment Southland	High.	High.
Heather	None.	Reduce the infestation to zero.	Lag.	Environment Southland	High.	High.
Knotweed (Indian Himalayan)	None.	Reduce the geographic distribution.	Lag.	Environment Southland	High.	High.
Spanish heath	None.	Reduce the infestation to zero.	Lag.	Environment Southland	High.	High.
Willow (crack, grey)*	None.	Reduce the infestation to zero.	Lag.	Environment Southland	Moderate.	Moderate.
Feral cat	Some rules relating to keeping cats are contained in the 'Southland District Council The keeping of animals, poultry and bees bylaw 2010'	Ongoing control to reduce impacts of known infestations.	Widespread.	Cat owners with support from Environment Southland.	Moderate.	Moderate.

Site-Led Species	Legislative rights and responsibilities	Management objectives	Stage of infestation	Most effective control agents	Urgency	Efficiency and effectiveness
	Cat owners will be responsible for getting cats neutered/ microchipped.					
Goat	Some rules relating to keeping goats are contained in the 'Southland District Council The keeping of animals, poultry and bees bylaw 2010'. Additional rules relating to goats are contained in the Wild Animal Control Act 1977.	Prevent the incursion or establishment of the species.	Not present.	Environment Southland.	High.	High.
Pig	Some rules relating to keeping pigs are contained in the 'Southland District Council The keeping of animals, poultry and bees bylaw 2010'. Additional rules relating to pigs are contained in the Wild Animal Control Act 1977.	Prevent the incursion or establishment of the species.	Not present.	Environment Southland.	High.	High.
Hedgehog	None.	Prevent the incursion or establishment of the species on pest free islands.	Explosion.	Environment Southland.	Moderate.	Moderate.
House mouse	None.	Prevent the incursion or establishment of the species	Not present.	Environment Southland.	High.	High.
Mustelids (ferret, stoat,	None.	Prevent the incursion or establishment	Not present.	Environment Southland.	High.	High.

Site-Led Species	Legislative rights and responsibilities	Management objectives	Stage of infestation	Most effective control agents	Urgency	Efficiency and effectiveness
weasel		of the species.				
Possum	None.	Prevent the incursion or establishment of the species on pest free islands.	Not present on some islands. Widespread on others.	Environment Southland.	High.	High.
Rat (Norway, ship and Kioie)	None.	Prevent the incursion or establishment of the species on pest free islands.	Not present on some islands. Widespread on others.	Environment Southland.	High.	High.

	All Stewart Island/Rakiura site-led species except for feral cats	Feral cats
Practicality of targeting beneficiaries	Practical to target some beneficiaries (Southland rate payers) through general rates.	Practical to target some beneficiaries (Southland rate payers) through general rates.
Practicality of targeting exacerbators	Impractical to specifically target exacerbators.	Reasonably practical to target domestic cat owners that have not already microchipped and neutered their cats.
Administrative efficiency	Funding through the general rate increases administrative efficiency through efficiency of scale because it targets multiple small programmes on multiple properties without having to individually target specific occupiers, beneficiaries and exacerbators.	Low cost programme will be efficient; however it does rely on participation from exacerbators.
Security	Environment Southland's contribution to the programme funding is secure. However the Department of Conservation contributions to the African club moss Programme is subject to central government funding which is expected to be secure for at least five years.	Environment Southland's contribution to the programme funding is secure.
Fairness	Programme is fair because it treats all Southland rate payers consistently to protect significant regional values (the values at the place).	Programme is fair, costs shared between domestic cat owners as exacerbator and Environment Southland through general rates on behalf of beneficiaries.
Reasonable	Protecting significant regional values through a general rate is a reasonable way to target all exacerbators and regional beneficiaries. It also allows for a reasonable allocation of resources (efficiency of scale).	The costs of the programme are reasonably low and predominately target exacerbators. Environment Southland are contributing to the initial costs for existing occupiers with domestic cats so that the rules do not unreasonably impact any individual.
Parties bearing indirect costs	None.	None.

	All Stewart Island/Rakiura site-led species except for feral cats	Feral cats
Transitional cost allocation arrangements	None.	Environment Southland are contributing to the initial costs for existing occupiers with domestic cats. Future costs will be covered by domestic cat owners.
Mechanisms available	General (biosecurity) rate, is the most suitable available mechanisms.	General (biosecurity) rate, and imposing a cost through a rule are the suitable available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the Stewart Island/Rakiura site-led programme be covered in the following way.

All Stewart Island/Rakiura site-led species except for feral cats

Funding of inspection and monitoring costs		Funding of control costs		
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Department of Conservation contribution
100%	-	40%	-	60%

Feral Cats

Funding of inspection and monitoring costs			Funding of control costs		
	General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Domestic Cat Owner contribution
Year 1	100%	-	50%	-	50%
Year 2 onwards	100%	-	-	-	100%

SITE-LED PROGRAMMES – Omaui

Feral cat

Description

Feral cat - see description under site-led programme for Stewart Island/Rakiura.

Feral goat

Description

Feral goat - see description under site-led programme for Stewart Island/Rakiura.

Feral goats are found in low numbers around the Omaui peninsular and have been a target for control.

Hedgehog

Description

Hedgehog - see description under site-led programme for Stewart Island/Rakiura.

Mustelid (ferret, stoat, weasel)

Description

Mustelids - see description under site-led programme for Stewart Island/Rakiura.

Possum

Description

Possum - see description under site-led programme for Stewart Island/Rakiura.

Rat (Norway, ship and kiore)

Description

Rat - see description under site-led programme for Stewart Island/Rakiura.

Proposed programme

Environment Southland is proposing a site-led programme for feral cats at Omaui.

Level of analysis

The assessment of feral cats is considered to require a medium level of analysis when assessed according to the NPD guidance document.

The assessment of feral goats, hedgehogs, mustelids, possums and rats is considered to require a low level of analysis when assessed according to the NPD guidance document.

Method

A qualitative assessment of the costs and benefits has been undertaken. Due to the specific values at Omaui, the intangible nature of the environmental and community benefits has been given additional weight for this analysis.

NPD section 6 - assessment

Options for response

The analysis considers two options for feral cats at Omaui:

1. do nothing;
2. site-led.

Benefits and costs of options for management of pest species at Omaui

Benefits and costs of options for management of pest species at Omaui

Option	Basic economic assumptions	Costs	Benefits
Do nothing	No quantitative costs.	<p>Doing nothing represents a significant risk to the values at Omaui. The biodiversity values at the site would be severely compromised.</p> <p>The Omaui community has worked hard to remove predation and grazing pressures on the Omaui environment, the gains they have made to date would be put at risk by a do nothing approach.</p> <p>Cats are not controlled. There is interbreeding between feral and domestic cats which contribute to higher feral cat numbers. People continue to feed feral or stray cats. High cat numbers mean continual predation on endangered species, continued re-invasion and lack of control puts Omaui Landcare group project at further risk. Presence of cats can detract from the visitor experience.</p>	People are able to keep and breed domestic companion cats and domestic goats.
Site-led	<p>Costs for managing site-led animal species at Omaui are limited to costs associated with education, information and reducing the feral cat population.</p> <p>Max \$7,000 (year 1) Max \$2,000 (annual enforcement/education costs).</p>	<p>Reducing cat numbers would relieve predation pressure on rodents and rabbits so rodent and rabbit numbers may increase.</p> <p>Cost to people who like keeping cats who will no longer be able to keep or breed domestic companion cats.</p> <p>Cost to people who like</p>	<p>Allows for continued control and reduces the risk of domestic animals becoming feral.</p> <p>Would have some benefits to native biodiversity including at risk species and ecosystems.</p> <p>Progressive containment would have some benefits to native biodiversity including at risk species and ecosystems.</p>

Option	Basic economic assumptions	Costs	Benefits
		keeping goats who will no longer be able to keep or breed domestic goats.	<p>Would produce some benefit to the recreational experience.</p> <p>Supports the work carried out by the Omaui Landcare Group.</p> <p>Supports community led wishes for cat ownership in the Omaui community.</p>

Risks of Omaui site-led programme not achieving objectives

Risk type	Risk	Risk likelihood	Risk magnitude	Explanation of benefits at risk	Potential for mitigation
Technical and operational risks	Not all domestic cats are de-sexed or microchipped.	Medium.	High.	Protecting the values of Omaui.	Surveillance, monitoring and education.
	Hard to police transporting rules.	Low.	Medium.	Protecting the values of Omaui.	Surveillance, monitoring and education.
Extent to which the option will be implemented and complied with	People like keeping cats/ kittens and may be unwilling to de-sex.	High.	High.	Protecting the values of Omaui.	Education.
	People like keeping goats and may want to continue to keep them.	High.	High.	Protecting the values of Omaui.	Education.
	New people moving into the area unaware of the rules.	High.	High.	Protecting the values of Omaui.	Education.
Risk that compliance with other legislation will adversely affect implementation	None known.				
Risk that public or political concerns will adversely affect implementation	Public backlash on restrictions on cat and goat ownership.	High.	High.	Protecting the values of Omaui.	Education.
Any other material risk	None known.				

Residual risks

None identified.

NPD section 7 - allocation of costs and benefits

Beneficiaries, exacerbators and costs of proposed programme for control of pest species at Omaui

The beneficiaries and exacerbators of the programme are:

- beneficiaries:
 - Omaui Landcare Group;
 - Department of Conservation;
 - Invercargill City Council;
 - Omaui community;
 - Southland community;
 - national community;
 - tourists;
- active exacerbators:
 - cat colony advocates/any person who feeds colony cats within the Omaui site-led area;
 - non-compliant cat owners;
 - non-compliant goat owners;
 - any person who actively dumps unwanted domestic cats or goats within the Omaui site-led area;
- passive exacerbators:
 - any person who does not control pest species on their land within the Omaui site-led area.

Grouping of subjects

For the site two groups of subjects have been identified, feral cats will be addressed as an individual species because the management of that species will require direct costs to be covered by cat owners. All other Omaui site-led pests will be grouped together for the purposes of determining the appropriate cost allocation as they satisfy the criteria under paragraph 119 of the guidance document.

The cost allocations for the site-led species are shown below and are split by the same groupings.

Matters for consideration in allocation of costs of proposed site-led programme for Omaui site-led programme

The matters for consideration are listed in Section 7(2)(d) of the NPD, and the analysis for each of these matters is shown below.

Matters for consideration in allocation of costs of proposed site-led programme for Omaui site-led programme

	All Omaui site-led species except for feral cats	Feral cats
Legislative rights and responsibilities	Some rules relating to keeping goats are contained in the 'Invercargill City Council. Invercargill city council bylaw 2013/2 – keeping of animals, poultry and bees.	Some rules relating to keeping cats are contained in the 'Invercargill City Council. Invercargill city council bylaw 2013/2 – keeping of animals, poultry and bees. Cat owners will be responsible for getting cats neutered/microchipped.
Management objectives	To protect the values at the place	To suppress feral cat numbers in Omaui area to protect the values at the place.

	All Omaui site-led species except for feral cats	Feral cats
Stage of infestation	Widespread (except goats – lag)	Widespread.
Most effective control agents	Occupiers, Omaui Landcare Group, Environment Southland and Department of Conservation	Cat owners with support from Environment Southland.
Urgency	Moderate	Moderate: feral cats are causing a known issue at the site. There is community support for implementation.
Efficiency and effectiveness	Moderate: species can be controlled to low numbers	High: assuming 50:50 cost sharing between cat owners and Environment Southland for neutering and microchipping.
Practicality of targeting beneficiaries	Practical to target some beneficiaries (Southland rate payers) through general rates.	Practical to target some beneficiaries (Southland rate payers) through general rates.
Practicality of targeting exacerbators	Impractical to specifically target exacerbators.	Reasonably practical to target domestic cat owners that have not already microchipped and neutered their cats.
Administrative efficiency	Funding through the general rate increases administrative efficiency through efficiency of scale because it targets multiple small programmes on multiple properties without having to individually target specific occupiers, beneficiaries and exacerbators.	Low cost programme will be efficient; however it does rely on participation from exacerbators.
Security	Omaui Landcare Group currently has adequately funding.	High, one off costs needed to implement the programme.
Fairness	Programme is fair because it treats all Southland rate payers consistently to protect significant regional values (the values at the place).	Cost allocation is fair as Environment Southland is subsidising cat owners.
Reasonable	Protecting significant regional values through a general rate is a reasonable way to target all exacerbators and regional beneficiaries. It also allows for a reasonable allocation of resources (efficiency of scale).	Costs are reasonable as Environment Southland is subsidising cat owners.
Parties bearing indirect costs	None.	None.
Transitional cost allocation arrangements	None.	Environment Southland is contributing to the initial costs for existing occupiers with domestic cats. Future costs will be covered by domestic cat owners.
Mechanisms available	General (biosecurity) rate, is the most suitable available	General (biosecurity) rate, and imposing a cost through a rule are

	All Omaui site-led species except for feral cats	Feral cats
	mechanisms.	the suitable available mechanisms.

Proposed allocation of costs

It is proposed that costs for undertaking the Omaui site-led programme, except for feral cats, be covered in the following way.

Funding of inspection and monitoring costs			Funding of control costs	
General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Omaui Landcare Group, Department of Conservation
100%	-	-	-	100%

It is proposed that costs for undertaking the Omaui site-led programme for feral cats be covered in the following way.

Funding of inspection and monitoring costs			Funding of control costs		
	General rate	Targeted rate on productive land	General rate	Targeted rate on productive land	Domestic Cat Owner contribution
Year 1	100%	-	50%	-	50%
Year 2 onwards	100%	-	-	-	100%