Poor Knights Island Weeding Report 2010/2011 Season

Juvenile pampas first year flower Crater Bay Aorangi located in Photopoint one.

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INTRODUCTION

This report is prepared for the Department of Conservation as an internal document but it is available for all interested parties.

The Department of Conservation is the administering body for the Poor Knights Islands Nature Reserve and is responsible for implementing such weed management projects. This project is part of a wider offshore island invasive plant programme encompassing other island nature reserves and was selected as a national priority ecosystem.

The purpose of this document is to provide an account of the work undertaken removing invasive plants from PKI in 2010/11. It documents findings of that work in terms of results achieved, lessons learnt and recommendations for the future.

Thanks must go to the local Iwi Trust Board, the Bowden family as local and active enthusiasts in the protection of the Poor Knights.

(NOTE: This report has been summarised as a training example from other 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 or all the details associated.)

TRIP OBJECTIVES

1. Locate and search all known weed sites as stated in the database or documented in island mapping records.
2. Survey areas free from weed sites to ensure they do not contain new or previously undiscovered infestations of target weeds (time permitting).
3. Apply the appropriate treatment required to destroy all target weeds and seeds found on adult plants.
4. Ensure site protocol is maintained to enable ease of site location/identification in subsequent future visits.
5. Maintain an inventory of all target weeds found and their respective treatments.
6. Update database and mapping records of work carried out.
7. Provide an overview of the work carried out on each of the islands and analysis of the data collected.
8. Provide any relevant information on issues related to the running of the island weed programme.
9. Provide any other relevant information relating to the management of the Hen and Chicken and Poor Knight's Nature Reserves.
10. Make recommendations for future management.

HISTORY OF WEED MANAGEMENT

Weed control first began on the Poor Knights Islands in 1993, two years after in 1995 the Hen and Chicken Islands were included to survey the weed sites and then to protect the natural values of the islands. The purpose was to eradicate and/or control to zero density five species of weed: Mexican devil weed, Mistflower, Moth plant and two species of pampas.

Abseiling on the islands began in 1999 allowing access to hard to reach areas of the islands.

By the year 2000 weed control on the Poor Knights was only needed on a maintenance level as the majority of sites had had their seed banks reduced to minimal levels.

In the 2010 season the weeding programme was run only as a half season from September to January due to half the island weeding funding going towards the kiore eradication on Hen Island planned for May 2011. As a result of the funding cut and the reduced time for the island weeders on the islands, the focus of the programme this season was to locate and treat all known weed sites on all the islands.

Figure 1: Photograph of a Mexican devil site

WEEDING PROTOCOLS

The main objective of the Island weed programme is to visit and treat all known weed sites. Due to the length of the season this year, this was imperative as the islands will not be treated over the summer season.

Searching new areas between sites allows a larger area to be searched, but due to terrain and time limitations this was not always possible.

Whilst searching for a specific weed site the team uses a description of the site, a compass bearing and a distance from a known location which is found in the island weed database. GPS waypoints are also available and make finding sites on flat areas very simple but when on steep slopes tend to be less accurate but are still a great help when searching for a site.

As the team searches towards a site they shall form a line with 5-10m between each member of the team and sweep towards the site allowing new ground to be searched, once the sites central marker is found the team begin searching out from the central point to the sites margins and beyond to make sure there has been no spill over from the site.

When target weeds are found, adult plants in flower should have the flower heads removed and deposited into a sealable bag prior to site treatment and returned to the main land in the team's camp rubbish at the end of each trip. All target weeds are then removed with root systems being dug out if needed and hung from nearby trees, they should be placed securely as to not allow them to become dislodged and re-grow.

It is important to mark areas of weeds with pink tape (figure 2) and a purple triangle at the centre of the site. Going along with last years methodology the boundaries were taped but also the localities where weeds were found. Tapes should be placed in clear view and have site number, weed species and the date as a minimum, any other information can also be added, e.g. whether adults or juveniles were found.

Figure 2: Photograph showing the correct etiquette for pink tape

The central triangle is purple and must show the site number and the weed species found at the site

Figure 3: Photograph showing the correct etiquette for the purple triangles

TARGET WEEDS

The main target weeds found on the islands are widespread on the mainland. The most likely cause of the island infestations is from wind and bird dispersal from the mainland and between the islands themselves.

Mexican devil weed (*Ageratina adenophora*) is a bushy, woody multi stemmed perennial up to 3 meters in height (figure 4). Leaves are dark green on upper sides and light green on underside with irregular rounded teeth on edges. Prominent leaf veins originating from a single point on the main stem. Creamy white flowers form from August to December in dense clusters. Thrives in light wells and on exposed slopes but tolerates a wide range of habitats.

Figure 4: Photograph of Mexican devil weed (first year flowering)

Mistflower (*Ageratina riparia*) is an erect or sprawling perennial herb with many red-brown stems which may become semi woody (figure 5. Leaves are dark green with toothed edge. Thrives in a wide range of habitats but preferring warm, wet, semi shaded areas.

Figure 5: Photograph of mistflower

Moth plant (*Araujia hortorum*) is an evergreen vine growing over hosts up to 10 meters (figure 6). Leaves are opposite in an arrow head shape, upper side is dark green and

grey/green underside. Clusters of small creamy coloured tubular flowers. Seedlings are shade tolerant allowing establishment in undisturbed forests.

Figure 6: Photograph of moth plant

Pampas grass (*Cortaderia selloana*) is a clump forming grass up to 4 meters in height (figure 7), leaves are dark green with hairs on the underside, dead leaves spiral like wood shavings. Seed heads are white and bushy. Tolerates a wide range of conditions but does not like the shade.

Figure 7: Photograph of pampas

Purple groundsel (*Senecio elegans*) is an erect herb up to 60cm in height, oval leaves are lobed (figure 8). Flowers form between August and May and are purple. Young plants begin as rosettes.

POOR KNIGHTS ISLANDS SITE

Figure 8 Photograph of the Poor Knights Island

The Poor Knights islands (figure 37) sit 22kms off the Tutukaka coastline; there are two main islands and many small islets. The northern most island is Tawhiti Rahi and covers a land area of 158 hectares and reach a summit height of 197 meters. Aorangi sits to the south and covers a land area of 107 hectares and reaches a summit height of 216 meters. The Poor Knights are covered by regenerating coastal forest mainly dominated by pohutukawa with karaka, kohekohe and tawapou.

Figure 9: Photograph of Aorangi

TRIP TIMETABLE

Poor Knights

Sept 6 – 10. 2010
Team – Pete Davis, Gena Williams and Dave Von Stone
Boat – Rako
Skipper – Leon Candy

Poor Knights

Jan 10 – 14. 2011
Team – Neil Forrester, Duncan Kervell, Zane Harris, Tamra Gibson and Sam Baker
Boat – Rako
Skipper – Leon Candy

Map 1 showing the islands visited during the weeding season 2010/2011.

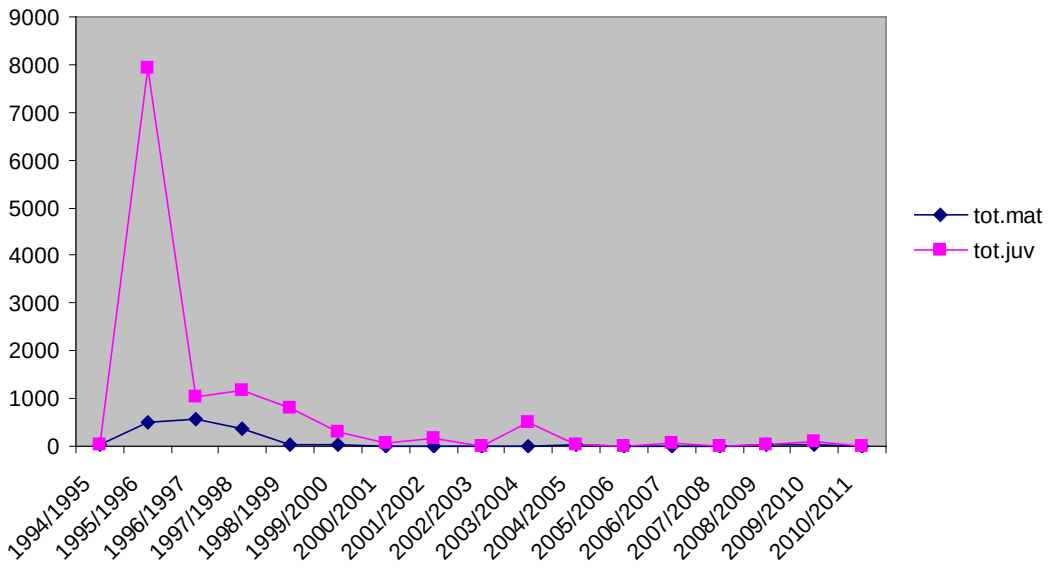
RESULTS AORANGI

Table 1: Breakdown of sites on Aorangi

	Total existing sites	Archived sites	Sites not found / visited	Total sites visited	Existing sites containing weeds	New weed sites	Sites found clean
Mexican devil weed	61	0	3	58	4	0	54
Mistflower	20	0	7	13	0	0	**13**
Moth plant	46	0	0	46	9	0	35
Pampas	5	0	1	4	0	1	4

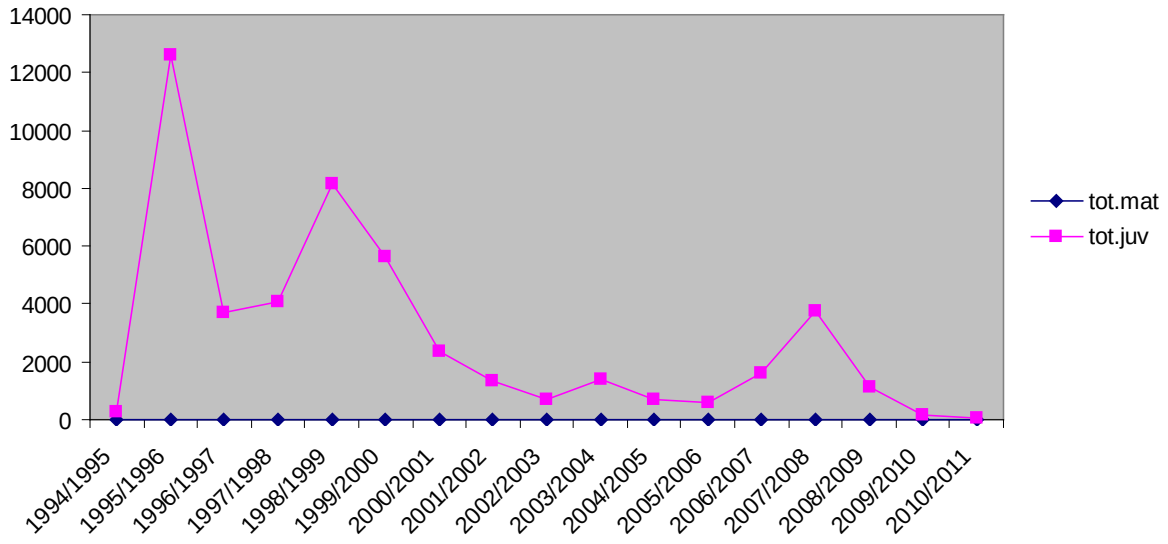
Table 2: Overall totals for weed species found on Aorangi, broken down into mature & juvenile plants

Weed Spp.	total weeds	Total mat.	total juv.
pampas	6	0	6
Mexican devil weed	4	0	4
mistflower	0	0	0
moth plant	44	0	44



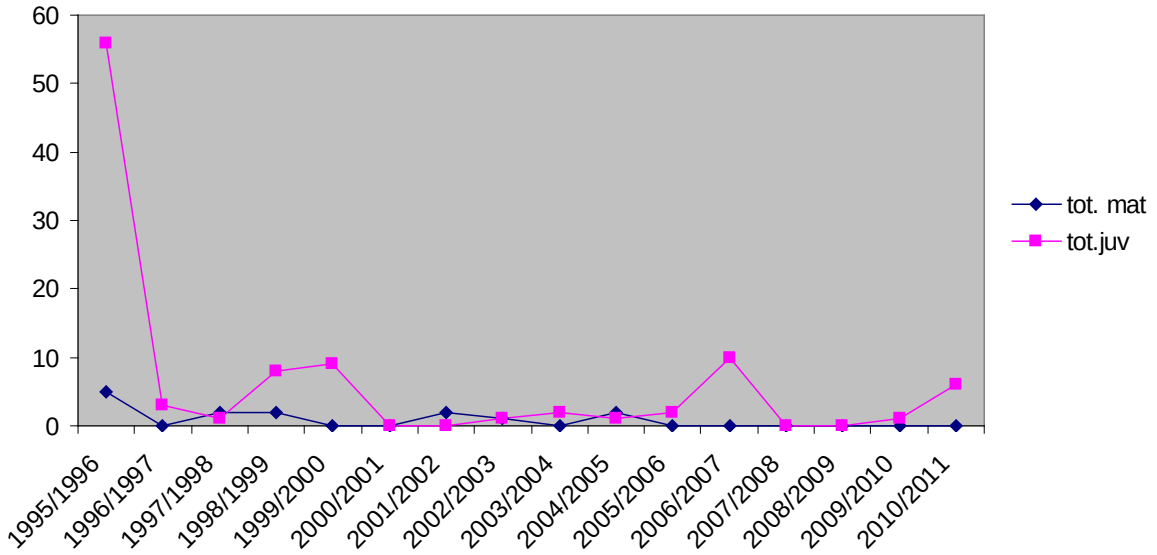
Graph 1: Summary of adult and juvenile Mexican devil weed on Aorangi from 1994 - present

Only four juvenile Mexican devil weed plants were pulled from the two trips to Aorangi this season (Table 14). The populations of Mexican devil weed are at very low levels (Figure 46) and future teams should start seeing a complete absence of this weed in the near future.



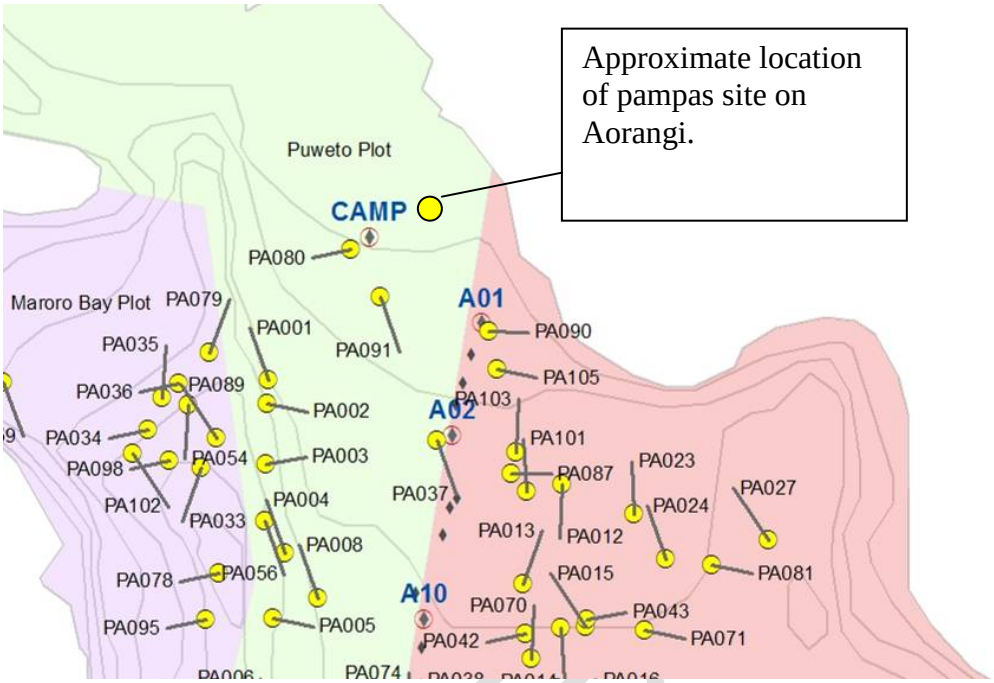
Graph 2: Summary of adult and juvenile moth plant on Aorangi from 1994 – present

This season 44 juvenile moth plants were pulled from Aorangi (Table 14) with the majority of these pulled during the September trip. Only 10 adult plants have been pulled in the last 10 years the last one to be pulled was in 2008 which would suggest that the seed bank on Aorangi has almost exhausted itself.



Graph 3: Summary of adult and juvenile pampas on Aorangi form 1995 – present

Pampas was not found at any pampas sites this season. A large adult and several juvenile plants were sighted on the wave platform in front of camp 1 (Figure 49), the juvenile plants were removed (Figure 48) but the adult could not be destroyed due to wasp attacks. No centre triangles or pink tapes were put up. The plant was returned to on a trip to the islands during May and Velpar was applied to the plant as there was not enough time to dig it out, this plant needs to be checked next season to make sure it has died.



Map 2: Map of Aorangi indicating approximate location of new pampas site

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Figure 10 : Photograph of team member Zane proudly exhibiting some adult Mexican devil he removed

Figure 11: Photograph of team member Tim abseiling into a site.

RESULTS TAWHITI RAHI

Figure 12: Photograph of Tawhiti Rahi

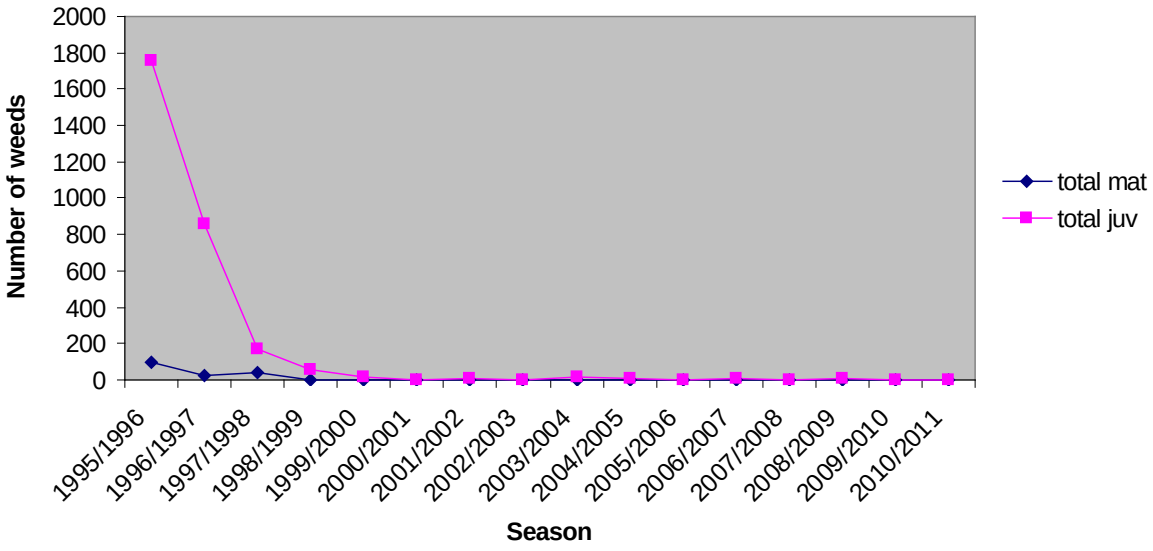
Results

Table 3: Break down of sites on Tawhiti Rahi

	Total existing sites	Archived sites	Sites not found/ visited	Total sites visited	Existing sites containing weeds	New weed sites	Sites found clean
Mexican devil weed	9	0	0	9	1	0	8
Pampas	5	0	3	2	0	0	2

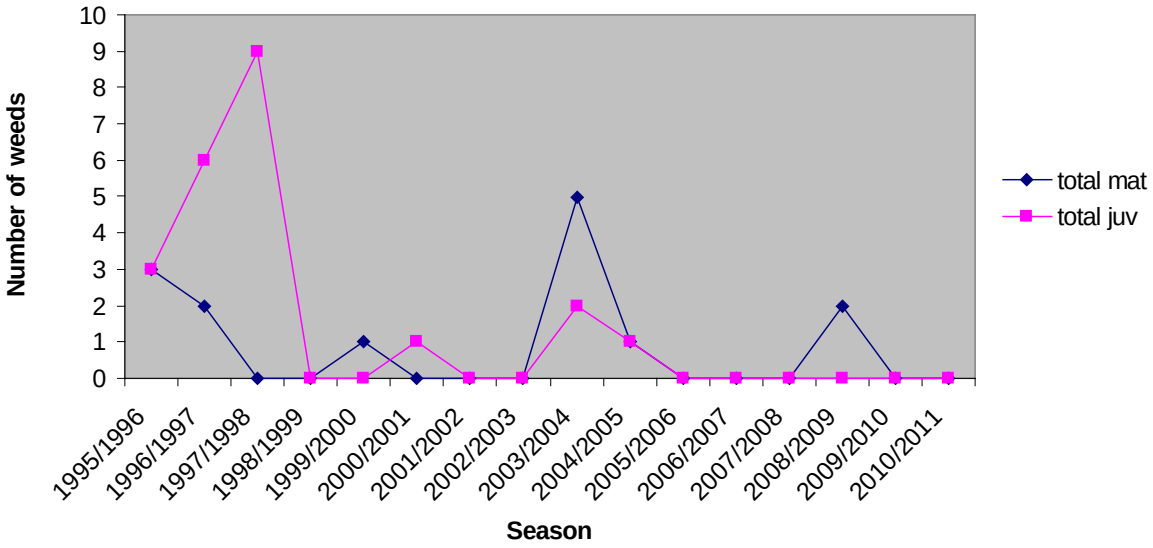
Table 4: Overall totals for weed species found on Tawhiti Rahi, broken down into adult and juvenile plants

weed Spp.	total weeds	total mat.	total juv.
pampas	0	0	0
Mexican devil weed	2	0	2



Graph 4: Summary of adult and juvenile Mexican devil weed on Tawhiti Rahi from 1995-present

Only two juvenile Mexican devil weed plants were found on Tawhiti Rahi (Table 15) this season at site PT006 which is currently the most active site on the island, two juvenile plants were found at this site during last seasons trips.



Graph 5: Summary of adult and juvenile pampas on Tawhiti Rahi from 1995-present

No pampas was found on Tawhiti Rahi this season (Figure 52) although the team did not manage to access all sites due to time constraints and inexperience of the volunteers to access very steep areas. Two adult pampas were found last season with one at sites 23 and one at site 26 but these were found clean this season.

RECOMMENDATIONS

- There is a very large area called Oneho plot of Aorangi that did not get searched during the season, there are no weed sites recorded in the area. This area should be searched next year to make sure no weeds are present.

- Spending time circumnavigating the islands using a boat to locate rogue pampas growing on the cliffs is beneficial as it is difficult to spot plants on cliffs from the land.

- Many of the sites visited were found clean of weeds whilst the islands are in such a good state it is appropriate to spend several days sweeping the whole island to search out any previously unfound infestations.

- The tracks around the island are becoming very overgrown and became very difficult to follow; it may be useful to spend some time cutting the paths back to keep them open and easily navigable.

- Given the extra time needed to search this area a full 9 days trip would be advantageous and would allow both main islands and possibly some of the smaller vegetated islands to be re-searched

- Due to the number of bird burrows, the number of people on the island should be kept to a minimum to reduce the amount of bird burrow collapse.

- Having the trip in late August or early September reduces the possibility of injuring birds by burrow collapse as the Buller shearwaters do not return to the Poor Knights in large numbers until mid-September

Figure 13: Photograph of bird burrows

- Team size should be no less than four members allowing the team to split up and search separate areas. This will allow better time management as well as a more productive day.
- Two GPS units taken to the island to allow the team to split and search separate areas.
- Although the inflatable tender leaked quite badly it is the best choice for island landing, it can be packed down to a small size for storage and is easy to fix when there is a puncture.
- On the trial trip to Whatupuke a ropes qualified person should be present to treat the abseil sites early in the season.
- The team should have an EPIRB with them at all times on the islands due to the poor mobile and VHF signal, due to the remoteness of the islands a locator beacon could offer a more reliable means of contacting help.
- The nine day trips this year worked well, giving enough time on the tenth day to clean down all gear ready for the next trip.
- A boat operation was run after the season to spot rogue pampas growing on the cliffs around the islands, it may be more useful doing this during the season before each visit to the islands, so the plants can be removed whilst the team is on the island.
- Currently the team uses print outs of data sheets to indicate where the weed sites are and what has historically been found there, this is slow and if it rains the sheets are useless. To overcome this issue and keep up with technology some form of data logger or smart phone should be used. This would potentially allow the user to gain access to data and easily navigate to the information of interest, add information on site which would reduce the need for so much office work inputting data, the use of mapping programs and GPS to remove the need for a separate GPS unit and potentially have photographic capabilities. All information could then be e-mailed back to the office each day as back up.

Figure 14: Photograph looking over South harbour at the Poor Knights

ADDITIONAL INFORMATION

Boats

As well as Rako being used for travel out to the islands, other charter boats were available to use when Rako was unavailable. The team never had to use these this year.

Dive Tutukaka has a fleet of boats and they will pick up and drop off DOC staff as long as it ties in with their diving trips schedules. They usually deprt tutkaka at 8.30am and then deprt the islands 3.30pm to return.

There were no problems landing on to the islands, all boats had enough floating rope to attach to the landing tender to allow the team to ferry all the gear ashore without the need to paddle the boat back and forth. All boats anchored relatively close to the shore which made loading and unloading very easy and trouble free.

The island weeders landing tender works very well, but the material the tender is constructed from is thin and holes form easily due to the rocky shores found on the islands. As a result the team patched around 15 holes during the season to keep the tender afloat, it is also easy to fix punctures out at the islands. This is the preferred choice as a rigid hull tender would have the under side destroyed by the rocky shore found at all landing sites.

Staffing levels

There were three members of the weed team this season which worked well but there was often times when man hours were lost due to searching sites which had been clear of weeds for many years, as well as the sites which needed abseils where only one person can abseil and one person to supervise which leaves one person with nothing to do and wastes man hours.

The fitness of the staff over the season never came into question. This could be due to the increasing difficulty of the islands visited with the most difficult islands being treated last which allowed the groups fitness to increase throughout the season, everyone was easily fit enough to deal with the terrain involved. Although when volunteers joined the team for a trip it was necessary to slow the pace to allow the volunteers to keep up, on islands with high numbers of sites this slow pace could become detrimental to treating all the sites in a timely manner.

Communication

The weed teams main communication methods for reaching the mainland and Whangarei Area Office (WAO) were via VHF radio on channel 6 and mobile telephones. The most common form of contact was with the WAO for the daily reporting, called from a high point somewhere on the islands around 8.30AM. The main issue that was experienced was the lack of signal on Hen East, the signal for both mobile and radios were very poor over much of the island with only very small areas available to receive enough signal for communication.
For a safety factor it would be very useful for the team to have an EPIRB or some other form of personal locator beacon in case of emergency.

Abseiling

All members of the weed team completed the abseiling course run by Kerry Sinclair of the Vertical Horizon Group during the first week of September; the course gave the team the skills required to safely treat all the rope accessed sites and also gave confidence in the equipment the team would be using over the season.

Whilst on the islands the team generally rotated abseiling duties through the team so each member would keep their confidence up.

Food Allowance

There were no issues with food allowances this season with the team always coming in under budget, this was including extra food purchased in case the team became stranded due to bad weather.

Biosecurity Surveillance

Ant traps were set on The Islands to indicate the presence of the invasive Argentinean ants around the camps on the island; fortunately all the traps came back as negative. No evidence was encountered of any other Biosecurity incursions

Boat day operations

After the season on the islands had finished two days were spent in March circumnavigating the islands by boat in an attempt to spot rogue pampas on the cliff faces as they are flowering and are easily spotted

Two tailed tuatara and forest gecko

On the trip to the Poor Knights the team found a tuatara (figure 60) and a forest gecko with a split tail (figure 61).

Figure 15: Photographs of a tuatara with a split tail

Figure 16: Photograph of a forest gecko (*Hoplodactus granulatus*) with a split tail

On communicating with Rod Hitchmough he informed me that spit tails are common amongst lizards and are formed when a lizard drops its tail but the tail is not completely severed and a new one begins to grow thus forming two tails.

Kaka tree

On several of the islands, many pohutukawa were sighted which seemed to have been ring barked, this turned out to be the kaka attacking them to extract sap from the trees. One tree is quite amazing due to the level of damage caused; the whole trunk and almost all branches had been attacked by the birds.

Figure 17: Photographs of a pohutukawa which has been attacked by kaka

Island gigantisism

Figure 18: Photographs showing comparison between leaf size of Kawakawa on the Poor Knights and the mainland

On the Poor Knight islands broadleaf plants grow with much larger, glossier leaves than their mainland counterparts in an occurrence known as “island gigantisms” (figure 63). One possible cause is the highly fertile soils which are continuously enriched by millions of sea birds which nest on the islands. The more widely accepted theory is the fact that the islands escaped the cold of the last ice age assisted by the warm waters of the east Auckland current which pass around the island before heading back out to sea.

PHOTOPOINT MONITORING

The island weeding programme has been going for some time . To see how the regeneration in weed sites occurs, future weed teams will be re photographing the photopoint monitoring at selected sites throughout the islands to collect useful qualitative data to supplement result monitoring. This type of monitoring involves taking photographs of weed sites from permanently marked and re-locatable points. This will allow monitors to deduce the way in which native and invasive vegetation grows and fill spaces available.

Standards for photopoints

- Photographs should be taken when shadows are minimal, e.g. on overcast days. This prevents disruptive shadowing in the photographs. If this is not possible, subsequent photographs should be taken at the same time of day as the initial shots to avoid shadows in different positions.
- A tripod or a fixed post should be used to help standardise the photo taken, e.g. it removes the influence of a person's height. Having the camera fixed reduces camera movement for a sharper picture.
- A card with the photopoint details and the date and time can also be included with the photographs.
- The information recorded for the photopoints should be precise, some one else may be re-measuring the photopoints in years to come.
- Photopoints shall be retaken at the exact position of the original photopoint and all variables (i.e. camera specifications, lighting levels, tripod height etc.) should be closely replicated from one monitoring interval to the next.

Taking the photos and recording detail

- Select a view that will provide useful information on the subject and briefly describe what the frame attempts to show
- Record the compass bearing to define the boundaries of the photoframe and give the frame a unique identification number
- Place a card in a convenient position in the foreground near the register of focus to show the photopoint number, photoframe number, the date and time, and the initial of the photographer. If you laminate the card and use a whiteboard marker you can re-use one card to record details for all photoframes.
- Record the condition of the weed population and native vegetation in the vicinity. Note conditions that have the potential to make the weeds look more or less impacted, e.g. dry or wet summer.

Re-measuring photopoints

Re-measuring the photopoints is simple when their location has been recorded in sufficient detail and the information and original photograph was collated and stored at the completion of the initial fieldwork.

A) Gather together all the necessary equipment along with copies of the recording sheets used for previous monitoring.
- This information should have been collated with the original photographs at the completion of the initial fieldwork.
- If possible the same camera should be used
- Variables, such as date, time, photographer should be recorded on copies of the recording sheets in the re-measurement column.

B) Locate the marker peg, using the recorded orientation points, bearings and distances. Remember to adjust for true north as magnetic north changes slowly over the years. If the marker has been removed you should still be able to relocate the exact photopoint using the references and the original photographs of the actual photopoint.

C) Once the marker peg has been located set up the camera. Ensure the camera settings replicate the initial settings recorded as closely as possible.

D) Use a copy of original photo to get the framing right and take the replicate photograph.

E) Record information on the photocopies of the original recording sheets in the re-measurement column.

Sites for photopoints.

As the Poor Knights are part of a larger programme most of the Outcome photopoint sites are located on other islands as follows:

Aorangi
PP01 – Pampas – Site down on wave platform (see cover photo)
Taranga
PP02 Mistflower – Site. 334 – North East facing
PP03 Mistflower - Site 107 – South facing
PP04 Pampas – Site. P1 – Level ground
PP05 Pampas - Site 396 – South West facing
PP06 Mexican devil – Site. 376 – North facing
PP07 Mex daisy – Site. 114 – South West facing
PP08 Groundsel – Site. 123 – North East facing
Lady Alice
PP09 Mistflower – Site 248 – South West facing
PP10 Mexican devil – Site. 8 – South East facing
PP11 Mexican devil – Site 243B – South West facing
PP12 Mexican devil – Site 82 – South East facing
PP13 Groundsel – Site 248 – South West facing
Whatupuke
PP14 Mexican devil – Site 28/32/33/34 – North facing
Coppermine
PP15 Mexican devil – Site 34 – South East facing
Mauitaha
PP16 Groundsel – Site 13/14 – North facing

Explanations of the Photopoint Record Sheet

WEED CONTROL PROGRAMME:	Name and programme code
AREA/CONSERVANCY:	Record the Area and Conservancy that the programme is in.
WEED SPECIES:	Record the name of the weed species for which the photopoints are being set up to monitor.
MONITORING OBJECTIVE:	Record the objective of your monitoring, i.e. what you are trying to measure by setting up the photopoints
NUMBER OF PHOTOPOINTS SET UP:	Record how many photopoints are set up for monitoring
CAMERA & LENS:	Record the camera make and model, e.g Canon EOS 500 and the make and type of lens used, e.g. Canon EF 35-80/f. 4-5.6
DATE ESTABLISHED:	Date on which the photopoints were established.
ESTABLISHED BY:	Name and position of person who established the photopoints.

PHOTOPOINT NUMBER:		Record the identification number given to the photopoint.
DESCRIPTION OF PHOTOPOINT LOCATION:		• Draw a sketch map of the photopoint and the surrounding orientation points in relation to an easily located section of the overall site. Include the distances and bearings to the photopoint from the orientation objects. • Record the six-figure grid reference from the relevant NZTM Topographic maps or GPS the location. • Attach a map or aerial photo marked with the photopoint location.
ORIENTATION POINTS:	Object: Distance and bearing to photopoint:	A description of the orientation points. Where possible these objects should be immovable. Record any identification tag numbers used. The measured distance in metres and the compass bearing from the orientation point feature to the tripod or peg. State from where on the orientation feature the measurements are taken.
PHOTOFRAMES: **A list and description of the photos taken at the photopoint to be recorded during initial set-up and re-measurement**	Frame number: Frame description: Tripod height: Date and time: Storing photographs	Record a unique identification number for this photoframe. Briefly describe what the frame attempts to show... Record the compass bearings that define the photoframe boundaries. Comment on the weed population and native vegetation in the vicinity Record the height from the ground to the camera base when fixed onto the tripod. Record the date and time of day the photograph is taken. All photographs shall be stored on a file in a photopoint file on a DOCDM

ACKNOWLEDGEMENTS

Over all the 2010/2011 season was a successful one although it was run only as a half season the team pushed hard to treat all the known sites and found several new sites. Without everyone's effort the season would not have run so well.
Many thanks goes to Mr Tim Dredge and Mr Zane Harris of the Island weed team, without their hard work and dedicated weeding the season would not have run as well as had. Thanks to Duncan Kervell for running the trial trip and for his help on the Poor Knights trip. Thanks also goes to staff at the Whangarei Area Office who were Lyn Davison, Monica Valdes and Glen Coulston for the organisational work they contributed. Leon Candy is thanked for providing boat transport to and from the islands; Thanks to Beth Reynolds for washing the team's tea towels between each trip and being the cheery morning radio contact for the team. Julian Sietses, Gareth Rapley, Anja Maduna, Sam Baker and Tamra Gibson are thanked for their voluntary work on the islands.

Figure 19: Team member Tim climbs down rock face to retrieve marking tape

APPENDIX 1.

Files storage Database and Mapping

Information is stored in the following locations:

- GPS data- S:\WngAO\Bio Threats\Island Weeding\GPS data

And an updatable copy of all current points called:
Hen, Chicks, and Poor Knights Islands_Weed Points_Now.gpx

Saved in: S:\GIS\Info for Conservancy\Island Weeders GPS

- Analysis graphs- S:\WngAO\Bio Threats\Island Weeding\Weed Graphs
  DOCDM-600529
- Maps- S:\WngAO\Bio Threats\Island Weeding\Maps
- Database Aorangi- DOCDM-14922
- Database Tawhiti Rahi- DOCDM-14924
- Database Mauitaha- DOCDM-14928
- Database Lady Alice- DOCDM-14925
- Database Whatupuke- DOCDM-14926
- Database Coppermine- DOCDM-14927
- Database Taranga- DOCDM-14919

APPENDIX 2

Equipment list

General

- 1 x inflatable boat
- 2x paddles
- 1 x blue hand pump
- 8 black barrels with 5 lids
- 7 white barrels with 5 lids
- 33 bins with 24 lids
- 9 tarpaulins (various sizes)
- Tents – 2 x Mac pac
- 3 x Adventurer delta
- 1 x Katmandu retreat
- 4 self inflating mats
- 1 x 90litre blue cactus backpack
- 1 x 45litre black cactus backpack
- 1 x old blue back pack
- 1 x 9kg gas bottle
- 1 x double burner gas stove
- 1 x double burner lantern
- 2 x large chilli bins
- 2 x small chilli bins
- 12 x 20 litre water containers

Work bin

- 1 x ranger present flag
- 1 x hand saw
- 1 x hammer
- 1 x pliers
- 1 x adjustable spanner
- 4 x fold out hand saws
- 3 x secateurs
- 2 x mini crow bars
- 1 x machete
- 4 x bottles of vigilant
- 4 x palmer canvas bum bags
- 1 x fairy down bum bag
- 3 x large yellow/black first aid kits

- 2 x small green first aid kits
- 1 x binoculars
- 6 spare mantels for lantern
- 1 x 13litre dry bag
- 1 x bottle of insect repellent
- 4 x compass
- bag of tea towels

Abseil gear

- 2 x Arc tery climbing harnesses
- 5 x Aspiring climbing harnesses
- 2 x Edelweiss chest harnesses
- 2 x Aspiring enterprises nappy harnesses
- 3 x yellow petzl climbing helmets
- 1 x red HB climbing helmet
- 1 x white HB climbing helmet
- 8 x slings of various lengths
- 1 x 6 meter length of climbing rope (red)
- 1 x 8 meter length of climbing rope (red)
- 1 x 10 meter length of climbing rope (white)
- 1 x 26 meters of red climbing rope
- 1 x 44 meters of red climbing rope
- 1 x 42 meters of red climbing rope
- 2 x 34 meters of red climbing rope
- 1 x 50 meters of red and white climbing rope
- 1 x 50 meters of blue and white climbing rope
- 2 x rope cleaners

Abseil gear Green bag

- 2 x figure 8’s
- 3 x black decenders
- 1 x red decenders
- 6 x silver aluminium karabiners
- 3 x blue aluminium karabiners
- 8 x silver steel karabiners
- 1 x stitch plate
- 3 x foot prussics
- 8 x hand prussics