

# Biodiversity Assessment

*Jordan Valley Fonterra Farm*

*Hikurangi, Northland*



Looking to Mt Hikurangi from Jordan Valley Fonterra Farm, with a totara-kahikatea remnant in the foreground

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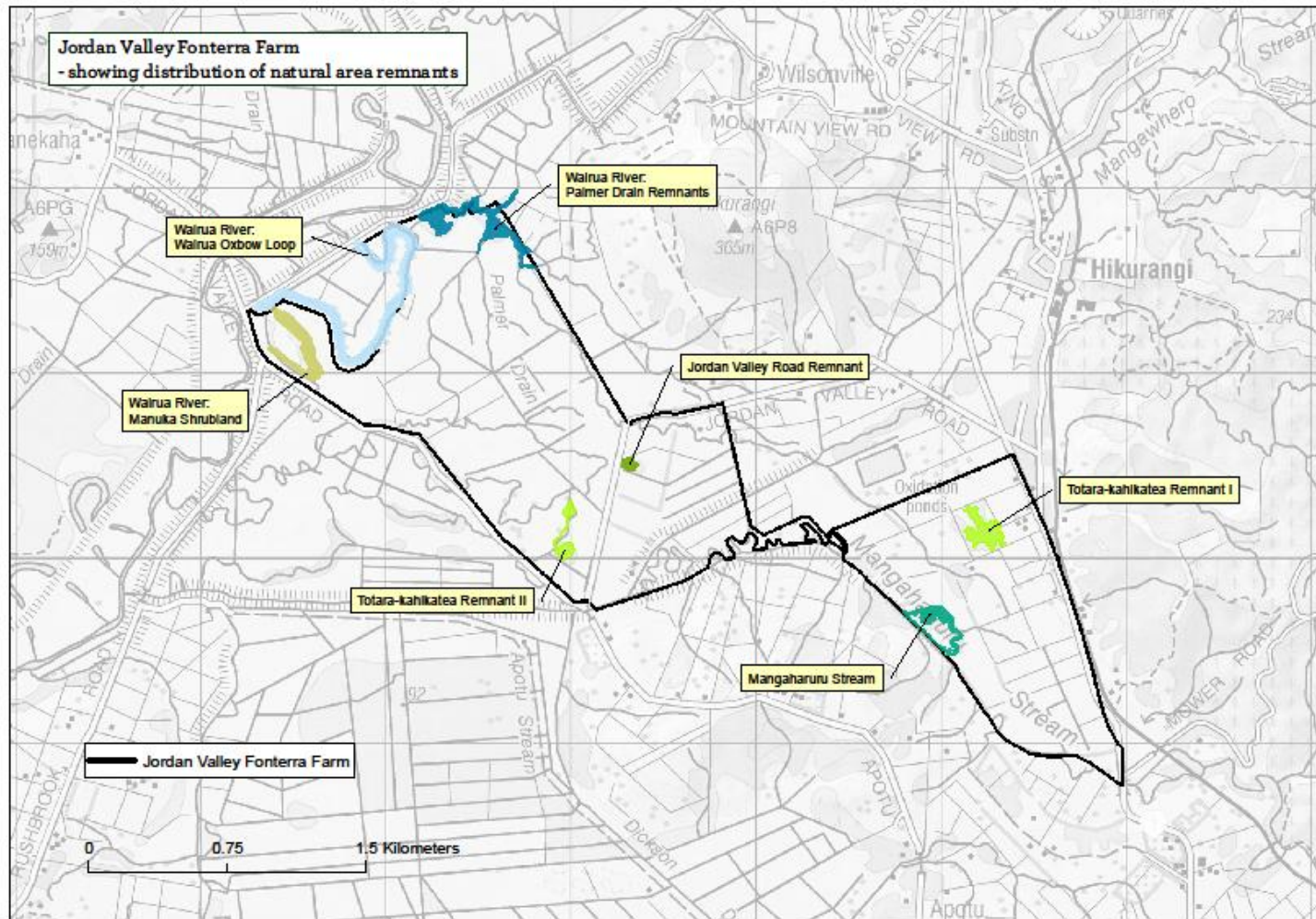
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Figure 1. Jordan Valley Fonterra Farm- Showing distribution of natural areas



## **Introduction**

The Department of Conservation (DOC) and Fonterra, as part of their partnership Living Waters (LW), have targeted the completion of 10 Farm Environment Plans (FEP) for the 2014/15 financial year within the Hikurangi Catchment.

The Jordan Valley Fonterra Farm (JVFF) has been identified as a pilot location for the LW FEP.

The LW Technical Working Group (TWG) agreed to utilise a DOC expert ecologist to under-take a biodiversity assessment of the JVFF. This assessment will be reviewed by the LW TWG to help create a FEP biodiversity assessment template, which could then be used throughout the wider Kaipara Harbour catchment and replicated nationally.

An initial FEP was produced for JVFF by Richard Allen (Fonterra, Supply Fonterra Environmental Program Lead) in June 2014.

On the 6 August 2014, Andrew Townsend (DOC Technical Advisor Ecology), and Fiona Gordon (DOC Services Ranger – Biodiversity) met with Mark Benton (Farm Manager JVFF) to discuss the natural values on JVFF.

Following this, Andrew and Fiona conducted an on the ground survey of the natural areas on the JVFF.

Andrew and Fiona returned on 13 August 2014 (with Wendy Holland (Department of Conservation, Partnerships Ranger) and 21<sup>st</sup> August 2014 to complete the survey and assessment of the remainder of the property.

A detailed assessment of the important natural areas remaining on the JVFF, are detailed in this report.



## Wairua River

This site comprises several remnants on the northern side of the property, adjacent to the Wairua River. This site is complex with several parts, which will each be treated separately as:

- Palmer Drain (1a-c),
- Wairua Oxbow (2a-d) and
- Manuka Shrubland (3).

It is clear from GIS analysis that the legal (surveyed) boundary does not align with landforms in the area, i.e., the legal boundary looks as if it should follow the centre of the stream but it lies approximately 20 metres southeast. This means that legally, there appear to be several discrete areas of natural vegetation (with intermediate parts owned by different landowners) when in fact, there is one area. (Figure 1 provides further details.)

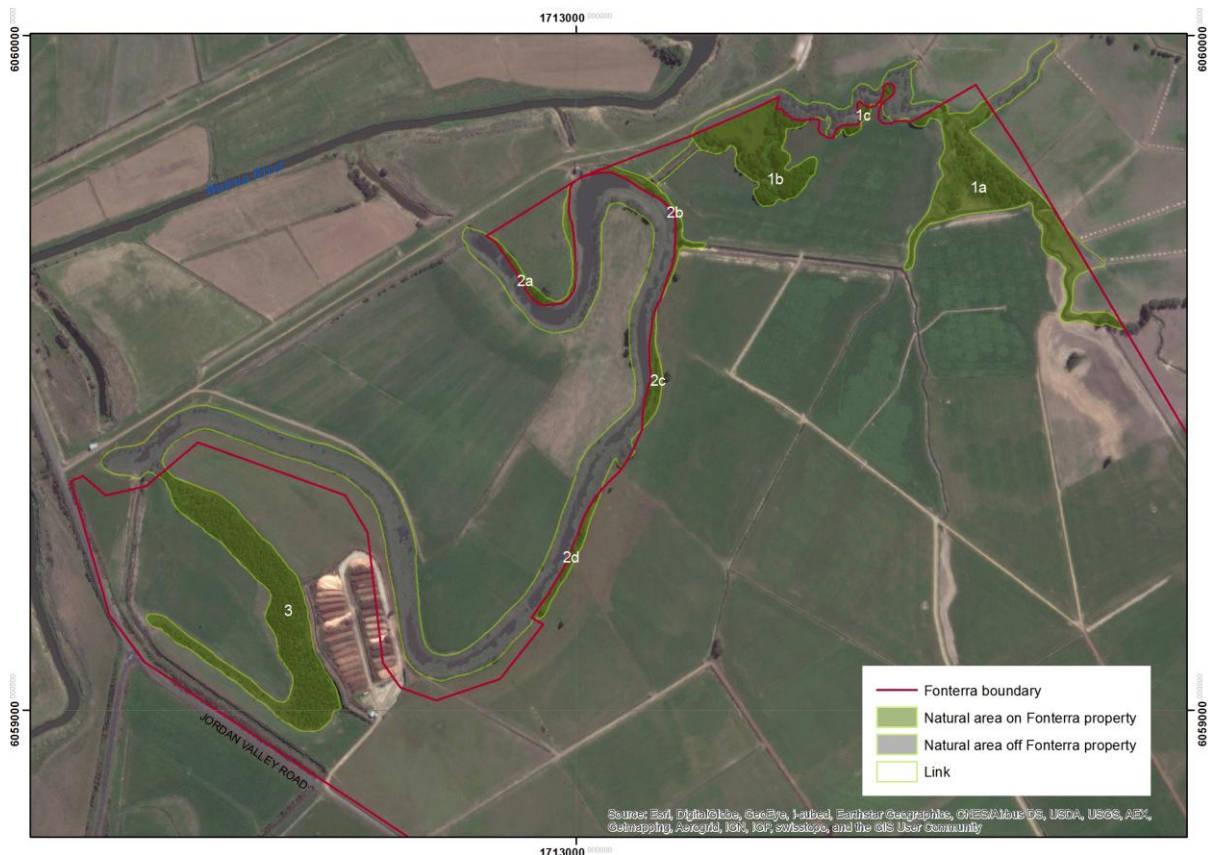


Figure 2. Legal boundary of Jordan Valley Farm and Wairua River remnants showing each as if it were a separate site.

## 1. Palmer Drain remnants

For the purposes of this report, the legal boundary is shown, but the sites are treated as if it is the middle of the stream because this is the way that the area is managed, i.e., fences are not aligned with the legal boundaries.

Location:	<p>The Palmer Drain Remnants are situated on the margins of the natural watercourse fed by Palmer Drain and areas of regenerating vegetation on the drains themselves. The remnants straddle the property boundary and therefore has multiple owners. The main parts in Fonterra control are located at:</p> <ul style="list-style-type: none"> <li>• 1a) Topo50 AW30 135 598 (1713590E 6059800N)</li> <li>• 1b) Topo50 AW30 133 597 (1713312E 6059777N)</li> <li>• 1c) Topo50 AW30 134 598 (1713425E 6059886N)</li> </ul>
Date visited:	6 August 2014
Area:	<p>Total: 5.13 ha</p> <p>Fonterra parts:</p> <p>1a) 2.29 ha</p> <p>1b) 1.37 ha</p> <p>1c) 0.12 ha</p> <p>Other: 1.35 ha</p>
Vegetation type(s) present:	<ul style="list-style-type: none"> <li>• Vegetation in the watercourse comprises herbfields of aquatic weeds such as parrot's feather and alligator weed where flow is minimal and open water where it is greater.</li> <li>• The margins of the watercourse are a mosaic of shrubland and grassland interspersed by patches of forest. The shrubland-grassland usually comprises scattered manuka, kanuka, privet and <i>Coprosma propinqua</i> over rank pasture, blackberry, parsley dropwort and rushes; and the forest and shrubland comprise areas of denser manuka and kanuka with privet, totara and small-leaved divaricating shrubs.</li> <li>• On the floodplain itself, is a patch of forest dominated by totara but with kahikatea, matai and black maire also present. The understory is poor, due to browse by cattle. This vegetation type also exists as discrete patches (or even single trees of the above species) up and down the edge of the stream/drain margin.</li> </ul>

- Significance:
- This site straddles two threatened environments. The floodplain forest is Acutely Threatened (Walker et al 2007) with approximately 8.8 % of indigenous cover remaining for the land environment, and only 1.8% legally protected. The forest and shrubland on the riverbank is Chronically Threatened and has about 14.7% left for the land environment, but only 1.36% protected. Black maire is also scarce in Northland and is regarded as being regionally significant. Black maire only occurs in inland floodplain forest habitats. Matai is of restricted distribution in Northland and is also regarded as being regionally significant.
  - Six plants of *Pittosporum obcordatum* were seen in this remnant. This is the third site for this species on the Hikurangi floodplain, which is a national stronghold with about 500 plants known. It is ranked as Nationally Vulnerable, and there are between 1,000 and 5,000 mature individuals remaining in the wild.
  - Several plants of the small rasp fern *Doodia squarrosa* (status is At Risk Naturally Uncommon) were also seen at this site.
- Threats:
- The area is managed to the waterway, with much of the riparian zone fenced so that cattle cannot access it, however several remnants that adjoin the waterway are not included in this fencing. For example, the totara-kahikatea-matai-black maire forest remnant is not fenced and the understory is extremely poorly developed and pugging and browse is evident.
  - Several weeds are present that have the potential to further degrade these remnants. These include tradescantia and privet.
- Recommendations:
- Alter fence lines so that cattle are excluded from the forest remnants.
  - Weed control for especially tradescantia and privet.
  - Collect seed and cultivate *Pittosporum obcordatum* plants for inclusion in riparian planting elsewhere on the property.





## 2. Wairua Oxbow Loop

The northern side of the property bounds the Wairua River which has had significant modifications to its course in the past as part of the flood mitigation scheme. Much of this has involved channelising the river and straightening out its course as it scrolls across the floodplain. One of these old river loops forms part of the northern boundary of the Jordan Valley Farm.

- Location:
- Wairua Oxbow Loop is largely public conservation land (Wairua River Marginal Strip No 3) administered by the Department of Conservation or legal riverbed with only a few small areas in Fonterra ownership:
    - 2a) Topo50 AW30 129 596 (1712938E 6059619N)
    - 2b) Topo50 AW30 131 977 (1713105E 6059779N)
    - 2c) Topo50 AW30 131 948 (1713119E 6059486N)
    - 2d) Topo50 AW30 129 592 (1712999E 6059234N)
- Date visited: 6 August 2014
- Actual area (GIS): Fonterra part: 1a) 2.29 ha; 1b) 1.37 ha; 1c) 0.12 ha; 1d) 0.26 ha  
Other part: 7.35 ha  
Total: 11.39 ha
- Vegetation type(s) present:
- A floating sud of the weeds, parrot's feather, alligator weed, bladderwort and native water milfoil occurs on much of what was the riverbed before it was diverted. In shallower areas, this gives way to a floating herbfield of alligator weed, *Persicaria strigosa* and *Isolepis prolifera*, and in deeper areas open water is dominated by lagarosiphon, submerged and emergent parrot's feather and water milfoil, and bladderwort.
  - Margins are dominated by areas of rank pasture grasses with blackberry and occasionally the native shrubs *Coprosma propinqua*, *C. parviflora*, small-leaved mahoe and privet.
  - On the upper edge there are occasional copses of totara and kahikatea treeland which is often surrounded by pasture. This type is a degraded form of the black maire and matai type that occurs in the Palmer Drain remnants. See Figure 3.
- Significance:
- This site no longer functions as part of the riverine complex because its flow is almost absent due to the stop-banks. Its significance is derived from the fact that it links the "manuka

shrubland” site and the “Palmer Drain”.

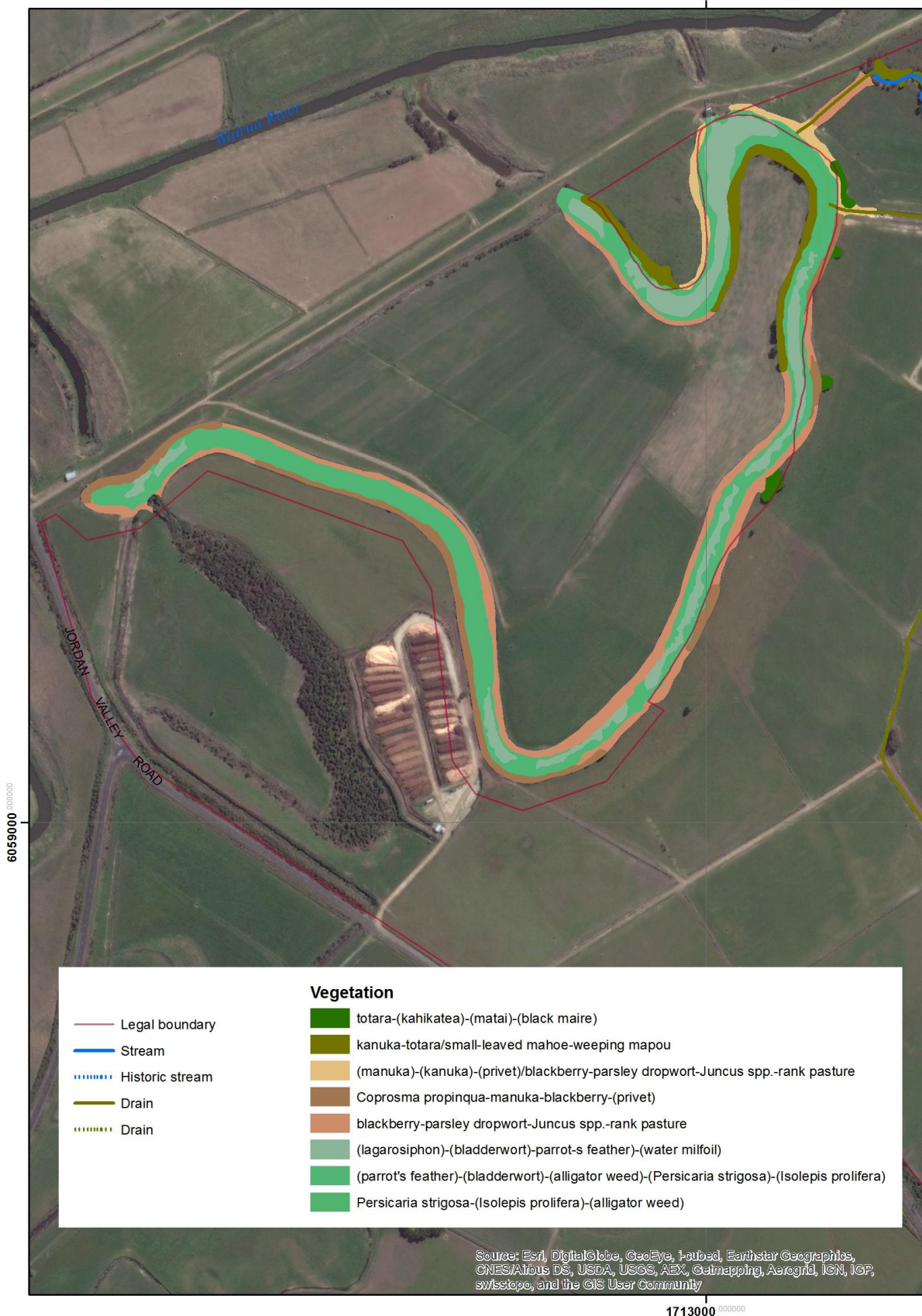
Threats:

- The Wairua Oxbow loop occurs on a Chronically Threatened Land Environment (Walker et al 2007), of which approximately 14.75% indigenous cover remains but only 1.36% is legally protected.
- Most of this loop is either public conservation land administered by the Department of Conservation (in the form of a Marginal Strip) or classed as waterway however a small extent is on the Jordan Valley property.
- Lack of flow through the Oxbow Loop means that it is choked with weeds.
- Areas of natural vegetation on the margin of the Oxbow Loop are grazed.

Recommendations:

- Much of the Marginal Strip is in grazing (or in the composting area), i.e., the fences do not follow the legal boundaries. Where natural vegetation occurs – especially the few remnant trees that are the remains of the totara-kahikatea-matai-black maire forest type – the fences should be moved to retire them.
- Planting could be considered to improve the margins for wildlife and buffer them. The species used should be those that occur in the Palmer Drain remnants, and seed could be collected and grown from both the Palmer Drain remnants and the Manuka shrubland, for this. Species location should be determined by where they occur in these remnants, i.e., floodplain forest species to improve the areas totara treeland on the floodplain; and shrubland and riverine species for the riparian margin. (This could include the nationally threatened *Pittosporum obcordatum*.)

Figure 2. Wairua Oxbow Loop



### 3. Manuka shrubland

Location:	Topo50 AW30 125 912 (1712575E 6059120N)
Date visited:	6 August 2014
Actual area (GIS):	2.81 ha
Vegetation type(s) present:	<ul style="list-style-type: none"> <li>• The main part of the wetland is dominated by a shrubland of scattered-to-dense <i>Coprosma propinqua</i>, manuka and kahikatea. In wetter areas, the understory is dominated by <i>Machaerina articulata</i> and in drier areas <i>Carex subdola</i> and <i>Carex ovalis</i> are commonly found. <i>Persicaria strigosa</i> is less fussy and is found throughout the shrubland in the understory. The margins of the wetland are variously dominated by patches of blackberry, privet and <i>Persicaria strigosa</i> vineland and herbfield.</li> <li>• A narrow tongue of <i>P. strigosa</i> herbfield with rushes and clumps of sedges extends northwest from the southern end of the wetland.</li> </ul>
Significance:	<ul style="list-style-type: none"> <li>• This vegetation remnant is on an Acutely Threatened land Environment (Walker et al 2007). This means that nationally, there is less than 10% of native vegetation remaining on this land type.</li> <li>• The sedges <i>Carex sinclairii</i> and <i>C. gaudichaudiana</i> were found in this remnant and are both distinctive of lowland, flood plain habitats and are uncommon in Northland.</li> </ul>
Threats:	<ul style="list-style-type: none"> <li>• The site is unfenced, and is slowly deteriorating, probably via access from stock.</li> <li>• <i>Persicaria strigosa</i> and <i>Carex ovalis</i> are both aggressive weeds in open wetland habitats. These species now dominate parts of the wetland, that were not so very long ago, a more dense shrubland (according to satellite imagery). Privet and blackberry are also common and some gorse plants were seen. All are troublesome in open wetlands.</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>• Control woody shrub weeds. (<i>P. strigosa</i> is probably too dense to make control worthwhile and <i>C. ovalis</i> is difficult to distinguish from the two native species.)</li> <li>• Fence wetland margin.</li> <li>• Consider legal protection.</li> </ul>

Figure 3. Manuka shrubland wetland



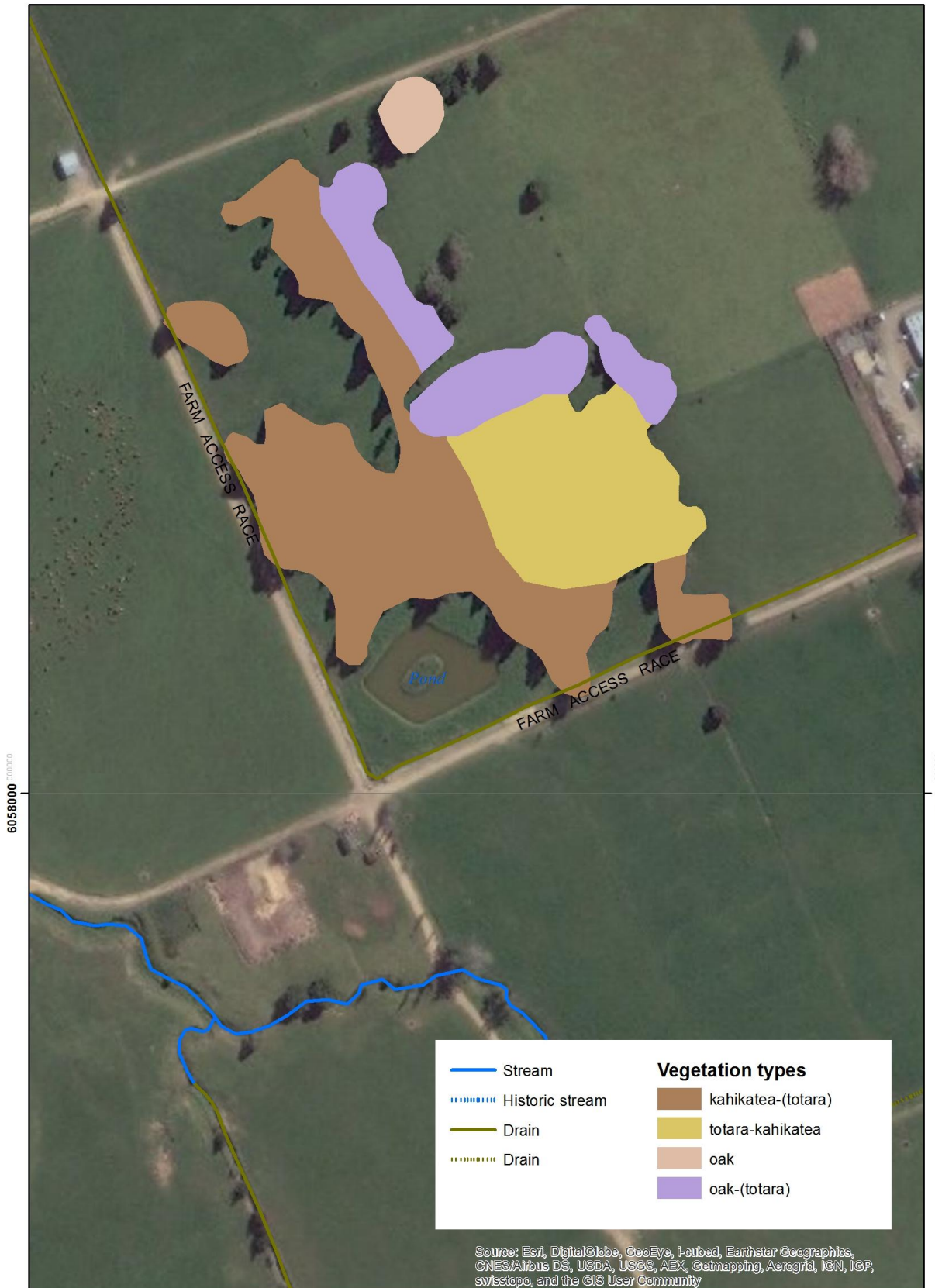


## Totara-kahikatea remnant I

Location:	This forest remnant is on the floodplain of the Mangaharuru and Wairua Rivers behind the old homestead, north and east of the main cattle race. It is visible from SH1, from just south of Hikurangi township. Topo50 AW30 162 581 (1716234E 6058155N)
Date visited:	13 August 2014
Actual area (GIS):	2.51 ha
Vegetation type(s) present:	<ul style="list-style-type: none"> <li>• Vegetation in the south-eastern part of the remnant is 15-18 metre tall forest of totara and kahikatea with a few matai and titoki and one rimu.</li> <li>• The western part is a scattered treeland of kahikatea over pasture with the occasional black maire.</li> <li>• There are also several large oak and other ornamental trees on the northern side of the remnant.</li> <li>• The understory is completely absent.</li> </ul>
Significance:	<ul style="list-style-type: none"> <li>• This vegetation remnant is on an Acutely Threatened Land Environment (Walker et al 2007). This means that nationally, there is less than 10% of native vegetation remaining on this land type.</li> <li>• Two trees species that are uncommon in Northland (regionally significant) were seen in this remnant. These are matai and black maire, both of which are components of flood-plain forest in Northland.</li> <li>• The absence of the weed tradescantia from this remnant makes it unique on the floodplain.</li> </ul>
Threats:	<ul style="list-style-type: none"> <li>• Accidental introduction of tradescantia into the remnant would allow a thick sward of this weed to form which would suppress any regeneration.</li> <li>• The ability of the remnant to regenerate is compromised by the presence of cattle which have completely browsed out the understory.</li> <li>• Possum browse and droppings were seen but their effect at present is minimal when compared with the lack of fencing.</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>• This remnant is ideal for a local community group or school to take on as a restoration project.</li> </ul>

- Everything should be done to ensure that tradescantia does not get into this remnant. It is probably absent because of the lack of a stream which would have carried it in, in a flood event. Also the remnant's distance from any public road means that the inadvertent dumping of garden waste has been minimal.
- The remnant needs to be fenced to remove the browse pressure. The understory is likely to recover by itself if this were achieved however there are several weed issues that would need to be controlled. These include Jerusalem cherry and privet.
- Open areas amongst the kahikatea treeland could be planted with local shrubland species such as manuka, *Coprosma propinqua*, *C. tenuicaulis* and *C. parviflora*, kohuhu, cabbage tree, small-leaved mahoe, weeping mapou, kowhai, manatu and turepo. Small numbers of local threatened plants such as *Pittosporum obcordatum* and *Hebe* 'Hikurangi Swamp' could be included in this planting.
- The forest area could be improved by planting on its edges to provide shelter to the interior. Local totara, kanuka and manuka would be appropriate species.
- Due to its significance, this site could also be considered for legal protection (through a QEII Open Space Covenant) or some other similar avenue.

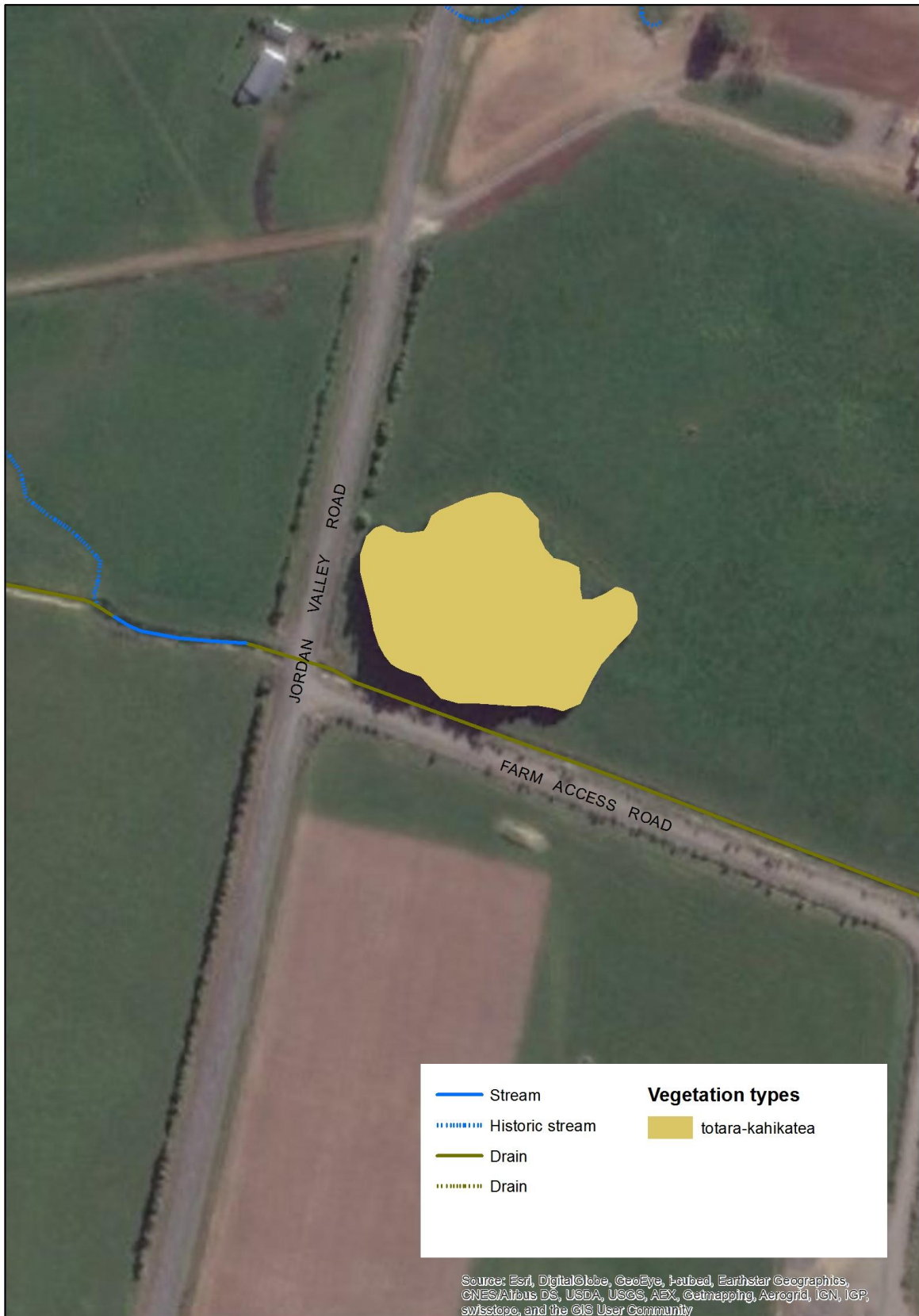
Figure 4. Totara-kahikatea remnant I



## Jordan Valley Road remnant

Location:	This forest remnant is immediately to the north of Fonterra building access-way, i.e., to the left hand side of the driveway entering the property. Topo50 AW30 143 585 (1714311E 6058511N)
Date visited:	13 August 2014
Actual area (GIS):	0.45 ha
Vegetation type(s) present:	<ul style="list-style-type: none"> <li>• A small remnant of kahikatea forest on the floodplain with several large trees of manatu and kowhai present and one pukatea.</li> </ul>
Significance:	<ul style="list-style-type: none"> <li>• This vegetation remnant is on an Acutely Threatened Land Environment (Walker et al 2007). This means that nationally, there is less than 10% of native vegetation remaining on this land type.</li> <li>• Species present here could be used as a seed source for some of the other planting areas, e.g., kowhai, manatu, weeping mapou and small-leaved mahoe.</li> </ul>
Threats:	<ul style="list-style-type: none"> <li>• Tradescantia covers about half the understory but is not yet very thick.</li> <li>• Drainage may be an issue. Several species typical of drier habitats (mamangi, kawakawa and karo) are present that suggest that this remnant is undergoing a change towards a drier environment. Kahikatea roots were also exposed suggesting that historical drainage has allowed the peaty soil to shrink.</li> <li>• The remnant's small size may be an issue in that it is easily invaded by weeds.</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>• Weed control for tradescantia, privet, Jerusalem cherry and hawthorn.</li> <li>• Planting to provide shelter and reduce the edge-effect of such a small remnant. Planting the area between the driveway and the remnant could also be considered.</li> </ul>

Figure 5. Jordan Valley Road remnant

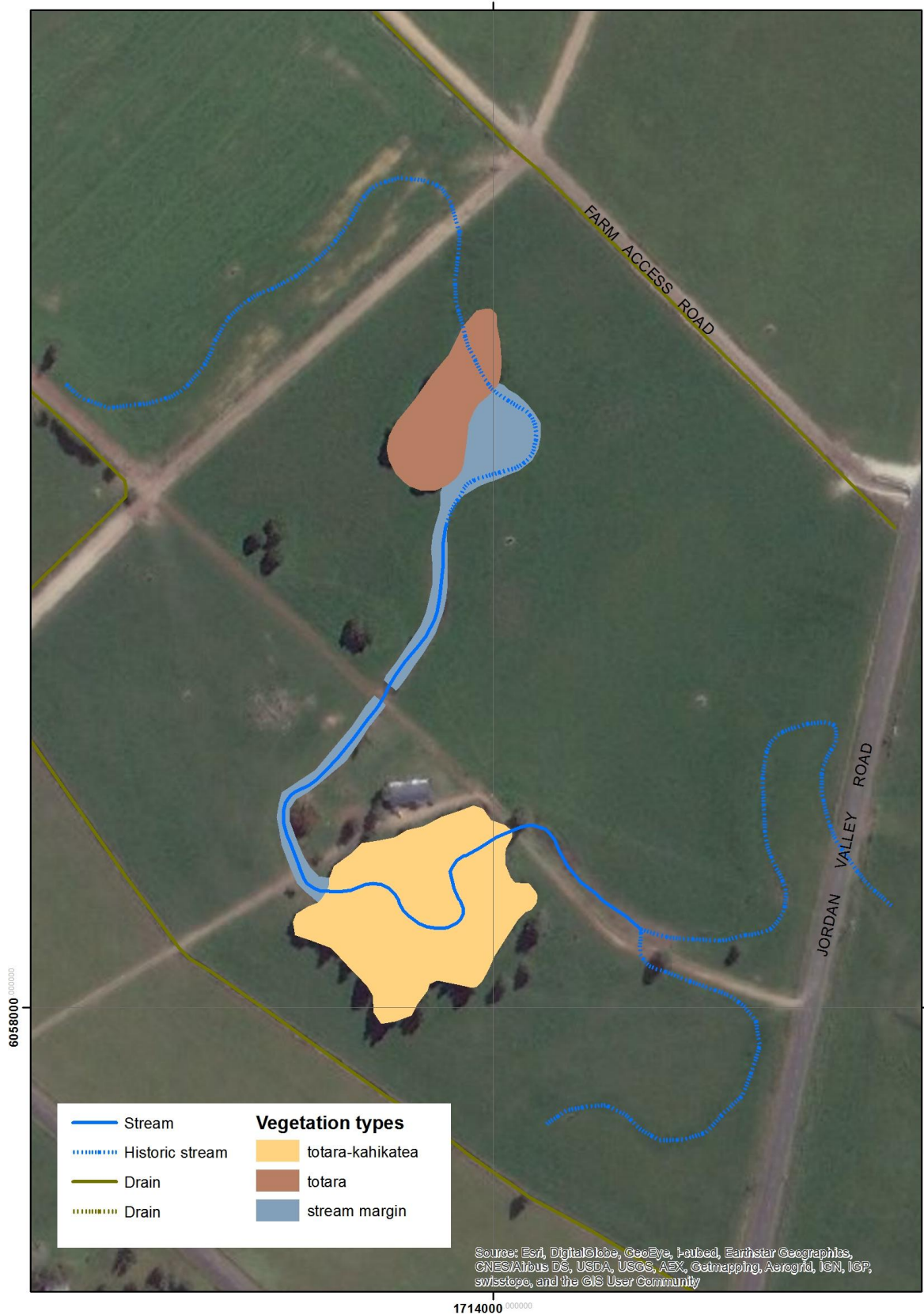




## Totara-kahikatea remnant II

Location:	This remnant is situated immediately south of the farm-worker's house and includes the snaking watercourse that ends amongst a few totara trees to the north of the house. Topo50 AW30 139 580 (1713967E 6058049N) Topo50 AW30 139 582 (1713984E 6058273N)
Date visited:	6 August 2014
Actual area (GIS):	1.11 ha
Vegetation type(s) present:	<ul style="list-style-type: none"> <li>• Totara-kahikatea forest (0.62 ha) south of the farmhouse.</li> <li>• Totara treeland consisting of a dozen or so trees north of the farmhouse (0.22 ha); and</li> <li>• A watercourse linking the two remnants (0.27 ha).</li> </ul>
Significance:	<ul style="list-style-type: none"> <li>• This vegetation remnant is on an Acutely Threatened Land Environment (Walker et al 2007). This means that nationally, there is less than 10% of native vegetation remaining on this land type.</li> <li>• Species present here could be used as a seed source for some of the other planting areas, e.g., kowhai, matai, black maire and turepo. (This was the only remnant where turepo was seen.)</li> </ul>
Threats:	<ul style="list-style-type: none"> <li>• Several weeds species were seen in this remnant and along the watercourse. These include tradescantia, hawthorn and crack willow.</li> <li>• Cattle browse and pugging is evident, especially where the watercourse meanders amongst the trees.</li> <li>• There is rubbish in the watercourse, which appears to be a dumping ground for rubbish and spent compost.</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>• Restore the water flow through the watercourse, if possible.</li> <li>• Remove rubbish from the watercourse.</li> <li>• Avoid dumping compost in wetlands and watercourses.</li> <li>• Fence both remnants and the watercourse that connects them.</li> <li>• Control troublesome weed species, e.g., tradescantia and hawthorn.</li> <li>• Consider planting edges of remnant and watercourse to provide shelter and buffer the water from surrounding land-use.</li> </ul>

Figure 6. Totara-kahikatea remnant II



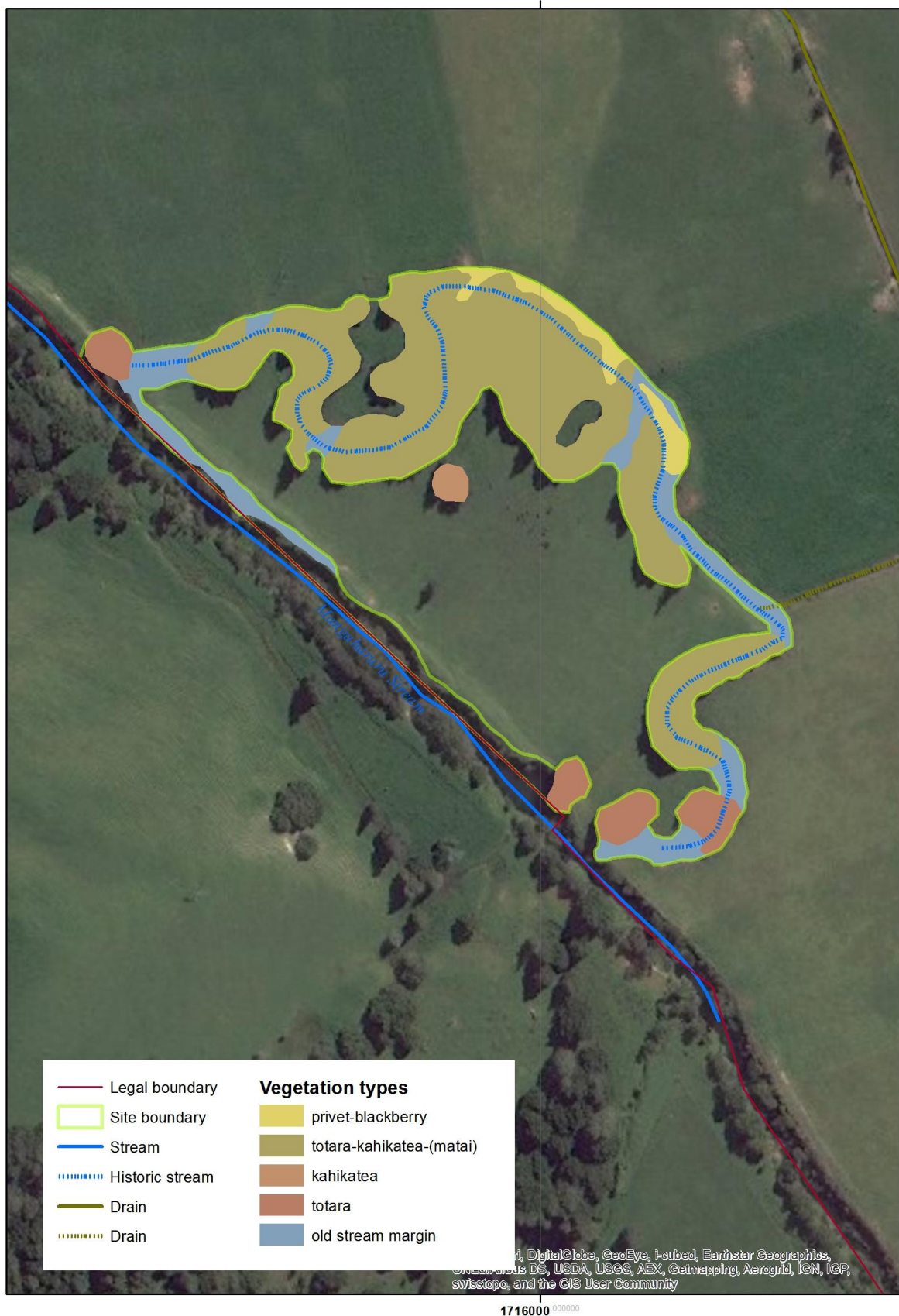
## Mangaharuru Stream

Location:	This forest remnant is situated on an old watercourse of the Mangaharuru Stream on the south-eastern side of the property. Topo50 AW30
Date visited:	6 August 2014
Actual area (GIS):	2.25 ha
Vegetation type(s) present:	<ul style="list-style-type: none"> <li>• A remnant comprising totara-kahikatea-(matai) forest follows an old watercourse of the Mangaharuru Stream. It has a poor understory, but given the chance this will recover as several native shrub seedlings were seen.</li> </ul>
Significance:	<ul style="list-style-type: none"> <li>• This remnant is on a Chronically Threatened Land Environment (Walker et al 2007). This means that there is between 10 and 20 % of native vegetation remaining on this land type.</li> <li>• Matai is uncommon in Northland (regionally significant) where it is usually found only in floodplain forest remnants.</li> </ul>
Threats:	<ul style="list-style-type: none"> <li>• Weeds are the main issue; Jerusalem cherry, Chinese privet and tradescantia all have the potential to dominate shaded areas (i.e., under a closed canopy) and barberry will form thickets around the edges. Crack willow along the drain could also be removed.</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>• There is very little need to put effort into planting plants in this remnant as there is an adequate seed rain from the existing canopy trees. With time, the remnant will establish its own understory. Some planting could be established on the edges however, as this will provide shelter and buffering. Although not seen in the remnant, local threatened plants such as <i>Pittosporum obcordatum</i> and <i>Hebe</i> 'Hikurangi Swamp' could be planted in appropriate places in the site.</li> <li>• The main remnant is fenced, but several trees are on the outside. Fences need to be moved to include these.</li> <li>• Investigate whether the Mangaharuru Stream could be diverted from the drain back through its old watercourse. Ideally, the paddock to the south-west of the remnant could form an island between the drain and the old watercourse. This would also ensure that the hydrology of the remnant is maintained, however</li> </ul>

this could provide a continuing source of existing weeds and also introduce new ones.

- Exotic trees (Lawson's cypress and radiata pine) on the edge of the stream bank could be cut down and the area where they occur replanted, but this is not a high priority.

Figure 7. Mangaharuru Stream





## Species list - Flora

Species recorded on the Jordan Valley Fonterra Farm

\*denotes exotic species

	<i>Adiantum hispidulum</i>
*agapanthus	<i>Agapanthus praecox</i>
titoki	<i>Alectryon excelsus</i>
*elephant's ears	<i>Alocasia brisbanensis</i>
*alligator weed	<i>Altenanthera phylloxeroides</i>
	<i>Asplenium flaccidum</i>
taraire	<i>Beilschmiedia tarairi</i>
*barberry	<i>Berberis glaucocarpa</i>
swamp kiokio	<i>Blechnum minus</i>
kiokio	<i>Blechnum novaezelandiae</i>
*wavy bitter cress	<i>Cardamine flexuosa</i>
	<i>Carex inversa</i>
	<i>Carex virgata</i>
*Lawson's cypress	<i>Chamaecyparis lawsoniana</i>
*Scotch thistle	<i>Cirsium vulgare</i>
*clivia	<i>Clivia miniata</i>
	<i>Collospermum hastatum</i>
mamangi	<i>Coprosma arborea</i>
	<i>Coprosma propinqua</i>
	<i>Coprosma repens</i>
	<i>Coprosma robusta</i>
cabbage tree	<i>Cordyline australis</i>
*pampas grass	<i>Cortaderia</i> spp.( <i>C. jubata</i> or <i>C. selloana</i> )
karaka	<i>Corynocarpus laevigatus</i>
*hawthorn	<i>Crataegus monogyna</i>
*China fir?	<i>Cunninghamia lanceolata</i>
ponga	<i>Cyathea dealbata</i>
mamaku	<i>Cyathea medullaris</i>
*umbrella sedge	<i>Cyperus eragrostis</i>
	<i>Cyperus ustulatus</i>

kahikatea	<i>Dacrycarpus dacrydoides</i>
rimu	<i>Dacrydium cupressinum</i>
*cocksfoot	<i>Dactylis glomerata</i>
	<i>Deparia petersonii</i> subsp. <i>congrua</i>
*foxglove	<i>Digitalis purpurea</i>
	<i>Diplazium australe</i>
wheki ponga	<i>Disksonia squarrosa</i>
rasp fern	<i>Doodia australis</i>
	<i>Doodia squarrosa</i>
	<i>Drymoanthus adversus</i>
	<i>Earina mucronata</i>
*alpine strawberry	<i>Fragaria vesca</i>
*cleavers	<i>Galium aparine</i>
towai	<i>Haloragis erecta</i>
pigeonwood	<i>Hedycarya arborea</i>
*ragwort	<i>Jacobaea vulgaris</i>
	<i>Juncus edgariae</i>
kanuka	<i>Kunzea robusta</i>
*lagarosiphon	<i>Lagarosiphon major</i>
	<i>Lastreopsis glabella</i>
pukatea	<i>Laurelia novae-zelandiae</i>
manuka	<i>Leptospermum scoparium</i>
*tree privet	<i>Ligustrum lucidum</i>
*Chinese privet	<i>Ligustrum sinense</i>
*Japanese honeysuckle	<i>Lonicera japonica</i>
lance fern	<i>Loxogramme dictyopteris</i>
*water purslane	<i>Ludwigia palustris</i>
small-leaved mahoe	<i>Melicytus micranthus</i>
mahoe	<i>Melicytus ramiflorus</i>
meadow rice-grass	<i>Microlaenia stipoides</i>
pohuehue	<i>Muehlenbeckia australis</i>
*water forget-me-not	<i>Myosotis laxa</i> subsp. <i>caespitosa</i>
*parrot's feather	<i>Myriophyllum aquaticum</i>
water milfoil	<i>Myriophyllum propinquum</i>

weeping mapou	<i>Myrsine divaricata</i>
black maire	<i>Nestegis cunninghamii</i>
*parsley dropwort	<i>Oenanthe pimpinellioides</i>
	<i>Oplismenus imbecillus</i>
	<i>Persicaria decipiens</i>
*inkweed	<i>Phytolacca octandra</i>
*radiata pine	<i>Pinus radiata</i>
kawakawa	<i>Piper excelsum</i>
karo	<i>Pittosporum crassifolium</i>
	<i>Pittosporum obcordatum</i>
	<i>Pittosporum tenuifolium</i>
kohuhu	<i>Plagianthus regius</i>
manatu	<i>Plantago lanceolata</i>
*narrow-leaved plantain	<i>Podocarpus totara</i>
totara	<i>Prumnopitys taxifolia</i>
matai	<i>Prunella vulgaris</i>
*selfheal	<i>Prunus persica</i>
*peach	<i>Pteris tremula</i>
shaking brake	<i>Pyrosia eleagnifolia</i>
	<i>Quercus robur</i>
*oak	<i>Ranunculus repens</i>
*buttercup	<i>Ranunculus sceleratus</i>
*celery leaved buttercup	<i>Rhopalostylis sapida</i>
nikau palm	<i>Rubus fruticosus</i> agg.
*blackberry	<i>Rumex conglomeratus</i>
*dock	<i>Salix fragilis</i>
*crack willow	<i>Solanum mauritianum</i>
*tobacco weed	<i>Solanum nigrum</i>
*black nightshade	<i>Solanum pseudocapsicum</i>
*Jerusalem cherry	<i>Sophora microphylla</i>
kowhai	<i>Streblus heterophyllus</i>
turepo	<i>Tradescantia fluminensis</i>
*tradescantia	<i>Ulex europaeus</i>
*gorse	<i>Uncinia banksii</i>

## Species list - Fauna

Species recorded on the Jordan Valley Fonterra Farm

\*denotes exotic species

*Common mynah	<i>Acridotheres tristis</i>
* Skylark	<i>Alauda arvensis</i>
*Mallard	<i>Anas platyrhynchos</i>
*Goldfinch	<i>Carduelis carduelis</i>
*Australian magpie	<i>Gymnorhina tibicen</i>
Welcome swallow	<i>Hirundo neoxena</i>
*House sparrow	<i>Passer domesticus</i>
*Cabbage white butterfly	<i>Pieris rapae</i>
Pukeko	<i>Porphyrio melanotus</i>
* Spotted dove	<i>Streptopelia chinensis</i>
Paradise shelduck, pūtangitangi	<i>Tadorna variegata</i>
NZ kingfisher, kōtare	<i>Todiramphus sanctus</i>
*Song Thrush	<i>Turdus philomelos</i>

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