NGĀ KŌWHIRINGA WHENUA MĀORI – MĀORI LAND-USE OPPORTUNITIES

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INTERNSHIP REPORT

NGĀ PAE O TE MĀRAMATANGA/

MANAAKI WHENUA LANDCARE RESEARCH

2016

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Ngā Pae o te Māramatanga Research Internship Programme: Progress Report as at 9 December 2016

Ngā Kōwhiringa Whenua Māori – Māori land-use opportunities

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AIM:

To identify suitable land use opportunities for Maori owned land in the Wairoa, Te Tairawhiti rohe.

INTRODUCTION:

The Wairoa Te Tairawhiti rohe (Figure 1) has limited intensive land use compared to Gisborne to the north and Napier to the South This internship is for an MSc student to identify horticultural opportunities for Māori land in the Wairoa, Te Tairawhiti rohe.

This study will select minimum three Maori owned landblocks to be used as case studies in which on-site assessments will be used in combination with desk top GIS based spatial analysis to identify suitable horticultural based land use opportunities.

Where soil and water quality are negatively impacted upon by current landuse, land management techniques are suggested to improve soil and water quality.

Enhanced ability to make informed decisions towards intensive land use can provide economic benefits to whanau, local community and the Wairoa Te Tairawhiti rohe.

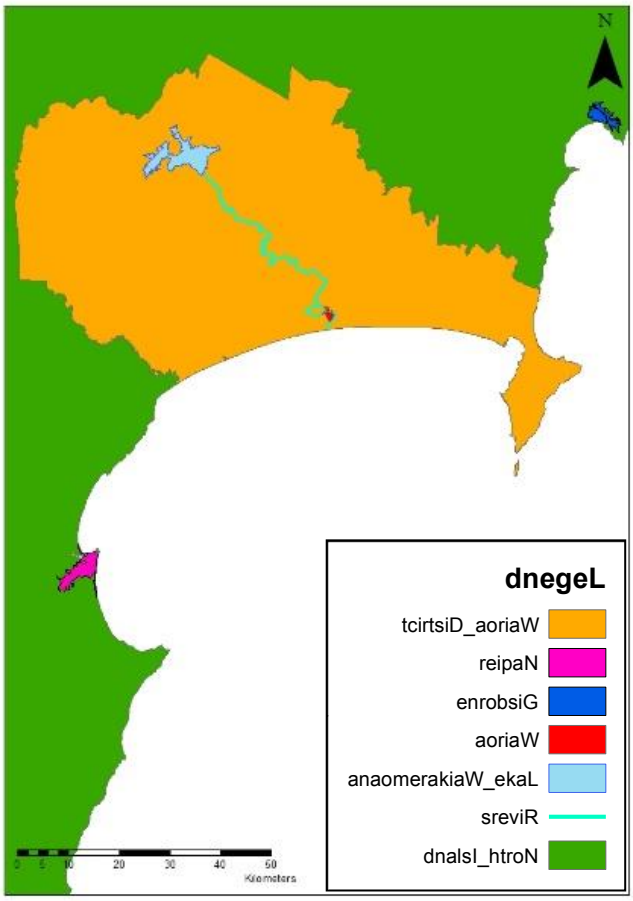

Figure 1: Study area Wairoa Te Tairawhiti rohe.

BACKGROUND:

The Wairoa District is less intensively utilized compared to the more developed centres of Gisborne to the north and Napier to the south. The purpose of this project is to conduct a land suitability analysis of the Wairoa District to identify maori owned landblocks with potential for horticultural development.

During pre-European times the Wairoa District had numerous Maori settlements mainly concentrated along the coast and some inland routes. Much of the Wairoa Plains were used for growing crops with much of the hill country burnt and reverting to Manuka (Page, 1988).

Page (1988) classified the then Northern Hawkes bay Region (including Wairoa District) into 16 Land use Capability (LUC) Suites. Page (1998) identified LUC Suite 1 being alluvial plains and terraces as the most productive and versatile landforms which are represented in Wairoa District, Gisborne and Heretaunga Plains. The climate of such areas holds few limitations to land use having high sunshine hours, infrequent frosts (5.1/year), winds are not strong with temperatures warm in summer and mild in winter. Annual rainfall ranges between 800 -1200mm. Such variables when combined in the same area allows that area to be highly suitable for a wide range of crops (Page, 1988).

Pullar (1965) reported soils of the Wairoa flood plains e.g. Waihirere and Awamate soils had potential to be highly productive for horticulture. Pullar (1965) also mentioned the potential of the lower Wairoa River, Awamate Lagoon, and groundwater as a potential irrigation sources.

Rijkse (1979) reported that the recent soils in the Wairoa Valley and composite Brown Soils, Pumice Soils and Allophanic Soils on Mahia Peninsula possessed the greatest potential for cropping (including horticulture). Soil examples include: Waihirere, Gisborne, Mahia and Kopuawhera soils (class 1A) and Awamate, Kaiti and Makauri soils (class 1B).

Accurate spatial climate data can allow for identification of niche areas where climate may be optimal for particular crops (Sansom & Tait, 2004). Studies done by Sansom & Tait, (2004); Wratt et al, (2006) and Webb et al, (2016) demonstrated that by incorporating short term (12 months) data (from spatially dense data loggers) into long term climate station data, the resolution of existing climate maps can be significantly improved. Such climate maps can be accurate to local scale conditions thereby being essential in quantifying the level of risk of crop failure thus helping landowners decide on where and what crops to invest in (Sansom & Tait, 2004).

METHODS:

By utilising Wairoa District Council records, networking with local Wairoa Councillors, local towns folk the following three land managers were contacted with landowners met thereafter. **Richard Allen** - Board member of Te Matarae o Te Wairoa Economic Development Trust; **Luke Hansen** - Chief Commercial Manager for Ngati Pahauwera Development Trust; **Nic Caviale-Develescaux** - Project Co-ordinator for Whangawehi Catchment Management Group Inc.

For the on site assessment land characteristics taken note of include: landowner name, landblock ref, soil type, aspect, slope, landform, current landuse, historical landuse, potential limitations, erosion susceptibility and potential for riparian planting. Photographs were taken of areas of interest e.g. soil erosion and potential for riparian planting. As part of a separate Master's study temperature monitors were also strategically placed on each landblock to help understand local weather and climate.

Following methods by Reid et al (2006) a district scale spatial analysis was undertaken to identify which areas were most suitable for the following crops: saffron, feijoa and gevuina (Chilean hazelnuts).

RESULTS:

The maori owned landblocks used in this study and their owners are summarised in Table 1 below:

Table 1: Summary of landowners contacted to participate in this study

Landowner	Landblock ref	Landblock area (Ha)
Willie Adsett	Mohaka A41B	7.4
Willie Adsett	Mohaka A42B	7.6
Ngati Pahauwera	LotDP27736	40.9
Liz Paama	Nukutaurua 2C2	33.4

The following landowners in Table 2 were contacted since the initial field work and are all willing to take part in the longer term Master's study.

Table 2: Summary of landowners contacted to participate in longer term Master's study:

BLOCK NAME	SIZE (Ha)	CONTACT PERSON
Waipapa A141	1.2	Taiawhio Gemmell
Waipapa A142	0.4	Richard Allen
Lot 3 DP 472079	5.0	Christina & Murray Stockman
Whangawehi 1B3E	3.0	Lads Te Nahu
Mohaka A41B	7.6	Willie Adsett
Mohaka_A42B	7.4	Willie Adsett
Nukutaurua 2C2	33.5	Liz Paama
Tawapata_North_Sub7B_8B	100.0	Mere Whaanga
Mohaka A51B, A52A	15.0	Charlie Lambert
Mohaka A4, B14	528.0	Clinton Hemana
Mohaka A13B	50.0	Derek Huata

Mohaka_A63_A64_A65	9.0	Ngati Pahauwera
Hereheretau_B5F	4.0	Charles Peakman
Kaiwaitau_7B2A	7.0	Pua Taumata
Paeroa_2G5	24.0	Liz Paama
Nuhaka 2A4A1C2B2	1.8	Irene Wesche
Nuhaka_2D2B1A1	0.8	Trina Smith
Kaiwaitau_3B2	86.6	Laura Kamau
		Mark Munro
		Turi Paku
Lot4DP24164		Phill Farr
Lot3DP27736_Ngati_Pahauwera		Luke Hansen
MohakaA16_Ngati_Pahauwera		Luke Hansen
Lot1DP8823_Koanga_Inst		Richard Grimmett
Section 10 Block XIII Nuhaka North SD		Nigel Tomalin
Tauwharetoi 3B1A Block		Katie & Daniel Cornwall
		David Haliburton
Lot8DP412245_Pongaroa_Trust_		Nic Caviale-Develescaux

On site assessment results from each landblock are summarized below:

Case example study #1:

Landowner:	Willie Adsett
Landblock ref and address:	Mohaka A41B & A42B (Fig 2), 3381 SH2 Raupunga
Soil series and type:	Wairere sandy loam
Landform:	River terrace
Slope:	Slope <3˚
Current landuse:	Sheep & beef
Landuse history:	Sheep & beef since 1960's
Potential limitations:	High gravel and stone content in soil; high drainage/low available water holding capacity (AWHC); soil compaction by stock.
Susceptibility to erosion:	Areas close to Mohaka River most prone to erosion.
Potential for riparian planting:	Areas close to Mohaka River not fenced off so has most potential for fencing and riparian planting to prevent stock wandering into river.
Advantages of landblock:	Easy access to SH2; good drainage; landblock bounded by Mohaka River and Mangaturanga Stream so plant/tree roots may have access to water table; moderate spring frosts..

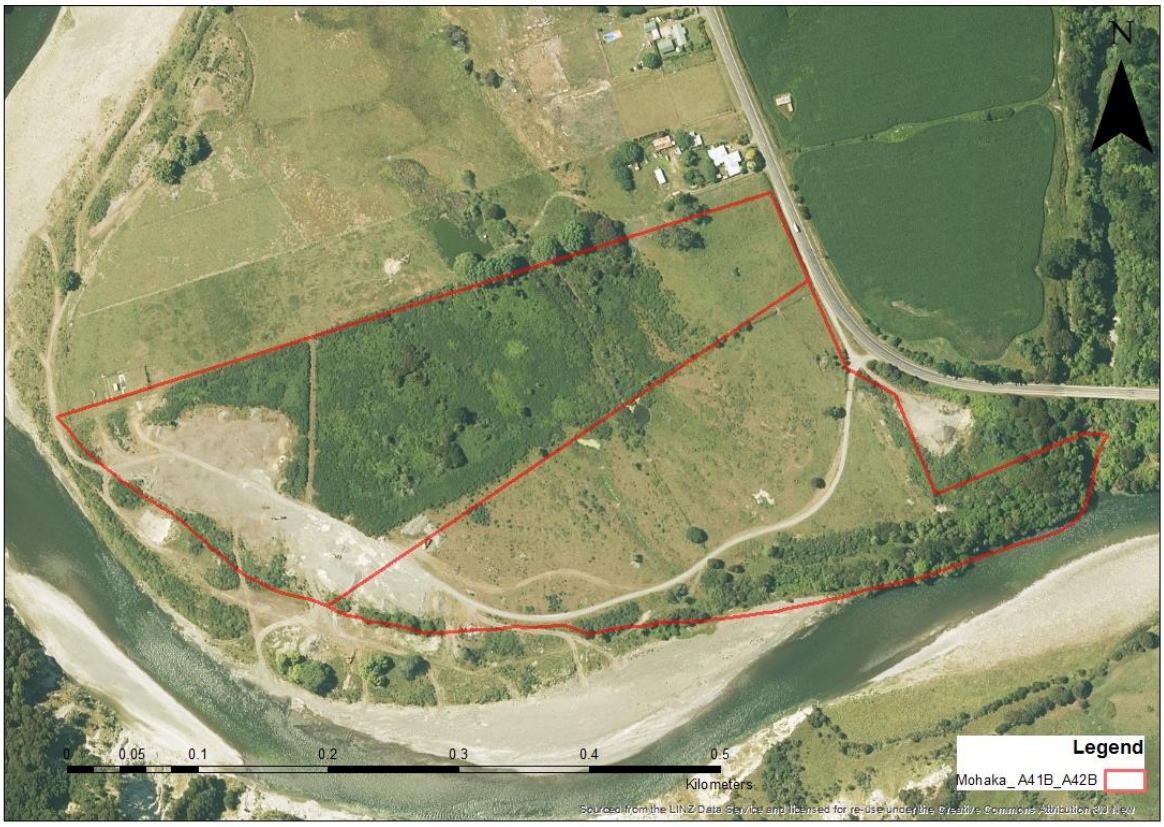

Figure 2: Satellite image showing landblocks Mohaka A41B & A42B boundaries.

Case example study #2:

Landowner:	Ngati Pahauwera
Landblock ref and address:	Lot3DP27736 (Fig 3), 75 Te O Tane Rd, Mohaka
Soil series and type:	Mohaka sandy loam on flats, Tutira sandy loam on hillslopes
Landform:	River terrace, hillslope
Slope:	Terrace slope <3˚, hillslope >15˚
Current landuse:	Sheep & beef
Landuse history:	Sheep & beef since 1960's
Potential limitations:	Coastal sea spray, strong coastal onshore winds, coastal erosion of sea cliff
Susceptibility to erosion:	Hillslope and coastal cliff most susceptible
Potential for riparian planting:	Stream in south end of landblock has potential for riparian planting; coastal cliff area
Advantages of landblock:	Little to no frosts; low slope angle (less than 3˚); warm/mild year round temperate climate (pers comm Murray Stockman, neighbour to landblock).

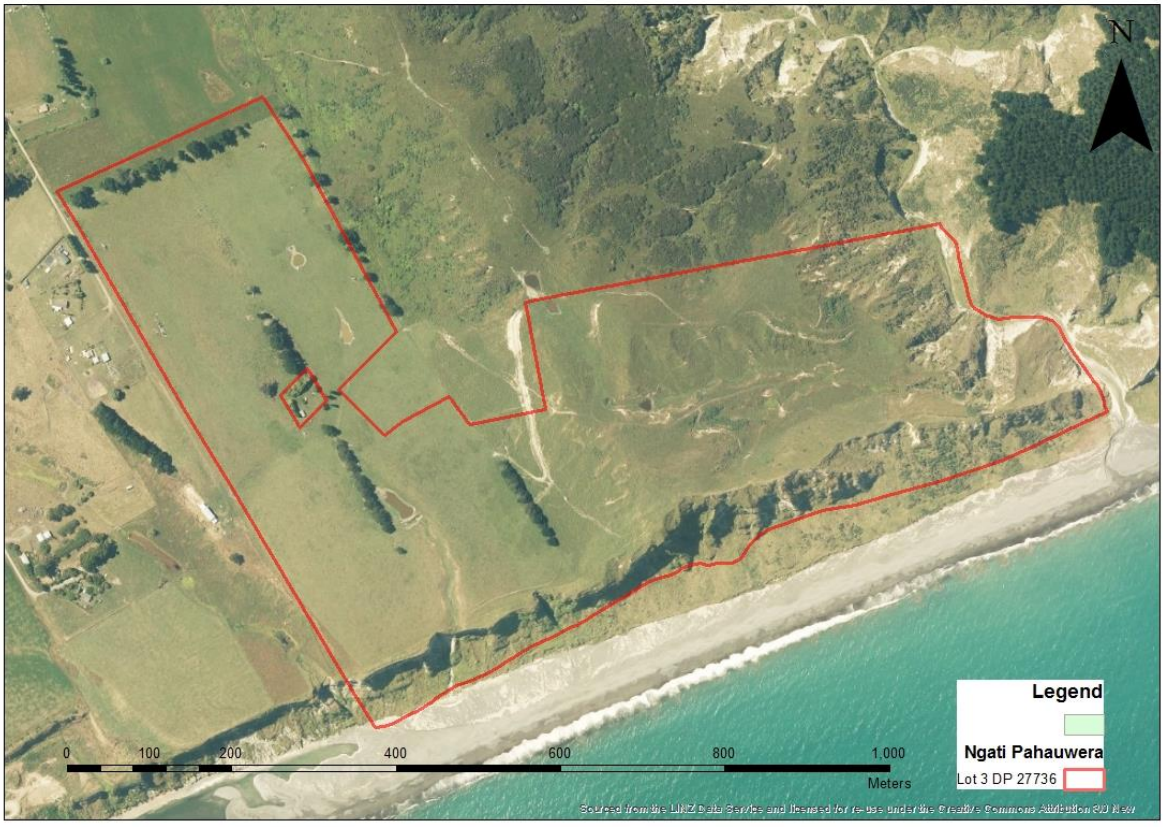

Figure 3: Satellite image showing landblock Lot3DP27736 boundaries.

Case example study #3:

Landowner/shareholder:	Liz Paama
Landblock ref and address:	Nukutaurua 2CC2 (Fig 4), 140 Nukutaurua Rd, Mahia
Soil series and type:	Mahia fine sandy loam on plateau, Mahioenui sandy loam on hillslope, unnamed coastal sandy loam on coastal flats
Landform:	Plateau, hillslope and coastal flats
Slope:	Slope <3˚ on plateau and coastal flats, >15˚ on hillslope
Current landuse:	Sheep & beef
Landuse history:	Sheep & beef since 1960's, never been cropped (pers comm Liz Paama)
Potential limitations:	Soil compaction/pugging from livestock; high summer temps; low summer rainfall; erosion from wind/rain
Susceptibility to erosion:	Coastal hillslope prone to erosion by streams in high flow (Fig 5).
Potential for riparian planting:	High – landblock has coastal access and has six streams, none with fencing or riparian planting. Stock allowed to enter streams and coastline at will (Figures 6, 7 and 8).
Advantages of landblock:	Little to no frosts (pers comm Richard Allen); low slope angle on plateau (less than 3˚ for 13 Ha); plateau soils have good drainage, soils on coastal flats even in dry spells receive water from plateau streams (Fig 9).

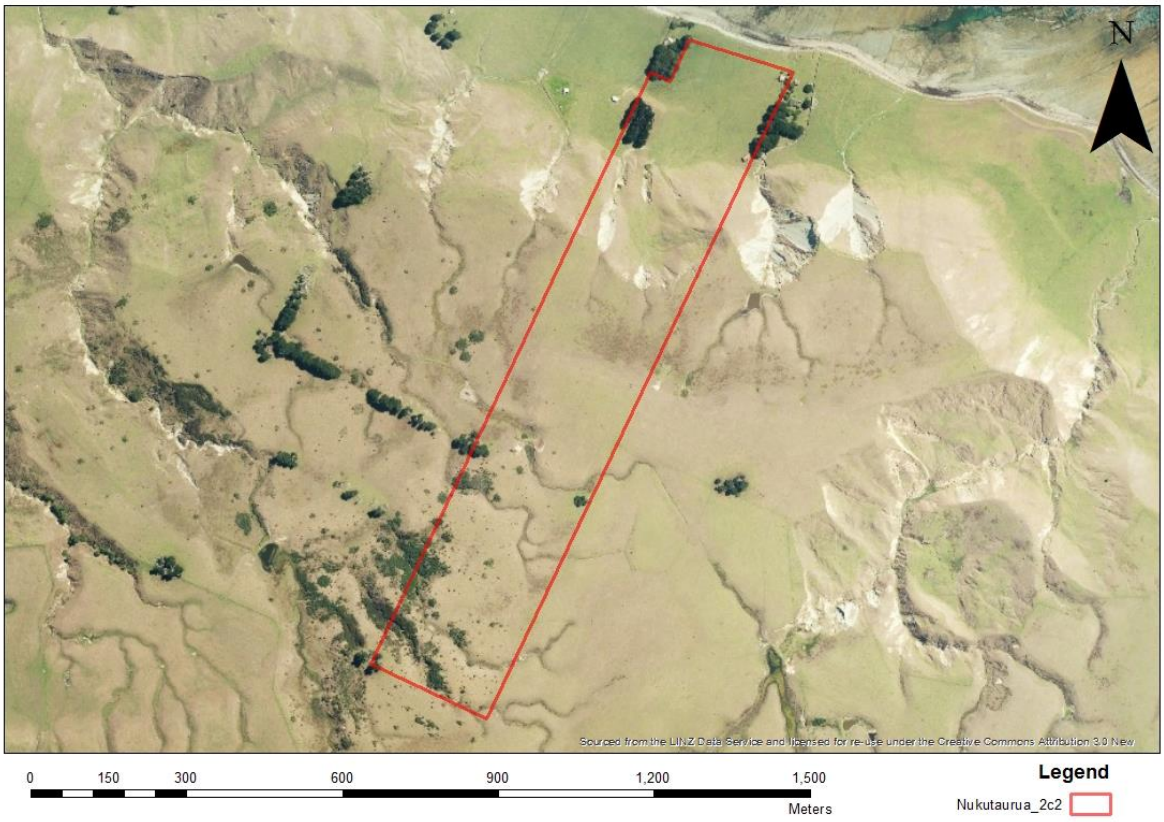

Figure 4: Satellite image showing landblock Nukutaurua 2C2 boundaries.

Figure 5: Stream outlet in foreground and stream hillslope erosion in background.

Figure 6: Image showing poorly maintained landblock boundary/fenceline with coastline and soil damage from stock.

Figure 7: Image showing poorly maintained fence line in foreground with stock having free access to coastline in background.

Figure 8: Image showing stock on landblock with unimpeded access to waterway.

Figure 9: Image showing coastal flat soils with green pasture irrigated from above plateau streams.

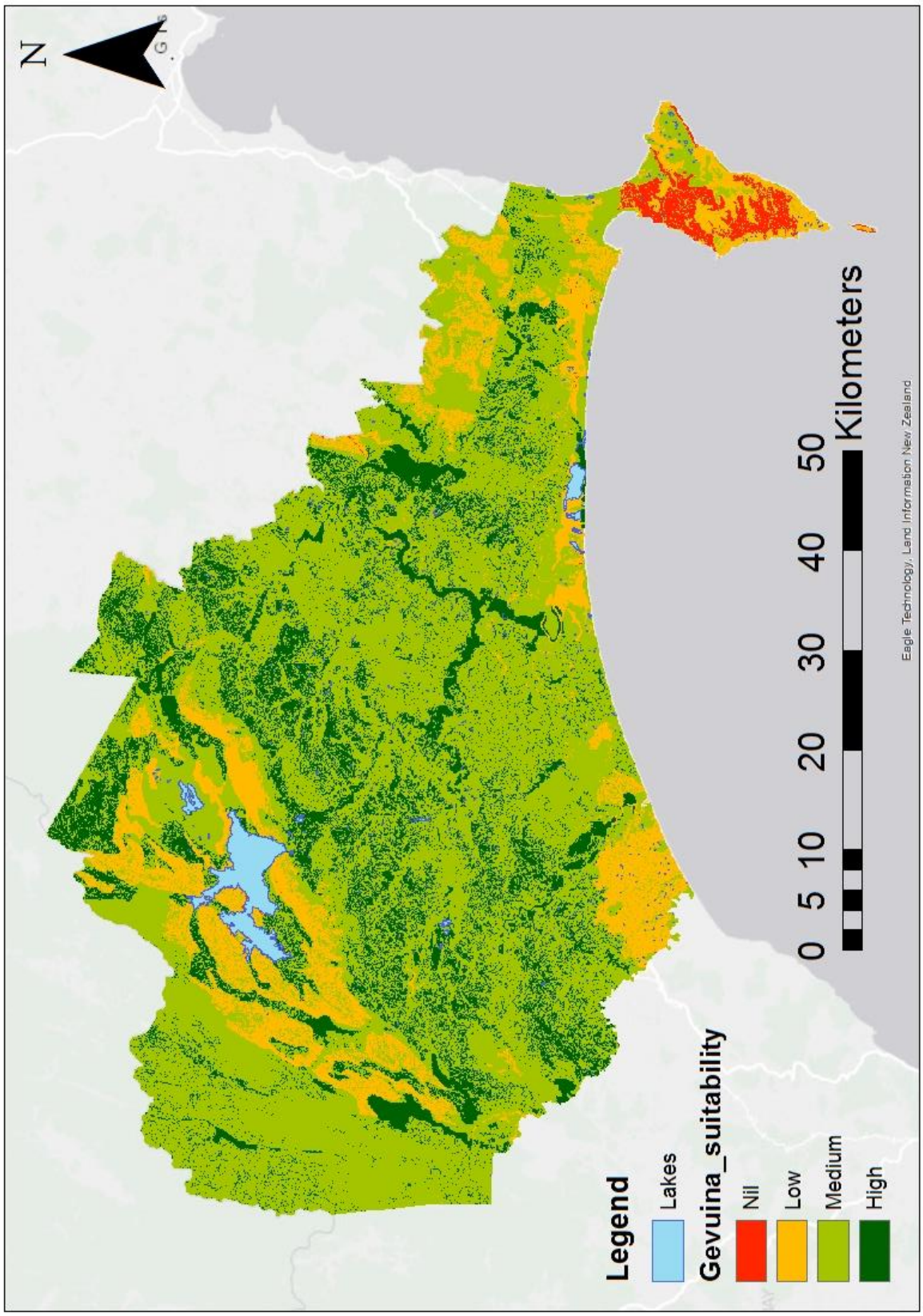

Figure 10: Map showing suitability of Gevuina (Chilean hazelnuts) in Wairoa District.

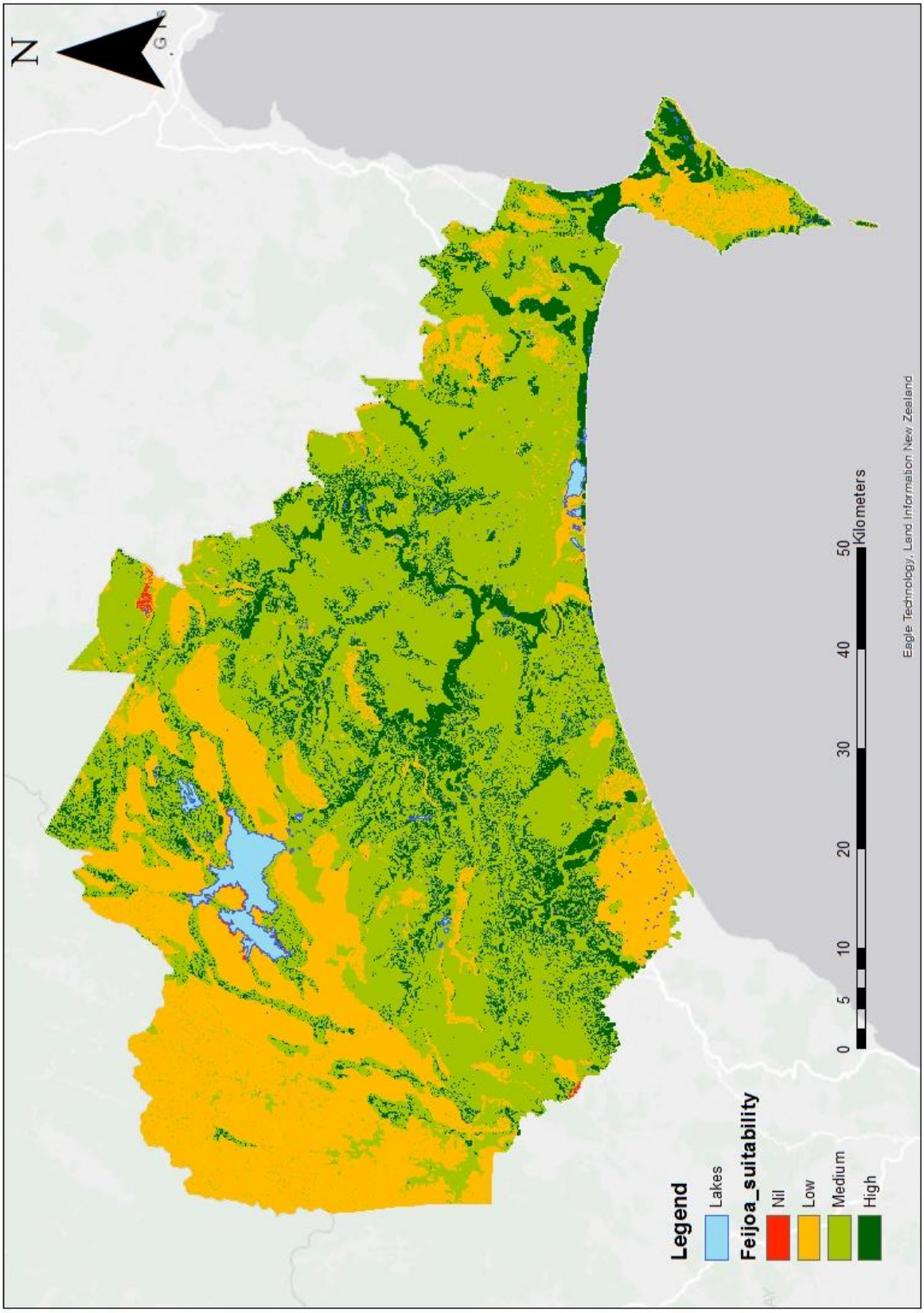

Figure 11: Map showing suitability of Feijoa's in Wairoa District.

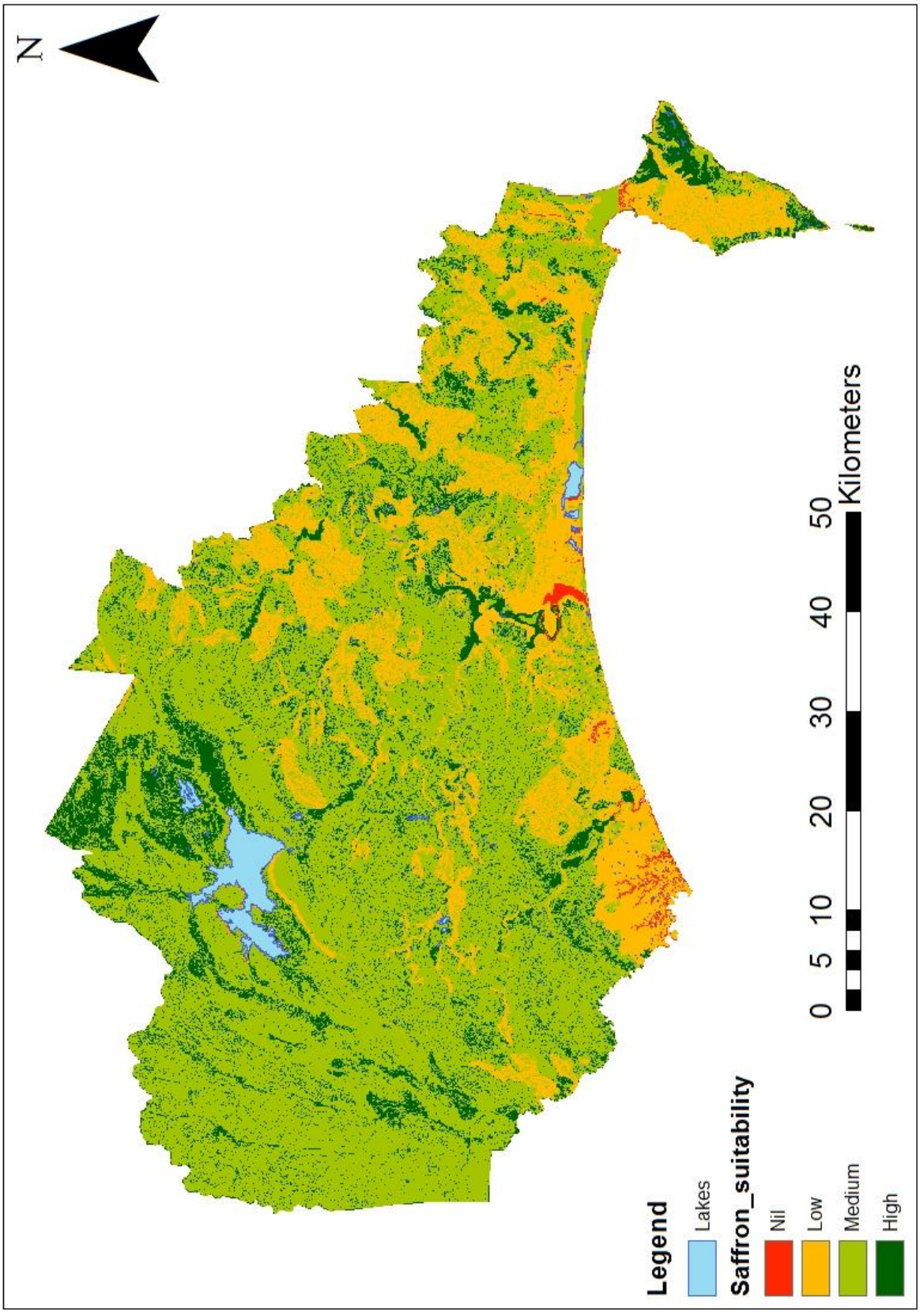

Figure 12: Map showing suitability of Saffron in Wairoa District.

RECOMMENDATIONS:

- For Willie Adsett landblocks Mohaka A41B/A42B river boundary to be fenced off to prevent stock from entering waterway and river boundary to be planted to prevent nutrients leaking into the Mohaka River. Land use options include: Feijoas, gevuina's and saffron – all high suitability.
- For Ngati Pahauwera's landblock Lot2DP27736 near south end of landblock plant sea cliff in native plants to minimise coastal wind and water erosion and provide wind shelter. Land use options include: Gevuina (medium suitability) and feijoa (medium suitability).
- For Lix Paama's Nukutaurua 2C2 landblock fenceline boundaries to be restored to prevent wandering of stock into streams and coastline. Streams to be planted in native plants preventing nutrients leaching into waterways and streambank erosion. Potential crops include: feijoas and saffron.
- Masters study to continue to achieve aim of further informing Maori landowners of potential horticultural opportunities housed within their land.
- Due to further networking with local landowners a further 16 Maori landowners will be further included in Master's study. These are listed in Table 2.

CONCLUSION:

The internship provided by Ngā Pae o te Māramatanga/Landcare Research has been successful in providing the first step towards informing Maori landowners in Wairoa of the horticultural land use options available to them. Further understanding of the soil and climate of Wairoa will lead to more horticultural land use options being made available for landowners. This will be achieved in the continuing Master's study finishing in January 2018.

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