

Biodiversity Monitoring Survey Report

NWR00494 (C17582) Te Hanga South Lands



Cover photo: Taken from Work Zone HAN-22 work facing east.

File Reference	NWR00494 (C17582)
Project name	Pt Te Hanga A9
Trust	Te Hanga South Lands Trust
Property location	Kakahu Road, South Waikato

Report completed by:
Ngā Whenua Rāhui

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Summary:

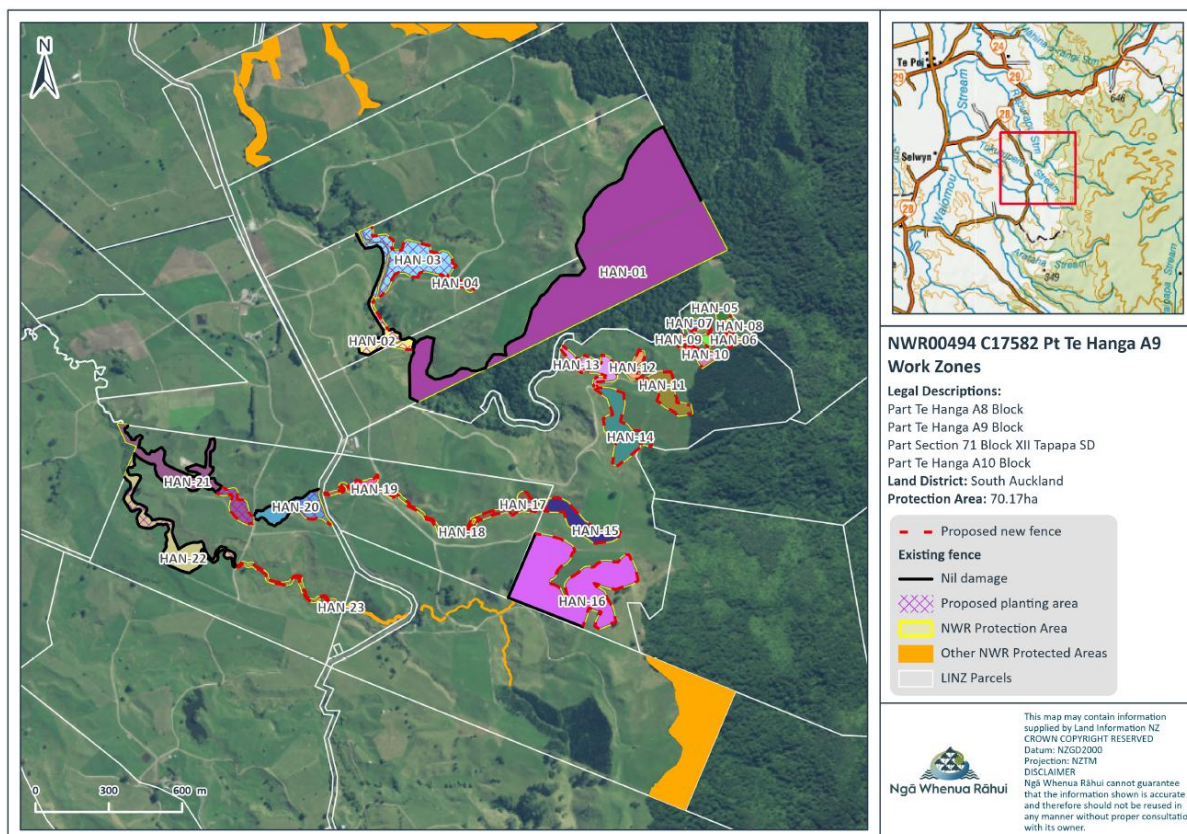
- Due to Te Hanga South Lands protected area being made up of scattered parcels of riparian restoration planting and mature forest, Nga Whenua Rahui created work zones for operational purposes only. The overall protected areas were partitioned into 23 work zones using unique naming convention HAN-01, HAN-02, HAN-03 etc.
- The overall condition of the Te Hanga South Lands mature forest area appears to be in a healthy state.
- Residual Trap Catch (RTC) results of 29% indicate a high possum presence.
- Small pest animals noted through general observations were Possum, Hedgehog, Hares, Rabbits.
- No pellets recorded during the pellet survey but observed rabbit and possum pellets during general observations.
- Seedling results indicate a good recruitment of palatable seedlings.
- Due to poor weather, selected waterways to carry out survey had poor visibility OR high velocity flow making it unsafe to carry out the freshwater fish night survey.
- Few emergent wildling pines noted during general observations in HAN-01 work zone. Also noted there was a stand of mature pine in HAN-22 work zone.
- A good presence of both endemic and native birds recorded across the protected areas. This however is not a full representation of species that maybe present in the protected areas.
- A total of 17498.5 metres of fence line with no damages. A total of 80.1 metres of fence line needing full replacement. A total of 74.8 metres of fence line with moderate repairs needed and 315.8 metres of fence line with minimal repairs required.

Protected Area Description

Te Hanga South Lands is situated on Northern South Catchment of the Rapurapu Stream in the foothills of the Kaimai Ranges. Undulating to very steep hill country. Several streams originating in the adjacent Kaimai Mamaku Forest Park flow through blocks including the Tukutapere and Rapurapu Streams. A lot of mahi being carried out by the trust with the support of Waikato regional council with erecting new fencing to exclude stock from protected areas and native tree planting to assist in stabilising the erosion prone soils which also contributes to better water quality, making for more favourable conditions for aquatic flora and fauna.

The protected areas are made up of 23 work zones and their ecological make up differs from mature forest to retired riparian areas newly planted or in stages of being planted with native. The mature forest in the protected areas of Te Hanga South Lands consists of Podocarp – broad leaf forest, scattered emergent podocarp species like Rimu, Kahikatea and Matai. It abuts the Kaimai Mamaku Forest Park. This project is a part of the Upper Waiomou Shovel Ready Catchment Programme alongside Waikato Regional Council, Fonterra and the Ministry for the Environment.

File Reference No:	NWR00494 (C17582)
Date Kawenata Signed:	27/04/2025
Kawenata Location:	South Waikato
Kawenata Size:	70.17 ha
Survey Date:	08/09/2025 – 12/04/2025



Introduction

Currently Nga Whenua Rahui manage over 300 individual kawenata throughout Aotearoa varying in size. Each kawenata may contain a number of different ecosystems, consisting of forests at different stages of growth and varying in size and tree species, e.g. beech forest, podocarp forest, coastal, regenerating manuka/kanuka stands, tussock and wetlands. They can contain rare, threatened, endangered or unusual combinations of both flora and fauna amongst bird, plant, insect and fish communities.

A range of biodiversity survey methods were used to assess the condition of the Te Hanga South Lands protected areas ecological health including:

- General observations to note the overall health of the flora and fauna with regards to presence and diversity of native species
- Presence of small pest animal species (possums) using the Residual Trap Catch (RTC) survey
- Presence of native and introduced bird species observed using the 5 Minute Bird Count survey and general observations
- Presence of Pest Plant Species using general observations
- Presence of palatable seedlings and pest animal pellets using the Seedling/Pellet survey
- A stream habitat survey to assess possible aquatic threats and impacts affecting water catchment.
- Presence of native and introduced fish species using the Freshwater Fish Survey

All the data collected is independent and can be described as what was observed by the surveying team. It reflects what was found regarding the immediate survey and can be seen as a “health check” in relation to the protected areas overall health, and biodiversity status. The data this report is based on is considered to be a ‘historical reference guide’ for future surveys.

Full details of the survey methods are described in the methodology of survey protocols section on the next page.



Photo 1: (left) Canopy cover in work zone HAN-01 varied throughout this zone.

Survey Protocols

Below is the list of monitoring protocols used for this biodiversity survey along with definitions for each protocol

Survey Protocols	Date conducted
General Observations	8th – 11th Sept 2025
Fencing Asset Management (FAMS)	8th -11th Sept 2025
5-Minute Bird Count	9th Sept 2025
RTC	8th – 10th Sept 2025
Stream Habitat	9th Sept 2025
Seedling/ Pellet	9th Sept 2025

General Observations: This involves a general walkthrough of the protected area and recording information such as native trees and animals seen, evidence of pest plants and pest animals, birds seen or heard, the general health of any streams and waterways, and any other notable environmental factors that may be impacting on the overall forest health within the block.

5-Minute Bird Count: Presence of bird diversity is recorded within the protected area at predetermined locations based on listening and looking for 5 minutes at each location.

RTC (Residual Trap Catch): RTC is a method used to estimate possum density within an area. On initial signing of kawenata, RTC transect lines are generated on a map and stay fixed in place for the duration of the agreement and are revisited each time a biodiversity survey is done. Each RTC line consists of 10 leg-hold traps placed at 20-meter spacings along the transect line for three nights which are checked and reset daily. The total number of possums caught is considered to be an estimated representation of the total possum density in that area, expressed as a percentage. All traps are set in accordance with the national A1 possum population monitoring best practice guide.

Seedling/Pellet Survey: This survey method is used to determine the impacts of hoofed browsing animals by measuring the seedling presence and heights of plant species they prefer to eat. In the absence of browsers, it would be expected that an even spread of seedlings across all height classes would be seen. Palatable plant diversity and abundance can also be an indicator of overall forest health with regards to understory diversity and regenerative succession. Pellet counts are done at the same time to gauge what pest animals may be present in the area (e.g., deer, goats, possums, cats, stoats, cows, pigs etc.).

Stream Habitat Survey: A 100-meter section of one or more accessible streams within the protected area is used for this assessment. A photo point, bearing, and location of the start is recoded, then all aspects of the stream is documented to the end point of 100 meters. Data collected includes stream substrate types (rock sizes, silt, mud etc.), bank width and stability, other contributing factors such as stream bank folia diversity and adjacent land type (native trees, weeds, farmland etc.), and any fish passage blockages such as windfall, dams etc. This section of stream will be revisited during the next survey to compare any differences.

Biodiversity Species

1.1 Native Flora

The table below shows plant species observed by staff through general observations while undertaking field survey work. It is not a comprehensive list of all plant species present within the protected area, only what staff observed at the time.

Canopy Classification	Māori/Common name	Botanical name
Emergent	Rimu	Dacrydium cupressinum
	Kahikatea	Dacrycarpus dacrydioides
	Tawa	Beilschmiedia tawa
	Matai	Prumnopitys taxifolia
Canopy	Tawa	Beilschmiedia tawa
	Rimu	Dacrydium cupressinum
	Rewarewa	Knightia excelsa
	Pukatea	Laurelia novae-zelandiae
	Kahikatea	Dacrycarpus dacrydioides
	Miro	Prumnopitys ferruginea
	Matai	Prumnopitys taxifolia
	Karaka	Corynocarpus laevigatus
	Mangeao	Litsea calicaris
	Broadleaf/Kapuka	Griselinia littoralis
	Pigeonwood	Hedycarya arborea
	Mahoe	Melicytus ramiflorus
	Tarata	Pittosporum eugenoides
	Mamaku	Cyathea medullaris
Sub-canopy	Mangeao	Litsea calicaris
	Nikau	Rhopalostylis sapida
	Ti Kouka	Cordyline australis
	Silver Tree Fern	Cyathea dealbata
	Wheki	Dicksonia squarrosa
	Mahoe	Melicytus ramiflorus
	Whe	Cyathea smithii
	Kanuka	Kunzea spp
	Pigeonwood	Hedycarya arborea
	Lancewood	Pseudopanax crass
	Lancewood	Pseudopanax ferox
Understory	Akeake	Dodonaea viscosa
	Pate	Schefflera digitata
	Red Mapou	Myrsine australis
	Kanono/Manono	Coprosma grandifolia
	Black Maire	Nestegis cunninghamii
	Hangehange	Geniostoma rupestre var. ligustrifolium
	Nikau	Rhopalostylis sapida
	Silver Tree Fern	Cyathea dealbata
	Kawakawa	Piper excelsum

Understory cont.	Mahoe	Melicytus ramiflorus
	Mamangi	Coprosma arborea
	Karamu	Coprosma robusta & lucida
Ground/Floor	Raurenga (kidney fern)	Cardiomanes reniforme
	Parataniwha	Elatostema rugosum
	Peretao (Waterfall Fern)	Blechnum colensoi
	Maukurangi (Miniature Tree Fern)	Blechnum fraseri
	Piupiu (Crown Fern)	Blechnum discolor
	Lance fern	Anarthropteris lanceolata
	Finger fern	Grammitis billardieri
	Pikopiko/ Mouku (Hen & Chicken)	Asplenium bulbiferum
	Pānako	Blechnum filiforme
	Petako (Sickle Spleenwort)	Asplenium polyodon
	Turawera (Shaking Brake)	Pteris tremula
	Fork fern	Tmesipteris lanceolata
Climbers/Epiphytes/ Saprophytes/Vines	Puka	
	Kahakaha/Kōkaha (Perching lily)	Collospermum hastatum
	Kiekie	Freycinetia banksii
	Kareao (Supple Jack)	Ripogonum scandens
	Rata	Metrosideros perforata & colensoi
	Thread Fern	Blechnum filiforme
	Mangemange (Bushman's Mattress)	Lygodium articulatum
	Mokimoki (Fragrant Fern)	Microsorium scandens
	Fork Ferns	Tmesipteris lanceolata
Comments: The majority of listed flora above, was observed in the more mature forest area (HAN-01) but not restricted to this area. Included in this list are species seen in newly planted in riparian areas.		



Photo 2,3 & 4: From left to right fork fern, pukatea seedling & parataniwha ground cover

1.2 Manu/Birds

The following bird species list was recorded through both the 5MBC survey & general observations made by the biodiversity surveying team. It reflects what was seen during the team's time in the block but does not record bird numbers. The national status of the birds was sourced from the New Zealand Birds Online and the Department of Conservation birds list.

***Green = Recovering**

Māori/Common Name	Scientific Name	Conservation Status	Aotearoa Status
Kereru	Hemiphaga novaeseelandiae	Not Threatened	Endemic
Pīwakawaka, fantail	Rhipidura fuliginosa	Not Threatened	Endemic
Pūtangitangi, Paradise shelduck	Tadorna variegata	Not Threatened	Endemic
Riroriro, grey warbler	Gerygone igata	Not Threatened	Endemic
Tūi	Prothemadera novaeseelandiae	Not Threatened	Endemic
Kāhu, swamp harrier	Circus approximans Peale	Not Threatened	Native
Kotare, kingfisher	Todiramphus sanctus	Not Threatened	Native
Kāruhiruhi, Pied shag	Phalacrocorax varius	Recovering	Native
Tauhou, silveryeye	Zosterops lateralis	Not Threatened	Native
Australian Magpie	Gymnorhina tibicen	N/A	Introduced
Kōurarini, Goldfinch	Carduelis carduelis	N/A	Introduced
Chaffinch	Fringilla coelebs	N/A	Introduced
House Sparrow/ Tiu	Passer domesticus	N/A	Naturalised
Song Thrush	Turdus philomelos	N/A	Introduced
Common Myna	Acridotheres tristis	N/A	Introduced
Spur-winged plover	Vanellus miles	N/A	Introduced
Canada Geese	Branta canadensis	N/A	Introduced
Eastern Rosella	Platycercus eximius	N/A	Introduced
Blackbird	Turdus merula	N/A	Introduced
Welcome Swallow	Hirundo neoxena	N/A	Introduced

Survey Results

2.1 Possum Survey Results

The RTC survey method would normally be conducted over 3 fine nights but due to poor weather only 2 nights were recorded. Resulting in a Mean RTC rating of 29% , which indicates a High possum presence.

2.2 Palatable Seedling Survey

Figure 1 (below): Bar graph showing a representation of palatable species within the remaining remnant forest (Work Zone HAN-01, HAN-16) within the Te Hanga South Lands protected areas. Results show what appears to be good recruitment across all height classes.



Figure 2 (below): The bar graph below shows the diversity and count of all palatable plant seedling species recorded during seedling surveys within the protected area. There are more known palatable plant species present, however only the plant species found at the time of the surveys are what is recorded. Hangehange (GENlig) was the most common followed by Mahoe (MELram).

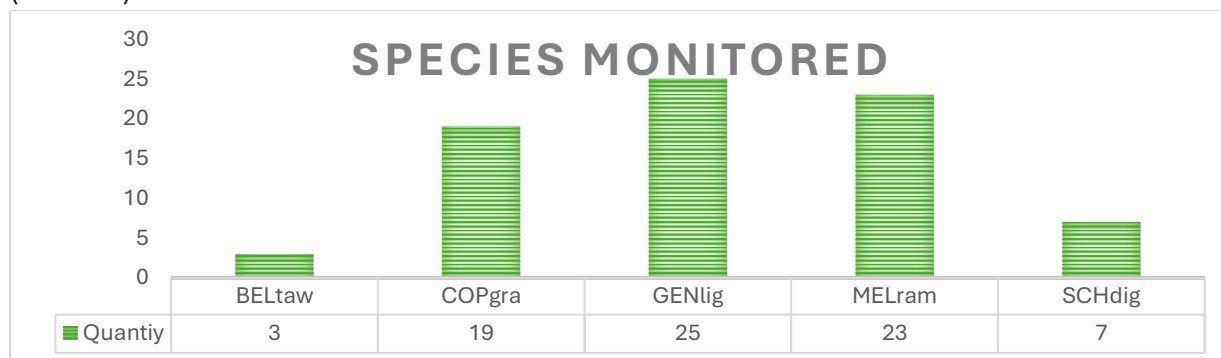


Table 1 (below): Common, botanical, and national vegetation survey (NVS) names of all palatable species found during seedling surveys within the Te Hanga South Lands protected areas.

Palatable species recorded during seedling surveys		
Common Name	Botanical Name	NVS code
Hangehange	Geniostoma ligustrifolium	GENlig
Mahoe	Melicytus ramiflorus	MELram
Kanono/Manono	Coprosma grandifolia	COPgra
Pate	Schefflera digitata	SCHdig
Tawa	Beilschmiedia tawa	BELtaw

2.3 Pellet Survey Results

Along with palatable seedling counts animal pellets are also recorded along RTC transect lines at the same time. The team also noted pellet presence while transversing within the protected areas. Pellets identified are recorded and shown in the table below.

Species
Cow
Possum
Hare
Rabbit



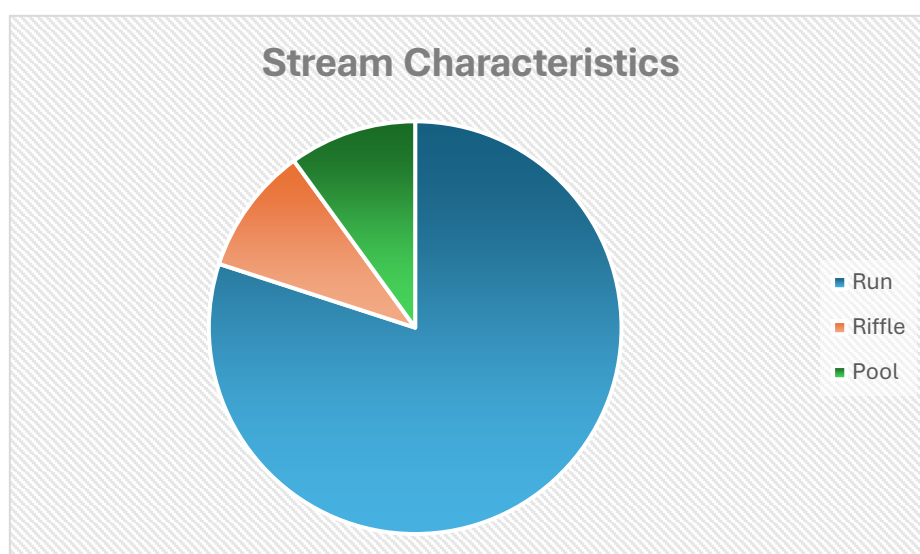
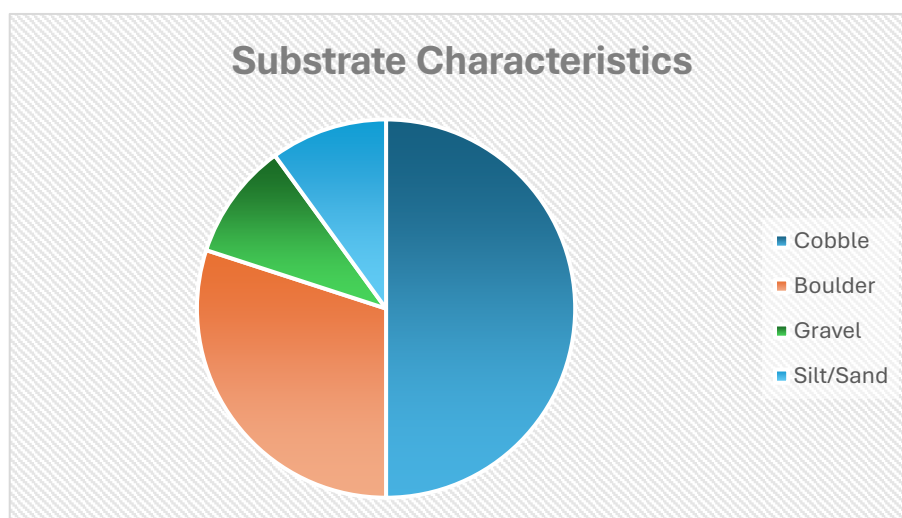
Photo 5, 6 & 7 (clockwise) : Animal feces Possum, Cow & Rabbit

2.4 Stream Habitat Survey

Stream name	Rapurapu Stream
Length of survey	100m
Water temperature	Cool (5-10°C)
Wetted width (m)	5 meters
Water movement	Quick flowing
Bank stability	Mostly Stable
Bank vegetation cover	Native vegetation
Dominant vegetation species	Native trees
Stock damage	None
Fencing	No
Fish blockages/barriers	No
Adjacent land use	Dairy Farm, Forestry
Water clarity	Clear
Comments and observations	This survey was conducted in section of stream flowing through the mature forest area (Work Zone HAN-01). Adjacent to the stream there were areas of riverine wetlands which hosted abundance of flora associated with wet areas i.e. Pukatea, Kahikatea, Paritaniwha.
Final comments	This survey reflects the immediately surveyed habitat only
Overall health rating	The section of the Rapurapu stream where these observations were made looked unobstructed and flowing freely. Due to rainfall during the BM Survey, we were unable to carry out a freshwater fish survey.

2.5 Stream Characteristics

Stream Characteristics	
Run	Runs usually come after pools and before riffles, where water is deep and has fast, uniform flow
Pool	A pool is an area of water with slow to no flow. They are usually deeper areas, and provide a calm habitat preferred by many aquatic species
Riffle	If there is water, seen and heard splashing over large rock
Substrate Characteristics	
Wood	Overhanging or fallen logs and bits of wood become part of the habitat
Silt or sand	Characterized as fine granulated, soft sand
Gravel	Measured in size, ranging from thumb nail to marble
Cobbles	Measured in size, ranging from marble golf ball
Boulder	Measured in size, ranging from basketball to anything larger
Bedrock	Solid rock exposed or underlying



Fresh Water Fish Survey

2.6 Fresh Water Fish Survey

Freshwater Fish Survey

A freshwater fish survey was undertaken to identify the fish species present within the streams and rivers of the property. The survey was implemented at the request of the Farm Advisor for the Trust.

The freshwater fish survey was not completed during the initial full biodiversity survey due to wet weather conditions. At the time, the streams were swollen and the water was cloudy, creating unsuitable conditions for conducting a night survey.

The survey was subsequently completed in early July 2026 under more favourable weather conditions. The Rapurapu Stream was surveyed, with the water being clear while maintaining a good flow, providing suitable conditions for the survey.

Three species were identified during the survey: Rainbow Trout, (*Oncorhynchus mykiss* Walbaum, 1792) Freshwater Koura, (*Paranephrops planifrons*) and Common Cockabullies (*Gobiomorphus cotidianus*) These were the only species observed on the night of the survey.

The Maramataka (moon phase) may have influenced the number of species observed. The survey was conducted during a full moon, which may affect fish behaviour. During periods of high moonlight, fish may be less inclined to venture into open areas and may instead remain in shaded or sheltered locations to reduce exposure to predators. Therefore, the full moon conditions may have contributed to the relatively low number of species observed during the survey.



Image 1: Common Bully (*Gobiomorphus cotidianus*)



Image 2: Freshwater Koura (*Paranephrops planifrons*)

Biodiversity Threats and Impacts

3.1 Pest Plant

Pest plants were identified through general observations made by the surveying team.

Common Name	Botanical Name	Coverage
Gorse	<i>Ulex europaeus</i>	Rare
Wildling Pine	<i>Pinus contorta</i>	Occasional
Grey Willow	<i>Salix cinerea</i>	Rare
Pampas	<i>Cortaderia selloana</i>	Rare
Blackberry	<i>Rubus fruticosus</i>	Rare
Comments: All pest plants noted here had some form of control applied. Only the odd scattered plant seen that had no control applied. With the exception of Wildling Pine. Emergent trees seen in the mature forest area in Work Zone HAN-01 and a mature stand in Work Zone HAN-22		



Photo 8 & 9 (left to right): Pest plant control in preparation for planting & Pampas found just inside fenceline in Work Zone 01.

3.2 Pest Animals

Pest animals were identified through general observations made by the surveying team. Animal pests were otherwise seen or seen as evidence of (sign). The table below only reflects what was seen by the surveying team at the time and may not be a true reflection of all pest species present within the protected area.

Pest animal	Observation type	Captured
Possum	Seen/Sign	Photo # 1
Hedgehog	Seen	Photo # 2
Hare	Seen	Photo # 3
Rabbit	Seen	No
Pig	Sign	No
Comments: Hares and Rabbits were commonly seen during the survey. These pest species can have a negative impact on the environment if left uncontrolled by destroying native vegetation, which leads to soil erosion and degradation, especially in arid areas. They can also spread invasive weeds and compete with native animals and livestock for food.		



Photo 10, 11 & 12 (left to right): Hare, Hedgehog & Possum

Fencing (FAMs)

Approx 20734 metres of existing fence line recorded during this survey. The table below shows areas of completed fences (existing), fencing areas yet to be fenced (proposed) and damages at various levels. High damaged fences will require immediate attention as they would be deemed as not stock proof.

Work Zone	Existing fence (metres)	Approx. Proposed fence (metres)	High damage	Medium damage	Low damage
HAN-01	3269.6	-	-	-	-
HAN-02	2263.4	-	-	-	-
HAN-03	2009.1	-	10.3	51.3	-
HAN-04	211.7	225.6	-	-	-
HAN-05	691.6	-	-	-	-
HAN-06	113	-	-	-	-
HAN-07	259.1	-	-	-	-
HAN-08	189.5	-	-	-	-
HAN-09	108.3	-	-	-	-
HAN-10	203.4	-	-	-	-
HAN-11	-	611.8	-	-	-
HAN-12	-	416.2	-	-	-
HAN-13	702.5	1,165.7	15.5	-	11
HAN-14	-	1,117	-	-	-
HAN-15	802	791.1	-	-	20.4
HAN-16	1198.3	434.2	15.9	-	200.7
HAN-17	779.9	-	-	-	-
HAN-18	975.8	-	-	-	-
HAN-19	576.9	-	-	-	-
HAN-20	706.3	-	-	-	5.9
HAN-21	2102.2	-	38.4	14.6	15
HAN-22	2189.3	-	-	8.9	62.7
HAN-23	1382.5	-	-	-	-

Comments: The Te Hanga South lands have had a huge amount of fencing completed in the last year or two. The workmanship is to a very high standard. There are areas of the existing fence line that will require attention in the very near future and areas where high damage is recorded so they will need to be attended to immediately as those areas are noted as not stockproof. There are also areas of proposed fence line yet to be erected.

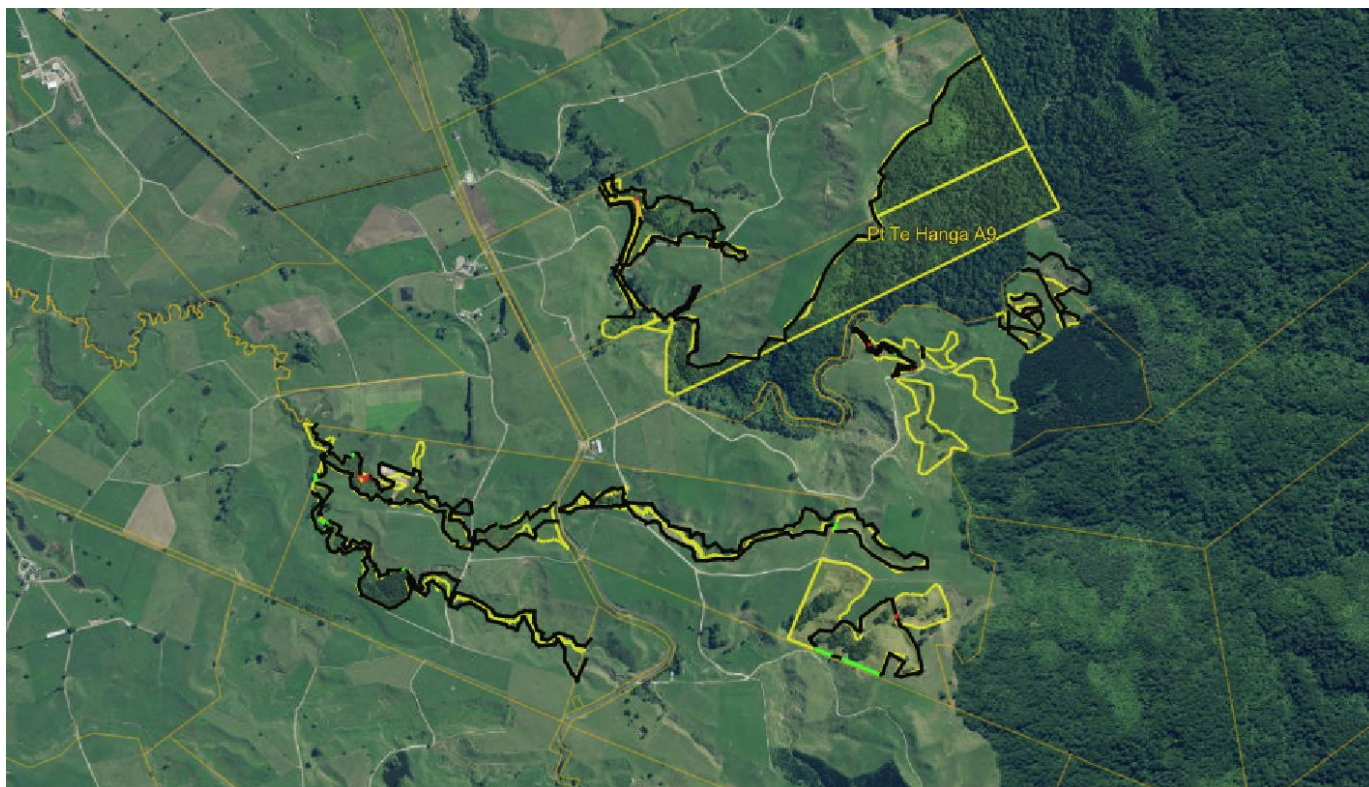


Figure 1 Photo 13,14,&15: Damaged fence lines

Findings

Overall, the state of Work Zone HAN-01 which hosts more mature forest appears to be in a reasonably good condition. With high possum presence, if left uncontrolled, this could potentially have a negative effect on the existing flora and impede possible succession of the taonga species currently present.

There was a high diversity of mature flora across Te Hanga South Lands, and with the newly retired and planted riparian margins, this can only enhance the biodiversity diversity of both flora and fauna greatly, if maintained and protected from threats such as Rabbits & Hare's.

Rabbits, if left uncontrolled they can populate rapidly as they have a high capacity for reproduction and threaten the success rate of the newly planted native plants by browsing on vulnerable native plants communities. They also support mammalian predators which are contributing to the extinction of many of our native birds and animals. The Hare may not reproduce as many offspring as Rabbits but can still pose a threat to the success rate of the native flora.

A lot of effort has gone into the restoration programme across Te Hanga South Lands and is evident when transversing across the farm. Work is ongoing in areas requiring fencing and planting (yet to be completed). Overall the work to date is evident and to a high standard.

There is minimal fencing repairs required across the entire length of existing fence line. A few loose wires, replacement posts and tree damage here and there.

Pest plant control was evident across Te Hanga South Lands in both protected areas where preparation for planting operations will take place and on the boundary lines of the mature forest.