



REPORT ON THE NATIVE TREE PLANTING PROJECT ON AROHA ISLAND IN JUNE 2013

by

Jeremy G. Gibb, AICT Trustee
June 2013

Report to the Aroha Island Charitable Trust

Aroha Island Charitable Trust
177 Rangitane Road, Kerikeri 0294
Phone: (09) 407 5243
Email: manager@arohaisland.co.nz
Website: www.arohaisland.co.nz



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INTRODUCTION

Of a total area of 12ha, Aroha is composed of 7ha of tidal muddy foreshore covered in mangroves and 5ha of Aroha Island located in Kerikeri Inlet. About 65% of Aroha Island is covered in regenerating native forest and the remaining 35% comprises grassed campgrounds, buildings, an orchard, carparks and a metaled driveway. The Island is linked to Rangitane Road by a causeway passing through the mangroves and is accessed on foot by a series of tracks through the native forest.

Aroha Island is composed of black volcanic rock, which reaches an approximate elevation of 10-11m above MHWS as a sub-horizontal plateau. The volcanic rock is a remnant basalt lava flow belonging to the Kerikeri Volcanic Group, which erupted some 11 to 2 million years ago.

Around the upper foreshore, the basalt lava has weathered into very hard boulders, which naturally armour the foreshore against erosion processes. Above MHWS the basalt has also weathered into boulders contained in a matrix of red-orange silt and clay. Ancient Maori middens of estuarine shells have been mixed into the volcanic-derived soil, which along with leafy litter, provide a relatively fertile soil for plant growth.

The aims of the Native Tree Planting Project are; to contribute to restoration of the Islands flora and fauna; increase the present diversity of the flora; stabilize the seaward slopes of the Island from erosion and consequent siltation of Kerikeri Inlet, and, contribute directly to long-term mitigation of the Greenhouse Effect. The writer managed the entire project.

The purpose of this report is to document the project of planting native trees on Aroha Island in June 2013 for The Aroha Island Charitable Trust, and especially, to help guide ongoing native plant restoration of the Island.

METHODS

Based on an estimate from Kerikeri Plant Production to supply a range of some 500 native plants, plus slow release fertilizer tablets, a successful application was made by AICT in early May 2013 to Pub Charity for a grant of \$5000.00 to purchase the plants and tablets.

Prior to finalising a range of plant species, a thorough inspection of the existing native forest on Aroha Island was made on 23 May by the writer with Tom Lindesay, co-owner of Kerikeri Plant Production. Following the joint inspection, the writer divided Aroha Island up into 7 potential planting zones

based on criteria such as exposure, sun, geology, soils, landform, existing native forest cover, ease of access, etc.

The writer, on the 1:800 Scale Aroha Island Map published in November 2002, then made a broad estimate of the area of each zone. Kerikeri Plant Production then selected 580 plants broadly compatible with each zone labeling them accordingly. The seven zones are described in Table 1.

TABLE 1: Seven planting zones for Aroha Island with approximate areas in square metres. Note that for various reasons, planting zones 6 & 7 were excluded from this project, which only included zones 1-5.

<p>1.Northwest Planting Zone (c.3870 m²). On the Southwest side of the driveway, includes the Cunningham Gardens, plateau and West-facing slopes to the sea of regenerating native forest.</p>
<p>2.North Planting Zone (c.1340 m²). On the Northeast side of the driveway, includes the plateau and North-facing slopes to the sea of regenerating native forest.</p>
<p>3.Northeast Planting Zone (c.9200 m²). On the Northeast side of the driveway, includes the plateau and orchard area North of the Eco-Centre and Northeast-facing slopes to the sea of regenerating native forest.</p>
<p>4.Southwest Planting Zone (c.11500 m²) On the Southwest side of the drive, includes the plateau generally North and West of the upper Camping area and Southwest-facing slopes to the sea of regenerating native forest.</p>
<p>5.South Planting Zone (c. 130 m²) To the Southeast of the lower Camping area. includes the South-facing grassed spur adjacent to the walking track.</p>
<p>6.East Planting Zone (c.4420 m²) To the East of the buildings and both Camping areas, includes East-facing slopes to the sea of regenerating native forest.</p>
<p>7.Urupa Planting Zone (c.1550 m²) A ridge to the East of the lower Camping area with regenerating native forest.</p>

On 25 May, the plants were transported from Plant Production to Aroha Island and on 1 June, further transported to Planting Zones 1-5 (Table 1), selected for this project.

Table 2 sets out details of the 580 plants of which there are 34 species from Northland sources as far away as The Three Kings Islands (e.g. *Tecomathe*, *Elingamita*, *Streblus*, etc.). Many of the plant species are new to Aroha Island but all are complimentary to the existing native species.

Table 2 also provides the expected mature heights of the trees, but it should be noted that many are not expected to reach maturity for many centuries such as *Kauri* and *Kahikatea* (60m). Therefore, the major beneficiaries of this project will largely be future generations to come and of course, Aroha Island and its associated ecology.

TABLE 2: Numbers of plants supplied to Aroha Island by Kerikeri Plant Production on Saturday 25 May 2013, and estimated heights of each species when mature.

Common Name	Botanical Name	No. Supplied	Fully Grown
COASTAL MAIRE	<i>Nestegis apetala</i> sp.	11	15m
CRIMSON RATA	<i>Metrosideros carmmea</i>	6	≤1.0m
ELINGAMITA	<i>Elingamita Johnsonia</i>	3	3m
FUCHSIA (groundcover)	<i>Procumbens prostrate</i>	5	≤1.0m
HOHERIA (Lacebark)	<i>Hoheria pupulnea (purpurea)</i>	10	10m
HOROPITO (Pepper Tree)	<i>Pseudowintera colorata</i>	10	8m
KAHIKATEA (White Pine)	<i>Dacrycarpus dacrydioides</i>	50	60m
KAIKOMAKO	<i>Pennantia corymbosa</i>	17	6m
KAURI	<i>Agathis australis</i>	47	60m
KAWAKA	<i>Libocedus plumosa</i>	22	25m
KOWHAI	<i>Sophora microphylla</i>	50	10m
LANCEWOOD (Horeoka)	<i>Pseudopanax crassifolius</i>	11	15m
MAKOMAKO (Wineberry)	<i>Aristolelia serrata</i>	18	6m
MATAI	<i>Prumnopitys taxifolia</i>	15	25m
MELICYTUS, NZ	<i>Melicytus novae-zelandiae</i>	8	10m
MIRO	<i>Prumnopitys ferruginea</i>	31	25m
PIGEONWOOD (Porokaiwhiri)	<i>Hedycarya arborea</i>	15	5m
POHUTUKAWA	<i>Metrosideros excelsa</i>	8	20m
PUKA (Broadleaf) (Akapuka)	<i>Griselinia lucida</i>	2	8m
PUKA (Pukanui)	<i>Meryta sinclairii</i>	20	8m
PUKATEA	<i>Laurelia novae-zelandiae</i>	5	30m
PURIRI	<i>Vitex lucens</i>	30	25m
PUTAPUTAWETA	<i>Carpodetus serratus</i>	20	10m
REWAREWA (Honeysuckle)	<i>Knightia excelsa</i>	3	30m
RIBBONWOOD (Manatu)	<i>Plagianthus regius</i>	21	17m
RIMU (Red Pine)	<i>Dacrydium cupressinum</i>	20	25m
STREBLUS (Milkwood)	<i>Streblus smithii</i>	38	12m
TANEKAHA (Celery Pine)	<i>Phyllocladus trichomaoides</i>	20	12m
TAWAPAU	<i>Planchonella costata</i>	10	20m
TECOMANTHE	<i>Tecomanthe speciosa</i>	10	Vine
TITOKI	<i>Alectryon excelsus</i>	20	10m
TORO	<i>Myrsine salicina</i>	15	4m
TOWAI	<i>Weinmannia silvicola</i>	5	15m
WHITE RATA	<i>Metrosideros perforata</i>	4	≤1.0m
		580	

Between 3 and 18 June, all 580 trees were planted in the 5 selected planting zones (Table 1) by voluntary labour provided by the Aroha Managers, Trustees, Members and generally friends of Aroha (see Acknowledgements). Prior to planting, each tree site was selected by the writer and marked with a dazzle painted bamboo stake. For larger trees (PB 12), each planter added 2 slow release fertilizer tablets and 1 tablet for smaller trees.

RESULTS

For the record, Table 3 lists the range and number of plant species planted in each planting zone and the final number of trees per zone. The number of plants per planting zone ranged from 10 (Aroha South) to 262 (Aroha Southwest). This mainly reflects the fact that these zones are 130 m² and 11,500 m², respectively, and the relatively high numbers of *Kahikatea* (50), *Kauri* (43), and *Miro* (31) planted in the Southwest Zone (Table 3).

Compared to the other 4 planting zones, Aroha Northwest has the greatest range of species (17) (Table 3). This zone comprises mostly the Cunningham Gardens and an early decision was taken by the Trustees to include both representative, rare and endangered plant species that could be viewed from the tracks.

Based on observations in mature native forests elsewhere in Northland (e.g. Puketi Forest), the trees were mostly planted in groups of similar species particularly around well-established existing species such as *Kauri*, *Rimu*, *Miro* etc. Other compatible species were often mixed in with these groups such as *Tanekaha* with *Kauri*. New species to Aroha Island were also planted in groups, some close to tracks so that they could easily be observed such as *Lancewood*, *Toro*, and *Pukatea*.

Emphasis was also placed on planting trees that would provide attractive food for native birds, and to distribute these around Aroha Island as much as practicable (e.g. *Puriri*, *Kowhai*, *Titoki* & *Pigeonwood* etc.). It is hoped that once there is abundant bird food on Aroha Island, some of the native birds may nest to keep the resident Kiwi company and provide a long overdue dawn chorus on a predator free Aroha Island.

It should be noted that the adopted early June planting period coincides with *Matariki*, the start of the Maori New Year, an appropriate time to plant native trees. By coincidence, all our planting was completed (18 June), by the Winter Solstice (21 June), and the rising of the Super Moon (23 June), when the full moon was at its closest point to Earth in 2013, and at its maximum size in the night sky.

TABLE 3: Numbers of plants planted in each selected zone on Aroha Island from 3-18 June 2013, including planting completion dates and relevant information on each species.

Planting Zone	Tree Nos.	Bag Size	Notes	Fully Grown
AROHA NORTHWEST			(Planting completed Monday 10 June)	
KAURI	4	PB12	Prefers a rich moist soil	60m
TECOMANTHE	10	PB6½	Plant under any tree/ 3 Kings Is	Vine
CRIMSON RATA	6	PB3	Can be grown on the coast	≤1.0m
WHITE RATA	4	PB3	Tolerates very shaded conditions	≤1.0m
HOROPITO (Pepper Tree)	10	PB6	Hardy/In sun for best foliage colour	8m
MELICYTUS, NZ	5	PB12	Good in exposed coastal site	10m
MELICYTUS, NZ	3	PB6½	Good in exposed coastal sites	10m
TAWAPAU	10	PB3	Attractive specimen tree/coastal/good soil	20m
COASTAL MAIRE	11	PB5	Good well-drained soil)	15m
ELINGAMITA	3	PB6½	Ok -wind & dryness/ frost tender/ 3 Kings Is	3m
TOWAI	2	PB3	Smaller than kamahi/range of situations	15m
STREBLUS (Milkwood)	8	PB12	Prefers rich well dug soil/ 3 Kings Is	12m
RIBBONWOOD (Manatu)	5	PB12	Will not tolerate severe drought	17m
TITOKI	5	PB12	Good shade tree	10m
PUTAPUTAWETA	5	PB12	Can be fairly quick growing	10m
RIMU (Red Pine)	3	PB12	Rich moist soil some shelter	25m
KOWHAI	8	PB6½	Suitable for planting as shade tree	10m
TANEKAHA (Celery Pine)	5	PB12	Not for persistent strong winds)	12m
Sub-total:	107			
AROHA NORTH			(Planting completed Sunday 9 June)	
POHUTUKAWA	4	PB12	Withstands rigorous coastal conditions/dry soil	20m
KOWHAI	20	PB6½	Suitable for planting as shade tree	10m
REWAREWA (Honeysuckle)	1	PB12	Does not like being waterlogged/dry soil	30m
REWAREWA (Honeysuckle)	2	PB5	Does not like being waterlogged/ dry soil	30m
PUKA (Pukanui)	17	PB12	Huge leathery leaves	8m
PUKA (Broadleaf) (Akapuka)	2	PB12	Good coastal plant	8m
PURIRI	7	PB12	Grows fairly fast in rich deep soil/coastal	25m
Sub-total:	53			
AROHA NORTHEAST			(Planting completed Tuesday 18 June)	
RIBBONWOOD (Manatu)	16	PB12	Will not tolerate severe drought	17m
PIGEONWOOD (Porokaiwhiri)	15	PB12	Good deep soil/Semi-shade	5m
KAWAKA	22	PB12	Looks like a light coloured NZ Leyland green	25m
HOHERIA (Lacebark)	10	PB12	Best in moist conditions	10m
MAKOMAKO (Wineberry)	18	PB12	Fast grower/Gives light shade to plants	6m
STREBLUS (Milkwood)	15	PB12	Prefers rich well dug soil	12m
TITOKI	15	PB12	Good shade tree	10m
TOWAI	3	PB3	Smaller than kamahi/range of situations	15m
KOWHAI	22	PB6½	Suitable for planting as shade tree	10m
PURIRI	7	PB12	Grows fairly fast in rich deep soil/coastal	25m
FUCHSIA (groundcover)	5	PB3	Grows over rocks – partial shade - Orchard	≤1.0m
Sub-total:	148			
AROHA SOUTHWEST			(Planting completed Saturday 15 June)	
KAHIKATEA (White Pine)	50	PB12	Happy with wet feet	60m
PUTAPUTAWETA	15	PB12	Can be fairly quick growing	10m
TANEKAHA (Celery Pine)	15	PB12	Prefers shelter from persistent strong winds	12m
STREBLUS (Milkwood)	15	PB12	Prefers rich well dug soil	12m
TORO	5	PB12	Grows in sun or shade	4m
TORO	10	PB5	Grows in sun or shade	4m
KAURI	43	PB12	Prefers a rich moist soil	60m
KAIKOMAKO	17	PB12	Good moist soil	6m
MATAI	15	PB6½	Tolerates dryer soil	25m
MIRO	31	PB6½	Good moist soil in semi shade	25m
RIMU (Red Pine)	17	PB12	Rich moist soil some shelter	25m
LANCEWOOD (Horeoka)	11	PB6½	Effective alone or in groups/hardy	15m
PUKATEA	5	PB12	Needs plenty of moisture/swampy areas	30m
PURIRI	13	PB12	Grows fairly fast in rich deep soil/coastal	25m
Sub-total:	262			
AROHA SOUTH			(Planting completed Tuesday 11 June)	
POHUTUKAWA	4	PB12	Withstands rigorous coastal conditions/dry soil	20m
PURIRI	3	PB12	Grows fairly fast in rich deep soil/coastal	20m
PUKA (Pukanui)	3	PB12	Huge leathery leaves	7m
Sub-total:	10			
TOTAL:	580			

FURTHER WORK

The June 2013 Native Tree Planting Project has revealed that further work is necessary to effectively restore the regenerating native forest on Aroha Island. In order of priority the recommended work is:

1. Removal of the *Cryptomeria japonica* (Japanese cedar) shelterbelt of mature exotic trees at the South end of the upper Camping Ground and other selected exotics on Aroha Island, plus the single *Cryptomeria* at the Aroha front gate on Rangitane Road.

Note: *Cryptomeria japonica* is endemic to Japan and may grow at 1m/year up to 70m with a trunk diameter of 4m. The trees shed needle-like litter during fresh winds, which when dry, is a hazard to bare footed visitors and campers and a problem for mowing. These exotics presently dominate the regenerating native bush and have no place in any restoration programme of NZ native forest. Once dropped, the trees can be either chipped to provide mulch for native plantings and the vegetable garden, or used as firewood.

2. Complete restoration planting with selected native tree species of the Northeast Planting Zone, East Planting Zone, and area South of the "removed" *Cryptomeria* shelterbelt. Restoration planting of the Urupa Planting Zone is conditional upon full approval by tangata whenua.

Note: In the writer's opinion, the North, Northwest and Southwest Planting Zones were planted to capacity in June 2013. The Northeast Planting Zone has not reached capacity and there is room for more trees. Based on the June 2013 planting programme, best estimates of tree numbers and species for the new zones to be planted can be made at anytime. If Kerikeri Plant Production is the selected supplier they should be given early warning in Spring 2013 of the number and range of species required so that Aroha gets the best quality of available trees ready to plant in June 2014.

CONCLUSIONS

On last inspection, all the native trees planted between 3 and 18 June 2013 were doing well notwithstanding the effects of a recent Southwesterly gale around the Winter Solstice and a Southeasterly gale late June.

Winter rains are now watering the new trees in. The midwinter timing of the planting of the 580 trees should give them enough time to establish themselves to survive the hot, dry months of the coming summer.

Although the writer led the project, it would not have been successful without the joyful assistance of the many volunteers (see Acknowledgements). Aroha Island, the ecology, and successive generations of visitors to come, will all be the true beneficiaries of this native plant restoration project.

ACKNOWLEDGEMENTS

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Pub Charity for the grant of \$5000.00 to fund the project.

Kerikeri Plant Production for the supply of 580 high quality plants.

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Anne Gibb, AICT Trustee, Rangitane, for finalizing the formatting of this report.

PHOTOGRAPHS



Figure 1: Native trees at Aroha ready to move to Planting Zones.



Figure 2: Anne Gibb and Lindsay Alexander planting native trees.



Figure 3: Helen Ough Dealy having a break from planting.



Figure 4: Jeremy Gibb with a Puriri tree ready for planting.



Figure 5: Tara Panckhurst healing in a native Miro.



Figure 6: Part of the planting team enjoying morning tea at Aroha Island.