

Predator Free Rakiura Social Impact Assessment

A report for the Department of Conservation

November 2017

Please cite as: Russell KJ, Taylor CN, Balanovic JX, Aley JP, Harbrow MA, Russell JC 2017. Predator Free Rakiura Social Impact Assessment. A report for the Department of Conservation. University of Auckland, Auckland.

Contents

1	Executive summary	3
2	Introduction	5
2.1	Background to the study	5
2.2	Objectives of the study	5
2.3	Outline of the baseline report	5
3	Approach	6
3.1	The SIA process	6
3.2	Methods and community engagement.....	6
3.3	Data sources	8
4	Predator eradication on inhabited islands	9
4.1	Experience to date	9
4.2	Key issues.....	9
5	Rakiura	10
5.1	Geography	10
5.2	Ecology.....	11
5.3	Predator Free Rakiura	13
5.3.1	Eradication in inhabited areas.....	14
5.3.2	Predator Free Halfmoon Bay	15
5.4	Other predator control initiatives.....	15
5.4.1	Stewart Island Rakiura Community and Environment Trust	15
5.4.2	Mamaku Sanctuary	15
6	People of Rakiura	16
6.1	Population	16
6.2	Demographics.....	17
7	Employment and livelihoods	18
7.1	Business activity and employment.....	18
7.2	Fisheries and aquaculture.....	20
7.3	Incomes, social deprivation and equity	21
7.4	Department of Conservation	21
8	Tourism and visitors	22
8.1	Visitor numbers	22
8.2	Transport	22
8.3	Tourism businesses (including accommodation)	23
8.4	Visitor levy	23
8.5	Concessions	24
8.6	Walking	24
8.7	Hunting and fishing	26
8.8	Views on tourism and the economy	26
9	Community, social services and social capital.....	27
9.1	Education.....	27
9.2	Community services	28

9.3	Health	29
9.4	Local government	29
9.5	Iwi	30
9.6	Community context	30
10	Issues and effects	31
10.1	Community perceptions of key issues	31
10.2	The ecological and conservation benefits of predator management	32
10.3	Project workforce	33
10.4	Information and misinformation	34
10.5	Predator Free Rakiura	35
10.5.1	Strategy	36
10.5.2	Governance and leadership	37
10.5.3	Methods.....	37
10.5.4	Deer.....	38
10.5.5	Domestic cats and dogs	39
10.5.6	Biosecurity	40
10.5.7	Kiore	41
10.6	Effects of eradication on non-target species.....	42
10.7	Reduced predator nuisance and control.....	42
10.8	Biodiversity restoration	43
10.9	Tourism	43
10.10	Effects on community cohesion	44
11	Ways forward and recommendations	45
12	References	48
13	Appendices.....	51
13.1	Appendix A: interview questions	51
13.2	Appendix B: Community day questions	52
13.3	Appendix C: List of articles searched	53

1 Executive summary

New Zealand has a strong history of eradicating introduced mammals on uninhabited islands and in fenced mainland areas. However, the implementation of eradications on inhabited islands presents new challenges and opportunities, primarily those posed by the perceptions of island residents and stakeholders of the target species and eradication methodologies.

Stewart Island/Rakiura is New Zealand's third largest island with a population of around 380 and tourism visits of around 36,500 per year, mostly over the summer season. Over the last 10 years, a number of studies have been completed and proposals put forward for a Predator Free Rakiura. To further advance the Predator Free Rakiura aspiration, the Department of Conservation, on behalf of the Predator Free Rakiura Governance Group, commissioned this social impact assessment (SIA).

This SIA investigates the potential positive and negative effects and implementation issues relating to eradication of introduced mammalian predators (feral cats (*Felis catus*), rats (*Rattus* spp.), possums (*Trichosurus vulpecula*) and hedgehogs (*Erinaceus europaeus*)) on Rakiura. The project followed standard SIA methodology including scoping and describing the social baseline, assessing the effects of the proposal and alternatives, reporting on the issues and effects, and providing recommendations for ways forward.

Both desktop research using secondary data sources and fieldwork to collect primary data was undertaken. Field research and community engagement included one-to-one interviews (29 participants), an open-house session (24 participants) and a group discussion (5 participants).

The report details the geography, ecology and social context for Rakiura; including population, demographics, employment, livelihoods and tourism. It then considers the issues and effects of predator management, based primarily on the field research in conjunction with the desktop profiling, and makes recommendations for ways forward.

Overall, there is strong support for increased predator management on Rakiura primarily for biodiversity benefits and a desire to see action. There remain questions about the feasibility of large-scale predator management, due to limitations of technical methods currently available, attitudes towards certain methods (particularly aerially distributed toxins), the cost and source of funding for major projects.

A strategy or pathway to Predator Free Rakiura would reinforce with stakeholders the steps and actions that are likely to be undertaken, and also demonstrate how current activities, including on individual properties, by community groups or large-scale projects, can all contribute to the Predator Free Rakiura vision. There is a need to undertake clear, regular and consistent messaging on key topics such as what future biosecurity protocols would be needed, predator interactions (e.g. how cats and rats interact and what happens if one species is removed) and on predator control methodologies.

Overall, Predator Free Rakiura is likely to have a positive, long-term social impact if it is well managed and engagement with the community continues. There will be opportunities to develop tourism, in number and in value (e.g. the spend per visitor to the island), as a result of predator management initiatives, as long as key capacity constraints such as accommodation are addressed. Well-managed tourism will have secondary benefits to the community in terms of employment and economic development. Any major predator management project is also likely to have a benefit to the community in terms of sustaining the population, its social infrastructure (e.g. the primary school) and its economy due to the project workforce.

The suggestions for taking Predator Free Rakiura forward include the following:

- Embedding it within a clear, long-term environmental, economic and social vision for the island, and a clear vision and predator management end point for Predator Free Rakiura within that vision.
- Recognising and building on what restoration has already been achieved on the island by SIRCET, DOC, other organisations and private land owners through unifying all predator control activities that are currently happening and identifying that all these actions are part of the first phase of a pathway to Predator Free Rakiura.
- Identifying opportunities for further predator control activities that become the next phase of the pathway to the vision, that build on existing work and leverage other initiatives such as Predator Free New Zealand, National Science Challenges and national funding and research activities. These could include targeting particular species, areas, trialling new technologies, or focusing on bringing together current initiatives to bridge gaps and create larger predator controlled areas.
- Developing an understanding of how biosecurity should be managed both now (to prevent new vertebrate pests arriving) and following predator control initiatives. The approach should include commencing education and communication efforts on the purpose of biosecurity, and potentially implementing some actions as part of a biosecurity plan for Rakiura.
- Providing regular communication and updates on Predator Free Rakiura via the website, Stewart Island Newsletter, open days and social media.
- Ensuring there is ongoing engagement that speaks to all the island residents and stakeholders, including 'silent voices' using a range of engagement communication methods. Different engagement methods need to be considered for the different groups of stakeholders and a detailed engagement plan needs to be developed in support of a unified strategy,
- Encouraging Predator Free NZ or Predator Free 2050 to have a webpage with case studies on islands/mainland islands and associated technical information and research.
- Better defining the role of the PFRGG: is it an advisory group, a decision-making body, or a funding mechanism?
- Considering employing a person, on-island, to advance the next steps including ongoing updates, education and communication to the community, engaging with the different parties on their views, coordinating current activities, and planning future activities. It is important to demonstrate actions alongside words but in a coordinated approach.

2 Introduction

2.1 Background to the study

The Department of Conservation (**DOC**) has commissioned this social impact assessment (SIA) on the Predator Free Rakiura aspiration on behalf of the Predator Free Rakiura Governance Group (**PFRGG**). The idea of making Stewart Island/Rakiura (henceforth Rakiura), the third largest island in New Zealand, free of mammalian predators has been around for at least a decade¹; however, there are a number of perceived technical and social constraints. In 2014, the PFRGG was established to assess the feasibility of the proposal. Self-nominated membership of the group includes representatives from the Rakiura resident community, business, hunting interests, fishing and aquaculture industry, Iwi, Rakiura Māori Lands Trust (RMLT), Tītī Islands, Whenua Hou, Southland District Council (SDC), Environment Southland (ES), and DOC.

Detailed technical reports on options for eradicating all introduced mammalian predators (cats (*Felis catus*), rats (*Rattus* spp.), possums (*Trichosurus vulpecula*) and hedgehogs (*Erinaceus europaeus*)) from the entirety of Rakiura or only Halfmoon Bay were completed in 2013 and 2014. The biological and ecological steps that will enable a Predator Free Rakiura will have social consequences for people living on and visiting the island. Therefore, DOC has commissioned this SIA to understand the social impacts of the possible different implementations of Predator Free Rakiura.

2.2 Objectives of the study

The objectives of this SIA are to identify the stakeholders for Predator Free Rakiura (in consultation with DOC and PFRGG as well as DOC's primary Treaty partner Te Rūnanga o Ngāi Tahu); clarify the biological steps to be discussed with stakeholders in an ongoing dialogue; conduct an SIA including face-to-face engagement; and provide insights into future actions, including engagement, to achieve a Predator Free Rakiura.

2.3 Outline of the report

This report provides an overview of the approach to the SIA, background on predator eradication on inhabited islands, and an overview of Rakiura's geography, people, livelihoods, tourism and community. It also looks at the organisational structures involved in the island and stakeholders (identified prior to engaging the community) in predator control. Finally, it draws together the issues around stakeholder engagement and scopes the effects of the Predator Free Rakiura aspiration. Initial work on the background sections informed the field work phase, and was then combined with feedback from the community and stakeholders to summarise the issues and effects and make recommendations on next steps.

¹ Beaven 2008

3 Approach

3.1 The SIA process

SIA is a process used to predict, analyse, monitor and manage the social effects of a proposed project or programme – which, in this instance, is a proposed programme of predator management. The focus of this SIA is on understanding the full range of intended and unintended social consequences, both positive and negative, of predator control or eradication on Rakiura. In this context, social impacts can include effects on people and communities in areas such as employment and livelihoods, local economy, outdoor recreation and amenity values.

The SIA process generally combines independent social research and monitoring (during project implementation), public involvement and elements of social and community development.² While SIA is most often applied to planning and consents under the Resource Management Act 1991 (RMA) in New Zealand, it is also a useful tool in the strategic planning of predator management by DOC and others.³ It is also useful to think about the SIA as part of a broader, strategic approach to sustainable development of the islands, and district and regional planning by the appropriate local authorities (Southland District Council and Environment Southland).

The SIA process typically involves well-practiced steps of scoping, description of the social baseline, and assessment of the effects of alternatives – such as alternative approaches to predator eradication on the island. This report covers the phases of: scoping, baseline description (social profile), detailed assessment of issues and effects, and ways forward, with recommendations.

The full SIA process extends into the implementation of a project or programme, at which point it is important to monitor effects so that appropriate mitigation and management actions are undertaken. The aim of the SIA is to guide the complete process of change in predator management, applying mitigation or enhancement measures to the analysis of the effects on each potential social outcome. It is also noted here that subsequent biosecurity will require ongoing community commitment and effort after eradication is completed. Therefore, the SIA includes suggestions around biosecurity management and community involvement.

Participation and community involvement are other aspects of the SIA process. Engagement with community and stakeholders is an important part of the research. This engagement work built on the stakeholder analysis developed during the scoping phase, with input from DOC staff and PFRGG. The feedback from community members was comprehensive and informative to the analysis that follows.

3.2 Methods and community engagement

The scoping phase included an initial social profile of the island population and community along with identifying key sources of information, key stakeholders, and issues and effects to address in the assessment stage. Scoping also included development of an engagement plan with priorities recommended. The scoping phase was based largely on a desktop exercise (described in more detail below). The scoping phase also drew upon the knowledge and experience of key DOC personnel

² Taylor et al. 2004

³ Russell et al. in press

and technical experts who have had past involvement with predator control efforts and proposals for the island.

The second phase, social baseline, overlapped with the scoping phase and provided a detailed social profile of the island people and community. The main method for the baseline was to utilise secondary data and reports, rather than undertake new social research, as much useful knowledge is already reported in various formats. DOC social science staff (Wellington office) contributed to the desktop analysis as part of training in SIA.

The third phase, detailed assessment, included engagement with community members and with identified key stakeholders off the island. The intent of this engagement was to build on and support a collaborative approach to Predator Free Rakiura. It was an opportunity to present and explain the approach of the SIA to the community and island stakeholders. In addition, this engagement was an opportunity to test and validate baseline information and fill information gaps as well as extend the initial understanding of issues and effects from the scoping phase. The engagement activities provided a further training component for two DOC social science staff.

Techniques of community and stakeholder engagement included:

- one-on-one interviews
- an open-house session
- group discussions with particular interest groups.

The field research had human ethics approval 019877 from the University of Auckland. The interviews with key stakeholders were undertaken voluntarily. Notes were taken but no audio recordings were made. All interview notes are confidential to the research team and no information attached to an individual will be provided to DOC or other parties without the separate, additional written agreement of the participant. A total of 29 interviews took place in September and October 2017. Interviews were semi-structured based around a set of questions developed during scoping work (see Appendix A).

A community open day was held in the community hall on Rakiura on Saturday 16 September 2017. There was an open invitation to the community distributed via mailbox drop, noticeboard notices and an article in the Stewart Island News to attend for as long as they would like. Information about the SIA and Predator Free Rakiura was presented and there were opportunities for the community to provide feedback to researchers on options and scenarios, including a written feedback form and one-on-one conversations. A total of 24 people attended across the 6 hours. Notes were made of key points raised in conversations on the day. No results from the community open day are directly attributable to any specific individuals who attended.

Finally, interested community members were asked to join a focus group discussion on the evening of Monday 18 September following the open day. Participation was self-nominated, with five participants, and the discussion lasted approximately two hours. The structure of the group discussion and questions raised at the meeting were based on the community open day feedback. Notes were made on the focus group but no recordings.

In the process of the community and stakeholder engagement, a range of options and alternatives relating to Predator Free Rakiura were discussed. The community open day included consideration of alternatives in the form of possible technical steps and associated management required to achieve predator-free status. These broad options included i) status quo (ongoing site based predator management), ii) single species eradication, iii) whole island eradication or iv) a predator-free Halfmoon Bay as previously investigated and discussed in detail below. The list of questions asked is included in Appendix B.

For the purposes of assessment, the SIA team considered social impacts and mitigation or enhancement measures for each scenario and the impacts of these scenarios on particular social outcomes, such as recreation activity, visitor numbers, employment and livelihoods, population, health, social services and community wellbeing. This approach recognised that the social impacts of different scenarios for predator management or removal on Rakiura could vary considerably.

3.3 Data sources

Desktop research utilising secondary data was used to understand the social profile of the Rakiura community, with a combination of quantitative and qualitative data. Sources of data were identified during scoping and then used to develop the baseline. Data are presented in temporal, spatial and descriptive forms. Where appropriate, the findings include trends and projections of key variables to give an understanding of how values and social perspectives relating to introduced mammalian predator eradication and the prevailing social context are changing over time. The desktop analysis used the following sources:

- A review of local histories, annual reports, graduate theses, and other research studies to develop an in-depth understanding of the island's social characteristics, current social issues and development potential.
- Analysis of available statistical data, census reports and other data (e.g. Business Frame data) on Rakiura compiled by local, regional and central government agencies, including Venture Southland, Southland District Council, Environment Southland (ES) and DOC. We note in particular that ES are in the process of gathering considerable baseline social data as part of their Water and Land planning processes (Dr Taylor is leading this study) and this information is drawn upon, as indicated.
- Data from tourism and transport operators and suppliers, plus national surveys and data sets on visitor numbers to Southland and Rakiura in particular.
- Data from DOC relating to visitor numbers and use of walks, tracks and huts.
- A content review of websites and visitor information to identify the key features and values associated with visiting Rakiura.
- A review of newspaper articles and newsletter content – a total of 39 articles were examined that spanned from January 2008 to March 2017, sourced predominantly from google searches and snowballing techniques. The articles included a range of media outlets, including Stuff.co.nz, the Southland Times, Scoop Independent News, the Listener, Forest and Bird, Otago Daily Times and Press releases (Appendix C).

The baseline was updated for this final assessment report with inputs from the PFRGG and Rakiura community during the engagement and assessment phases.

4 Predator eradication on inhabited islands

4.1 Experience to date

For the past ten years the implementation of introduced mammal eradications on inhabited islands has been identified as difficult.⁴ In particular, the eradication of small mammalian predators, especially rodents, is problematic as their eradication usually relies solely upon the aerial distribution of rodenticide.⁵ The aerial distribution of toxin for introduced mammalian predator control (not eradication) also has a history of contention on the 'mainland' (main islands) of New Zealand, where issues exist in areas such as governance, consultation, rights coercion, public health, risk perception, and non-target side-effects (both native and introduced game animals, and pets).⁶

The focus in New Zealand to date has been on eradication from uninhabited islands. Various definitions of what constitutes an inhabited island are possible but it seems appropriate with regards to eradications to require an inhabited island to have "*the basic infrastructure to enable a community to function socially and economically, such as any of schools, churches, community buildings or general shared spaces, alongside enterprises delivering goods and services, and opportunities for residents to pursue a range of livelihood opportunities in the public and private sectors*".⁷

Notwithstanding the identified challenges to eradicating introduced mammalian predators from inhabited islands, a number of eradications have been successful on islands that meet the qualification of inhabited. In particular, small islands off the coast of the United Kingdom and Rakino Island in the Hauraki Gulf have all had rats successfully eradicated, although notably these were all achieved through ground-based operations. Eradications of invasive mammalian predators from larger islands, requiring aerial delivery of toxin, have been proposed for a number of inhabited islands, including Lord Howe Island, Australia⁸; Aotea/Great Barrier Island, New Zealand⁹; and Tristan de Cunha Island, Atlantic Ocean¹⁰. In all these cases, discussions in communities have taken place over prolonged time periods and planning is still ongoing due to the issues emerging.¹¹

4.2 Key issues

Engagement with residents on inhabited islands regarding eradication of introduced mammalian predators has identified a number of issues.¹² Many of these issues are the same as those identified for aerial distribution of toxins for control purposes on the 'mainland'¹³; however, another set of issues revolves around the nature of 'islandness' and belonging, and the perception that outsiders are driving agendas.¹⁴ Overarching all of these issues is often not the issues themselves, but the manner in which residents were engaged. Historically this has often been retrospectively and

⁴ Oppel et al. 2011; Glen et al. 2013

⁵ Howald et al. 2007

⁶ Green & Rohan 2012

⁷ Russell et al. in press

⁸ Wilkinson & Priddell 2011

⁹ Ogden & Gilbert 2009

¹⁰ Varnham et al. 2011

¹¹ Russell et al. in press; although in October 2017 the Lord Howe Island board committed to rodent eradication in 2018.

¹² Aley 2016

¹³ Kannemeyer 2013

¹⁴ Aley 2016

reactively¹⁵, precluding co-production of planning and co-ownership of projects by island communities.

Proposals for eradication of introduced mammalian predators from inhabited islands, whether from those living on or off islands, often partition the biodiversity issues on the island away from other issues of island living, such as maintenance of human livelihoods. This approach has created conflicts because the importance of mitigating ecological impacts from introduced mammalian predators must sit alongside a larger body of issues which are identified as priorities to islanders including, but not limited to, employment, infrastructure and tourism. Therefore, proposals for eradication of introduced species on islands must take a 'whole-of-island' approach that positions the benefits and costs of introduced species eradication within a broader framework of livelihoods and sustainability, not just limiting assessments to the costs and benefits for biodiversity values alone.

5 Rakiura

5.1 Geography

Rakiura is located approximately 30 km south of the South Island (Figure 1) and is part of the Southland region. The island measures 64 km by 40 km at its widest points with a total of 174 600 ha and is surrounded by over 95 small islands including several that have been cleared of introduced mammalian predators (e.g. Whenua Hou, Taukihepa, Bench and Ulva Islands). Throughout the report, references to Rakiura, or the island, refer to the whole island group.

Approximately 90% of the island is public conservation land that is administered by DOC, including 80% that sits within the Rakiura National Park. Eight per cent is Māori Land administered by the Rakiura Māori Lands Trust, and the remaining 2% is largely private land centred on the town of Oban.¹⁶ Rakiura National Park, the newest and most southerly of New Zealand's 12 national parks, was gazetted in 2002. It covers approximately 139,000 hectares of land and encompasses a network of former nature reserves, scenic reserves, and state forest areas.¹⁷

There are a number of significant features and ecosystems on the island. The highest point is Mt Anglem/Hananui (979 m). Other significant peaks and ranges include the Ruggedy Mountains in the north, and the Tin Range and the granite domes of Gog and Magog in the far south. Paterson Inlet/Whaka a te wera forms a long indentation on the island's east coast with the Freshwater and Rakeahua Rivers at its head. Other features on the east coast include Port Adventure and Port Pegasus/Pikihatiti. The beach and dune system of Mason Bay stretches for 12 km on the island's west coast.¹⁸

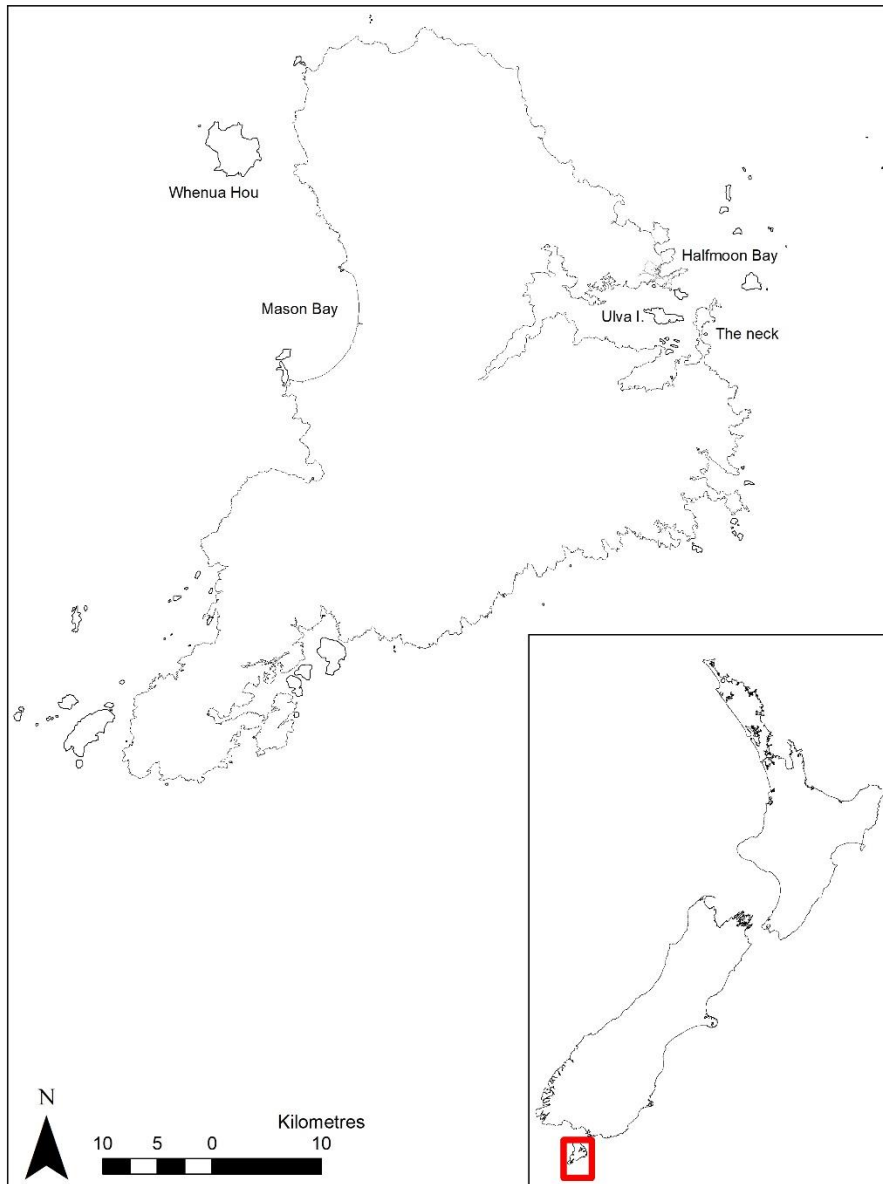
¹⁵ Russell et al. submitted

¹⁶ Bell & Bramley 2013

¹⁷ DOC 2012

¹⁸ Beaven 2008

Figure 1: Rakiura



5.2 Ecology

The natural environment of Rakiura is nationally significant. Its habitats and ecosystems are both physically and ecologically highly connected and relatively unmodified in comparison to mainland New Zealand. They often span continuously from the alpine and subalpine tops, through to the extensive lowland forests, wetland systems, and the coastal marine environment, which is now relatively rare in New Zealand.¹⁹

Norway rats (*Rattus norvegicus*), ships rats (*Rattus rattus*), kiore (*Rattus exulans*), feral cats and possums are also causing a steady decline in the island's indigenous flora and fauna. Hedgehogs are found at low numbers around the township of Oban. However, one contributor to the island's exceptionally high conservation values is the absence of some major pests that are present on mainland New Zealand, including

¹⁹ DOC 2012

mustelids (*Mustela* spp.), rabbits (*Oryctolagus cuniculus*), feral pigs (*Sus scrofa*), feral goats (*Capra hircus*) and apparently mice (*Mus musculus*).²⁰

The dominant habitat is podocarp forest. Due to minimal logging, it is largely intact and is one of the best examples of primary forest remaining in the country.²¹ The dominant species are rimu (*Dacrydium cupressinum*), kāmahī (*Weinmannia racemosa*) and southern rātā (*Metrosideros umbellata*) with beech forest notably absent. Extensive mānuka (*Leptospermum scoparium*) shrublands (some fire-induced) occur in several areas while coastal teteaweke (*Olearia oporina*) and muttongbird scrub (*Brachyglottis rotundifolia*) are found on the more exposed headlands around the coast. In coastal forest areas, many species are affected by possum and deer browsing. The ground and shrub tiers of the forest are often sparse with very few young hardwood trees.²²

There are a variety of streams and wetlands on Rakiura. Streams often have brown, tannin-stained waters and many are notable for their rich riparian vegetation including thick moss and lichen carpets.²³ The extensive wetlands on the island are nationally significant and minimal human-induced impacts on them has resulted in wetlands with high integrity and intactness. There is a large diversity of wetland types including subalpine bogs, cushion-fields, shrublands, tussocklands, sedgeland, rushlands, tarns, bog ponds, lakes, streams, swamps and saltmarshes.²⁴

The nationally significant Freshwater River catchment contains over 75 km² of spectacularly patterned natural wetlands containing a mosaic of wetland types including acid bog, pools, infertile sand ridges, mānuka/wire rush peatlands, mānuka shrubland, red tussock areas, podocarp forest, oligotrophic wetlands and tidal mudflats. The mudflats are important for shorebirds, especially the southern New Zealand dotterel (*Charadrius obscurus*). The Rakeahua and Toitoi rivers are among other catchments with nationally rare wetlands.²⁵ The wetlands are an important habitat for native fish. They contain large stocks of giant kōkopu (*Galaxias argenteus*), banded kōkopu (*Galaxias fasciatus*) and longfin eel (*Anguilla dieffenbachia*). Two native fish found only in Southland are also present: the Gollum (*Galaxias gollumoides*) and southern flathead galaxias (*Galaxias* sp. 'southern'). The freshwater fauna of Rakiura is also nationally unique due to the absence of salmonids or other introduced fish species; however, there are regular accidental salmonid introductions whose impacts are not currently known.

Rakiura's dune systems are internationally and nationally significant and are some of the finest examples remaining in the world. On Rakiura, native sand dune plants such as pingao (*Desmoschoenus spiralis*) and sand tussock (*Austrofestuca littoralis*) foster a unique and dynamic dune ecology characterised by more freely moving sand. The Mason Bay dune system has been recognised as internationally significant due to its size and natural patterning of flora and fauna. Mason Bay and a few other beaches contain threatened species including the creeping herb (*Gunnera hamiltonii*) and the sand spurge (*Euphorbia glauca*). Other threatened or rare species found in these environments include South Island lily and tutu (*Coriaria* sp. 'sandy coast'). The pimelea moths *Meterana* n. sp. and *Notoreas* n. sp. Exotic marram (*Ammophila arenaria*) was introduced to Rakiura as a tool to stabilise sand movement but has

²⁰ Beaven 2008; Bell & Bramley 2013

²¹ Morgan & Simmons 2014

²² DOC 2012

²³ DOC 2012

²⁴ DOC 2012

²⁵ DOC 2012

invaded some of these dune systems and is considered the greatest threat to these environments.²⁶

Alpine ecosystems are found on Mt Anglem/Hananui, Mt Rakeahua and the Tin Range. They are unique in a national context as they occur at a lower altitude than similar ecosystems on the mainland and a number of common alpine species are not present or have endemic local varieties.²⁷

The offshore islands range from sea-washed rock stacks with no vascular plant life through to larger islands such as Codfish Island/Whenua Hou and Taukihepa/Big South Cape Island which contain substantial forests, scrublands and coastal ecosystems. Introduced mammalian predators have severely affected both plant and animal life on most offshore islands. Removal of introduced animals has taken place on several islands.²⁸ All of these offshore island environments are extremely valuable as they contain ecosystems that are typically less human modified than those on Rakiura. Some – particularly those Titi Islands that have never been invaded by predators – may be of international significance as some of the least modified habitats on the planet. The islands harbour hundreds of thousands of seabirds, including the culturally important tītī (mutton bird *Ardenna grisea*). They have also provided a last refuge for species such as the South Island saddleback/tīeke (*Philesturnus carunculatus carunculatus*).²⁹

Several at risk sub-species live on Rakiura in addition to those mentioned above. Those found only on the island include the Stewart Island fernbird (*Bowdleria punctata stewartiana*), weka (*Gallirallus australis scotti*), robin (*Petroica australis rakiura*) and Stewart Island brown kiwi/tokoeka (*Apteryx australis lawryi*). Stewart Island brown kiwi/tokoeka are present in good numbers and may even be seen during the day. The critically endangered kākāpo (*Strigops habroptilus*) exist now only on Codfish Island/Whenua Hou, having been evacuated from southern Rakiura in the 1980s. Red-crowned parakeet (*Cyanoramphus novaezelandiae novaezelandiae*) are common on Rakiura, while rare or absent on mainland New Zealand. All populations of South Island saddleback (*Philesturnus carunculatus carunculatus*) originate from birds from the Rakiura area.³⁰

Rakiura is a hotspot for endemic plants with 28 of New Zealand's 585 native vascular plant species found nowhere else. At least 32 nationally threatened and uncommon plant species have been recorded.³¹ The island is also home to several rare invertebrate and reptile species.

5.3 Predator Free Rakiura

In 2012, Gareth Morgan approached DOC and suggested a partnership approach to investigate eradication of rats, possums and feral cats from Rakiura.³² The scope was subsequently extended to include the removal of hedgehogs.

The complete Predator Free Rakiura aspiration is extremely ambitious. Rakiura would be a significantly larger biodiversity restoration project than has ever been attempted in New Zealand. It would be 15 times larger than the largest successful

²⁶ DOC 2012

²⁷ DOC 2012

²⁸ Clout & Russell 2016

²⁹ DOC 2012

³⁰ DOC 2012

³¹ de Lange et al. 2004; DOC 2012

³² Bell & Bramley 2013; <http://predatorfreestewartisland.org.nz>

mammal eradication on an island conducted in New Zealand (Norway rats from Campbell Island/Motu Ihupuku).³³ In 2008, the cost of removing rats, possums, hedgehogs and feral cats from Rakiura was estimated to be around \$35–55 million. This cost estimate assumed that aerially distributed toxin would be used across much of the island, with ground based methods being employed around the township.³⁴

A 2013 feasibility study considered that successful eradication across the entire island was not possible with current tools and best practice for island eradications.³⁵ Subsequent efforts have focussed on proposals to make the area around the township predator free – a proposal known as Predator Free Halfmoon Bay.

Three technical reports have been completed considering the methods for predator removal³⁶, construction and management of a predator proof fence³⁷ and biosecurity options³⁸; all focussed around Halfmoon Bay. An economic appraisal of both the Halfmoon Bay proposal and the full Predator Free Rakiura aspiration was completed in 2014.³⁹

No proposal includes deer control or eradication. In New Zealand white-tailed deer (*Odocoileus virginianus*) are only found on Rakiura and one other location, and are considered by some as an iconic and highly valued species on the island. Some sectors of the hunting community also oppose the use of toxins.⁴⁰

The current Regional Pest Management Strategy requires domestic cats to be de-sexed, microchipped and collared on the island, which is seen as essential to success if a predator eradication operation is to succeed⁴¹; however, enforcement is not undertaken and it is unclear how many domestic cats comply with these rules. A review of the strategy is currently underway and a new draft is scheduled for public consultation by Environment Southland in early 2018.

5.3.1 Eradication in inhabited areas

Ensuring complete coverage of inhabited areas (i.e. Halfmoon Bay) is a significant challenge. It requires toxic baits and/or traps to be placed in every structure and area associated with human inhabitants. They would need to be placed in, around and where practical, under, all buildings along with treatment of vehicles and boats. Traps or bait stations would need to be regularly checked. This would commence 3–6 months before eradication programmes started elsewhere in the area and for 6 months afterwards. For this treatment area, 40–60% is private land and therefore near universal support or compliance would be required of land owners and residents.⁴²

³³ Bell & Bramley 2013

³⁴ Beaven 2008

³⁵ Bell & Bramley 2013

³⁶ Ewans 2014

³⁷ Bell 2014

³⁸ Clayton 2015

³⁹ Morgan & Simmons 2014

⁴⁰ Beaven 2008

⁴¹ Ewans 2014

⁴² Beaven 2008; Ewans 2014

Residents could also be asked to take other measures to help remove alternative sources of food for target animals (e.g. stopping composting prior to the operation, storing feed for domestic animals, edible dry goods, etc. in rat proof containers).⁴³

5.3.2 Predator Free Halfmoon Bay

A predator-proof fence was proposed so introduced mammalian predators could be removed from Halfmoon Bay as the first step in a two-stage process of eradication across the island. Since proposal of the fence, other options were put forward for Predator Free Halfmoon Bay including a trap and poisoning grid barrier to minimise re-invasion from outside the treatment area, and targeting of a reduced number of predator species. Even this smaller scale project would be internationally unique given the presence of a permanent settlement, size of the area, proposed methods and mix of predator species targeted.⁴⁴

Ground based methods would be used to remove predators from behind a defended area. This would include the use of toxic baits in bait stations (brodifacoum, diphacinone, cyanide), trapping, spotlight hunting and the use of predator dogs to locate (but not kill) target animals. Localised hand broadcasting of bait could be used around steep areas with poor access. This approach was considered technically feasible with some risks around the ability to fully remove rats from the area and then keep them out.⁴⁵

5.4 Other predator control initiatives

5.4.1 Stewart Island Rakiura Community and Environment Trust

The Stewart Island Rakiura Community and Environment Trust (SIRCET)⁴⁶ was established in 2003 and undertakes a number of environment and conservation projects to enhance both the community and the environment. Their major project is predator control, primarily by trapping, over an area of 210 ha around the township of Oban. They employ two people part time, including a project manager, and are supported by volunteers. The Trust commissioned the first report scoping the potential to eradicate rats, wild cats and possums from Rakiura in 2008.⁴⁷

5.4.2 Mamaku Sanctuary

The Mamaku Sanctuary is a 172 ha property with a large proportion of the land within a 2.1 kilometre km predator proof fence.⁴⁸ Purchased this year from the Dancing Star Foundation, the Sanctuary is now owned by the Mamaku Point Conservation Trust. The new owners plan to increase predator management and address reinvasion within the sanctuary, undertake a range of restoration activities, upgrade the on-site 40-bed education centre, and open the reserve to greater public access e.g. for walking.

⁴³ Ewans 2014

⁴⁴ Ewans 2014

⁴⁵ Ewans 2014

⁴⁶ www.sircet.org.nz

⁴⁷ Beaven 2008

⁴⁸ www.mamakupoint.nz

6 People of Rakiura

6.1 Population

The usually resident population for Rakiura at the time of the 2013 census was 381, a decrease of 6% or 18 people on 2006 (Table 1). Most of the population, 73%, lives in the town of Oban, which has decreased by the same amount as the total island population. In comparison, the Southland District population increased between 2006 and 2013.

Table 1: Usually resident population and population change 2001–2013

Towns/larger settlements	2001	2006	2013	Change (n)		Change (%)	
				2001–2006	2006–2013	2001–2006	2006–2013
Oban	303	294	276	-9	-18	-3.0%	-6.1%
Stewart Island	387	399	381	+12	-18	3.1%	-6.0%
Southland District	28,713	28,434	29,619	-279	1185	-1.0%	4.2%

Between 2016 and 2026, the population of Oban is projected to grow by 3.5%, or 10 people. It is not projected to grow from 2026 to 2046 (Table 2). In comparison, Southland District is expected to grow 2% in the first 10 years and then decline 1.1% from 2026 to 2046.

Table 2: Population projections for selected years (Medium projection)

Towns/larger settlements	2013	2023	2033	2043	Change (%)	
					2013–2023	2023–2043
Stewart Island	390	410	410	410	5.1%	0%
Southland District	30,300	31,500	31,600	31,300	4.0%	-0.6%

Source: Statistics NZ projections

As for the population figures, the number of households on the island has declined between 2006 and 2013 (Table 3). This change is in permanent household numbers, but there are a number of ratepayers on the island who are not resident on the island. Of the 602 ratepayers on the island, 273 (45%) have a Rakiura address and 329 (55%) have an off-island address.

Table 3: Households and household change 2001–2013

Towns/larger settlements	2001	2006	2013	Change (n)		Change (%)	
				2001–2006	2006–2013	2001–2006	2006–2013
Oban	135	135	123	0	-12	0.0%	-8.9%
Stewart Island	168	183	171	15	-12	8.9%	-6.6%
Southland District	10,476	10,548	11,499	72	951	0.7%	9.0%

Almost half the population, 45%, had lived in the same residence for less than 5 years and a quarter (25%) for more than 15 years, at the time of the 2013 census (Table 4). These data show that the proportion who stay in the same house for more than 15 years is noticeably higher on Rakiura than for Southland District, and is slightly higher in Oban than for all of Rakiura. Across New Zealand, 49% have lived

in their same residence for less than 5 years and 15% for more than 15 years, so the Rakiura population is relatively consistent with the national pattern.

Reasons for moving from a current residence nationally can include housing, employment and other social factors such as education and retirement. Those moving for employment reasons are most commonly in the agriculture and fishing sectors.⁴⁹ On Rakiura, there are also short-term or seasonal residents employed in tourism and conservation. As there are limited opportunities to change houses on the island or to acquire a house, employment appears the most important influence on shorter residence stays.

Table 4: Length of residence (2013 census)

Towns/larger settlements	Less than 5 Years	More than 15 Years	Total	Less than 5 Years (%)	More than 15 Years (%)
Oban	123	75	273	45%	27%
Stewart Island	165	90	366	45%	25%
Southland District	13,281	5,622	29,622	45%	19%

Employment has a direct effect on population numbers in rural Southland and Rakiura is no exception.⁵⁰ As a result of declining employment and population on Rakiura, there have been various proposals over time to mitigate the negative effects of threats to employment, such as the current issues around the *Bonamia* oyster parasite in aquaculture farms pushing people to leave. There are also proposals to boost economic development at a regional or island level, such as the Southland Regional Development Strategy proposals for the island, supported by MBIE.

6.2 Demographics

Overall, Oban and Rakiura have an older population than Southland District as a whole (Table 5). Only 15% of the island's population is aged under 14 (primary school age) and only 1% between 15 to 19 years old. Nearly half the population, 44%, is aged between 40 and 64 years old and 18% is older than 65, which is noticeably a larger proportion of older people than for the Southland District.

Table 5: Selected age categories (2013 census)

Towns/larger settlements	0–14 Years	15–19 Years	20–39 Years	40–64 Years	65–79 Years	80+ Years
Oban	12%	2%	26%	42%	15%	3%
Stewart Island	15%	1%	24%	44%	18%	
Southland District	22%	6%	23%	35%	11%	3%

The population is predominantly European (91.9%) with 18.7% Māori and 4.1% other ethnicities. A small proportion of people identify as Pacific (1.6%), Asian (0.8%) or Middle Eastern, Latin American, African (0.8%). This is consistent with Southland District as a whole (Table 6).

⁴⁹ www.stats.govt.nz/browse_for_stats/population/Migration/internal-migration/reasons-for-moving-within-between-regions.aspx

⁵⁰ Taylor et al. 2009

Table 6: Ethnicity (2013 census)

Towns/larger settlements	European	Māori	Pacific Peoples	Asian	Middle Eastern, Latin American, African	Other
Oban	88%	21%	0%	0%	0%	4%
Stewart Island	91.9%	18.7%	1.6%	0.8%	0.8%	4.1%
Southland District	89.8%	10%	0.8%	3.9%	0.6%	2.5%

Note: as census respondents can nominate multiple ethnicities percentages add to >100%.

There is a relatively even split between gender with 192 males and 189 females. This is consistent with Southland District as a whole (Table 7).

Table 7: Gender (2013 census)

Towns/larger settlements	Female	Male
Stewart Island	189	192
Southland District	14,325	15,288

7 Employment and livelihoods

7.1 Business activity and employment

The largest employment sectors in Oban are pubs/taverns, followed by seafood processing (a fifth of employment) then nature reserves/conservation parks operation, and accommodation. Overall, the industries show that tourism (pubs, accommodation, scenic transport, etc.), fishing and seafood processing, and conservation are high employers on the island. Conservation could also capture some tourism-focused employment (e.g. rangers). In 2012, tourism was the leading employer on the island and contributed 69 full time equivalent jobs. A 2010 study estimated visitors' annual spend at \$11.54 million.⁵¹ A number of people are also employed in industries that service the community such as the supermarket, primary education, health and postal services.

Businesses on the island include Real Journeys, the Hotel, 4 Square, Stewart Island Flights, helicopter operators, the three water taxis, and other tourism operators (e.g. accommodation and guides). A search for business diversity identified new businesses starting recently including jade carving courses and electric bike hire, suggesting there are opportunities for diversifying business opportunities. The Stewart Island heritage centre, a \$3.6 million project part funded by the Government, is expected to bring employment opportunities both during construction and as part of ongoing operations.

⁵¹ Tourism Resource Consultants 2010

Table 8: Modified Employment Counts for Oban⁵² ordered from top down for top 20 categories at ANZSIC06 5 digit level, 2016

Rank	Industry Name	MEC
1	Pubs/Taverns and Bars	33.5
2	Seafood Processing	20.8
3	Nature Reserves and Conservation Parks Operation	15.6
4	Accommodation	15.4
5	Scenic and Sightseeing Transport	13.2
6	Rock Lobster and Crab Potting	12.7
7	Supermarket and Grocery Stores	9.5
8	Longline and Rack (Offshore) Aquaculture	8.2
9	Employment Placement and Recruitment Services	7.3
10	Hardware and Building Supplies Retailing	6.2
11	Primary Education	5.8
12	Postal Services	5.7
13	Dairy Cattle Farming	5.2
14	Electricity Distribution	5.0
15	Other Allied Health Services	4.3
16	Cafes and Restaurants	3.9
17	Other Interest Group Services n.e.c.	3.0
18	Clothing Retailing	2.9
19	Local Government Administration	2.6
20	Other Fishing	2.6

Source: Market Economics Research for Environment Southland using Statistics NZ business and employment statistics

A study of aquaculture found that the number of residents employed in primary industries on Rakiura was similar between 2001 (39 residents) and 2013 (36 residents) (Table 9). Over the same period, tourism (represented by accommodation, cafes and restaurants; and cultural and recreational services) increased. Tourism related employment numbers have not substantially changed since 1978, although cruise ships now result in peaks of arrivals on the days they arrive. Total employment has reduced from 240 to 231 people between 2001 and 2013, but unemployment has also fallen from 12 to 3 people.⁵³

Table 9: Employment change on Rakiura, 2001–2013

Industry group	2001		2013	
	Number	Percent	Number	Percent
Agriculture, Forestry and Fishing	39	16%	36	16%
Accommodation, Cafes and Restaurants	36	15%	42	18%
Transport and Storage	36	15%	24	10%
Cultural and Recreational Services	21	9%	27	12%
Financial, Insurance, property and Business Services	18	8%	24	10%
Retail trade	15	6%	15	6%
Manufacturing (including processing)	15	6%	12	5%
Education services	9	4%	9	4%
Health and community services	6	3%	6	3%
All industries	240	100%	231	100%

⁵² The modification is unrounded and includes working proprietors in the count for ANZSIC06 6-Digit Code categories of employment.

⁵³ Baines & Quigley 2015, p. 8

7.2 Fisheries and aquaculture

Fisheries and aquaculture are significant industries for Rakiura. Historically, blue cod (*Parapercis colias*), lobster (*Jasus edwardsii*) and pāua (*Haliotis iris*) were the most important sectors, similar to other towns around southern New Zealand such as Waikawa, Bluff and Riverton. However, since the quota system was introduced in 1986 there has been a move to fewer and larger boats and a focus on deep-sea fishing. As a result, there is also less fish processing occurring on the island.⁵⁴ Despite its history, fishing has never been a sole income source for island residents⁵⁵ although growth over the last 25 years has created jobs on the island as well as people from off-island servicing the fishing industry or fishing local waters. Wild seafood products include blue cod, lobster, pāua, kina (*Evechinus chloroticus*) and oysters (*Ostrea chilensis*), along with inshore finfish stocks. While Bluff is the main port and processing facility, with Riverton a secondary port, there is some fishing infrastructure on Rakiura. Distribution is to seafood markets both domestically and internationally.⁵⁶

In the last 12 years, aquaculture employees on the island have increased from 18 to 23. A 2015 study also found that the annual income for those involved in aquaculture is higher than the median income for other Rakiura residents.⁵⁷ Big Glory Bay is a small (approximately 12 km²) embayment of Paterson Inlet/Whaka a te wera and the 36 consents in the Bay collectively allow for the farming of bivalves, three salmon species, rock lobster and algae. However, current aquaculture activity in the Bay only consists of cage farming of king salmon (also known as Chinook salmon; *Oncorhynchus tshawytscha*), and long line cultivation of green lipped mussels and flat oysters. Operators believe that the Bay is at carrying capacity in terms of both plankton supply for bivalves and nitrogen budget for salmon farming.⁵⁸ There is interest in extending the aquaculture industry to other parts of Rakiura to expand these livelihood opportunities, which is part of the regional development strategy, but there is some opposition to aquaculture expansion from environmental and wildlife protection interests.⁵⁹ The Environmental Defence Society has announced that a proposed salmon farm at Port Pegasus is no longer going ahead.⁶⁰

Oyster farming is another source of income for the island. In 2017, the *Bonamia ostraea* parasite was discovered, with a significant effect on the oyster farming industry. In particular, a major cull of farmed oysters has had to be undertaken and could mean the end of oyster farming in Big Glory Bay, although the farmed populations are being culled with the expectation that the wild populations in Foveaux Strait can be saved, enabling that industry to continue.⁶¹ The figures on fisheries and aquaculture employment given in this report pre-date the discovery of *B. ostraea*. In total, 14 oyster farms are affected and 12 jobs have been lost on the island as a direct result of the cull, with follow on effects to other sectors are likely.⁶²

⁵⁴ Baines & Quigley 2015

⁵⁵ Leppens 2005

⁵⁶ Venture Southland 2012

⁵⁷ Baines & Quigley 2015

⁵⁸ Venture Southland 2012

⁵⁹ www.stuff.co.nz/southland-times/news/92683955/Environmental-groups-voice-concerns-over-Stewart-Island-aquaculture-project

⁶⁰ www.eds.org.nz/our-work/policy/media-statements/media-statements-2017/media-release-nbsp-port-pegasus-salmon-canned

⁶¹ http://www2.nzherald.co.nz/the-country/news/article.cfm?c_id=16&objectid=11876064

⁶² www.radionz.co.nz/news/national/333465/mpi-faces-angry-stewart-island-locals-over-oysters

7.3 Incomes, social deprivation and equity

Household incomes on Rakiura are lower than for Southland District as a whole, with a higher proportion of households earning less than \$20,000 per year and between \$20,000 and \$50,000 per year (Table 10). About half the households have an income of more than \$50,000 per year, fewer than the 63% of households for Southland District that earn in this higher bracket.

Table 10: Household Income (2013 Census, # of households)

Towns/larger settlements	\$0–\$20,000	\$20,001–\$50,000	\$50,001 or more	Total
Oban	18 (15%)	42 (34%)	63 (51%)	123
Stewart Island	18 (12%)	54 (36%)	78 (52%)	150
Southland District	965 (8%)	3,361 (29%)	7,224 (63%)	11,550

A greater proportion of people on Rakiura are involved with voluntary work, 63%, compared to people in Southland District, 43% (Table 11). In particular, a greater number of people are involved with 'Other helping or voluntary work for or through any organisation, group or marae' than for Southland District as a whole. Venture Southland recently developed a database of community groups across Southland and identified 44 on Rakiura. While these findings may reflect a greater engagement in conservation voluntary work on the island, our research also identified that a small number of people are involved in numerous different groups.

Table 11: Voluntary work (2013 Census, # of responses)

Towns/larger settlements	Looking After a Child Who Does Not Live in Own Household	Helping Someone Who is Ill or Has a Disability Who Does Not Live in Own Household	Other Helping or Voluntary Work for or Through Any Organisation, Group or Marae	Share of residents that Volunteer
Oban	33	21	90	63%
Southland District	3,309	1,566	4,017	43%

Note: Data for people aged 15 and over. Numbers represent responses as individuals can mark more than one voluntary activity.

Government superannuation or benefits support a number of residents on the island – primarily superannuation (reflecting the population aged 65 or older) – with a few receiving the unemployment benefit, domestic purposes benefit or other benefits.

7.4 Department of Conservation

DOC employs approximately 8% of the island's working age (15–64) population, 21 out of 264 residents, in either permanent or casual roles. DOC also employs seasonal or temporary staff, some of whom come from the island population but others from off-island, for the seasonal period. In the summer of 2017/18, there are 15 permanent positions (including the manager) of which 12 are full time and three are part time, equating to 14.5 FTEs; however, one position was vacant. There are also up to 6 casual staff that work year-round.

For the summer of 2017/18, an additional 15 temporary staff will be employed, although there is some flexibility in the number of casual and temporary contracts. Overall, this means the DOC workforce nearly doubles in the summer months.

8 Tourism and visitors

8.1 Visitor numbers

The number of visitors to Rakiura in the year to June 2016 was 36,457 and to June 2017, 36,654⁶³, although these figures are based on visitor levy data⁶⁴ and probably miss a small number of visitors arriving by private transport. Morgan and Simmons (2014) estimated that around 30,000 visitors came to the island in 2012/13. Based on this number, the increase since then is 22%.

Following the financial crisis in 2008, there was a significant decline in visitor numbers; however, this has recently reversed with increases evident since 2013, based on ferry and flight passenger numbers. DOC's Rakiura National Park Visitor Centre numbers show a 12% increase since 2012/13.⁶⁵ Growth in international visitors has been particularly strong with MBIE's International Visitor Survey (IVS) recording a 79% increase in international visitors to Rakiura National Park between 2014/15 and 2016/17.⁶⁶ The substantial difference between these two figures highlights the issues with visitor number sources on the island with one source only recording those that come through the door into the centre and the other surveying those of international origin that walk the track. Estimates of visitors from the IVS are also understood to be much higher than other estimates. There appears to have been little change in visits by New Zealanders in recent years⁶⁷ so it is probable that the recent increases in total numbers are driven by growth in international visitors to the island, attracted by the National Park.

Rakiura's economy is heavily influenced by seasonal changes in tourist patterns on the island. The tourist season lasts from Labour Weekend to Easter, with a quiet time over winter with many businesses closing for two months then. However, there were a number of mentions by operators of a lengthening season into the current winter period. Specific points of peak tourism around New Year's Eve and during cruise-ship visits were identified in desktop research and interviews.

8.2 Transport

There are two main ways to access Rakiura. The Stewart Island Experience ferry (run by Real Journeys) runs between Bluff and Halfmoon Bay. It runs up to four return services a day in peak season but less frequently in winter. It also provides freight services for the community to the mainland. The crossing takes 1 hour. The ferry has historically transported up to 85% of visitors to the Island.⁶⁸ Stewart Island Flights offers 3 return flights a day by fixed wing aircraft between Invercargill Airport and the Ryans Creek Airstrip on Rakiura, with more flights per day over the tourist season as demand requires. Around 70% of air passengers are tourists. The flight takes approximately 15 minutes.

⁶³ SDC visitor levy data.

⁶⁴ The visitor levy is a much more accurate measure of numbers than available previously.

⁶⁵ Department of Conservation unpublished data

⁶⁶ International Visitor Survey YE March 2017

⁶⁷ Unpublished data from 2013 and 2016 Survey of New Zealanders

⁶⁸ Tourism Resource Consultants 2010

Other access options include flights to beach landings around the island, the most common one being Mason Bay although other options include West Ruggedy Beach, Little Hellfire Beach and Doughboy Bay. A flight to Mason Bay, walk, water taxi and walk is a popular day trip. Charter boats are available to deliver groups from Bluff and other locations to various points on the island (e.g. hunting block access). There are a number of helicopter companies across Southland that provide helicopter transport services to the island, including directly into hunting blocks. Charter fishing boats and private marine vessels also bring visitors.

In many ways, transport shapes the lives of islanders, overcoming isolation and providing links beyond the island, but also setting timetables and adding travel time and costs to movements of residents, visitors and goods.⁶⁹

8.3 Tourism businesses (including accommodation)

There are a number of accommodation options for visitors. These include the hotel/motel, two other motels, three backpackers lodges, several bed and breakfast options, and houses for rent. DOC and hunting groups maintain numerous huts and there is a forty-bed education centre that is currently being renovated. In addition, families living off the island maintain holiday homes there.⁷⁰

The number one attraction on Rakiura is Ulva Island, a 267 ha island in Paterson Inlet/Whaka a te wera that was declared predator free 1997 and is serviced by water taxi. It is home to several rare bird species including saddleback/tieke, orange fronted parakeets/kākāriki karaka and the Stewart Island weka, with visits by eco-tourism operators. The Venture Southland Tourism Strategy has a vision that by 2020 Rakiura will be recognised as one of the best nature-based island experiences in Australasia.⁷¹

Other businesses cater for walking and tramping, hunting, kayaking, fishing charters, boat tours, the Rakiura Museum and wildlife tours. Shark cage diving is available but is a contentious tourism activity. Concerns have been raised by residents about changing shark behaviour resulting in greater danger for humans and boats from great white sharks (*Carcharodon carcharias*). The primary operators for this activity are based in Bluff.

Cruise ships make regular visits with five ship visits expected in the 2017/18 season; two visited on one day in 2017. Local tourist operators attempt to attract custom from these fleeting visits, but they note that most of the patronage is catered for by the larger tour operators.

8.4 Visitor levy

The Southland District Council (Stewart Island/Rakiura Visitor Levy) Empowering Act 2012 enables Southland District Council to set and collect levies from passengers travelling to Rakiura to provide services and facilities for visitors. The levy was introduced in 2012 and is currently set at \$5 per visitor. It is primarily collected through the transport operators (Stewart Island Flights, Stewart Island Experience,

⁶⁹ Dillon 2005

⁷⁰ As noted in section 6.1, 329 homes have off-island addresses for rating purposes – some of which are rented to residents.

⁷¹ Tourism Resource Consultants 2010

cruise ship operators) or freedom travellers, who travel by other means, can pay the levy directly on the island.

In the year to June 2016 the levy generated \$182,285 in funding for projects on the island and, to June 2017, \$183,270.⁷² To date, funds have been allocated to a variety of projects including wharves at Port William, Millars Beach and Ulva Island, upgrading the Horseshoe Bay Track, picnic tables, free WIFI, SIRCET, the new heritage centre, footpath upgrades, street maps and signage. From 2014 to September 2017, a total of \$255,438 was allocated to these projects.

8.5 Concessions

DOC administers 179 concessions that relate to Rakiura covering a wide range of activities. Not all of these are actively used and some holders have more than one concession. Some relate to authorisations that apply to multiple areas of public conservation lands and waters or even nationwide

Relevant concessions include 48 for guiding, four for helicopter landings, four (of five allowed) for Freshwater River access, two for structures, six for telecommunications, four local concessions for marine mammal watching and a variety of research and wild animal control concessions. The majority of guiding concessions are for the Rakiura Track and Ulva Island, with eight concession holders having concessions only for the Rakiura Track, nine only for Ulva Island, and 17 for both. Many concessions are multi-conservancy ones that are held by organisations that bring package tourists to Rakiura and hold concession to take them on a walk. Where a guiding concession is used, DOC receives revenue on a per head basis.

Concessions are not required for activities below the mean high water springs such as water taxis to Ulva Island, or low-tide beach landings of helicopters or planes. Thus, independent walkers to either Ulva Island or the Rakiura Track do not pay a concession fee, however, those that overnight in a DOC hut would pay hut fees.

8.6 Walking

Ulva Island is the most popular walking destination on the island with 15,599 visitors estimated to have visited in 2016/17.⁷³ Visitor numbers to Ulva Island have increased and remained steady since Norway rat eradication, despite the fall in tourism to the island in general after the financial crisis.⁷⁴

A range of other walks are provided around Oban. These include Observation Rock (10,911 walkers in 2016/17), Ackers Point (4,934 walkers), Raroa Walk (3,279 walkers) and the Lee Bay to Little River section of the Rakiura Track (numbers unknown).

The Rakiura Track is one of New Zealand's nine Great Walks, representing the country's premier multi day walking opportunities. Following a series of facility upgrades, inclusion on the National Visitor Booking System in November 2010 and additional promotion as part of the Air New Zealand partnership (commenced April 2012), use of this track has grown strongly in recent years. In 2016/17, 6,145 visitors walked the track, an increase of 86% since the 2011/12 season (Table 12).

⁷² SDC visitor levy data.

⁷³ DOC, unpublished data.

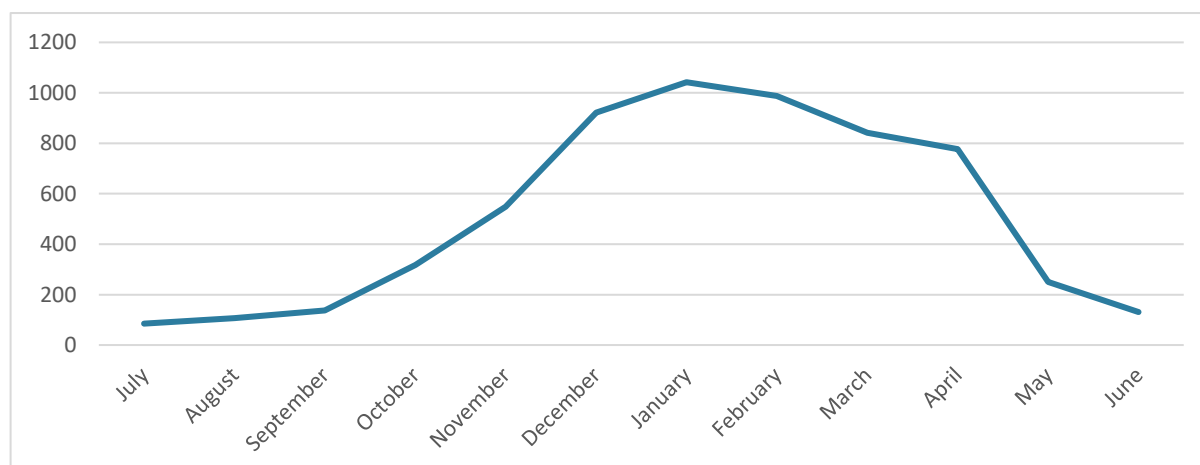
⁷⁴ Morgan & Simmons 2014

Table 12: Monthly and annual visitor numbers for the Rakiura Track from the National Visitor Booking System (NVBS)

Season	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
July	42	32	48	32	84	85
August	41	34	29	65	61	107
September	44	66	102	134	194	137
October	245	141	214	261	263	318
November	268	263	351	269	470	548
December	556	638	715	813	836	922
January	651	680	801	913	1130	1042
February	488	561	646	853	1028	987
March	422	620	584	826	1044	841
April	322	401	513	639	630	777
May	142	96	178	228	193	250
June	84	87	96	72	97	131
Total Visitors for year	3305	3619	4277	5105	6030	6145

Figure 2 shows the monthly numbers for the Rakiura track in 2016/17 and illustrates the seasonal nature of walking activity on the track and to the island in general.

Figure 2: Rakiura Track monthly walking figures for 2016/17



The 7–10 day North-West Circuit is the longest formal tramping track in New Zealand and can be extended further by combining with the lesser used Southern Circuit. It provides a unique opportunity for tramping in a remote, coastal environment. Numbers for the North-West Circuit are unclear as some sections (e.g. Port William to Bungaree Hut and particularly Freshwater Landing to Mason Bay) are more popular than others. The Southern Circuit attracts fewer than 200 visitors per year.

Each year a handful of experienced walkers traverse the Tin Range to or from Port Pegasus in the far south of Rakiura. This area offers a unique wilderness experience to those who are self-reliant and equipped for the challenge, isolation, and weather.⁷⁵

⁷⁵ DOC staff, pers. comm.

8.7 Hunting and fishing

Rakiura is popular for recreational hunting and fishing. It is one of only two areas in New Zealand with white tail deer, and red deer are also present. Public conservation land on Rakiura is divided into hunting blocks that groups are able to book. Open access hunting blocks that do not require booking are also available. The blocks include designated campsites and some have hunter huts managed by the Rakiura Hunter Camp Trust. A system of hunting blocks with huts or campsites also operates on private land owned by the Rakiura Māori Lands Trust with access for a fee and through a booking system.

Recreational hunters from all over New Zealand and occasionally from overseas visit Rakiura, with stays lasting up to ten days. The combined experience of the Rakiura environment and 'back to basics' recreational hunting, camping, tramping, fishing and diving is highly valued, and is unique in New Zealand.⁷⁶ Between 1,500 and 2,000 hunting permits are issued annually for hunting on public conservation land on Rakiura.

Recreational fishing is for blue cod in particular, along with other fin fish and rock lobster. The most popular areas for blue cod are around Halfmoon Bay and Paterson Inlet/Whaka a te wera and the least popular area is the less sheltered Southwest Coast. Fishers access these areas from a combination of private and charter vessels.⁷⁷

In addition to attracting visitors from off the island, hunting and fishing are also an important recreational pursuit and source of meat for island residents (see Section 10.5.4).

8.8 Views on tourism and the economy

Tourism is viewed differently within the community and the tourism industry. On the one hand, many see tourism as an essential component of the island's economy that enables locals to subsist on the island. Moreover, some see tourists as adding richness to the community – with some stories in Celebrating Rakiura paying specific heed towards pleasant and/or commendable experiences with tourists.

On the other hand, there also appears to be a voice in the community (which has spanned across the 10-year period of analysis) that has a more critical view of tourists and tourism, and the utility of further tourism growth. Part of the reason for concerns appears to come from the perception that tourists are in some way 'disrupting the island's way of life', whether that be the natural environment or the cultural/social environment. As early as 2008, there were explicit mentions of how tourism appears to either create, exacerbate or reveal tensions in the community among small business operators who 'fight' over the business of tourists. Specific mentions were made about the 'rumours' and 'misinformation' that occur during the peak tourist periods. This also relates to the apparent disappointment of the loss of the I-SITE in 2008, which was seen as an impartial source of information for visitors (which closed due to a lack of funds and difficult parent company regulations).

There are also conflicting views around conservation (directly and indirectly) in that the island's natural values and resources (e.g. native birds) are the main attraction for tourism, which in turn brings business but also tensions about how the natural

⁷⁶ DOC 2012

⁷⁷ Davey and Hartill, 2011

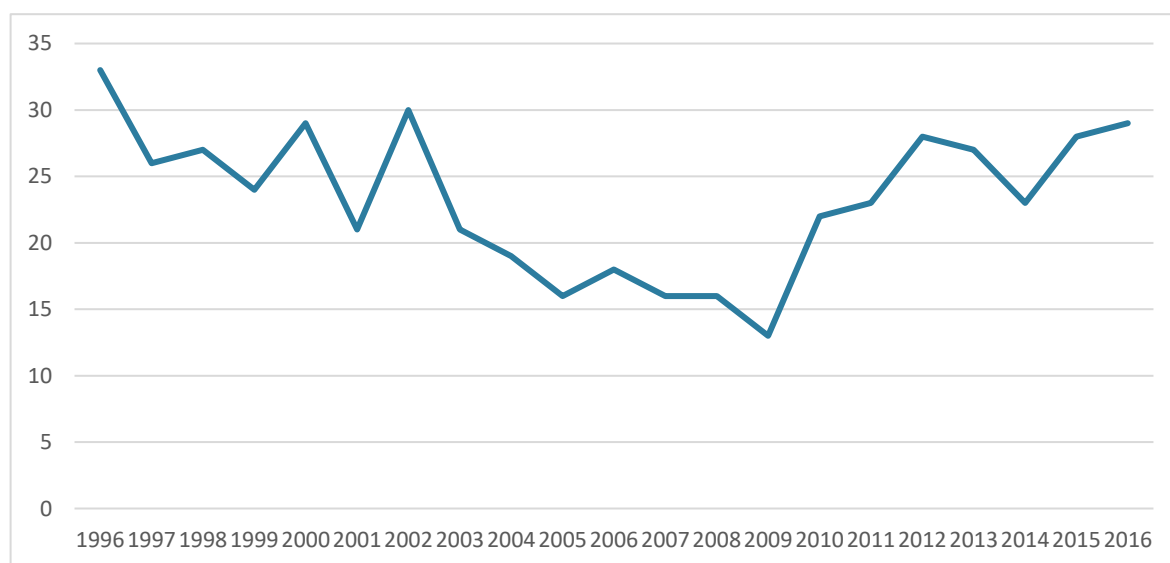
resources should be valued and used. Perceptions of DOC waiver in this context, in that while DOC is readily seen as a partner of the community, the drive towards increasing conservation and tourism appears to have led to a perception that DOC has multiple agendas; one in the island's interests and one for the broader, and sometimes conflicting, national interests and objectives in conservation and economic development.

9 Community, social services and social capital

9.1 Education

There is a single primary school on the island, with a current school roll of 31 students. The school roll dropped to just 13 students in 2009, but has remained in the 20s for the last 6 years (Figure 3). The school currently has two teachers and needs to maintain a roll of more than 26 students to justify retaining both full time teachers.⁷⁸ Given these low roll numbers, economic activity can have important implications for the school as the gain or loss of just a few families can have a disproportionate effect on the role of the school and the positive part it plays in the community.

Figure 3: Halfmoon Bay Primary School roll 1996–2016



The school is involved in a number of environmental and conservation projects including working with SIRCET to manage a trap line, maintaining traps around the community centre, and working on a stream (Mill Creek) restoration project. They integrate the environment into school work with several students doing Science Fair projects, such as testing efficacy of different baits for traps. The principal is currently on a Royal Society of New Zealand science teacher leadership programme fellowship working with DOC.

Options for secondary education are only available off the island and require students either to stay with relatives or board privately, at one of the schools in Invercargill City, or attend a boarding school further afield. Interview participants described families leaving the island in order to support a child that has reached

⁷⁸ www.stuff.co.nz/southland-times/news/68590864/families-respond-to-stewart-island-schools-plea

secondary school age. The primary school has a programme to support transition to boarding school in an effort to reduce this problem.

Almost a quarter of the population has no education qualification, although this is lower than the proportion with no qualification for Southland District as a whole (Table 13). Around half the population has some form of qualification and nearly a third a tertiary qualification – higher than the approximately 20% for Southland District as a whole.

Table 13: Highest education qualification, three categories (2013 Census)

Towns/larger settlements	No Qualification	Level 1–4 + Overseas	Tertiary Qualification
Oban	25%	48%	28%
Stewart Island	21%	49%	29%
Southland District	31%	50%	19%

9.2 Community services

Rakiura has numerous community services, some of which are influenced by fluctuations of factors such as the island’s business growth and decline, availability of time from volunteers, donations, fundraisers and other social events. The types of services range from established centres (such as the community centre) as well as on-going groups and short- to long-term projects (Table 14).

Table 14: Community facilities and services

Service	Relevance to Community
Stewart Island Community Centre - 10 Ayr Street	Used for a variety of purposes including community events, announcements, hosting visitors (schools and VIPs) and everyday activities (i.e. sports/arts/plays). It has gym, sauna, kitchen and stage/lighting. It also provides WiFi which people use just outside the centre. Can accommodate up to 200 people.
Rakiura Heritage Trust (Museum) and Rakiura Heritage Centre Trust (future museum) - 9 Ayr Street	A volunteer community group runs the current Museum in an old building. A new museum is to be constructed and will be run by a new community group. Museums have shorter hours during winter.
Department of Conservation – Rakiura National Park Visitor Centre - Main Road	Provides up to date advice for people wanting to explore the island’s natural environment. It has 2 display rooms and a retail area. It has a conference room with an approximate 50-person capacity.
Library and Library Office - 10 Ayr Street	Attached to the community centre and has limited hours. Volunteer run and has one Southland District Council staff member, who also provides non-library services. It provides an interloan service from the mainland.
Halfmoon Bay Police Station - 537 Kelly Ave	Staffed by a single police officer (currently from Invercargill).
Bunkhouse Theatre - 10 Main Road	Long standing local movie “a local’s tale” that runs continuously (narrated by the local dog - which sits outside the theatre). It runs film festivals (short films) which is a highlight for the community, and mainly shows New Zealand based movies. Has an art stall.

Service	Relevance to Community
Churches	There are two churches, the Oban Presbyterian Church (Kamaha Road) which has a regular Sunday service, Sunday school and occasionally holds events. The St Andrew's Anglican Church (Excelsior Road) has monthly services.
RSA - Ayr Street	Also referred to as 'the pavilion'. Decently sized, holds events. Houses the Stewart Island Lions Club.
Environment Centre - Elgin Terrance	Run by SIRCERT, it is across the road from the beach and is predominately an information centre. Includes info on rat trapping, nurseries, projects (e.g. titi monitoring/sponsor a hectare) and groups.
Medicinal and Edible Plant Garden	On SDC land close to the environment centre and is run by the trustees of SIRCET. A nominal amount is paid towards its maintenance.
Community Garden - Elgin Terrance	Sits behind the medical centre (close to the DOC office). Is run by a volunteer base who maintain the garden.
Community Native Plant Nursery - Horseshoe Bay Road	Is currently visible by a shed but is being moved up to Traill park to make it more accessible to locals. There is a sign-up process for its use. The plants grown are sold at the local markets and the money is returned to SIRCET projects.
Rakiura Rugrats – Stewart Island Early Childhood Education Centre - 6 Ayr Street	Near the school and has one paid helper and a number of parent volunteers. Is important to the community for allowing young parents (mostly mums) to have care while doing other things.

9.3 Health

The island has a small medical centre staffed by two rural nurses. While the nurses have limited hours, they are on call as needed. In emergencies, medical evacuations are flown to Invercargill by Stewart Island Flights. If that is not feasible, or at night, people needing attention are helicoptered to Invercargill or Dunedin by the rescue helicopters based in Te Anau and Dunedin, which requires extra time and expense. Staff in the health centre need specialist expertise in 'rural' health care⁷⁹ as they are responsible for the care of all the island's residents and visitors. Earlier in the island's history, there was an on-island GP who left due to the lack of patients. At present, in any instance of needing medical advice from a GP or specialist, doctors on the mainland (usually Invercargill) will be called by the nurses. Otherwise the islanders are required to make their own way to the mainland for medical specialist attention, which has an associated cost of travel and accommodation that is a barrier for some of the residents. In addition, families of patients incur costs of travel, accommodation and inconvenience when going to support their relative or spouse.

9.4 Local government

Rakiura is within the Environment Southland (Southland Regional Council) area. Environment Southland is responsible for pest management in the region, including Rakiura. The regional council is also responsible for consents relating to toxin use on land. The territorial authority is Southland District Council, currently represented by Councillor Bruce Ford. The island has a community board with seven members, including the local councillor.

⁷⁹ Dillon 2005

Southland District Council owns and operates the Stewart Island Electrical Supply Authority, which is responsible for the generation and supply of electricity on the island. It also undertakes waste collection and manages the Rakiura Resource Recovery Centre and is the consenting agency for land use consents.

9.5 Iwi

There are a number of iwi groups that have an interest in the island. Te Rūnanga o Ngāi Tahu is the tribal authority for the area, along with a number of committee groups both for Rakiura and the nearby tītī (muttonbird) islands:

- Te Rūnanga o Ngāi Tahu
- Rakiura Māori Lands Trust
- Kaitiaki Roopu
- Rakiura Tītī Island Committee
- Rakiura Tītī Islands Administering Body (administer the former Crown Tītī Islands)
- Whenua Hou Committee
- Awarua Runaka
- Oraka Aparima Runaka
- Other Māori land owners/interested parties
- Ngāi Tahu whanui
- Te Whaka o Te Wera Mataitai Committee
- Tangata Tiaki Kaitiaki ki Murihiku
- Manawhenua ki Rakiura

9.6 Community context

Rakiura can be characterised as a community that exhibits traditional rural and island characteristics⁸⁰ of self-reliance and resilience, with an emphasis on individual action alongside an evident willingness to pitch in and work collectively to resolve issues and find local solutions. This community context underlies the issues and effects described later (Section 10), as it shapes many views regarding the impacts of predator management and conservation. The field research and local newsletters, in particular, show how the Rakiura people hold what could be described as 'traditional NZ cultural values'. These include valued qualities such as humility (not being overly proud and not taking things too seriously), practicality (the 'can do' attitude and a valuing of effort), ingenuity (using the resources available in efficient ways), a reverence for nature (outdoor activities and a respect for the natural environment), family and community (tight knit groups and an interdependence between people for a variety of services and needs), and resilience (not complaining too much and getting on with the job).

These qualities seemed to be embedded into the community's way of life and are evident in the ways in which they address problems and approach community based projects (conservation and otherwise). Specifically, the community appears to be very involved and vested in all aspects of the island's environmental and social needs, and therefore prefers a contribution from as many members as possible. Moreover, there seems to be an inclination towards 'practical', effort-based contributions such as offering one's skills, knowledge and time – as illustrated by numerous fundraising efforts and volunteering positions taken on by many on the island. Donations are also a component, but economic contributions seem to be less

⁸⁰ Dillon 2005

emphasised than tangible ones. Tying all of these elements together is an apparent 'self-reliant' way of life, in that the community members contribute in a variety of areas and are resourceful in how they go about it. There is an element of 'overcoming great odds' despite the small size of the community (a narrative consistent with the wider New Zealand culture of the high-achieving 'little guy' – punching above our weight).

This social context appears to influence conservation and predator management projects on the island to date. There were many instances, in our field research and the local Celebrating Rakiura newsletter, of people doing hands-on predator control via trapping and ground-based poisoning. Consistent with the community's ethos for humility, collaboration and light-heartedness, there are many events and competitions which are specifically focused towards conservation (such as kiwi month and rat kill competitions).

With regard to leadership, both local leaders and DOC are trusted authorities that have considerable influence in terms of identifying the conservation needs of the island and the means to address them. Therefore, a complicated relationship emerges between Rakiura and government. At the island level where DOC staff live and work, DOC is seen as an intermediary and a source of local leadership using national resources in managing conservation and predator management, while also being the front for wider government, which is seen as somewhat of an imposition. It seems that much of the hesitancy towards the proposed methods for predator management can be related to the indiscriminate nature of the approach used (e.g. aerial toxins) and lack of involvement from the community in planning and decision-making.

10 Issues and effects

10.1 Community perceptions of key issues

An assessment of media articles⁸¹ and other sources, such as local news items, the SIRCET Celebrating Rakiura Newsletters and other community event notices, and analysis of the field research results, examined the discourse regarding PFR, conservation and tourism. These provide a guide to the scope of potential issues and effects of PFR. A summary of the contextual themes discovered is outlined in Table 15.

Table 15: Contextual themes

Theme	Sub Theme	Description
Culture of Conservation	PFR - Positive	Perceptions that the project, while ambitious, is a worthwhile goal and challenge that would greatly enhance the lives and environment of Rakiura.
	PFR - Critical	Perceptions that the project is overly ambitious (too costly, too large in scope, too unfeasible), and that the supposed outcomes would not necessarily benefit the island (i.e. increased tourism).
	Technology	Covers both technology that is used and accepted (hunting, trapping, hand baiting, ground baiting) and technology that is rejected by some people (aerial poisoning/1080), and technology still in development.
Tourism and Economy	Positive Influence	Perspective that tourism is a vital, necessary and beneficial influence on the Rakiura Community (feeds economy and culture).
	Negative Influence	Perspective that tourism is a means to an end, which, while it serves the economy, causes conflict among community members and degrades the environment and culture.
	Seasonal Fluctuations	Summer boom of tourism (and business) followed by a lull in the winter. Peaks during New Years, cruise ship visits and events.
Social Context	Traditional NZ Values	Qualities include humility, equality, ingenuity, resilience, family, practicality, effort, nature/conservation, and, to some, religiosity.
	Community Life	Everyone is considered and involved in decisions and work. Propensity for rumours/misinformation. Preference for face-to-face, informal, communication.
	Self-Reliance	'Can do', independent attitude that applies to individuals and to the community. Manifests as fundraising, volunteering, donating, community projects, etc).

10.2 The ecological and conservation benefits of predator management

A strong finding from the research is that there is a long-standing interest in conservation on the island and an active interest in the ecological benefits of predator control. Indeed, most respondents commented that the benefits of Predator Free Rakiura would be ecological rather than social or economic and consider these benefits to be sufficient to justify the project. There is clear evidence that local people value the intrinsic ecological values of the island and the specific ecological benefits of predator control for particular species.

The review of local articles and media as well as interviews confirmed this viewpoint, identifying themes that related to conservation on the island, both in general as well as relating to predator-control specifically. Though the review only covered articles from 2008 onwards, about the time Predator Free Rakiura was first proposed, many

references in the newsletters were nostalgic/historical pieces which illustrated that Rakiura has a long history of conservation, particularly with predator (and even more specifically rat) eradication – where people seemed to have taken a personal approach to keeping the cleared areas, such as Ulva Island, predator free and abundant with natural wildlife. DOC’s role on the island aligns closely with this history as, across the years, DOC is spoken about as an integral member of the community who, for the most part, has its interests in the local environment and the community.

Consistent with this strong conservation history, many of the local newsletter articles demonstrated a positive view of predator control on the island and of conservation. Earlier news coverage of Predator Free Rakiura also showed a positive view of predator control as the Predator Free Rakiura plan was often described as an ‘ambitious’ but worthwhile endeavour as it would not only greatly enhance the biodiversity on the island, but would also put Rakiura on the map as the largest predator free island in history – ‘the Galapagos of the south’.

10.3 Project workforce

Depending on the timing and form of Predator Free Rakiura, there will be a need for employment on the island. For a major project, it is anticipated that this would start with a few jobs for planning, research, consultation and management in the lead up to project operational implementation, then would peak during major control or eradication operations, and then result in a long-term investment for ongoing management and biosecurity. There may also be long-term employment opportunities in biodiversity in regards to reintroductions of native species, restoration projects, or building visitor facilities and capacity.

An identified issue with an increase in employment, even a small number of staff, is the lack of seasonal (short-term) and long-term accommodation on the island. While DOC has six houses for staff, these are already at capacity and there is limited long-term accommodation options for medium- and long-term workers. Planning for a Predator Free Rakiura workforce, how they will be housed and what secondary benefits could be provided to the community needs to be an integral part of planning. It is likely that the large workforce needed for an eradication project would require some form of short-term accommodation to be constructed to house these workers. How this is built and its long-term purpose could provide secondary social benefits to the community such as providing elderly (65+) accommodation, which was identified as lacking on the island, greater education or backpacker accommodation, or huts that are then used as visitor facilities on the island. The option to use existing hut accommodation around the island for project teams would also need to be considered. As accommodation is an ongoing problem, and wider than a conservation issue, there is an opportunity to invest in solving a major social issue for the community through the Predator Free Rakiura project. This demonstrates the wider benefits a conservation project can bring to a community if well-managed and carefully implemented, and also how sometimes the most beneficial investments in conservation may not be obviously biodiversity related.

A project workforce will have other short-term benefits to the community if properly managed, in particular, spending in the hospitality industry that would provide economic benefits and potential short-term employment options to service the workforce. However, to get the greatest long-term benefit to the community, the hiring of long-term workers (particularly for planning and then later biosecurity and management stages, and the support provided to them) should be carefully thought

through. Attracting workers with families and supporting them to move to the island could have a number of additional social benefits in terms of long-term population growth, potential students for the school, economic benefits from long-term new residents, sustainability of the existing power supply and options for new technologies, and greater social benefits to the community as these workers would be more likely to integrate into the existing social structure and contribute to the social capital of the island.

10.4 Information and misinformation

As part of our interviews, we asked people for their views on the Predator Free Rakiura aspiration, pests, approaches and biosecurity. In some cases, people were well informed about the issues, but there were also many misperceptions noted and misunderstandings of biological or technical components. There was also a clear interest in being provided with more information about certain issues, particularly biosecurity and being able to visualise and understand what these measures would look like. These issues are not unique to a small community, where it is important to ensure that information is clear and accessible and to be very aware of the easy spread of (in)accurate information.

Some examples of misinformation or lack of clear scientific evidence were around issues such as predator (cat/rat or rat/mouse) interactions e.g. the 'cats keep the rats under control' or the 'rats eat the mice' or 'kiwis are recovering because of rat control'. Scientific evidence⁸² suggests that cats suppress the rats' activity, so the presence of cats mean rats are less visible and when cats are removed rats become more active, and therefore visible, but not more plentiful. While competition from rats may be stopping mice from establishing on Rakiura, it is unlikely rats are eating or hunting the mice, and a lack of suitable habitat, e.g. grasslands, may also play a role restricting the ability of mice to establish. Another area of misinformation or incomplete information is the longevity of toxins in the environment.

There is also a lack of clarity around the effect of different predator control techniques, including the effect of poisons and traps and their by-kill. There were many concerns about the effect of different poisons on animals, their effectiveness, their ability to enter the waterways and how long they stay in the environment. There were also concerns about various traps and their likelihood of hurting or killing native birds.

None of these issues are unique to Rakiura. However, they demonstrate there is a priority need for simple, regular and consistent messaging about the role of predators, their interactions, and the effects of poisons, along with other issues such as incursions, effectiveness of barriers and traps and recent scientific advancements such as from the National Science Challenge. Communication needs to be open, from a trusted source and to enable two-way discussion, so that people can raise their thoughts and issues and receive feedback. It also needs to be tailored to the values, concerns and motivations of the community for supporting predator control. Case studies and spokespeople could be used to demonstrate issues and how they played out in reality, including experiences on other islands, including satellite islands around Rakiura.

⁸² Fitzgerald & Turner 2000.

Finally, several people also raised the opportunity for better messaging about the results and benefits of predator control, and about the rare species and opportunities for their restoration on Rakiura. Examples given included the muttonbirds at Ackers Point managed by SIRCET, examples of deer control and bush regeneration, the benefits of not having rodents in the house as seen on the Titi Islands and, from elsewhere in New Zealand, successful incursion/biosecurity responses such as in the Hauraki Gulf.

10.5 Predator Free Rakiura

Overall, there was wide support for increased site-based predator control and working towards a Predator Free Rakiura goal, although there are still many questions about the technical feasibility and the approach. No participants were completely against greater predator control and, when questioned, only a few people in the community were identified as being against the proposal. While it is unclear why these people are against the aspiration, a number of possible reasons are examined below.

These findings on community support reflect a 2014 survey that found the wider Rakiura community strongly supported the objectives of Predator Free Rakiura but not necessarily all the technical details or methods.⁸³ The community was found to be much less supportive of the predator fence and aerial distribution of toxin, but supported ground-based methods (Table 16).

Table 16: 2014 community survey results⁸⁴

	Full time residents (n= 172)	Part time residents (n = 100)	Visitors (n = 136)
Do you support the idea of Pest Free Rakiura	69% agree	76%	61%
Do you support the erection of a predator fence	19%	27%	37%
Do you support manual trapping of predators	98%	97%	95%
Do you support manual poisoning of predators (i.e. bait stations)	84%	88%	86%
Do you support aerial poisoning of predators	16%	16%	7%

Of the identified predators on the island, this research found there was strong support for the proposed eradication of rats, possums and feral cats, and generally for eradicating them simultaneously if feasible. People were more ambivalent about hedgehogs as they did not see them as a major threat but did consider that they should be included if feasible and where it made sense e.g. as a 'nice to have'.

There were several comments about Predator Free Rakiura being an opportunity to lead the way for, and work under the umbrella of, Predator Free New Zealand and to be a role model for other areas. People also raised concerns regarding the perceived risk that, if action was not taken soon, then Rakiura could miss out to other areas, particularly on the two main islands, as predator control increased and more sanctuaries and predator free areas were created. This could result in a lost opportunity to maintain and increase the island's visitation and tourism revenue.

⁸³ Coats 2014

⁸⁴ Coats 2014

There is also a risk of lost funding opportunity if community support for projects cannot be ensured with uninhabited 'mainland islands' potentially preferred over Rakiura.

10.5.1 Strategy

There is a need for a strategy or pathway for the project from the current status of predator control on Rakiura to a Predator Free Rakiura. Full island eradication is currently an aspirational goal that, if and when feasible, is likely to get high support on the island depending on techniques. However, there were many comments about the feasibility of the project e.g. 'whole island would be great, but can't do it [yet]'.

Conversely, there was very little to no strong support for a Predator Free Halfmoon Bay, beyond that it was a currently feasible area in which to undertake predator control. SIRCET and Mamaku Sanctuary already undertake predator management in this area, and it is not the highest priority for protection of the biodiversity values that residents see as the primary benefit of a PFR. Generally, people were not fixed on a particular project but were keen to see action e.g. to do something, show a proof of concept, or provide evidence of progress. A number of current projects and stepping stones were raised e.g. Ulva Island, Halfmoon Bay, Mamaku Sanctuary, the Neck, and greater control around rare species in particular areas such as dotterels or kiwi.

We conclude that there is a need to define better the Predator Free Rakiura vision and its pathway for the island – which may well be complete eradication – and clearly communicate a set of objectives towards that vision or goal. Complete eradication is unlikely to be financially or practically feasible in the short-term but there is likely to be high support for identifying this as a medium-term goal for the island. The strategy or pathway from now to complete eradication can then be developed. This should start by unifying, under one strategic umbrella, the predator management work currently undertaken by all stakeholders and identifying that all these actions are part of Predator Free Rakiura including:

- DOC predator control around the island including 1080 possum control
- SIRCET work
- trapping and poisoning by individuals on their land around Oban
- control around kiwis by private groups
- reinvasion control on Ulva Island
- control at Mamaku Sanctuary
- control on the Rakiura Māori Lands Trust land
- rat and feral cat control around hunting huts.

A number of next step projects could then be developed that might integrate some of these initiatives and look to expand them. For example, the Neck could be isolated and rat control undertaken, which could lower the reinvasion risk for Ulva Island as well enhancing this high use area. However, such integration of efforts must still respect the autonomy and ownership of the individual projects. There may also be opportunities to create model projects and leverage other funding, e.g. PFNZ2050 funding and National Science Challenge initiatives were also suggested. However, we note that historically complete eradication of predators from an island is achieved through a single orchestrated campaign and that growing site-based predator control projects has not historically been considered a pathway to eradication. This issue is also being discussed within the larger national dialogue of Predator Free New Zealand.

10.5.2 Governance and leadership

We asked people how they wanted to be involved going forwards, which resulted in many suggestions about engagement, but also project governance and leadership.

A critical element was continuing to have an inclusive and responsive approach that works with people. One of the limitations of our research was the missing 'silent voices' and it was identified by respondents that, while community days and activities were excellent, there is a need to use a range of methods to talk widely to people on the island. Regular updates, e.g. via the Stewart Island Newsletter, were also requested.

There were several suggestions of leadership going forwards and the role of DOC and the PFRGG. Several people mentioned that working with SIRCET was a good idea and they could be a vehicle for greater action. There were also suggestions to employ someone for planning and engagement of Predator Free Rakiura. Some groups raised questions about why DOC did not have a greater role and were not perceived as being on the PFRGG, while others thought it appropriate that DOC supported, but did not lead the project. No one raised the need for a new group and in general there was support for streamlining or reducing groups and administration. Also, it is apparent that the role of the PFRGG needs to be better defined: is it an advisory group, a decision-making body, or a funding mechanism? Credibility of leadership is likely to lie in the style of leadership, including being up-front with information and dealing openly with uncertainty, keeping the community well informed, listening to all view points and building social support and trust around the project.

We find that there is a need for a project role to coordinate technical work on moving Predator Free Rakiura forward, as a unifying umbrella concept for any predator management on Rakiura, but also to develop community support for the project, and involve the community on key issues such as methods, and to undertake education about the project. Such a role would enable meeting some of the success factors identified in earlier research, including community ownership and support for the project; understanding and respecting the community's attitudes to eradication, methods and biodiversity; and using a decision-making process that includes groups not resident on the island, such as non-resident property owners and business owners.⁸⁵ This person could also be the main communicator on the project including ensuring regular updates to the community on project progress, but also on what is currently still uncertain and the next steps to address uncertainties.

10.5.3 Methods

A key issue that needs ongoing attention is the dialogue around methods used in any predator management. This project did not set out to specifically discuss methods, as historically this is an issue for technical experts to identify and discuss in consultation with the community. However, participants regularly raised varying views on management methods, particularly toxins. There was a broad range of views from 'bomb the place' through to significant concern about any use of aerial toxin whatsoever. In some cases, this links to (mis)information about approaches, for example, people were concerned about the use of aerial toxin around houses but not in the bush. However, it is highly unlikely that toxin would be distributed aurally near an inhabited area such as Oban. Other concerns were about how long toxins (different poisons) stayed in the environment, the potential for by-kill, the potential

⁸⁵ Bell & Bramley 2013; Beaven 2008

for toxins to enter waterways and affect fishing and aquaculture, and the impact on human health and welling – all of which reflect earlier findings.⁸⁶ Together, the findings suggest that the determination of predator control methods should be an iterative process with the community, where their perceptions are addressed while feasibility studies are conducted. Approached this way, the final result will be based on expert technical knowledge but also have involved the community as partners throughout. The result of a collaborative approach is more likely to produce stronger relationships that are founded on transparency and trust.

10.5.4 Deer

The issue of deer management was raised by many people and there were different views about it. On the island, deer are widely viewed as a hunting resource that provides community benefits in terms of food, family time (e.g. father/son hunting trips), and as a reciprocity resource (e.g. swapping venison for fish etc.). In contrast, for hunters from off the island (who hunt in general or on Rakiura), the deer are generally regarded for their novelty, trophy hunting potential, and opportunity for a 'back to basics' hunting trip. Many people said that this hunting from those off the island brought economic benefits to the community, but when questioned it was estimated that 90% of visiting hunters bypassed Oban and came and went straight from the hunting blocks, consistent with previous research.⁸⁷ While transport operators, including local water taxis, gain some benefits from these groups, the greater economic benefits of shopping and consuming accommodation and food only occurred for a small proportion of hunters or when businesses actively promote their products to hunters.

There were many concerns about deer being included in or affected by predator control or eradication projects, and an emphasis on the need to ensure they are seen as a special resource. However, there were many groups and individuals that also perceived deer as a pest and indicated that they should be actively managed, if not eradicated from the island. Previous work has generally found that deer are viewed as a recreational resource and most people do not want them removed.⁸⁸ While we found divergent views on deer in general, most people were agreed that deer were considered a pest around town where many people commented about them eating gardens e.g. 'they eat my roses'.

Any strategy for Predator Free Rakiura should look to concurrently consider deer explicitly in terms of their ongoing management. This will negate potential concerns and speculation about Predator Free Rakiura being a vehicle to eradicate deer in the long-term.

Because brodifacoum can accumulate in the muscles and organs of deer, there would likely be a withholding period during which commercial hunting would be banned in and around any treatment area, and recreational hunting strongly discouraged. This could be for up to 36 months after the last bait is laid. Hunting would not be practical in areas where people were routinely checking traps and bait stations and carrying out monitoring.⁸⁹ There may be some effect on populations as sub lethal doses of brodifacoum may affect calving.⁹⁰ These issues with toxin use are of major concern to the hunting community and the withholding period for eating deer could have a

⁸⁶ Beaven 2008; Heenan 2009; New Zealand Herald 2008; Radio New Zealand 2014; Southland Times 2009b, 2011, 2012, 2013; www.predatorfreestewartisland.org.nz

⁸⁷ Lovelock & Robinson 2005.

⁸⁸ Beaven 2008; Heenan 2009; New Zealand Herald 2008; Southland Times 2009a

⁸⁹ Ewans 2014

⁹⁰ Beaven 2008

significant effect on local families that rely on venison for food and exchange. While hunters appear to support predator control as a principal, those we spoke to were not supportive of aerial poisoning, or in some cases any poison. When developing predator control methods, both the on-island hunting community and the wider New Zealand hunting community need to be considered as stakeholders.

10.5.5 Domestic cats and dogs

Our findings showed that there has been a significant social change in the attitude to pet management for domestic cats and dogs in recent years. Many people reported on the success of the kiwi aversion training for dogs and the improvements in ensuring dogs were kept on leashes around town and in fenced areas at houses, rather than roaming the streets as once occurred. There was a social expectation that, with greater numbers of kiwi around the village, residents would be more responsible and therefore the community would be clearly aware if there had been an incident with a dog attacking a kiwi. There was also recognition of the need to be responsible cat owners with support for the rules of registration and microchipping, even if these have not been implemented and enforced. We were told two people now had cat 'hotels' i.e. areas where the cat can be outside but are fenced in and therefore cannot prey upon birds.

There were questions raised about visiting pets being brought to the island. Holiday home owners are known to bring their cats and dogs with them to the island (the ferry provides free transport to pets). Although SIRCET arrange for kiwi aversion dog training at peak periods (e.g. long weekends and the holidays) some people questioned whether these visiting animals were controlled to the same level as the permanent resident pets and whether these visiting pets should be allowed to come to the island at all. As an example, the reintroduction of snipe to the Titī Islands has led to a prohibition of domestic cats and dogs, which is successful as people understand the rationale for not taking them to the island.

While no one suggested including domestic cats and dogs in Predator Free Rakiura, it would be sensible to consider the policies on both permanent pet residents and visiting domestic pets as part of the broader project given the impacts these animals can have on native wildlife. These rules could be considered in the review of the Regional Pest Management Plan in 2018.

Interestingly, the issue of domestic cats and dogs being harmed or killed by predator control methods, poison or trapping, was rarely raised, although this has been identified as an issue in past work.⁹¹ Domestic cats and dogs could be at risk from secondary poisoning from eating carcasses, and cats from measures such as trapping or toxins aimed at feral cats. There could also be some risk to domestic chickens depending on the toxins and methodologies used. SIRCET did note that there had been some domestic cats trapped in their trap grid. As long as live cat trapping is undertaken around residential areas, microchipping and collars enable the identification and subsequent release of domestic cats compared to feral cats. Poison, while well known as having a potential effect on domestic pets, particularly dogs, was only raised in the context of people bringing their pets to the nurses for treatment as there is no vet on the island. While this issue was not significant in terms of our findings, ensuring mitigation measures are in place to reduce or eliminate effects on domestic cats and dogs from predator control is still likely to be an important issue.

⁹¹ Beaven 2008; Radio New Zealand 2014; The Press 2015; www.predatorfreestewartisland.org.nz

10.5.6 Biosecurity

Currently, there is limited biosecurity when traveling to Rakiura. Visitors to Ulva Island are encouraged to check their bags for rodents and to clean their shoes. Visitors to the Titī Islands undertake similar self-checks for biosecurity under voluntary guidelines. In contrast, visitors to Whenua Hou undertake potentially the highest level of island biosecurity in New Zealand, due to the presence of kākāpo. Once predators are removed, non-negligible risks of predator incursion would remain from the movement of people, luggage and freight. Incursions are likely and would need to be managed through biosecurity protocols. Several interviewees also raised the question of whether biosecurity should be in place now to stop predators not on the island from arriving, particularly mustelids and mice.

There was a clear lack of information about what biosecurity for Rakiura may look like in a Predator Free Rakiura scenario, or even with greater predator control undertaken. Examples of biosecurity that people anticipated ranged from being asked to check your bag/having a rodent dog check baggage and freight through to pathogen level biosecurity that is in place for Whenua Hou. While some respondents were comfortable with 'whatever you have to do' there were major concerns expressed by others about how intrusive, costly and time-consuming biosecurity could be, as previously raised by residents in other fora.⁹²

Previous research has identified that routine checks of luggage and gear by trained staff with predator detection dogs would be required at several locations, potentially requiring purpose built facilities. Likely locations are Bluff and Halfmoon Bay wharves, Invercargill Airport, Stewart Island Airport, Stewart Island Airfield and Fern Gully Heliport. These areas are the common departure and arrival points for most trips to the island. Other measures could include:⁹³

- information for visitors and residents about the reasons for biosecurity
- traps and bait stations at departure wharves
- signage and education for voluntary checks
- compulsory checks – either visibly or with detection dogs (rodent and others)
- predator proof containers and storage sheds
- restricting the number of departure points to Rakiura
- biosecurity facilities for aquaculture
- developing a biosecurity certification system for boats.

Most biosecurity measures for the target predators of Predator Free Rakiura are relatively unobtrusive but some private properties or vessels could require specific plans agreed with owners because of their higher level of risk (e.g. large size, presence of food, rubbish or building structures).

Another concern from respondents was whether biosecurity would be feasible. While most visitors come either by ferry or air and freight from Bluff, giving clear departure and arrival points for biosecurity, the number of fishing, hunting and other boats and helicopters that travel from various points around Southland to various points around Rakiura (either to land or even just anchor within swimming distance of land) was raised as a major issue for ensuring adequate biosecurity. These are issues that have also been raised in the past.⁹⁴

⁹² www.predatorfreestewartisland.org.nz

⁹³ Beaven 2008

⁹⁴ Beaven 2008; Southland Times 2013, 2014; The Press 2015

The pathways and vectors with the highest risk are as follows:

- Domestic cats establishing new feral populations if cats are not de-sexed.
- Bulk transfer of cargo from Bluff and other ports to Halfmoon Bay, Big Glory Bay and Paterson Inlet.
- Boats travelling to and from aquaculture areas.
- Commercial fishing vessels.
- Large groups (e.g. hunters) moving equipment and supplies by boat or helicopter to various locations.
- Vessels sinking or running aground.
- Cargo being carried by helicopter.
- Residents and visitors bringing large quantities of supplies onto the island.
- Deliberate reintroduction of species.

Mice would need specific consideration as they are known to be arriving on the island but have not established, presumably due to competition with rats. If rats were removed, even from key arrival areas, preventing mouse establishment would need serious consideration.

Given that the reinvasion risk is predominantly related to human activities, community acceptance, support for and involvement in development of biosecurity measures, by both the Rakiura island community and the wider tourism and transport stakeholders, is vital for biosecurity measures to be effective. As there is a high level of concern, and a lack of knowledge of what biosecurity would look like or how incursions are dealt with, developing the likely biosecurity measures, and communicating and discussing these with stakeholders early on would be vital. Clearly linking the level of biosecurity to the Predator Free Rakiura target species (i.e. vertebrate predators) and articulating, if not demonstrating, what it will actually mean for residents for their personal travel, for visitors, for freight, for boats and hunters would be important to build support for any proposal. In addition, building an understanding of why biosecurity is needed can commence immediately to develop social acceptance. Biosecurity measures could also commence in the short-term, for example asking people to check bags and freight checks with detector dogs, to demonstrate the nature of biosecurity in terms of time and invasiveness going forwards.

Finally, the cost for funding biosecurity needs to be considered and discussed in the community. We are not aware of discussions on how biosecurity would be funded. However, biosecurity to Rakiura will predominantly be the responsibility of the regional council, Environment Southland. Options for funding biosecurity would need to be considered and discussed with the community.

10.5.7 Kiore

Kiore are a target species for the predator removal but also a valued taonga species for some Māori.⁹⁵ A 2016 study on the ethics of killing introduced animals found that the local community did not think that kiore should be excluded from the eradication due to their cultural value.⁹⁶ Interviewees did not raise concerns about the eradication of kiore from Rakiura, and kiore have already been eradicated from some of the offshore islands. While there does not appear to be a strong desire to protect

⁹⁵ Bell & Bramley 2013

⁹⁶ Specht 2016

kiore for their cultural value on Rakiura, ongoing discussions will be needed with local iwi to confirm the approach to kiore in predator control.

10.6 Effects of eradication on non-target species

Predator control has impacts on non-target species⁹⁷ and this has been raised in various fora as a concern for residents.⁹⁸ Impacts on conservation values are considered low and the risk is primarily to individual animals rather than to populations. Some identified risks to non-target species are as follows:

- Where rats and possums remove bait from bait stations, animals such as paradise shelducks and Stewart Island weka could eat the bait.
- Primary poisoning of inquisitive birds could occur e.g. South Island kākā, South Island robins, tomtits or kākārīki.
- Secondary poisoning of predatory or scavenging birds could occur e.g. black backed gulls, morepork, Australasian harrier, NZ falcon.
- Ground dwelling and inquisitive birds (e.g. weka, Stewart Island kiwi, South Island kākā) could be at risk from some trapping techniques depending on what is used.
- Ruru and other predatory birds may also migrate out of the treatment area once rats are removed as this is a main food source for them.
- Poisoning of deer resulting in death or residual poisons in the meat.
- Poisoning or trapping of domestic cats and dogs either directly, or via secondary poisoning.

Mitigation of effects relating to non-target species is possible but would have to be balanced with the cost and effectiveness of predator removal methods. Some mitigation measures may themselves have impacts on the community. Possible mitigations include:

- temporary removal of native species from the treatment area
- muzzling dogs during the main predator control period
- keeping pets inside, in outdoor enclosures or temporarily removing them from the island
- modifying bait station or trap design
- using deer repellent on poison
- advising hunters to discard offal (where toxin is most likely to accumulate) and offering testing for any deer shot for home consumption
- implementing non-toxic buffer areas
- replacement of brodifacoum with diphacinone or traps for some or all of the treatment area
- holding stocks of antidote for anti-coagulant toxins on the island.

10.7 Reduced predator nuisance and control

Removal of rats from around the township will remove a nuisance to local residents. It will remove impacts such as damage to homes, vehicles and properties from rats chewing on wiring and the potential human health impacts from rats will be removed.⁹⁹ The productivity of local gardens may also increase.¹⁰⁰

⁹⁷ Ewans 2014

⁹⁸ Beaven 2008; Southland Times 2011; www.predatorfreestewartisland.org.nz

⁹⁹ Wilson et al. 2017

¹⁰⁰ Beaven 2008

10.8 Biodiversity restoration

Significant biodiversity gains could be expected as a result of eradication of predators from Rakiura.¹⁰¹ Species that would benefit from island eradication in particular include: Stewart Island fernbird/mātā, Stewart Island robin/toutouwai, kākā, kererū (*Hemiphaga novaeseelandiae*), kākārīki, rifleman/titipounamu, kiwi, brown creeper, harlequin gecko, southern skink, southern New Zealand dotterel, short and long tailed bats and Stewart Island weka. Not all of these species are present or have suitable habitat around the township. Other plant and animal species would also benefit. There may be potential for other forest birds to be reintroduced to the Halfmoon Bay area. Species listed as suitable after eradication of predators from the island are kākāpo, saddleback/tīeke (already present on Ulva Island), mohua, takahē and North Island kōkākō (as a surrogate for the likely extinct South Island kōkākō).

Biodiversity gains have already been demonstrated as a result of predator control around the town. There have been substantial increases in populations of tūi and bellbird, and Stewart Island weka have been successfully introduced to the township and this is attributed to predator control undertaken by SIRCET. A 2015 bird survey found that kākārīki were significantly more likely to be present at predator control sites than at other sites during morning bird surveys.¹⁰² Importantly, the current abundance and diversity of birds around the township counter-intuitively has some negative implications for progressing Predator Free Rakiura. For example, some residents do not recognise that the diversity of birds around the township is not reflective of the entirety of Rakiura. Furthermore, to experience many of the native birds that Predator Free Rakiura would restore, already many tourists need not go any further than the township or Ulva Island.

10.9 Tourism

The views on tourism effects were diverse with different predictions on whether it would increase tourism, and differing views on whether that tourism would be beneficial to the community. In 2014, a study anticipated that Predator Free Halfmoon Bay could result in a 50–75% increase in tourist visits, an increase in the length of stay, and an increase in tourism spend of 80–140% on the island.¹⁰³ Our findings are that, while increased predator control and removal provides opportunities to develop tourism on the island and this would be beneficial to the community, there are a number of capacity constraints that need to be addressed first. There also needs to be a managed approach to any tourism increase to ensure that it is beneficial to the community and within social and infrastructural limits.

Our research found that there were a number of people who thought that tourism would increase and many commented on the recent shift already in employment industries on the island from traditional fishing and aquaculture industries to tourism and hospitality related employment. Our research also identified there could be opportunities to develop longer term visits and convert day trips into overnight stays, or one-night stays into longer stays. However, many people also commented that increased predator control alone may not be sufficient to attract tourists, but would need to be used as a selling point for the island. Residents often commented that the National Park had not delivered the tourism increases that had been

¹⁰¹ Beaven 2008

¹⁰² predatorfreestewartisland.org.nz/acoustic-recorder-forest-bird-survey/

¹⁰³ Morgan & Simmons 2014

predicted for the island, and used this to caution how much tourism might result from a Predator Free Rakiura (see sections 8.1 and 8.6 for discussion of actual numbers).

A significant issue raised with enabling increased tourism was the capacity of the island to host more tourists. In particular, the need for more accommodation, a greater number and diversity of restaurants, and an information centre, were all mentioned, along with smaller infrastructure investments. Increased tourism would result in an increased revenue from the visitor levy which could address some of the smaller infrastructure needs such as footpaths, toilets and information boards and booths.

While there are a number of restaurant and food businesses on the island, it was mentioned that some have closed in recent times, most recently the fish and chip shop, which is currently for sale. There are several reasons for businesses closing such as owners leaving for children's high school education, a desire to leave the island and struggling to make a profit all mentioned. Those working in the tourism industry noted that the lack of diversity in eating establishments was a significant issue for visitors to the island.

Accommodation was also mentioned as a constraint, both for visitors and workers. The shortage of visitor accommodation in the peak season is considered a major constraint and identified as a reason for many day trips or short trips. A greater number of bed nights will only be possible with an expansion of the accommodation options on the island. Employers also noted that seasonal worker accommodation was a major constraint when employing summer workers for the peak tourism season, as many of these employees come from off-island and need to be accommodated for several months. Most employers house seasonal workers in houses they own for this purpose; however, they all mentioned that they needed more seasonal accommodation and that this would be a major constraint to employing more people to accommodate more tourists. Both building new houses or purchasing existing housing stock is difficult and expensive.

Finally, many people raised the negative impacts of tourism and there was general agreement across all interviewees that a significant increase in tourism could have a negative net effect on the community. Many people made comments along the lines of 'we don't want to be like Queenstown', including those in the tourism industry. Therefore, while some increase in tourism is likely possible from Predator Free Rakiura, if it is combined with actions to promote the island and address the capacity constraint, it needs to be carefully managed to ensure the net gain is beneficial to the community.

10.10 Effects on community cohesion

Predator Free Rakiura sits at a pivotal juncture of biodiversity, tourism, livelihoods and ways of life for island people. As a closely-knit community that relies on each other for a variety of needs, it is important for the community to maintain a strong element of cohesion. At the same time, there will always be divided views and tensions in the community about support for Predator Free Rakiura, predator control methods or tourism outcomes. Formal organisations and social structures, including central government agencies, local and regional council, and corporates have a limited presence on the island. Communication is largely informal in nature and leadership relaxed. While the informal nature of social organisation can be a great strength, it also means the community is vulnerable to social conflicts that become

difficult to manage. Potential sources of this effect from Predator Free Rakiura include:

- any restriction, or even hiatus, in deer hunting
- use of aerial poison
- any presence of toxins in coastal water or marine resources
- the presence of a predator fence that restricts movement/access
- excessive or awkward biosecurity arrangements
- an increase in tourism numbers beyond social and infrastructural carrying capacity
- employment and livelihoods – who gets or loses jobs
- unreasonable expectations of volunteers
- methods of community engagement
- generational differences in terms of perspectives and acceptance
- different views of old timers and newcomers
- how leadership is structured and who is represented.

11 Ways forward and recommendations

This report provides the findings of an SIA of the proposal for a Predator Free Rakiura. In this sense, the report is a strategic assessment of an aspiration rather than an assessment of a specifically identified project or action. The report provides a baseline description of the social environment, and identifies key characteristics of the island community and social environment that are likely to influence how Predator Free Rakiura is designed and implemented. The report scopes key issues and effects, and identifies the ways in which different stakeholders will have an interest in Predator Free Rakiura, the main concerns and barriers they identify for Predator Free Rakiura, and how negative effects could be mitigated and positive ones enhanced. Suggestions are made for phasing Predator Free Rakiura, project leadership and governance, and how ongoing engagement with the community and stakeholders should proceed from here.

A variety of different social effects were explored, especially around tourism and the opportunities, constraints and issues it poses, particularly if there is any increase in visitor numbers. Other effects examined were biosecurity, access, hunting, health, employment in conservation, and community cohesion.

Overall, there is support for greater predator control on Rakiura, including building on progress already made, management of predators in new areas that are feasible and, eventually, for a vision of a predator free island. While the community and stakeholders appreciated the idea of Predator Free Rakiura, many raised questions about its feasibility, both technically (e.g. were the methods available), phasing or stages of action, and financially (who would pay).

It is clear that there is a lot of information and misinformation in the community about the aspiration of Predator Free Rakiura, the different approaches to operationalising it and the various methodologies that could be employed (including toxins). There are some areas where communication of science could improve community understanding and knowledge of the science behind predator control, particularly, where this information is related to the values, beliefs and concerns of stakeholders and their motivations for supporting or not supporting Predator Free Rakiura. There appears to be a clear need for clear, regular and consistent messaging about the role of predators, their interactions, and the effects of toxins, along with other issues such as management of incursions, effectiveness of barriers and traps, and recent scientific and technical advancements.

The research found that the Rakiura community is highly motivated and engaged, and one that values 'hands on' contributions for island prosperity. Working with this feature of island social life is essential for success in designing and implementing Predator Free Rakiura from this point, including mitigating any changes that can affect livelihoods and ways of life. Willingness of many to be involved in a positive strategy is a major feature that offers potential for an agency such as DOC, SIRCET or the PFRGG to work with and leverage off in terms of their existing, local role in the community. The 'wrong' approach can be more detrimental than beneficial; but, done well, this motivation can be used as momentum for change. Therefore, community involvement and support are the levers for long-term success.

Issues raised and suggestions made for taking Predator Free Rakiura to the next stage include the following:

- Embedding it within a clear, long-term environmental, economic and social vision for the island, and a clear vision and predator management end point for Predator Free Rakiura within that vision.
- Recognising and building on what restoration has already been achieved on the island by SIRCET, DOC, other organisations and private land owners through unifying all predator control activities that are currently happening and identifying that all these actions are part of the first phase of a pathway to Predator Free Rakiura.
- Identifying opportunities for further predator control activities that become the next phase of the pathway to the vision, that build on existing work and leverage other initiatives such as Predator Free New Zealand, National Science Challenges and national funding and research activities. These could include targeting particular species, areas, trialling new technologies, or focusing on bringing together current initiatives to bridge gaps and create larger predator controlled areas.
- Developing an understanding of how biosecurity should be managed both now (to prevent new vertebrate pests arriving) and following predator control initiatives. The approach should include commencing education and communication efforts on the purpose of biosecurity, and potentially implementing some actions as part of a biosecurity plan for Rakiura.
- Providing regular communication and updates on Predator Free Rakiura via the website, Stewart Island Newsletter, open days and social media.
- Ensuring there is ongoing engagement that speaks to all the island residents and stakeholders, including 'silent voices' using a range of engagement communication methods. Different engagement methods need to be considered for the different groups of stakeholders and a detailed engagement plan needs to be developed in support of a unified strategy,
- Encouraging Predator Free NZ or Predator Free 2050 to have a webpage with case studies on islands/mainland islands and associated technical information and research.
- Better defining the role of the PFRGG: is it an advisory group, a decision-making body, or a funding mechanism?
- Considering employing a person, on-island, to advance the next steps including ongoing updates, education and communication to the community, engaging with the different parties on their views, coordinating current activities, and planning future activities. It is important to demonstrate actions alongside words but in a coordinated approach.

Table 17 provides some guidance on potential methods that could be used with different stakeholder groups.

Table 17: Possible methods of engagement with stakeholder groups

Stakeholder group	Method of engagement
General community (adults)	<ul style="list-style-type: none"> - Updates via Stewart Island News - Community open days (alone or in coordination with other events) - Survey of all residents (paper or face to face) to comprehensively gauge position on particular proposals for actions - Social media such as a Facebook page
Environmental and community groups (e.g. SIRCET)	<ul style="list-style-type: none"> - Regular discussions with trustees and employees via meetings or two-way online or paper communication
Businesses and organisations (e.g. Real Journeys, accommodation/transport operators, other facilities (e.g. Mamaku Sanctuary)	<ul style="list-style-type: none"> - One-to-one discussions on how to work together - Focus group sessions to look at key issues and opportunities to address
Non-resident ratepayers	<ul style="list-style-type: none"> - Postal survey to comprehensively gauge position on proposals for actions - Hold community events at key holiday times (e.g. long weekends, summer holidays) to encourage face to face discussions, including specific issues such as pet management
High-school and university students	<ul style="list-style-type: none"> - Hold community events at school and university holidays when those studying off-island can attend - Consider a social media engagement platform for youth to discuss the issues (e.g. via a Facebook group).
Primary school students	<ul style="list-style-type: none"> - Use school programmes to engage on the issues and discuss views (e.g. science fair projects, ongoing trapping projects, etc.)
Tourists	<ul style="list-style-type: none"> - One-to-one discussions with operators - Visitor surveys (paper or online, onsite or offsite) - Using social media platforms e.g. Facebook, Twitter, TripAdvisor

12 References

- Aley, J. (2016). *Environmental and pest management attitudes of Hauraki Gulf island communities*. MSc thesis. University of Auckland, Auckland, New Zealand. 196 p.
- Baines, J. & Quigley, R. (2015). *The social and community effects of aquaculture. A case study of Southland aquaculture*. MPI Information Paper No: 2015/06. 49 p.
- Beaven, B. (2008). *Scoping the potential to eradicate rats, wild cats and possums from Stewart Island / Rakiura*. Unpublished report produced by the Department of Conservation for Stewart Island / Rakiura Community & Environment Trust (SIRCET). 140 p.
- Bell, P. (2014). *Predator Free Rakiura Halfmoon Bay Project – analysis of options for proposed predator fence*. Report prepared by the Department of Conservation for the Predator Free Rakiura Governance Group. 17 p.
- Bell, P. & Bramley, A. (2013). *Eliminating predators from Stewart Island: scoping report to investigating issues of technical feasibility*. Department of Conservation, Wellington. 23 p.
- Clayton, R. (2015). *Predator Free Rakiura Halfmoon Bay Project – biosecurity options*. Report prepared by Nivalis Ecology for the Predator Free Rakiura Governance Group. 29 p.
- Clout, M.N. & Russell, J.C. (2006). *The eradication of mammals from New Zealand islands*. In: Koike, F., Clout, M.N., Kawamichi, M., De Poorter, M., Iwatsuki, K. eds. *Assessment and control of biological invasion risks*. Gland, Switzerland, International Union for Conservation of Nature. Pp. 127–141.
- Coats, V. (2014). *Predator free survey results*. Accessed from <http://rakiura.weebly.com/results.html> on 27/7/2017.
- Davey, N. & Hartill, B. (2011). *Survey of the Southland recreational blue cod fishery during the 2009–2010 fishing year*. New Zealand Fisheries Assessment Report 2011/57. Ministry of Fisheries, Wellington, New Zealand. 50 p.
- De Lange, P.J., Norton, D.A., Heenan, P.B., Courtney, S.P., Molloy, P.B.J., Ogle, C.C., Rance, B.D., Johnson, P.N., & Hitchmough, R. (2004). *Threatened and uncommon plants of New Zealand*. *New Zealand Journal of Botany* 42(1): 45–76.
- Dillon, D. (2005). *Islands, islandness and nursing: advanced nursing practice in rural remote and small island areas*. A dissertation submitted to Otago Polytechnic, Dunedin, in partial fulfilment of the degree of Master of Nursing.
- DOC (2012). *Stewart Island/Rakiura Conservation Management Strategy and Rakiura National Park Management Plan 2011–2021*. Department of Conservation, Invercargill, New Zealand. 309 p.
- Ewans, R. (2014). *Predator Free Rakiura Halfmoon Bay Project – methods for predator removal*. Report prepared by Eco-South for the Predator Free Rakiura Governance Group. 56 p.
- Fitzgerald, B. M., & Turner, D. C. (2000). *Hunting behaviour of domestic cats and their impact on prey populations*. *The domestic cat: the biology of its behaviour*. Edited by DC Turner and P. Bateson. Cambridge University Press, Cambridge, 151-176.

- Glen, A.S., Atkinson, R., Campbell, K.J., Hagen, E., Holmes, N.D., Keitt, B.S., Parkes, J.P., Saunders, A., Sawyer, J., & Torres, H. (2013). *Eradicating multiple invasive species on inhabited islands: the next big step in island restoration?* *Biological Invasions*, 15(12), 2589–2603.
- Green, W. & Rohan, M. (2012). *Opposition to aerial 1080 poisoning for control of invasive mammals in New Zealand: risk perceptions and agency responses*. *Journal of the Royal Society of New Zealand* 42(3): 185–213.
- Heenan, R. (2009). *Draft Stewart Island / Rakiura Conservation Management Strategy and Draft Rakiura National Park Management Plan: Summary of Submissions May 2009*. Department of Conservation, Invercargill. 35 p.
- Howald, G., Donlan, C., Galván, J.P., Russell, J.C., Parkes, J., Samaniego, A., Wang, Y., Veitch, D., Genovesi, P., Pascal, M., Saunders, A., & Tershy, B. (2007). *Invasive rodent eradication on islands*. *Conservation Biology*, 21(5), 1258–1268.
- Kannermeyer, R.L. (2013). *Public attitudes to pest control and aerial 1080 use in the Coromandel*. Unpublished MSc thesis, University of Auckland, Auckland. 209 p.
- Leppens, J. (2005). *Fishing for tourists: perceptions from the Stewart Island Community of the creation of Rakiura National Park*. Masters Thesis, Lincoln University, New Zealand.
- Lovelock, B., & Robinson, K. (2005). *Maximizing economic returns from consumptive wildlife tourism in peripheral areas: white-tailed deer hunting on Stewart Island/Rakiura, New Zealand*. *Nature-based tourism in peripheral areas: Development or disaster*, 151–172.
- Morgan, G. & Simmons, G. (2014). *Predator-Free Rakiura an economic appraisal*. Morgan Foundation, Wellington. 52 p.
- New Zealand Herald (2008). *\$35m plan to rid island. Community in support but deer hunters likely to be upset*. Anon. published 11/3/2008.
- Ogden, J. & Gilbert, J. (2009). *Prospects for the eradication of rats from a large inhabited island: community based ecosystem studies on Great Barrier Island*. *New Zealand Biological Invasions* 11(7): 1705–1717.
- Oppel, S., Beaven, B.M., Bolton, M., Vickery, J., & Bodey, T.W. (2011). *Eradication of invasive mammals on islands inhabited by humans and domestic animals*. *Conservation Biology* 25(2): 232–240.
- Radio New Zealand (2014). *Stewart islanders prepare for heated public debate on predator fence for the island*. Radio New Zealand Newswire 15/4/2014.
- Russell, J.C., Taylor, C.N., & Aley J.P. (in press). *Social assessment of inhabited islands for wildlife management and eradication* *Australasian Journal of Environmental Management*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2873280
- Russell, J.C., & Taylor, C.N. (submitted). *Strategic environmental assessment for invasive species management on inhabited islands*. *Proceedings of the Island Invasives 2017 conference*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3022964
- Southland Times (2009a). *Stewart Is deer 'being ignored' by DOC*. Amy Milne published 30/6/2009.

Southland Times (2009b). *Want fewer deer? 'Encourage more hunters'*. Shane Cowlshaw published 18/7/2009.

Southland Times (2011). *The rats have moved in*. Scot Mackay published 2/4/2011.

Southland Times (2012). *Predator-free Stewart Island up to residents, says Morgan*. Neil Ratley published 19/10/2012.

Southland Times (2013). Letter to the editor, Martin Pepers published 4/1/2013.

Southland Times (2014). *Residents rise up over pest fence* Hannah McLeod published 16/4/2014

Specht, M. (2016). *The ethics of killing invasive animals in ecological restoration*. MA thesis. University of Otago, Dunedin, New Zealand. 131 p.

Taylor, C.N., Bryan, C.H., & Goodrich, C.G. (2004) *Social assessment: Theory, process and techniques*. Social Ecology Press, Middleton, Wisconsin.

Taylor, C.N., McCall, R., & Taylor, P.K. (2009). *Going the extra mile ... meeting social needs in Western Southland*. Report on the Western Southland Rural Services Research Project. Presbyterian Support, Invercargill.

The Press (2015). *Predator-free plan forces curbs on cats*. Dave Nicoll published 7/10/2015.

Tourism Resource Consultants (2010). *Stewart Island Visitor Strategy 2010 - 2015*. Report prepared for Venture Southland. Tourism Resource Consultants. 35 p.

Varnham, K., Glass, T., & Stringer, C. (2011). Involving the community in rodent eradication on Tristan da Cunha. In: Veitch, C.R., Clout, M.N., & Towns, D. R. (eds.) *Island Invasives: Eradication and Management*, IUCN, Gland, Switzerland., Pp. 504–507.

Venture Southland (2012). *Southland Aquaculture Strategy*. 21 p.

Wilkinson, I.S., & Priddel, D. (2011). *Rodent eradication on Lord Howe Island: challenges posed by people, livestock, and threatened endemics*. In: Veitch, C.R., Clout, M.N., & Towns, D.R. eds. *Island Invasives: Eradication and Management*. IUCN, Gland, Switzerland. Pp. 508–514.

Wilson, N., McIntyre, M., Blaschke, P., Muellner, P., Mansoor, O.D., & Baker, M.G. (2017). *Potential public health benefits from eradicating rats in New Zealand cities and a tentative research agenda*. *Journal of the Royal Society of New Zealand*. DOI: 10.1080/03036758.2017.1343193.

13 Appendices

13.1 Appendix A: interview questions

- What is your role in the Rakiura community?
 - Note for business / organisation representatives we are looking for their business / organisation view which could differ from their personal view in some instances.
- Do you have a job / company that is related to the island? What is your organisation's role with the island and its community?
 - E.g. hunters – what do you provide e.g. huts / facilitate outside hunting / work with locals, a transport company it might be what services do you provide locals compared to tourists etc.
- How long have you lived on the island / been in business on or with the island?
- What predators are on Rakiura? Which ones are a concern to you?
 - Known predators are: rats (three species), cats, hedgehogs, possums. Mice appear to be unable to establish. Deer are also on the island and sometimes considered a pest.
- What is your understanding of Predator Free Rakiura? If there were options, e.g. full eradication, partial eradication, or status quo what do you think are the benefits and disadvantages of each?
 - Refer community day slides for background information as needed.
- What do you think will be the social effects of a Predator Free Rakiura? Consider:
 - Effects during eradication e.g. temporary workforce to undertake project, controlling pets, closed walkways, hunting restrictions etc.
 - Long-term effects
 - Social impacts include:
 - Health
 - Social services
 - Population change – what are the effects of this (e.g. population growth could mean more children which could mean maintaining / increasing teachers on the island)
 - Employment change
 - Livelihoods (e.g. more jobs = better livelihoods)
 - Local economic impacts – e.g. could it attract more tourism. This could have flow on effects e.g. need for more infrastructure
 - Recreation
 - How could each of these issues affect you / your business? E.g. more tourism = more employment or = more infrastructure needed (some people might see an effect as positive and others as negative)
 - What concerns you about the project? E.g. impact on hunting, biosecurity.
 - What do you think biosecurity after an eradication might look like and how do you think it could affect you?
 - How do you think effects can be managed for the best, long-term outcomes for the community?
 - How would you like to participate in planning from this point?

13.2 Appendix B: Community day questions

- What is your vision for Rakiura and the community? How important do you think Predator Free Rakiura is to this vision?
- Predator Free New Zealand is focused on removing rats, mustelids (stoats, ferrets, weasels) and possums from the whole country by 2050. What role do you think Rakiura has as part of this vision?
- What do you think of each of the predator species on Rakiura (cats, rats, hedgehogs, possums)? Are there any other pest species which are a problem on Rakiura?
- How do you want pest species managed? How do you think the removal of these species from Rakiura would affect your life?
- Thinking about the status quo e.g. leaving things as they are for Rakiura: what do you think of this option? What long-term social impacts do you think it might have?
- Eradicating a single predator: what do you think of this idea? Which predator would you prioritise? What do you think the social impacts during the eradication might be? What do you think are the long-term social impacts of eradicating one predator? How do you think these impacts will affect you, your business / organisation, and the community? If you were to maximise opportunities and mitigate issues from this option what would you recommend?
- Predator Free Rakiura: what do you think of this idea? What do you think the social impacts during the eradication might be? What do you think are the long-term social impacts of a full Predator Free Rakiura eradication? How do you think these impacts will affect you, your business / organisation, and the community? If you were to maximise opportunities and mitigate issues from this option what would you recommend?
- What do you think biosecurity to stop predators returning to Rakiura after any eradication would look like and how do you think it would affect your life?
- Predator Free Rakiura is an ongoing conversation. How would you like to be involved with this project going forwards? Are there any particular voices in the community that aren't being heard, or aspects to the project that haven't been considered? How could these voices or aspects be engaged?

13.3 Appendix C: List of articles searched

Department of Conservation (2012). *Rakiura National Park celebrations 10th anniversary*. Downloaded from: www.doc.govt.nz/news/media-releases/2012/rakiura-national-park-celebrates-10th-anniversary

Forest and Bird (2013) *Pest-free Stewart Island comes one step closer to becoming Reality*. Downloaded from: <http://blog.forestandbird.org.nz/pest-free-stewart-island-comes-one-step-closer-to-becoming-reality/>

Local news (2011) *Stewart Island Snack and Yak – the connecting space between local and community led projects*. Downloaded from: <http://inspiringcommunities.org.nz/wp-content/uploads/2015/03/Snack-and-Yak-The-Stewart-Island-way-of-connecting.pdf>

Local news (2010) *The story of the Stewart Island Community Centre – building a community and a centre to be proud of*. Downloaded from: <http://inspiringcommunities.org.nz/wp-content/uploads/2015/03/Stewart-Island-Community-Centre-story.pdf>

Ministry of Culture and Heritage (2015). *Stewart Island gains first marine heritage site*. Downloaded from: www.mch.govt.nz/news-events/news/stewart-island-gains-first-marine-heritage-site

Newshub (2013). *Pest Free Stewart Island costly – Report*. Downloaded from: www.newshub.co.nz/nznews/pestfree-stewart-island-costly--report-2013051505

One News (2015) *Pest-free plans for Stewart Island sets benchmark to become world's biggest eco-sanctuary*. Downloaded from: www.tvnz.co.nz/one-news/new-zealand/pest-free-plans-for-stewart-island-sets-benchmark-to-become-world-s-biggest-eco-sanctuary-q14237

Otago Daily Times (2008) *Pest Eradication on Stewart Island a bold plan*. Downloaded from: www.odt.co.nz/opinion/editorial/pest-eradication-stewart-island-bold-plan

Otago Daily Times (2015) *Pest-free plan has big price tag*. Downloaded from: www.odt.co.nz/regions/southland/pest-free-plan-has-big-price-tag

Radio New Zealand (2015). *'Team Rat' Completes World's Largest Island Eradication*.

Radio New Zealand (2015) *Stewart Island could become world's biggest sanctuary*. Downloaded from: www.radionz.co.nz/news/regional/286159/stewart-island-could-become-world-s-biggest-sanctuary

Scoop Independent News (2012) *Rakiura/Stewart Island deserves protection*. Downloaded from: www.scoop.co.nz/stories/PA1207/S00147/rakiurastewart-island-deserves-protection.htm

Scoop Independent News (November 2016) *Rat Plague Erupts on Stewart island – what do they eat?* Downloaded from: <http://www.scoop.co.nz/stories/PO1611/S00427/rat-plague-erupts-on-stewart-island-what-do-they-eat.htm>

Scope Media (2015). *World-class Stewart Island eco-sanctuary Dancing Star reserve up for sale (media release from the NZ Sotheby's international Realty)*. Downloaded from: <http://www.scopemediaco.nz/2015/11/world-class-stewart-island-eco-sanctuary-dancing-star-reserve-up-for-sale/>

SIRCET NEWS (2012). Downloaded from: www.sircet.org.nz/site/assets/files/1104/sircet_news_august_2012.pdf

Southland (2014). *Morgan to face residents over predator-free proposal for Stewart Island*. Downloaded from: www.stuff.co.nz/southland-times/news/9941575/Morgan-to-face-residents-over-predator-free-proposal-for-Stewart-Island

Southland Times (2009). *DOC urged to do more for hoihos*. Amy Milne published 22/07/2009.

Southland Times (2016a). *DOC wants to shelve plans for predator fence on Stewart Island*. Dave Nicoll published 13/6/2016.

Southland Times (2016b). *Oban may have deer problem*. Dave Nicoll published 14/7/2016.

Stewart Island News: Celebrating Rakiura (2009). PDF downloaded from: www.stewartislandnews.com/uploads/5/3/5/0/53500577/july_2009.pdf

Stewart Island News: Celebrating Rakiura (Dec 2014 - Jan 2015). Downloaded from: <http://rmlt.co.nz/assets/Uploads/SIN-Dec14.pdf>

Stewart Island News: Celebrating Rakiura (Dec 2015 – Jan 2016). Downloaded from: <http://rmlt.co.nz/assets/Uploads/Dec2015.pdf>

Stewart Island News: Celebrating Rakiura (February 2017) Downloaded from: <http://www.visitrakiura.co.nz/assets/Uploads/Stewart-Island-News-Feb-2017.pdf>

Stewart Island News: Celebrating Rakiura (Jan 2016). Downloaded from: <http://rmlt.co.nz/assets/Uploads/Jan2016.pdf>

Stewart Island News: Celebrating Rakiura (March 2015). Downloaded from: <http://rmlt.co.nz/assets/Uploads/March-SIN.pdf>

Stewart Island News: Celebrating Rakiura (March 2015). Downloaded from: <http://rmlt.co.nz/assets/Uploads/Stewart-Island-News-March-2016.pdf>

Stewart Island News: Celebrating Rakiura (March 2017) Downloaded from: www.visitrakiura.co.nz/assets/Uploads/Stewart-Island-News-March-2017.pdf

Stewart Island News: Celebrating Rakiura (October 2015). Downloaded from: <http://www.visitrakiura.co.nz/assets/Uploads/SIN-October15.pdf>

Stuff.co.nz (2014) *Stewart Island residents back DOC's plan to get rid of feral cats*. Downloaded from: www.stuff.co.nz/environment/81014907/stewart-island-residents-back-docs-plan-to-get-rid-of-feral-cats

Stuff (2016). *Golden summer on Stewart Island as visitor numbers swell*. Dave Nicoll. Accessed from www.stuff.co.nz/travel/76379637/Golden-summer-on-Stewart-Island-as-visitor-numbers-swell on 3/8/2017.

Stuff.co.nz (2016) *Stewart Island kiwi deaths spur southland district council action*. Downloaded from: www.stuff.co.nz/environment/75786148/stewart-island-kiwi-deaths-spur-southland-district-council-action

Stuff.co.nz (2016) *Department of Conservation puts Stewart Island Predator fence on backburner*. Downloaded from: www.stuff.co.nz/environment/80940208/department-of-conservation-puts-stewart-island-predator-fence-on-backburner

Stuff.co.nz (2017) *New Zealand's greatest gifts: Rakiura National Park*. Downloaded from: www.stuff.co.nz/travel/destinations/nz/87191639/new-zealands-greatest-gifts-rakiura-national-park

The Dominion Post (2013). *Pest-free plan for Stewart Island*. Downloaded from: www.stuff.co.nz/environment/8667620/Pest-free-plan-for-Stewart-Island

The Dominion Post (2014) *Pest-free Island 'will create jobs.'* Downloaded from: www.stuff.co.nz/environment/8667620/Pest-free-plan-for-Stewart-Island

The Listener; Fiona Rae (2012) *Editorial: Let's imagine a pest-free New Zealand*. Downloaded from: www.noted.co.nz/archive/listener-nz-2012/editorial-lets-imagine-a-pest-free-new-zealand/

The Southland Times (2009) *Stewart Island community rallies for family*. Downloaded from: www.stuff.co.nz/southland-times/news/3194380/Stewart-Island-community-rallies-for-family

The Southland Times (2009) *Stewart Island tourist operator receives apology*. Downloaded from: www.stuff.co.nz/southland-times/news/22775/Stewart-Island-tourist-operator-receives-apology

The Southland Times (2010) *Stewart Island the place to be*. Downloaded from www.stuff.co.nz/travel/destinations/nz/4506402/Stewart-Island-the-place-to-be

The Southland times (2011) *107 Standard whales die on Stewart Island*. Downloaded from: www.stuff.co.nz/national/4681611/107-stranded-whales-die-on-Stewart-Island

The Southland times (2012) *Shark Researchers return to south*. Downloaded from: www.stuff.co.nz/southland-times/news/6574245/Shark-researchers-return-to-south

The Southland times (2013) *Pest-free island 'would attract tourists'*. Downloaded from: www.stuff.co.nz/national/8865027/Pest-free-island-would-attract-tourists

Tweed, Carol (2010). *Remote, Rugged, Wild and beautiful: Kayaking around Stewart Island*. Downloaded from the Kayaknz website (issue 7) - www.kayaknz.co.nz/site/kayakmagazine/files/Articles/Issue%2057//Remote,%20Rugged,%20Wild%20&%20Beautiful%20-%20Kayaking%20around%20Stewart%20Island%20-%20Issue%2057%20Pages%206-10.pdf

The Southland Times (2015) *Wilderness type with nursing skills wanted on Stewart Island*. Downloaded from: www.stuff.co.nz/national/health/74761809/wilderness-type-with-nursing-skills-wanted-on-stewart-island

nzDoctor.co.nz (2015) *Stewart Island to get regular GP visits for first time in decades*. Downloaded from: www.nzdoctor.co.nz/news/2015/october-2015/08/stewart-island-to-get-regular-gp-visits-for-first-time-in-decades.aspx