PROJECT PLAN

Title: *Poor Knights Islands invasive plant management programme*

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EXECUTIVE SUMMARY

This project plan has been completed by the New Zealand Department of Conservation with support and advice from the Pacific Invasives Initiative. The plan has been designed to guide implementation of invasive plants (weeds) on the Poor Knights islands(PKI) and describes how to proceed with such an operation in the most efficient and effective way.

Invasive plant management on PKI is technically and socially feasible. It is clearly evident from numerous invasive plant management programmes that removal of invasive plants from small (<1000ha) isolated islands such as PKI is highly achievable. The issue however is how best to go about doing so and what level of control or eradication of the weed species present is required for native regeneration.

Invasive plant management has previously occurred on the islands but in a sporadic and *ad hoc* effort. The local community on the mainland adjoining PKI strongly support the total removal of the weeds on PKI in perpetuity. The local Iwi also wish to see their islands protected from invasive plant threats.

This Project plan describes how invasive plant management can be achieved under several stages. It further shows what monitoring is required to demonstrate success, learning's and failures. Lastly it highlights the Biosecurity considerations necessary to ensure the islands are not put at risk of further incursions from the invasive plant management programme.

There are a numbers of risks and challenges that largely revolve around resource availability (skilled labour, island travel logistics, quarantine, staff time, and finances), non-target issues and timeframe planning for completion, particularly surrounding the life duration of the project and timing of treatment. These however can and will be managed as explained further in the document.

(NOTE: This report has been summarised as a training example from documents and personal experience associated with the Poor Knights Islands management programme. It is accurate, but does not reflect the true complexity of the project.)

1. INTRODUCTION

This Project Plan is prepared for the Department of Conservation as an internal document for confirming funding allocations for an invasive plant management project. It is publicly available to any other interested parties.

The Department of Conservation is the administering body for the Poor Knights Island's Nature Reserve and is responsible for implementing such invasive plant management projects. This project is part of a wider offshore island invasive plant programme encompassing other island nature reserves.

The purpose of this plan is to provide details for the Department's management of the work required to undertake invasive plant managements on the Poor Knights Islands.

Thanks to the local Iwi Trust Board, the Bowden family as local enthusiasts in the protection of the Poor Knights and the local tourism dive operators who support the project.

This plan will be used as a guiding document for further planning to eventually implement a comprehensive invasive plant management programme on the Poor Knights.

2. GOAL, OBJECTIVES and OUTCOMES

2.1 Goal

The goal of the proposed project is to ensure the natural processes and ecosystem integrity of the Poor Knights Islands are functioning in a healthy state and secure from invasive plant impacts.

Achieving this goal is important because the PKI has national importance as a significant biodiversity hotspot with numerous threatened plant/animal species and species that are endemic only to the islands. The islands are also home to vulnerable and nationally under-represented forest types.

2.2. Objectives and Outcomes

The invasive plant species present on the islands and their wide extent of distribution determine that a site-led approach to the invasive plant issues is the best approach. The potential for reinvasion combined with, seed bank viability, extent and age of infestations determine the target level of control between eradication and control at opposite ends of the management spectrum.

It is believed some invasive plant species can feasibly be eradicated due to unlikely reinvasion, while others can at best be controlled to zero density over differing time scales due to either bird or wind borne reinvasion of seed.

Table 1: The objectives that this project will work towards and the outcomes that will be seen as a result of achieving these objectives:

Objectives	Outcomes
1. Eradicate all human-dispersed invasive plant species within 5 years	The natural native vegetation colonisation and successional processes which invasive plants otherwise disrupt are maintained
	The unique plant and animal species populations are protected and enhanced by preventing loss of habitat through invasive plant competition.
	The rare and vulnerable coastal forest types remain intact and protected from displacement and transformation by invasive plants.
2. Control to Zero-density bird-dispersed invasive plant species within 10years	As above
	As above
	As above
3. Control to Zero-density wind-dispersed invasive plant species within 20years	As above

3. THE SITE AND TARGET SPECIES

3.1 The Site

The Poor Knights Islands comprise a total area of approximately 272ha. The island group consists of 7 islands and islets - 2 large fully vegetated islands, the rest smaller partially vegetated islands. The islets and coastal edges of Tawhiti Rahi and Aorangi are steep cliffs and broken terrain. Tawhiti Rahi and Aorangi rise to flat plateaus with highest points approx 200m above sea level. Access onto the islands is via difficult boat landings onto rock ledges in calm conditions or via helicopter.

Forested areas are tall canopy up to 15metres high with dense understory. Primarily Pohutukawa *(Metrosideros excelsus)* forest in climax forest areas and mature coastal hardwood forest types in areas recovering from disturbance such as slips, fires or recent history Iwi settlement. Exposed coastal faces are covered in dense coastal scrub up to 2m high or bare exposed rock. The islands are the only breeding place for Bullers shearwater. Fairy prion, Diving petrel, Pycroft petrel, Grey ternlet and blue penguin also breed on the islands.

Iwi have *mana whenua* over the Poor Knights Islands. The islands are therefore extremely *tapu* and sacred sites to Iwi with extensive layers of archaeological sites.

The only mammalian pests to have inhabited the islands were pigs which Captain Cook introduced to Aorangi Island only. These were eradicated in the 1930s.

Diving charter operators are frequently in the waters exploring the world class diving.

Landing on the islands is by Nature Reserve Landing Permits and only after consultation between the Department of Conservation and Iwi. Approvals are only given where the purpose of the visit has a cultural, scientific or biodiversity benefit.

Figure 1: The Poor Knights Islands, Northland, New Zealand

Table 2: Summary of site Information

Site Unique ID	PKI
Site name	Poor Knights Islands Nature Reserve
Easting	NZTM E 175 7639
Northing	NZTM N 607 4772
Municipality	Whangarei District
Village	N/A
Community	Tutukaka Coast
Landowner	Public Conservation Land- Nature Reserve
Search radius (m)	N/A entire island 272ha
Notes	See database for more information on site details

3.2 The Target Species

Four invasive plant species are currently present on the Poor Knights Islands. These being Mexican devil *(Ageratina adenophora)* Mistflower *(Ageratina riparia),* Mothplant *(Araujia hortorum/sericifera)* and pampas grass *(Cortaderia selloana and C. jubata).*

All four of these species are primarily wind dispersed and it is suspected the invasive plants found their own way to the islands originally. They have managed to reach the Poor Knights at a distance of 16km offshore.

The plants are easily killed by hand weeding, manual digging or chemical application. Glyphosate is effective on all plants. Haloxyfop is also a grass-only specific herbicide for pampas grass particularly large (2m plus) specimens. Woody plant specific herbicide metsulfuron will kill mothplant, Mexican devil and mistflower effectively where native grasses require protection.

The least harmful option is hand-weeding and it is the preferred and most cost-effective technique on the Poor Knights. Mothplant roots are brittle and care has to be taken to extract the full root system as a break-off will re-sprout.

There is potential for other species to also arrive in future from the mainland of New Zealand with many invasive plant species prevalent along the Northland coast.

4. PROJECT APPROACH

By undertaking two 10-day visits per year to the islands and hand-weeding the sites found, the target plants life-cycles from germination to producing seed can be beaten. With vigilance over time the existing seed bank will deplete and the lightwells will shade over. As these islands are out on the extreme limits of wind dispersal the potential seed rain shadow is very low which means new incursions will be infrequent and easily addressed before they become a concern and can get re-established.

The logistics of working on remote islands require a high level of trip planning. Weather and access onto the island can be inclement but is not insurmountable. There are areas to land via both helicopters and from boat. Suitable safe campsites exist.

This technique has successfully been used on the Hen and Chickens, Kermadecs and other islands in the Hauraki Gulf such as Hauturu and Rangitoto islands.

5. SCOPE

5.1 In-scope

This project only looks at management of invasive plants on the Poor Knights Islands and the Biosecurity risks such a project may bring with itself in being implemented.

This project is based on adaptive management principles to learn how best to manage these invasive plants within this particular site. It may provide insights for others working on these invasive plants or similar to also learn from.

The implementation of this project has some synergies for the other tasks and actions required in protecting the values of the Poor Knights by virtue of it providing real time occupation on the island to detect biosecurity incursions from other sources, and enforcement and advocacy of the statutory legal provisions that protect the site from inappropriate human behaviours.

5.2 Out-of-scope

This project does not cover -

- general Biosecurity requirements for the Poor Knights Islands and in particular responses to an incursion. The Department's existing Island contingency projects covers such an eventuality.
- any other site management requirements on the Poor Knights Islands or any other management of islands outside of the Poor Knights.

This project does not include any form of research into the levels of invasiveness of the particular invasive plants involved.

6 PROJECT GOVERNANCE

This project is a Department-funded project.

Table 3: Project tasks and responsibilities

Task	Person responsible
• Overall accountability	Whangarei Area Manager will give permission for the project to proceed
• Ensure the project is delivered and remains within budget • Communication and consultation with Iwi, other stakeholders and interested parties at the strategic decisions level	Whangarei Programme Manager Biodiversity
• Deliver and implement the field requirements of the project including any training required • Communication and consultation with Iwi, other stakeholders and interested parties at the operational details level	Whangarei Ranger Biodiversity (utilising a field team of 4-6 people)

6.1 Project Reporting

Table 4: Required project reporting.

Report	When	Contents	Distribution
Field Trip Report	1 month post field trip completion	Summary of the activities of the field team and sites treated.	Internal and Iwi
Annual project report	1 month post end of financial year.	Comprehensive report on the progress of the project toward goals and objectives	Internal and Iwi
Strategic review evaluation	Every 5 years into project	Comprehensive overview and analysis of the strategic direction of the project. Analysis of monitoring data in relation to goals, outcomes and objectives	Internal and Iwi

7 MONITORING THE SUCCESS OF THE PROJECT

This type of work on these islands and with these invasive plant species has been proven time and again to be successful at delivering outcomes, so there is not a significant need to put a large expense into intensive outcome monitoring programmes. The use of marked photopoints showing the recovery will provide a sound record of the success achieved.

Table 5: Outcome Monitoring Requirements

Outcomes	Indicator
The natural native vegetation colonisation and successional processes which invasive plants otherwise disrupt are maintained.	Treated areas are recolonized by native plants
The unique plant and animal species populations are protected and enhanced by preventing loss of habitat through invasive plant competition.	Number of sites treated
The rare and vulnerable coastal forest types remain intact and protected from displacement and transformation by invasive plants.	Number of invasive plants removed

8 STAKEHOLDER ENGAGEMENT

The Department's Whangarei Area Manager is the government official with delegated accountability and is a primary stakeholder in this project. The Local Iwi Trust Board are also a primary stakeholder in this project. They have been supportive of the aspirations to keep their *taonga* free from introduced pests and the implementation of invasive plant management programmes on the islands within their *rohe*.

Consultation has been undertaken during the formative proposals and shall be ongoing. Iwi will always remain involved in deciding what activities occur on the Poor Knights Islands and will have a high level of influence in the project.

The wider community is very much interested in seeing our nature reserve protected from threats. There is strong support from the local dive and tourism operators and local communities to see the Poor Knights kept pristine.

There are many individuals in the wider community and Iwi who wish to volunteer their labour to support such a project and to assist with the invasive plant removal in a physical capacity. These individuals will be given that opportunity as part of the volunteer support, or, as part of the employed invasive plant team where they have the suitable skill sets required.

Table 6: Key Stakeholders

Name	Affiliation	Contact details	Project interest	Stage (1 to 6) of engagement	Notes/comments
TBC	Iwi Trust Board		Iwi mana whenua	1 to 6	Co governance decision maker on the work permitted on the islands. Advisor to the project and tikanga requirements. Field Trip participant including whanau
TBC	Northland Regional Council		Support	1 to 6	Field trips and Council support
TBC	Whangarei		Support	1 to 6	Field Trips and Council

	District Council				support
TBC	Coastal Natives Nursery		Support	3 to 6	Field trip participants (including their staff) and designing a strategy.
TBC	Dive, dive, dive!		Support	3 to 6	Field trip participants including their staff and local business support

9 PROJECT TIMELINE

As is the nature of all invasive plant management programmes this project is *ad infinitum*. As long as invasive plants persist on the mainland and a seed rain can fall on the Poor Knights there will be a need to continue surveillance and treatment of new infestations.

Once the programme has removed the existing infestations there will always be a requirement for sustaining the project. This requirement can be viewed as a low cost insurance policy for the high conservation values at the site that ensures the invasive plants do not re-establish and again cost extensive funding to remove.

Table 7: Project Milestones

Milestone	Date	Responsible
Operational Planning Stage		
Business planning	June each year	Ranger
Implementation Stage - Pre-treatment tasks		
Trip 1 logistics and Biosecurity	August each year	Ranger and Weedteam
Trip 2 logistics and Biosecurity	January each year	Ranger and Weedteam
Implementation Stage – Apply the treatment(s)		
Field trip 1	September each year	Weedteam
Field trip 2	January each year	Weedteam
Implementation Stage – Conduct the Post-Implementation Reporting and Monitoring		
Write up annual reports	April	Ranger and Weedteam supervisor
Sustaining the Project Stage		
5 Year review report	June	Ranger
10 year review report	June	Ranger

10 PROJECT COSTS

It is envisaged a high initial labour cost is required in the first 5 years to get on top of the invasive plant infestations and the major seedbank germination that occurs from site disturbance. All invasive plant programmes are long-term as seeds can be reintroduced easily and seed banks can take a long time to rot in the soil.

Initial set-up costs are not significant in this case as much of the equipment required is already available within the organisation. The bulk of costs are in the labour. Volunteers can also be engaged as part of the field team to reduce this labour component, however it is best to cost in their absence as they cannot be guaranteed.

Costs for sustaining the project are effectively a low cost insurance policy that ensures the invasive plants do not re-establish on the islands and that biosecurity measures are remaining effective at keeping other species incursions from establishing.

Table 8: Estimated Project Costs per Stage

Item	Details	Cost (NZ$)
Operational Planning Stage:		
Operational plan compilation	120hrs Labour (for planning and consultation, liaison, etc.)	3,600
Operational Planning Stage, Sub-total		3,600
Operational Planning Stage, Contingency (10%)		360
Operational Planning Stage, Expected cost		**3,960**
Yr 1-5 Annual costs Implementation Stage:		
	Boat Charters x 4 per year	1,500
	Aerial charter and survey	3,000
	Field supervisor and 3 team members (2 x 10-day trips)	12,800
	Field supplies/food	1200
	Field equipment	1000
Implementation Stage, Annual sub-total		19,500
Implementation Stage, Contingency (20%)		3,900
Implementation Stage, Expected annual cost		23,400
Implementation Stage, Expected 5-yr cost		**117,000**
Yrs 5-10 Sustaining the Project Stage:		
Yr5-10	Boat Charters x 2 per year	1,000
	Field supervisor and 3 team members (2 x 5-day trips)	6,400
	Field supplies/food	600
	Field equipment	500
Sustaining the Project Stage running costs for 5 years (A)		8,500
Sustaining the Project Stage set-up costs (B)		0
Sustaining the Project Stage sub-total(C=A+B)		8,500
Sustaining the Project Stage Contingency (D=20% of C)		1,700
Sustaining the Project Stage, Expected Annual cost		**10,200**
Sustaining the Project Stage, Expected 5-year cost		**51,000**
PROJECT TOTAL		**171,960**

11 RISK MANAGEMENT

Table 9: Key Project Risks and Proposed Management

Risk	Management approach
Maintaining required cash resources	Ensure communication is maintained with stakeholders and reporting and feedback is provided. Sound financial management. Review to demonstrate success after 5 years.
Obtaining field team members	Advertising for positions in DOC gazette,

	university student associations and newspapers
Maintaining commitment over a long project life-cycle	Ensure communication is maintained with stakeholders and reporting and feedback provided. Review to demonstrate success after 5 years
Timing of visits before flowering period	As access is difficult, a watch on weather patterns will be necessary to look for a window of opportunity for safe landing and departure.
Illegal landings on PKI could compromise biosecurity actions	Awareness raising through boat owners channels, wharves, launching ramps, etc.
Seabird burrows could be damaged by workers	Arrange training to show workers how to move with minimal damage to burrows

12 REFERENCES

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