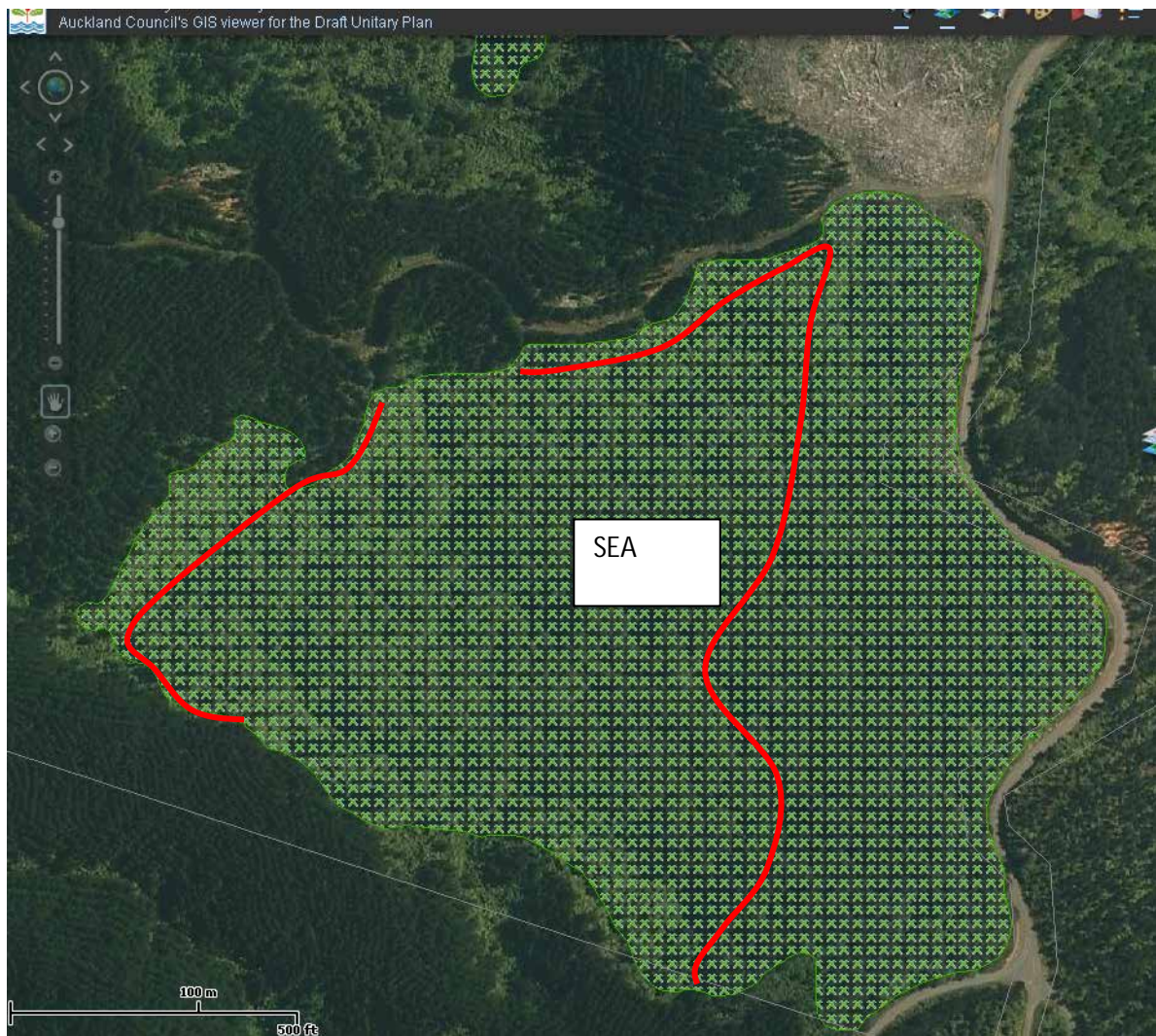


Keeney Road SEA 5588



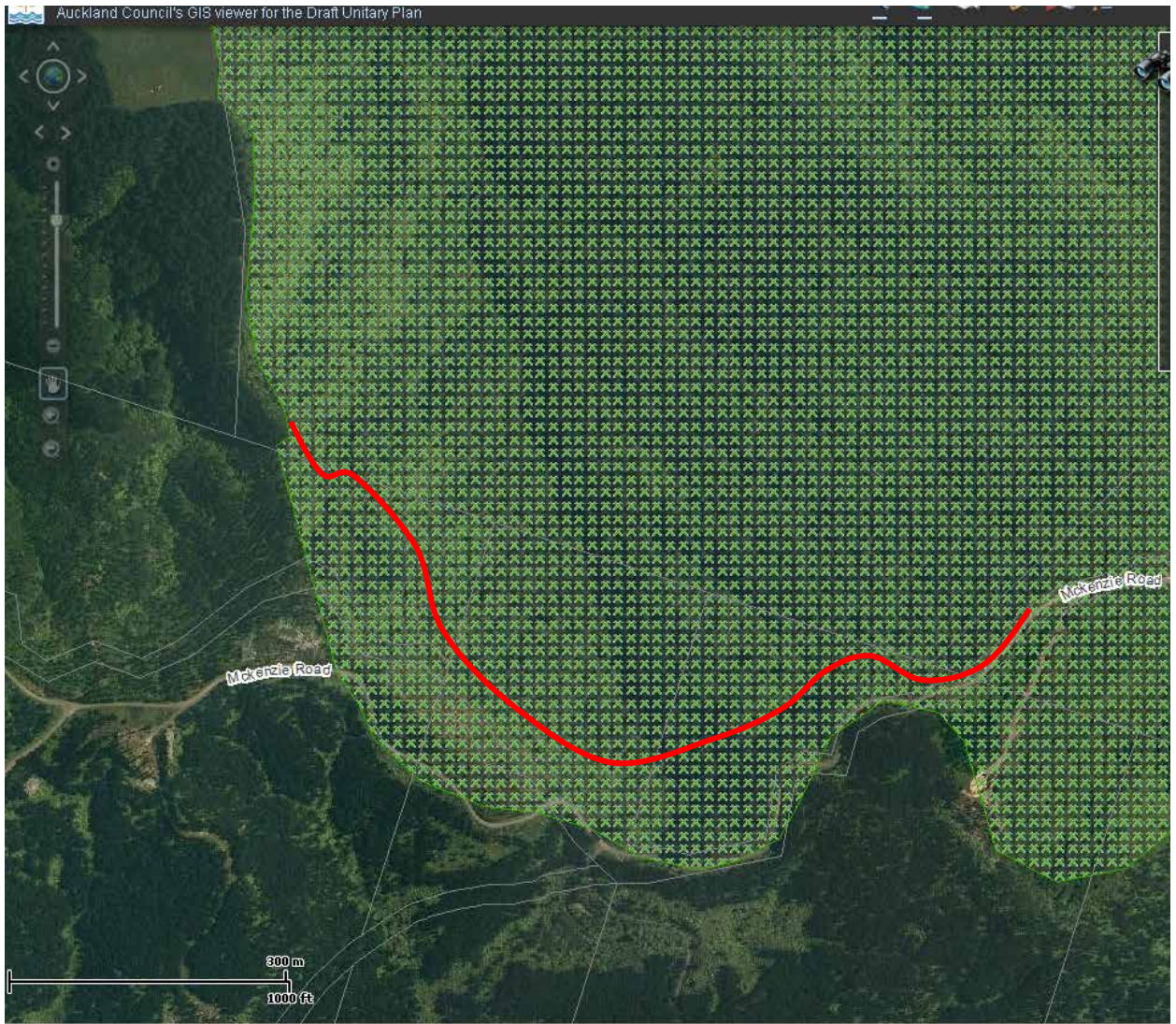


Mackenzie road SEA -5588



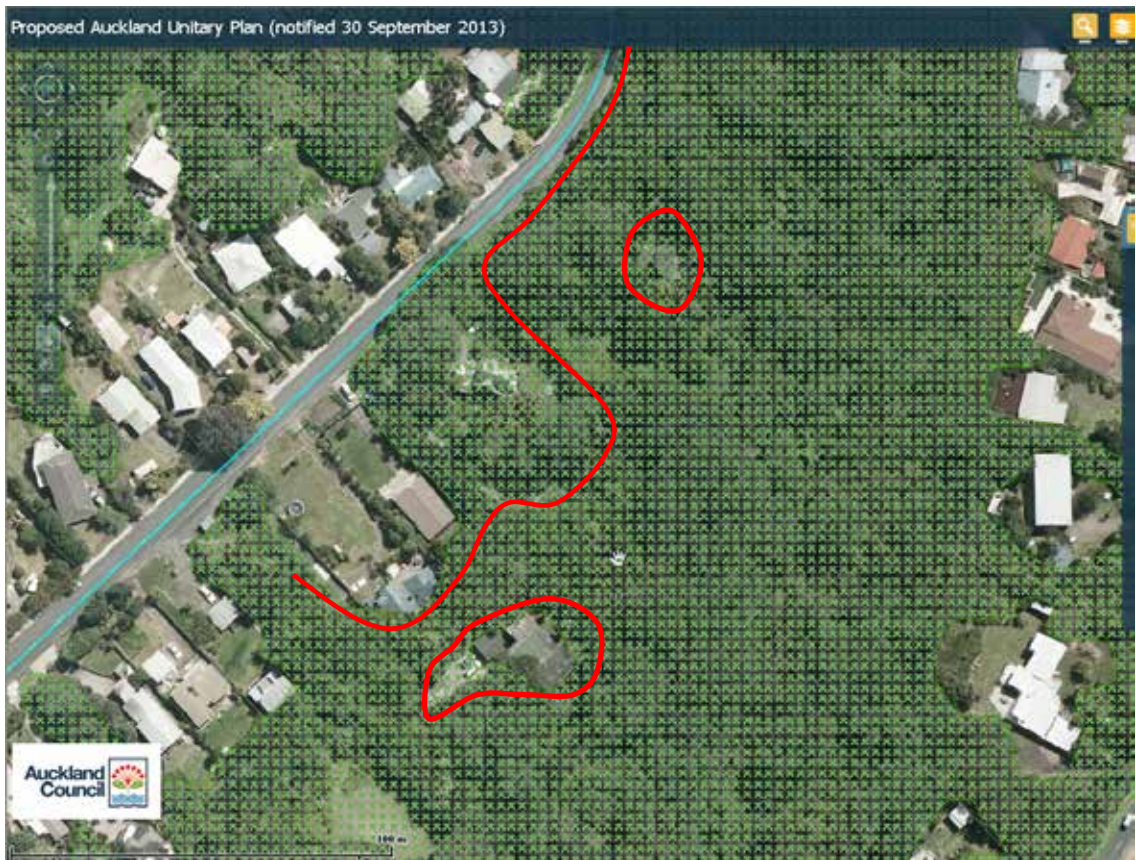


Mckenzie Road – SEA 5588

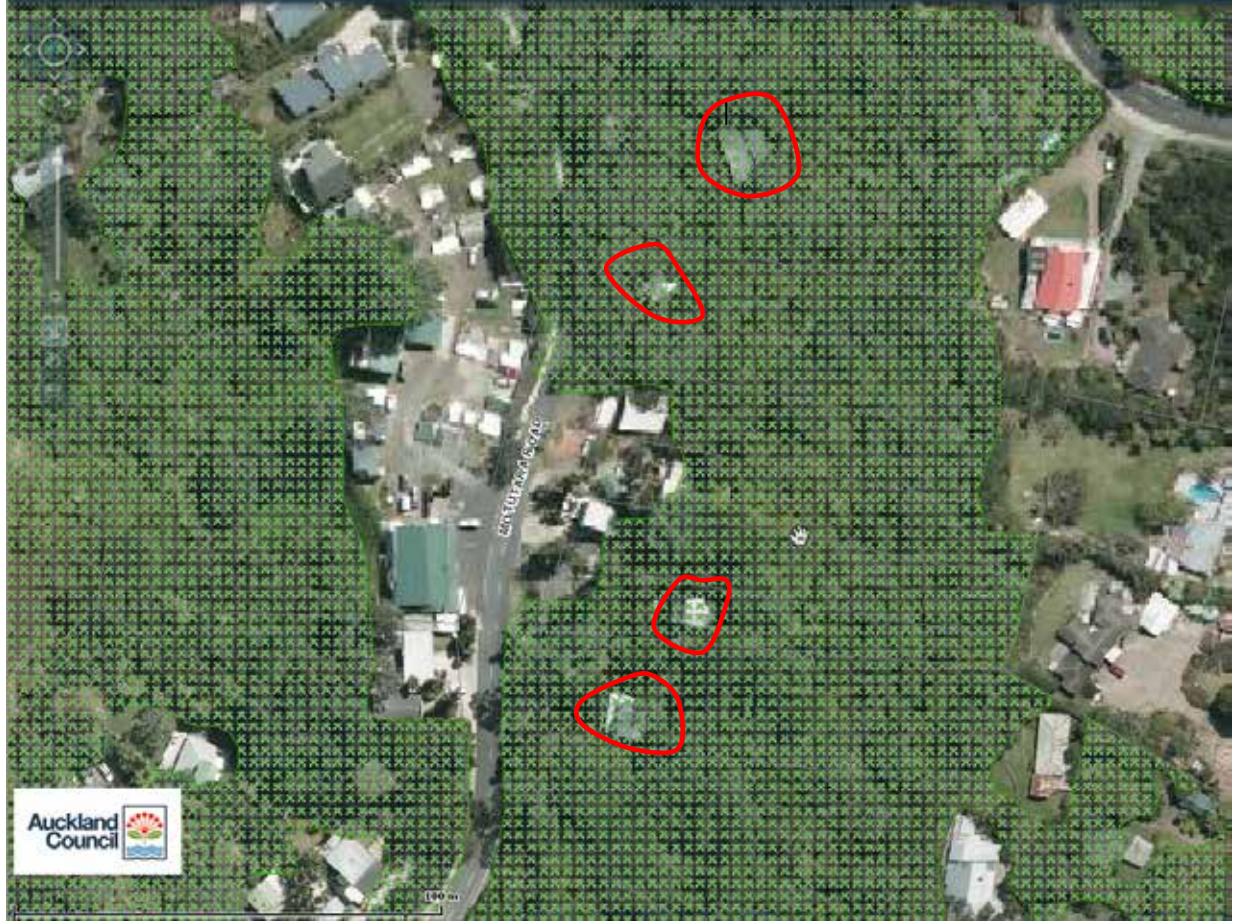




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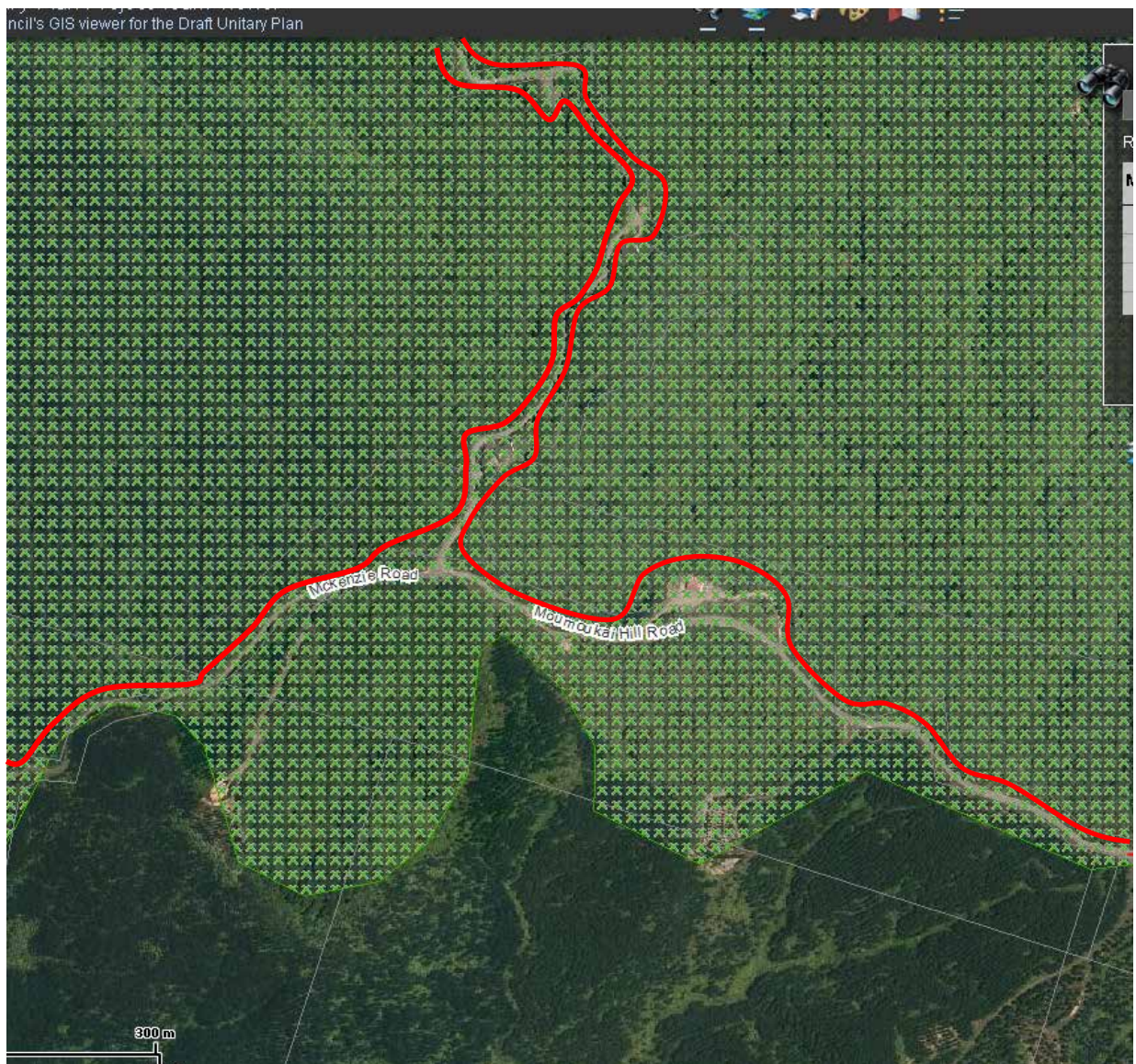








# Moumoukau Hill Road – SEA change – 2 maps

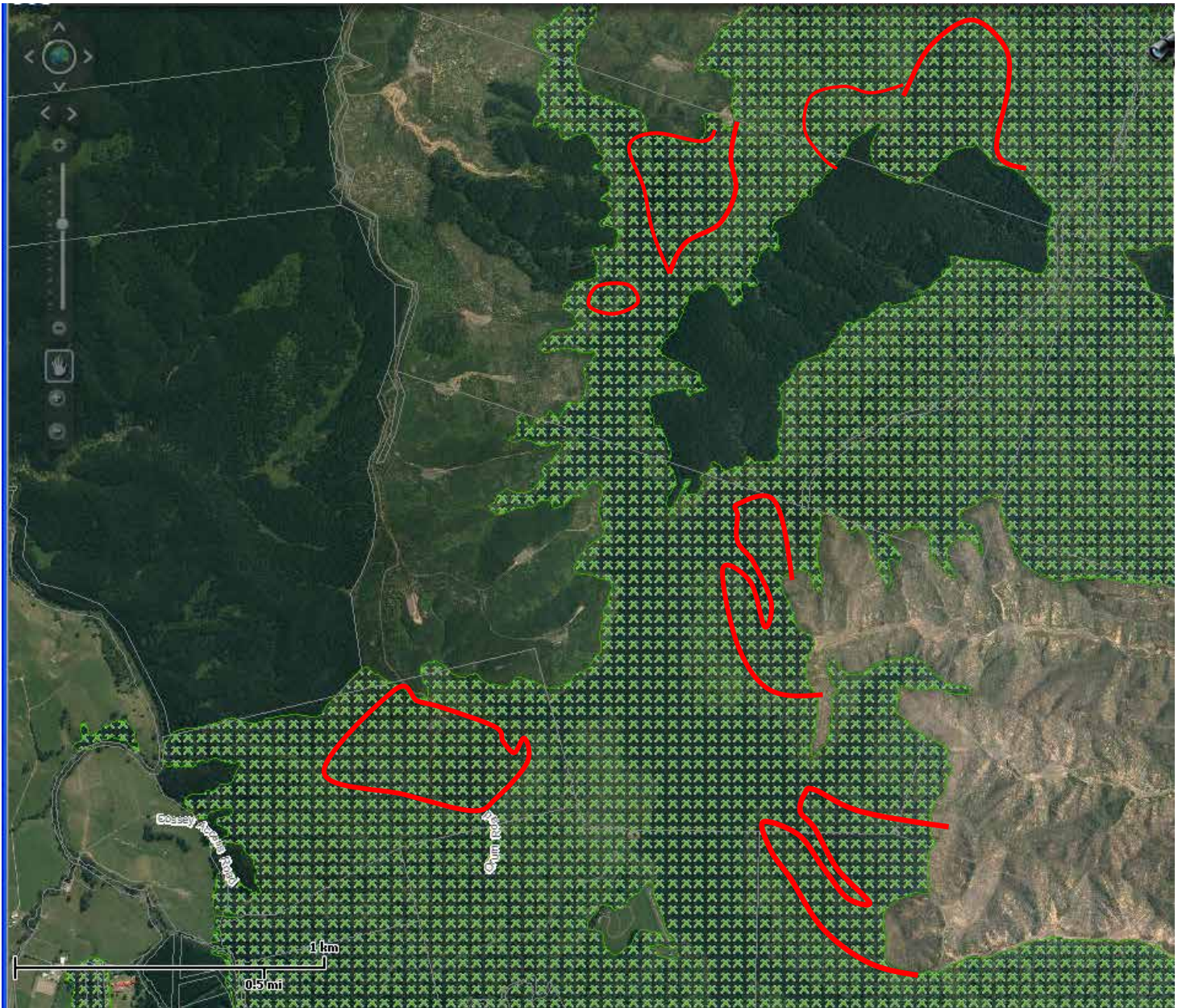






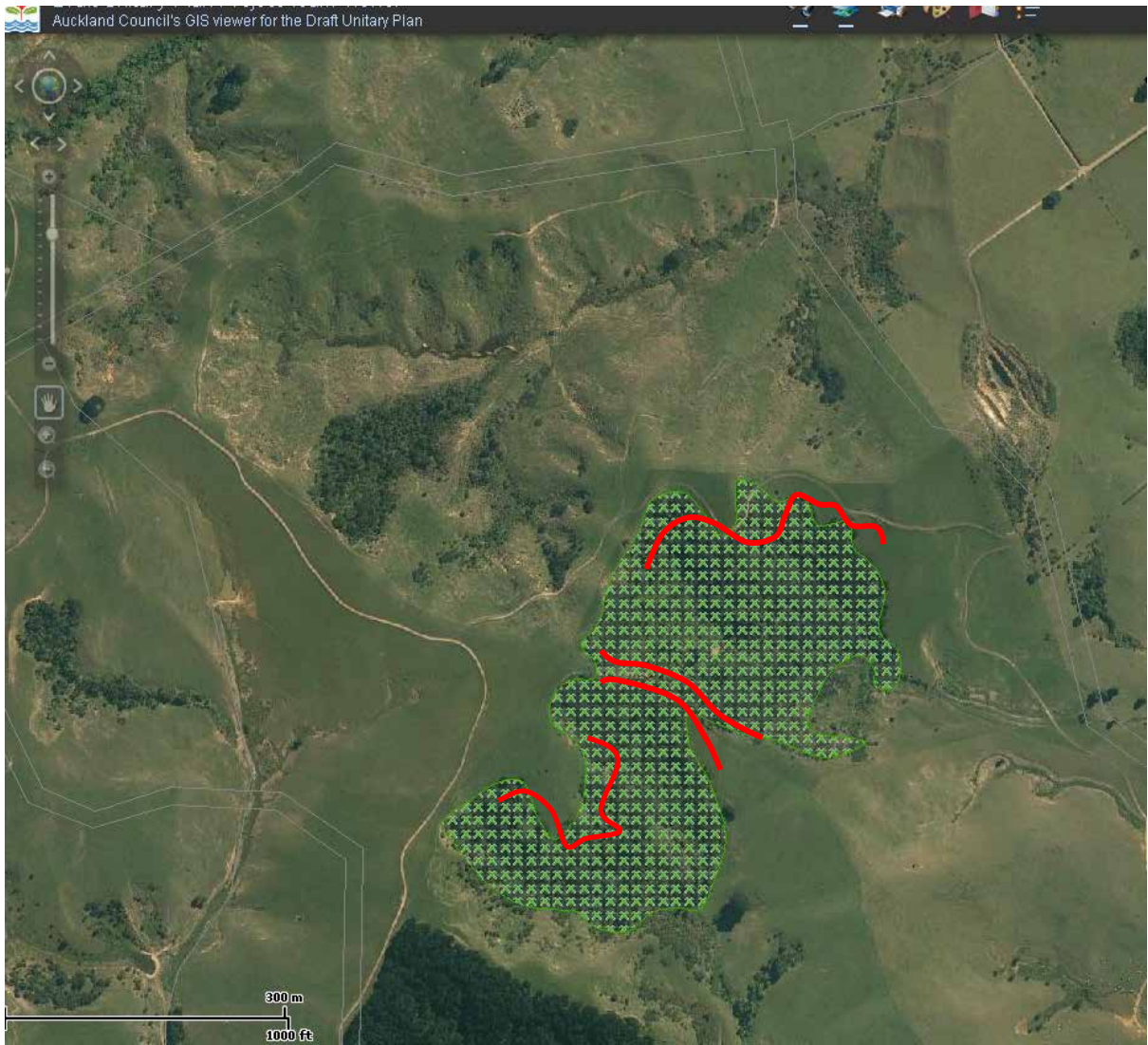
Orum Road – Hunua – SEA 5588





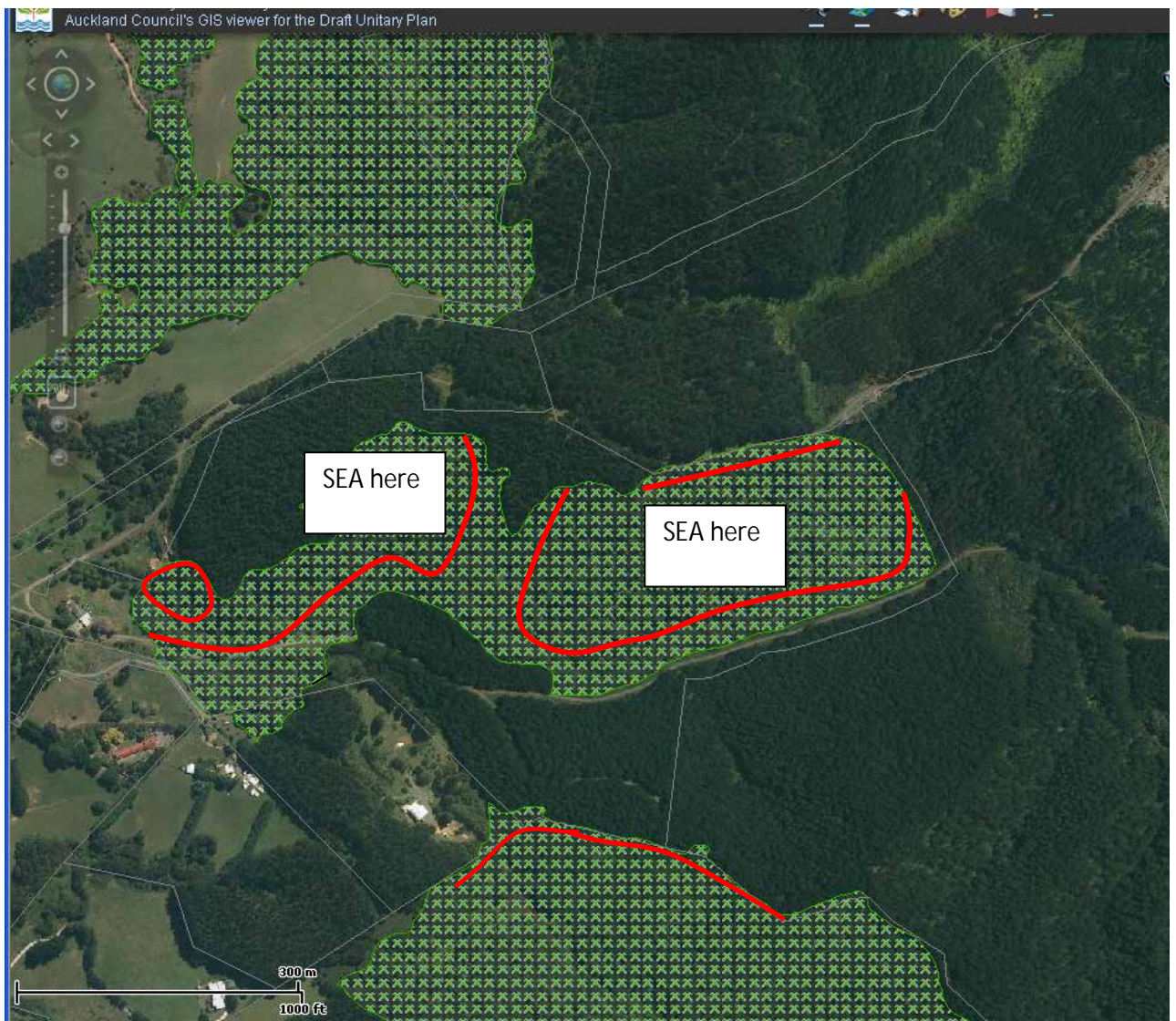


# Paparata Road – SEA 372



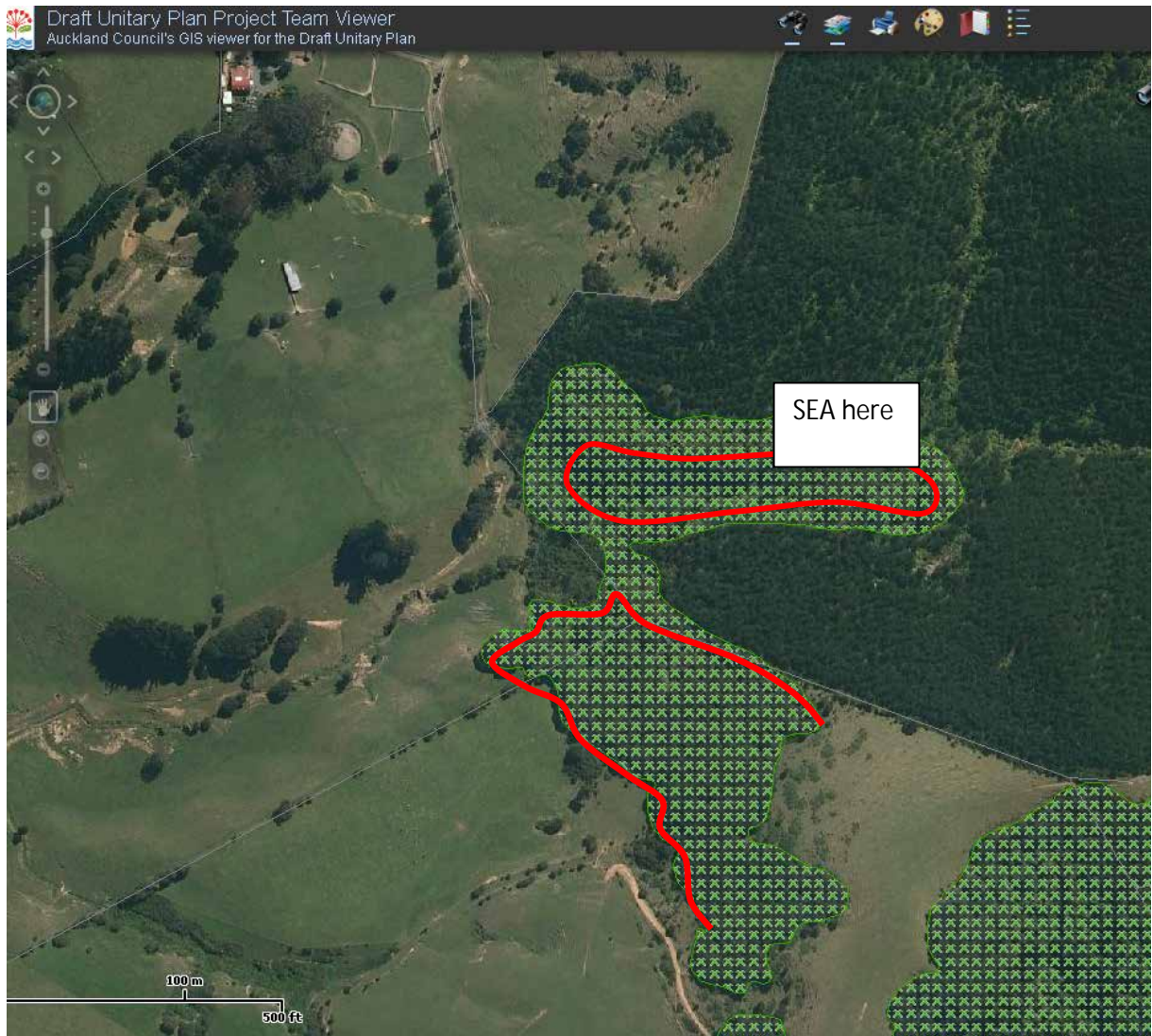


Paparimu forest – SEA 5588



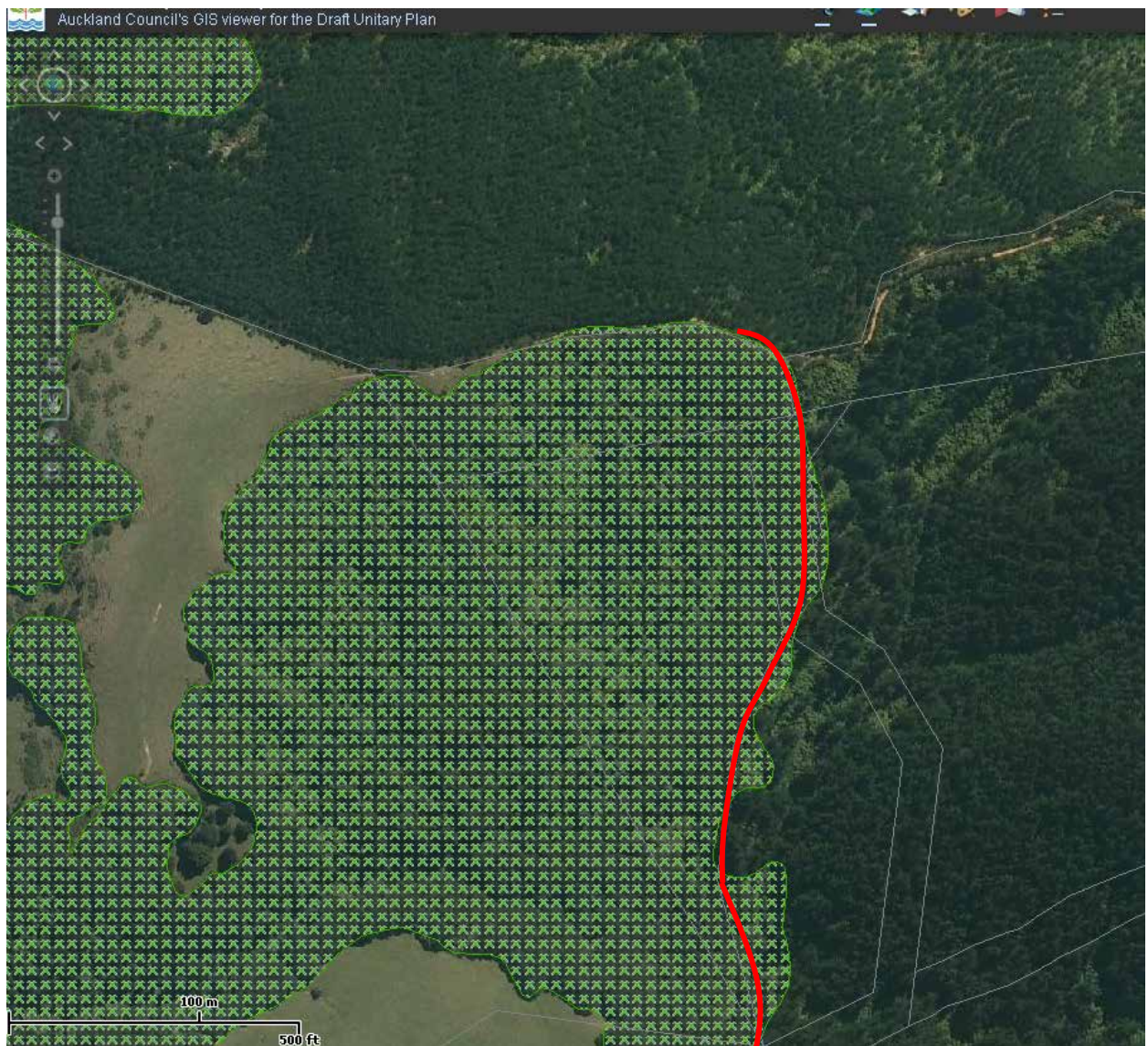


# Paparimu forest – SEA change SEA 5588





Paparimu forest – SEA 5588





64 Rosecamp Road, Beach Haven SEA 8172

Doreen and Andrew Noakes

Red line shows how SEA boundary could be redrawn to better reflect the vegetation within this SEA. (Area to the east would be excluded.)





# ECOLOGICAL ASSESSMENT OF PUKAKI CRATER

June 2009

Ecological assessment prepared on behalf of:  
MANUKAU CITY COUNCIL

Compiled by:  
TE NGAHERE LTD

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Te Ngahere



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## EXECUTIVE SUMMARY

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A Te Ngahere Ecologist was contracted to Manukau City Council to inspect Pukaki Crater, Mangere, and identify the ecological significance of the site. Mapping of the vegetation zones and consultation of the District Plan was also undertaken. The following is a summary of the findings:

- The site is considered ecologically significant under the utilised criteria due to the significance of the rare vegetation community of a lava forest. Pukaki Crater is also significant in a geological and cultural context.
- Pukaki Crater has undergone adverse effects largely through land use including agricultural farming.
- The vegetation community as a whole requires protection from further land development and unsuitable land use.
- Marginal native flora and fauna was observed at the site.
- No single tree or shrub was identified as requiring protection, however care must be taken to avoid further damage to the sparse vegetative community and substrate/crater. To avoid major damage to the site diligent restoration efforts are recommended.
- The lack of native vegetation and suitable habitat for native fauna was observed.
- Overall, the habitat was deemed suitable for native reptiles and invertebrates. The general presence of exotic vegetation including ground cover (i.e. grasses including kikuyu) provides suitable habitat for these species. The removal of vegetation in this area will therefore make the area less suitable for native species and should be carefully staged if restoration efforts are to be undertaken.
- Any works should be monitored, including monitoring by a suitably qualified ecologist, and the establishment of permanent photopoints to be revisited annually.
- Long-term staged weed control is required within the site, as the removal of vegetative cover will facilitate further significant degradation of the site.
- Weed control is best carried out during spring and summer and autumn months.
- At this stage it is recommended to refrain from planting the site until archaeological investigation confirms that native vegetation cover will assist the restoration of the site and particular plant species are deemed suitable. Jones (2007) is suggested to be utilised as a guide for any planting of the site.

## 1.0 ECOLOGICAL ASSESSMENT



Figure 1: Location of the Pukaki Crater Site, Mangere, Auckland (Source: Zoomin).

As shown in Figure 1, Pukaki Crater is located in Mangere, Auckland. The surrounding area is a mixture of residential housing and agriculture. The Auckland International Airport is within close proximity. Pukaki crater is rich in a cultural and geological context.

### 1.1 Pukaki Crater Flora

The vegetation at Pukaki Crater is predominately exotic with sparse, patchy woody species vegetation cover. Hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*), kikuyu (*Pennisetum clandestinum*), pasture grasses (including yorkshire fog (*Holcus lanatus*) and crows foot (*Eleusine indica*)) and pasture weeds (including dock (*Rumex* species) and buttercup (*Ranunculus* species)) dominate the site.

Vegetation varies throughout the site in relation to topography (i.e. being an explosion crater and



tuff ring with differing elevation, moisture and light levels) and land use (i.e. the pasture is grazed mainly on the flat and the patchy bush on the ring is still open to stock). The true vegetation type of the site is lava forest, although largely degraded and altered as described.

Sections 1.1.1 – 1.1.6 describe the general vegetative zones present at Pukaki Crater. The areas that are not specified within figure 2 are generally kikuyu with scattered exotic species including gorse, woolly nightshade (*Solanum mauritianum*), barberry (*Berberis glaucocarpa*) and willows (*Salix* species).

The north and west boundaries are well maintained and generally weed free. The east and south boundaries are generally lined with exotic species including gorse, boxthorn (*Lycium ferocissimum*), barberry, tree privet (*Ligustrum lucidum*), pampas (*Cortaderia selloana*) and woolly nightshade.

The Urupa is well maintained, with exotic and native species around the boundaries of this site. The bush strip on the southwest side of the mangal contains the most mature and species rich native forest observed on the site (including mapou, mahoe, ponga, hangehange, karaka and Coprosma species).

On the eastern side of the crater there are two patches of periwinkle and an area of the drain (that surrounds the crater) that is infested with water celery. This species is not a recognised pest plant.

Infestations of some pest plants are marked in Figure 2. These species (and others) should be targeted as soon as possible as they are prolific invasive pest plants.

### **1.1.1 Mixed Exotic/Native Bush**

The general canopy consists of a limited number of species including hawthorn and mahoe. The sub-canopy and ground cover is varied, often mixed native and exotic species. The native vegetation is threatened by a number of exotic plant species, particularly kikuyu and vine species. Wandering Jew (*Tradescantia fluminensis*) dominates the ground cover in areas. Various ferns, mosses and lichens are present within the site.

### **1.1.2 Gullies**

There are two gullies of which are largely dominated by exotic species including woolly nightshade, barberry and blue morning glory (*Ipomoea indica*).

### **1.1.3 Pasture**

The pasture is a mixture of grasses including a rye-clover mix with broadleaf weeds present. Patches of wet grass exist throughout the pasture, where the basin once was. The pasture has not been marked in Figure 2. The area of pasture involves the grazed crater basin other than the additional vegetation zones as marked.

### **1.1.4 Wet Grass**

The wet grass consists of several species adapted to standing water and boggy ground, including *Persicaria* species, giant umbrella sedge (*Cyperus ustulatus*), rushes and floating species including azolla (*Azolla filiculoides*), duckweed (*Lemna minor*) and the introduced starwort (*Callitriche stagnalis*). Exotic species threaten these areas as they reclaim the area by out-competing the

native species.

### **1.1.5 Raupo**

Raupo (*Typha orientalis*) dominates several areas of the Pukaki Crater. Other species present within the raupo include various ferns and swamp sedges (*Carex virgata* and *C. lesssoniana*). Occasional willows are also present.

### **1.1.6 Mangal**

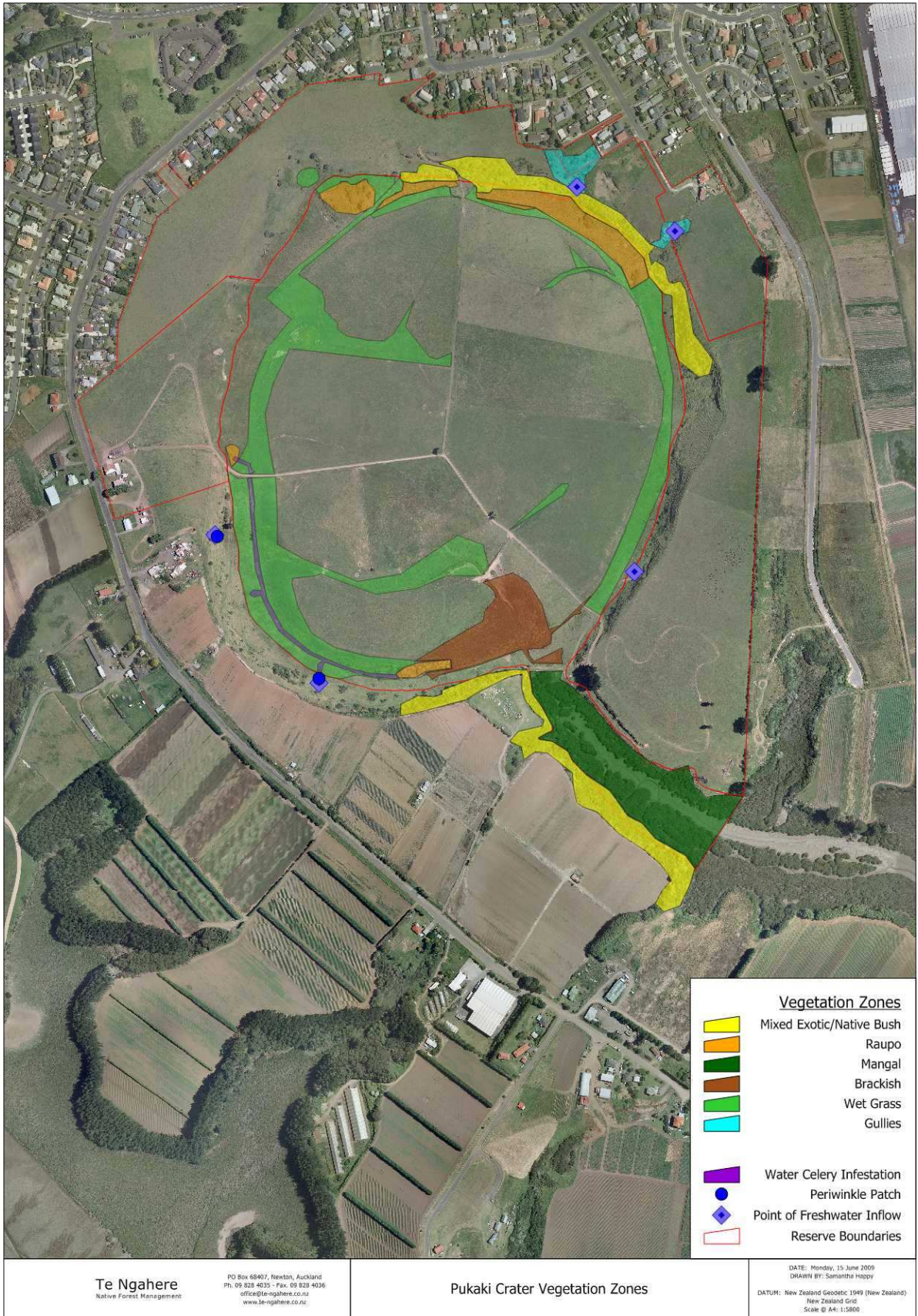
The mangal (mangrove (*Avicennia marina* subsp. *australasica*) community) to the south of the crater is where the tidal flow historically exchanged water with the basin. This is a well established mangal. The weir that has blocked this flow has ceased flow between the basin and intertidal mangroves, which has impacted on the vegetation (and fauna) tremendously.

### **1.1.7 Brackish Community**

On the basin side of the weir, a lagoon of standing water supports what remains of a brackish community of saltmarsh ribbonwood (*Plagianthus divaricatus*), batchelors button (*Cotula coronopifolia*) and sea rush (*Juncus kraussii* var. *australiensis*) with occasional mangroves (*Avicennia marina* subsp. *australasica*).

Five points of freshwater inflow have also been marked in Figure 2. These could be springs, stormwater outflows or ephemeral streams.





**Figure 2: General Vegetative Zones within the Pukaki Crater Site, Mangere.**

### 1.1.8 Flora Species Lists

**Table 1.1: Native Vegetation Present within Pukaki Crater.**

Common Name	Scientific Name	Abundant	Common	Present/ Occasional
Azolla	<i>Azolla filiculoides</i>			√
Batchelors Button	<i>Cotula coronopifolia</i>			√
Blechnum	<i>Blechnum membranaceum</i>			√
Bracken	<i>Pteridium esculentum</i>			√
Cabbage Tree, Ti kouka	<i>Cordyline australis</i>			√
Duckweed	<i>Lemna minor</i>			√
Giant Umbrella Sedge	<i>Cyperus ustulatus</i>			√
Gully Fern	<i>Pneumatopteris pennigera</i>			√
	<i>Hypolepis distans</i>			√
Hounds Tongue	<i>Microsorium novae-zealandiae</i>			√
Isolepis	<i>Isolepis species</i>			√
Juncus	<i>Juncus spp.</i>		√	
Karamu	<i>Coprosma robusta</i>			√
Karaka	<i>Corynocarpus laevigatus</i>			√
Karo	<i>Pittosporum crassifolium</i>			√
Kawakawa	<i>Macropiper excelsum</i>			√
Kiokio	<i>Blechnum novaezealandiae</i>			√
Koromiko	<i>Hebe stricta</i>			√
Kowhai	<i>Sophora microphylla</i>			√
Large-seeded Coprosma	<i>Coprosma macrocarpa</i>			√
Mahoe	<i>Melicytus ramiflorus</i>	√		
Mamaku, Black tree fern	<i>Cyathea medullaris</i>			√
Mangrove	<i>Avicennia marina subsp. australasica</i>			√
Mapou	<i>Myrsine australis</i>			√
Microlaena, Meadow Rice Grass	<i>Microlaena stipoides</i>			√
Pohuehue, Large-leaved	<i>Muehlenbeckia australis</i>			√
Pohuehue, Small-leaved	<i>Muehlenbeckia complexa</i>			√
Rasp fern	<i>Doodia australis</i>			√
Raupou, Bullrush	<i>Typha orientalis</i>		√	
Saltmarsh Ribbonwood	<i>Plagianthus divaricatus</i>			√
Sea rush	<i>Juncus kraussii var. australiensis</i>			√
Shining Spleenwort	<i>Asplenium oblongifolium</i>			√
Silverfern	<i>Cyathea dealbata</i>			√



Common Name	Scientific Name	Abundant	Common	Present/ Occasional
Swamp Fern	<i>Thelypteris confluens</i>			√
Swamp Sedge	<i>Carex lessoniana</i>			√
Swamp Sedge, Pukio	<i>Carex virgata</i>			√
Wiwi	<i>Juncus gregiflorus</i>		√	

**Table 1.2: Exotic Vegetation Present within Pukaki Crater.**

Common Name	Scientific Name	Abundant	Common	Present/ Occasional
Amaranth, Prostrate	<i>Amaranthus deflexus</i>			√
Arum Lily	<i>Zantedeschia aethiopica</i>		√	
Arum, Italian	<i>Arum italicum</i>			√
Barberry	<i>Berberis glaucocarpa</i>		√	
Blackberry (Wild aggregates)	<i>Rubus fruticosus agg.</i>			√
Black Nightshade	<i>Solanum nigrum</i>			√
Blue Morning Glory	<i>Ipomoea indica</i>		√	
Boneseed	<i>Chrysanthemoides monilifera</i>			√
Boxthorn	<i>Lycium ferocissimum</i>		√	
Buttercup, Celery-leaved	<i>Ranunculus sceleratus</i>			√
Buttercup, Creeping	<i>Ranunculus repens</i>	√		
Broadleaf Weeds	<i>Various spp</i>	√		
Canna Lily	<i>Canna indica</i>			√
Castor Oil Plant	<i>Ricinus communis</i>			√
Crows Foot Grass	<i>Eleusine indica</i>		√	
Cleavers	<i>Galium spp.</i>			√
Climbing Asparagus	<i>Asparagus scandens</i>			√
Clover	<i>Trifolium spp.</i>		√	
Convolvulus	<i>Convolvulus arvensis</i>			√
Cotoneaster	<i>Cotoneaster glaucophyllus</i>			√
Dock, Broad-leaved	<i>Rumex obtusifolius</i>		√	
Dock, Clustered	<i>Rumex conglomeratus</i>		√	
Elephant's Ear	<i>Alocasia brisbanensis</i>			√
Euphorbia	<i>Euphorbia spp.</i>			√
Fennel	<i>Foeniculum vulgare</i>			√
Fig (Edible)	<i>Ficus carica</i>			√
Geranium	<i>Geranium spp.</i>		√	
Ginger, Kahili	<i>Hedychium gardnerianum</i>			√
Gorse	<i>Ulex europaeus</i>	√		
Grass species	'Grasses' spp.	√		

Common Name	Scientific Name	Abundant	Common	Present/ Occasional
Hawthorn	<i>Crataegus monogyna</i>	√		
Hemlock	<i>Conium maculatum</i>			√
Inkweed	<i>Phytolacca octandra</i>			√
Ivy, German	<i>Delairea odorata</i>			√
Japanese Spindle Tree	<i>Euonymus japonicus</i>			√
Jasmine	<i>Jasminum polyanthum</i>			√
Kikuyu Grass	<i>Pennisetum clandestinum</i>	√		
Macrocarpa	<i>Macrocarpa sp.</i>			√
Mexican Daisy	<i>Erigeron karvinskianus</i>			√
Moth Plant	<i>Araujia hortorum</i>			√
Oxalis	<i>Oxalis spp.</i>	√		
Ox-tongue	<i>Helminthotheca echioides</i>			√
Pampas Grass, White	<i>Cortaderia selloana</i>			√
Paspalum	<i>Paspalum spp.</i>			√
Periwinkle	<i>Vinca major</i>			√
Phoenix Palm	<i>Phoenix canariensis</i>			√
Pines	<i>Pinus spp.</i>			√
Plantain	<i>Plantago spp.</i>		√	
Privet, Chinese	<i>Ligustrum sinense</i>			√
Privet, Tree	<i>Ligustrum lucidum</i>			√
Ragwort	<i>Senecio vulgaris</i>			√
Rose	<i>Rosa spp.</i>			√
Sharp Rush	<i>Juncus acutus</i>			√
Shrub Balsam	<i>Impatiens sodenii</i>			√
Smilax	<i>Asparagus asparagoides</i>			√
Starwort	<i>Callitriche stagnalis</i>			√
Thistle, Scotch	<i>Cirsium vulgare</i>			√
Three Cornered Garlic	<i>Allium triquetum</i>			√
Umbrella Sedge	<i>Cyperus eragrostis</i>			√
Wandering Jew	<i>Tradescantia fluminensis</i>		√	
Water Celery	<i>Apium nodiflorum</i>			
Watercress	<i>Nasturtium officinale</i>			√
Wattle, Brush	<i>Paraserianthes lophantha</i>			√
Willow, Crack	<i>Salix fragilis</i>			√
Willow, Grey	<i>Salix cinerea</i>			√
Willow, Other	<i>Salix species</i>			√
Willow Weed	<i>Persicaria sp.</i>			√
Woolly Nightshade	<i>Solanum mauritianum</i>	√		
Yorkshire Fog Grass	<i>Holcus lanatus</i>		√	

Please note there is the possibility that some species may have been missed or could be seasonal.



## 1.2 Pukaki Crater Fauna

The macro fauna of Pukaki Crater was observed during the site visit on June 11, 2009. The fauna largely consists of introduced species.

Anecdotal evidence suggests a hare (*Lepus europaeus*) population to be present.

Small fish were observed in the standing water and in the brackish lagoon.

### 1.2.1 Pukaki Crater Avifauna Species List

The avifauna of Pukaki Crater was observed over one day due to time constraints. Anecdotal evidence suggests that there have been minimal native birds present at the site, decreasing significantly over approximately the last 10-years.

**Table 1.3: Avifauna Observed within Pukaki Crater.**

Common Name	Scientific Name	Status	Abundant	Common	Present/ Occasional
Blackbird	<i>Turdus merula</i>	Introduced			√
Black-backed gull	<i>Larus dominicanus</i>	Native			√
Fantail	<i>Rhipidura fuliginosa</i>	Native			√
Heron, white-faced	<i>Ardea novaehollandiae</i>	Native			√
House Sparrow	<i>Passer domesticus</i>	Introduced			√
Magpie	<i>Gymnorhina tibicen</i>	Introduced			√
New Zealand Kingfisher	<i>Halcyon sancta</i>	Native			√
Pheasant	<i>Phasianus sp.</i>	Introduced			√
Pukeko	<i>Porphyrio porphyrio</i>	Native			√
Song Thrush	<i>Turdus philomelos</i>	Introduced			√
Spur Winged Plover	<i>Vanellus miles</i>	Native			√
Welcome Swallow	<i>Hirundo tahitica</i>	Native		√	

### 1.2.2 Pukaki Crater Reptiles and Invertebrates

No lizard surveys were undertaken at Pukaki Crater.

The habitat may be suitable for a number of lizard species (e.g. copper skink (*Cyclodina aenea*) and ornate skink (*Cyclodina ornata*). However any native lizard population present will be under significant predation pressure from mammalian predators including feral and domestic cats.

The introduced rainbow skink (*Lampropholis delicata*) is likely to be present at the site.

Note all reptiles (native and introduced) are protected in New Zealand under the Wildlife Act 1953, and all adverse impacts on reptiles must be avoided under the Resource Management Act 1991. Rainbow skinks are included by default.

## **1.3 Site Specific Issues**

### **1.3.1 Neighbouring Properties**

Properties near the boundaries of the crater pose the threat of further introductions of flora and fauna into Pukaki Crater. Examples of pest plants observed to be growing within the close proximity of the site include phoenix palm and woolly nightshade. Some properties appeared to be discarding their organic waste over the fence into the crater. This poses the further risk of introduction of weeds and threatens the success of any pest control efforts that may take place.

### **1.3.2 Historical Land Use**

Pukaki Crater has undergone drastic land use changes. The most recent land use has been intensive farming, which has altered the natural state of the area. It is recommended that the water and soil be tested to determine what effect this has had. It would also be interesting to test what I have termed the brackish lagoon to determine the salinity of this area. Small fish were observed within this lagoon, and this area has the potential to sustain a nursery ground for inanga and other flora and fauna.

### **1.3.3 Utrification**

Algae that are often termed 'slime' are present in some areas of wet grass and standing water. This is caused by the utrification of the water by stock. Water quality degradation should be lessened by excluding stock.

### **1.3.4 Hares**

Hares are herbivores that can drastically reduce seedling and sapling establishment in native vegetation though browsing. The Auckland Regional Pest Management Strategy (2007) lists hares as an organism to be further researched as a potential pest. It is recommended that the hare population be controlled.

### **1.3.5 Rats**

A strong odour of rats was noticed near the stormwater drain in the nor-northeastern gully of the crater. It is recommended that the rats be controlled. The high stature grass and various weed species are contributing to the problem by providing habitat.



## **2.0 ASSESSMENT OF SIGNIFICANCE**

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### Designations under the Manukau Operative District Plan 2002:

- Mangere Puhinui Rural Zone
- Geological feature – Pukaki Lagoon Tuff Ring and Crater
- Airport Noise Notification Area

The above designations indicate that the site is recognised as a geologically significant feature under the District Plan.

### **2.1 Rarity and Distinctiveness**

No rare plants were identified during vegetation surveys at the site. However, the lava forest is a rare community type that is considered significant. In this regard the site is considered significant although the quality of this forest is far from pristine.

### **2.2 Representativeness**

The site shows evidence of disturbance in recent times (which has been well documented), which could include the disturbance and/or clearance of old, rarer native vegetation being lava forest. The resultant vegetation is relatively common. The site is therefore not significant in this regard, however please refer to 2.1.

### **2.3 Ecological Context**

The site is comprised of mainly open and edge habitat (i.e. windier, drier and warmer than the interior of a forest). Therefore the site is not regarded as significant in this regard. However, the site probably was significant to several communities in pre-European times.

### **2.4 Sustainability**

The sparse vegetation covers a small area. The shape and size could potentially threaten the crater's ability to sustain a functioning ecosystem in the long term, however, with the continuation of weed and animal pest management the crater should be able to continue into the long term as a functioning ecosystem.

### **2.5 Mitigation of Significant Areas Effected by Historical Land Use**

Taking the above four categories into consideration it can be concluded that the site is considered an ecologically significant site due to the rare lava forest community. Pukaki Crater is of geological and cultural significance also.

The major impact of historical land use has accumulated over time to result in an area that has limited flora and fauna. It is important that any further negative impacts remain at a minor level. The following measures could be taken to avoid and mitigate impacts on the Pukaki Crater's flora, fauna and ecological integrity.

### **2.5.1 Weed Management**

Weed management should be undertaken only once archaeological investigation has been undertaken. Weed control is required to prevent the ongoing establishment of weed species in the site, whilst encouraging the process of natural regeneration (although minimal regeneration is anticipated).

If the weed infestations are not controlled they can potentially smother native plants, prevent native regeneration and inhibit the essential functions of the native ecosystem. Much of the area is pasture and kikuyu, containing and effectively operating as a seed source of pasture weeds within the site. Due to the ongoing potential for new weeds to establish in the open site it is important (where possible) to remove surrounding seed sources. Neighbouring properties can potentially introduce exotic plants including environmental weeds. Careful boundary surveillance is recommended. Approaching properties that exhibit obvious biosecurity threats to the Pukaki Crater would aid in protecting the area. Education and awareness is key to successful community buy-in.

Control should be performed three times a year (Spring, Summer and Autumn), with follow-up maintenance over a period of at least three years (10+years of weed management is recommended to ensure effective weed control of invasive weeds that remain viable in the soil for a number of years).

### **2.5.2 Revegetation**

Revegetation is recommended only once archaeological investigation has been undertaken. Sites including the Urupa should be respectively avoided until a management plan has been developed. Planting should only occur in winter and eco-sourcing from the closest naturally occurring established vegetation is highly recommended.

If revegetation is to be undertaken, Jones (2007) should be utilised as a suitable species guideline. It is strongly recommended that an archaeologist assesses the site prior to any revegetation efforts due to the archaeological significance of the site.

It is not envisaged that large planting efforts of colonising species would be effective in restoring the Pukaki Crater due to the unique volcanic nature of the site and substrate (i.e. lack of soil). The original vegetative cover would likely to have been an interesting uncommon community that would have been rare within the Manukau Ecological District.

### **2.5.3 Future Land Use**

Ultimately, ceasing grazing at Pukaki Crater would benefit the site dramatically. Well managed weed control would assist the site in gradually progressing towards a more natural state.

Removing the bank that has blocked the tidal flow would also contribute to the ecological integrity of the crater.

### **2.5.4 Better Understanding of Original Cover**

It is difficult to restore an area back to its original state when this is unknown. It is highly recommended that research into the pre-European extent and composition of the flora and fauna of the Pukaki Crater (and greater vicinity) be undertaken to better understand what is required for the effective restoration of Pukaki Crater.



### **3.0 ECOLOGICAL MONITORING**

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It is very important to monitor a geologically significant site such as Pukaki Crater. Photopoints should be established to effectively monitor the site over time. The establishment of photopoints requires little financial expense and can be revisited on an annual basis.

## 4.0 REFERENCES

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Auckland Regional Council. (2007). Auckland Regional Pest Management Strategy 2007-2012. Auckland: Author.

Jones, K. L. (2007). Caring for archaeological sites. Practical guidelines for protecting and managing archaeological sites in New Zealand. Wellington: Science & Technical Publishing, Department of Conservation.

Parkes, J. (2001). Methods to monitor the density and impact of hares (*Lepus europaeus*) in grasslands in New Zealand. DOC Science Internal Series 8. Wellington: New Zealand Department of Conservation.





SEA\_T\_4449

SEA\_T\_593










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# SEA\_T\_25

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:5,236

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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Height datum: Auckland 1946.

# SEA\_T\_30

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:2,303

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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 Height datum: Auckland 1946.

# SEA\_T\_33

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,272

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWs10












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# SEA\_T\_40

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:3,046

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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Height datum: Auckland 1946.

# SEA\_T\_41

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:3,368

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_44

## Changes to SEA Overlay

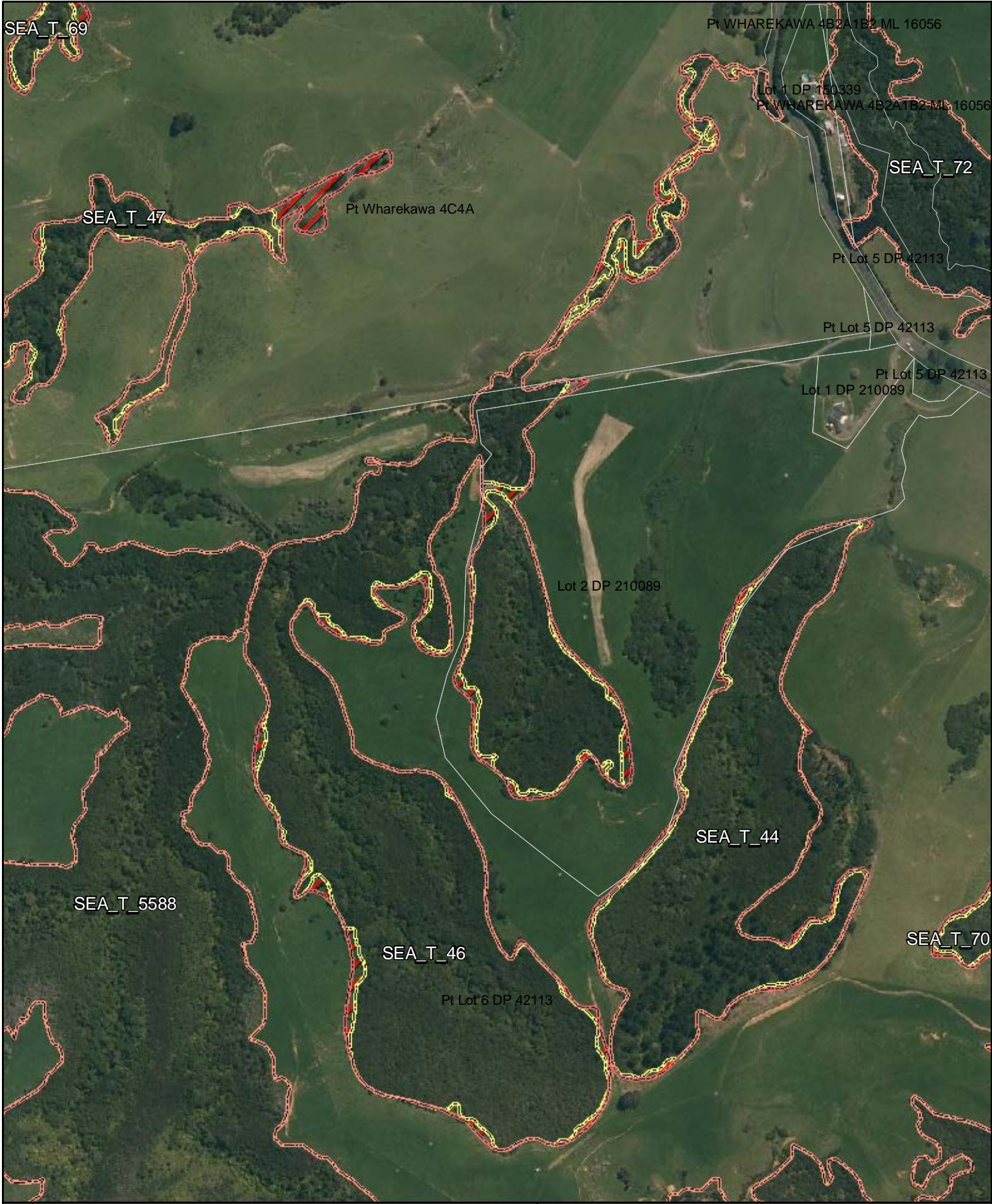
Date: October 2013

A4 @ 1:3,156

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_46

## Changes to SEA Overlay

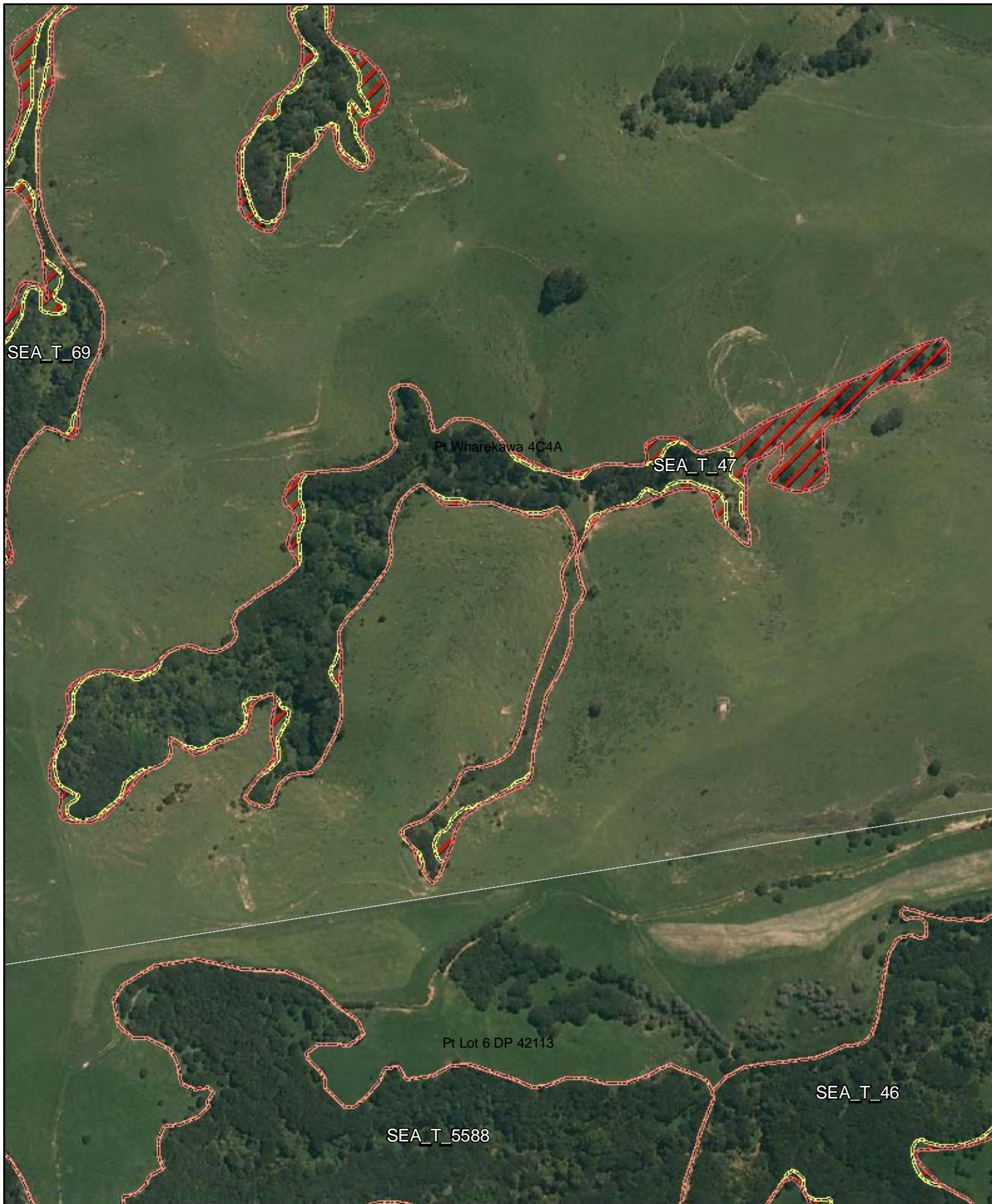
Date: October 2013

A4 @ 1:6,146

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_47

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:3,313

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





SEA\_T\_33

SEA\_T\_48

Pt Lot 1 DP 9805

Pt Lot 1 DP 9805






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# SEA\_T\_48

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,848

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10



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# SEA\_T\_54

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:2,992

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





Lot 2 DP 29410

SEA\_T\_55

Lot 1 DP 429434






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# SEA\_T\_55

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:694

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10



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# SEA\_T\_56

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,532

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_59

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:878

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_62

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,985

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_63

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:957

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





Lot 2 DP 356374

Lot 4 DP 369781

SEA\_T\_65

Lot 8 DP 369781






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Height datum: Auckland 1946.

# SEA\_T\_65

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:747

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_66

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,117

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





Allotment 63 PSH OF Waiuku East








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# SEA\_T\_102

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:805

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_112

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:653

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_114

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:650

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







SEA T\_505






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# SEA\_T\_115

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,207

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_116

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,311

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_117

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:5,497

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_118

## Changes to SEA Overlay

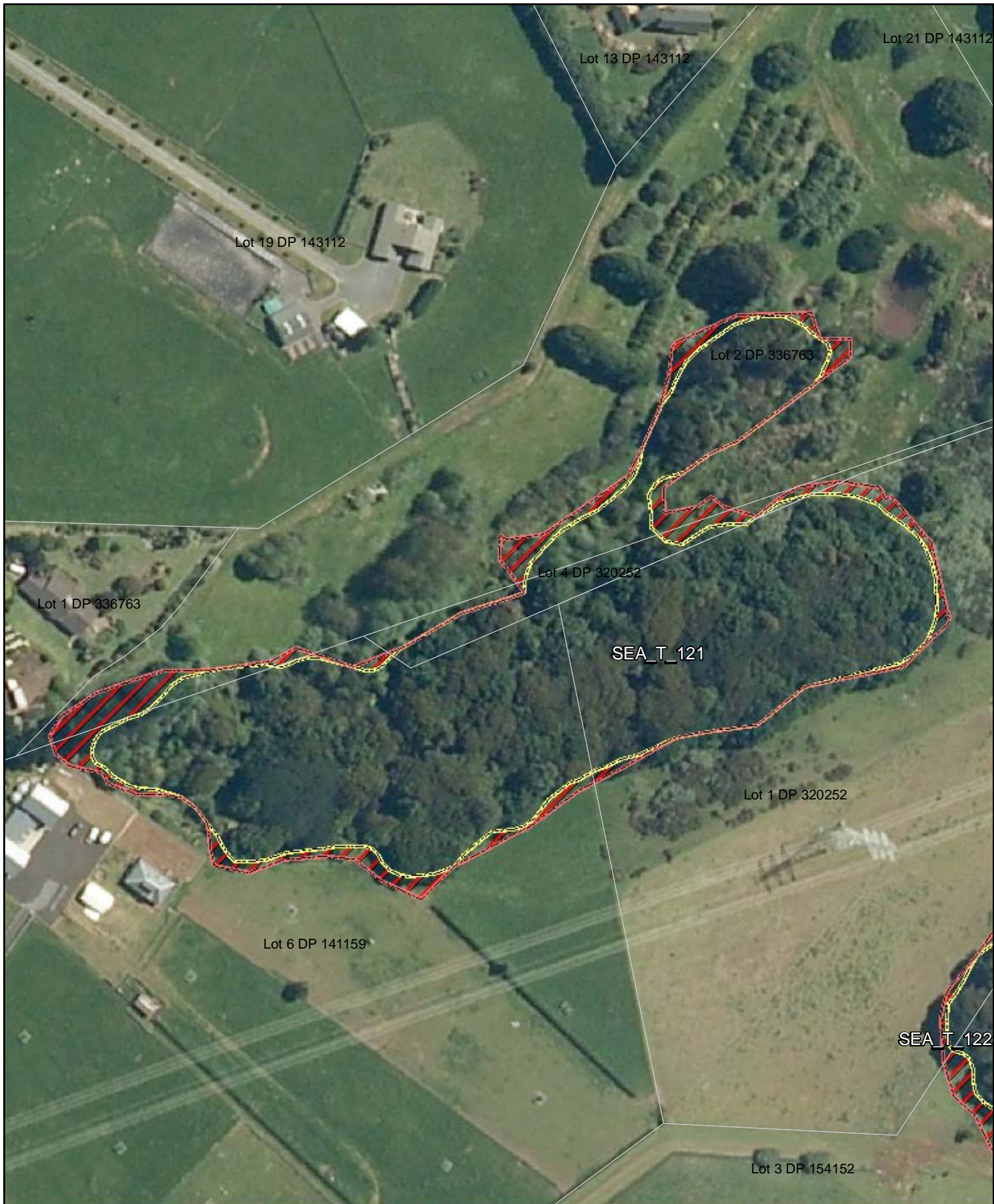
Date: October 2013

A4 @ 1:1,124

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_121

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,606

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_122

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:637

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





Lot 1 DP 86057  
SEA\_T\_5383

Pt Allotment 190 PSH OF Waipipi

Pt Allotment 193 PSH OF Waipipi

Allotment 89 SBSC 5 PSH OF Waipipi

Allotment 113 SBSC 5 PSH OF Waipipi

Pt Allotment 105 SBSC 5 PSH OF Waipipi

SEA\_T\_4467

Lot 1 DP 134530

Lot 12 DP 105923

Lot 11 DP 105923

Allotment 192 PSH OF Waipipi

Lot 13 DP 105923

Lot 1 DP 31783

Lot 134 DP 85255

Pt Allotment 334 PSH OF Waipipi

SEA\_T\_125

Lot 131 DP 85255

Lot 2 DP 354756

Pt Allotment 334 PSH OF Waipipi

Pt Allotment 334 PSH OF Waipipi

Lot 1 DP 193912

Pt Allotment 334B PSH OF Waipipi

Allotment 334A PSH OF Waipipi

Pt Allotment 334B PSH OF Waipipi

Pt Allotment 334 PSH OF Waipipi

Pt Allotment 163 PSH OF Waipipi

Pt Allotment 334 PSH OF Waipipi

Lot 1 DP 73969

Pt Allotment 334B PSH OF Waipipi

Pt Allotment 163 PSH OF Waipipi






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# SEA\_T\_125

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:6,141

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10



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Lot 1 DP 117065

Lot 3 DP 373738

Lot 2 DP 373738  
SEA\_T\_131






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# SEA\_T\_131

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,349

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_133

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:4,222

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_139

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,918

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





SEA\_T\_4471








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# SEA\_T\_148

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,993

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_151

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,922

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_153

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:2,521

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





SEA\_T\_156

Lot 1 DP 206001






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# SEA\_T\_156

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:792

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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 Height datum: Auckland 1946.

# SEA\_T\_158

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:2,252

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_161

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:2,398

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_170

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,771

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_172

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:1,710

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_176

## Changes to SEA Overlay

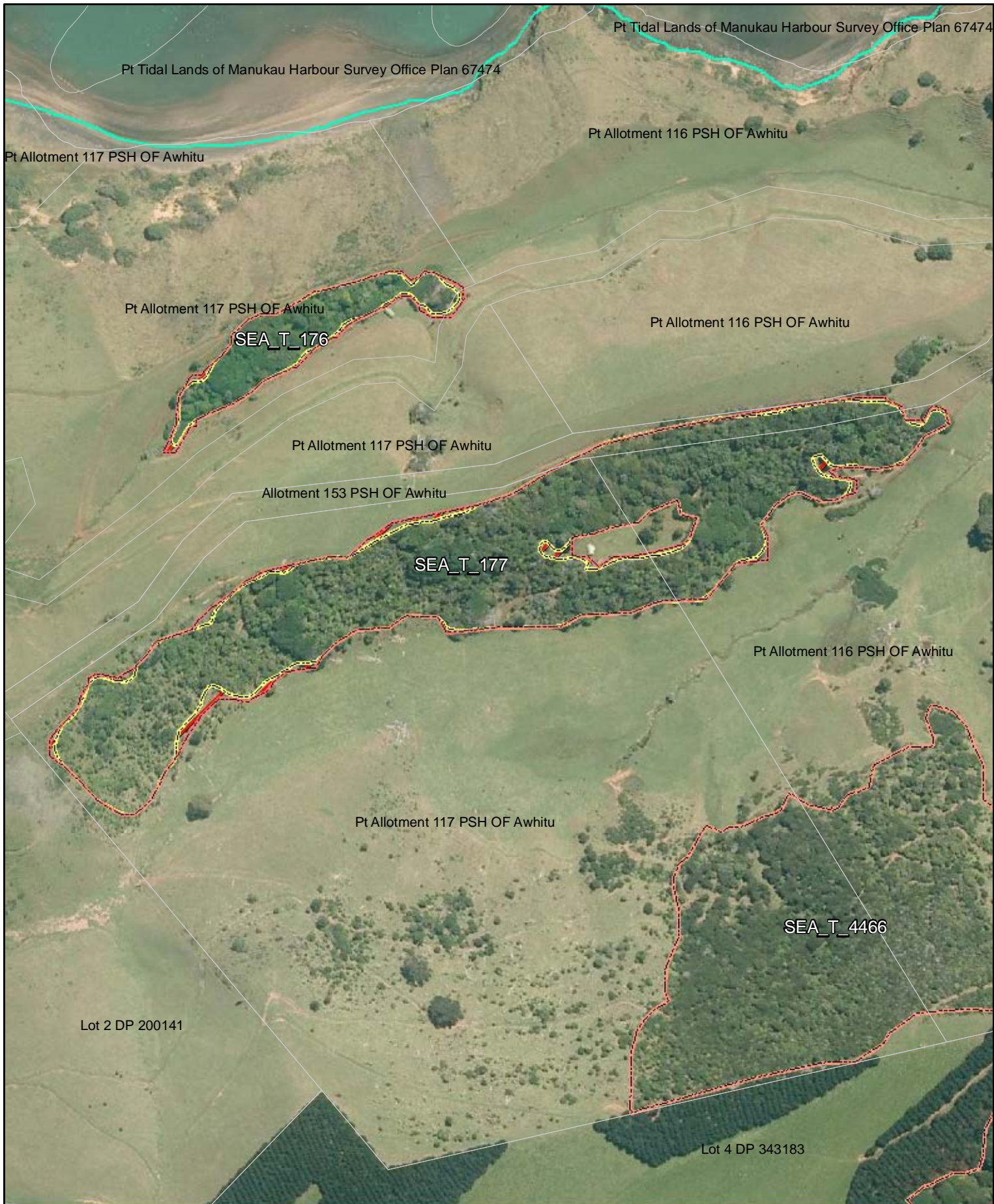
Date: October 2013

A4 @ 1:1,193

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10












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# SEA\_T\_177

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:3,580

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10







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# SEA\_T\_179

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:688

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10





Lot 2 DP 36878

SEA\_T\_194

Pt Allotment 97 PSH OF Awhitu






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# SEA\_T\_194

## Changes to SEA Overlay

Date: October 2013

A4 @ 1:569

-  Parcel Boundaries
-  SEA Overlay - Notified Version
-  Proposed revised SEA boundary
-  SEA area recommended for exclusion
-  Coast Boundary MHWS10

