

# KAPIRO, MANGATOA AND PUKETOTARA FORESTS

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Owned by  
**LANDCORP FARMING LTD**

## Forest Management Plan

For the period 2013 / 2018



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## **1. INTRODUCTION**

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### **Growing wood**

Wood has many different uses, from firewood to construction timber, to newspapers and tissue paper, from furniture to clothing. Wood fibre is extremely versatile and is produced using carbon dioxide and the energy of the sun. Wood from well managed forests is a renewable resource that can meet the economic, social and cultural needs of our society without compromising the environment.

Landcorp Farming Ltd's objective is to grow wood for further processing in New Zealand or overseas and obtain an economic return on investment. Landcorp Farming Ltd seeks to achieve this objective through the growing of suitable species with wood characteristics that meet the demand of the market. The trees are established, protected and tended as required to meet those demands.

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### **Principles and Criteria**

Landcorp Farming Ltd is committed to adopt the Forest Stewardship Council (FSC) Principles and to meet their Criteria pertaining to forest management. The FSC Principles and Criteria describe the essential elements or rules of environmentally appropriate, socially beneficial and economically viable forest management.

Landcorp Farming Ltd is committed to the PF Olsen FSC Group Scheme that is implemented through the Group Scheme Member Manual and associated documents.

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### **About this Plan**

This document provides a summary of the forest management plan and contains:

- Management objectives;
  - A description of the land and forest resources;
  - Environmental safeguards;
  - Identification and protection of rare, threatened and endangered species;
  - Rationale for species selection, management regime and harvest plan and techniques to be used;
  - Appropriate management of unstocked reserve areas;
  - Maps showing plantation area, legal boundaries and protected areas;
  - Provisions for monitoring and protection.
-

## **2. MANAGEMENT OBJECTIVES**

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### **Environmental and economic services**

Kapiro, Mangatoa and Puketotara Forests can provide environmental benefits, including:

- Enhanced water quality;
- Soil stabilisation and conservation;
- Providing a buffer against flooding during storms;
- Shading waterways for aquatic life;
- Enhance wildlife and plant habitat leading to increased biodiversity;
- Carbon sequestration and emissions offsetting.
- Stock shelter;
- Providing economic and social benefits to the community and Landcorp Farming Ltd.

Some forest operations and events such as wind storms, flooding and fire, and agents such as pests and diseases, and weeds can cause adverse effects on the forest and on some of the environmental, economic and social services it provides.

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### **Management objectives**

The forest is managed to:

- Grow trees and produce logs for the manufacturing of wood products in New Zealand and overseas with a focus on high quality pruned and structural logs depending on the growth capability and environmental characteristics of the site.
- Provide quality pruned or structural shelterbelts for the primary purpose of stock welfare, but managed to also provide environmental and economic benefits.
- Protect significant areas of soil conservation concern.
- Ensure that the productivity of the land does not decline.
- Ensure that environmental values are identified and maintained.
- Harvest the trees as close as possible to their economic optimum age.
- Replant following harvesting, and
- Help to offset the Landcorp Farming Ltd carbon liability under the New Zealand Emission Trading Scheme (ETS).

Landcorp Farming Ltd is committed to ensure that the management of the forest is sustainable, from an environmental, social, cultural and economic perspective.

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Environmental management includes steps to identify rare, threatened and endangered species where such presence is a possibility, protection of reserve areas, waterways and the control of pests and weeds.

The social perspective includes ensuring that contractors and their workers adhere to health and safety standards and consultation with neighbours and stakeholders in respect of operations on the forest.

The cultural perspective includes consultation with the appropriate iwi to ensure that culturally significant resources, historic and archaeological sites are identified and appropriately managed.

The economic perspective refers to the selection of a species, management and harvesting regime, which provides a reasonable return on investment while minimising the risks of this investment.

**Implementation**

The forest management objectives described above are implemented by PF Olsen Ltd (PF Olsen), the forest manager for Kapiro, Mangatoa and Puketotara Forests. The manager applies recognised best forestry management practice within a quality management framework to plan for and deliver the required forest management objectives.

The Quality management framework includes:

- The PF Olsen ISO 9001 certified forest management system, ensuring that the forest management planning is up to date and that operations are scheduled and undertaken according to the plan.
- The PF Olsen ISO 14001 certified environmental management system, ensuring that high standards of environmental management are recognised and integrated into every facet of the forest planning and management.
- The FSC Environmental certification (when requested by the forest owner customer) to ensure management principles and practice adhere to internationally recognised and adopted standards for environmental management.

## OPERATING ENVIRONMENT

### 3. FOREST LANDSCAPE DESCRIPTION

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**Overview** This section describes the physical and legal attributes of the land on which the forest is located. Included in this section are discussions of:

- Location and access
- Topography
- Soils
- Climate
- Legal ownership and tenure

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**Location and access**

Kapiro, Mangatoa and Puketotara are forests that are all located in Northland on properties (Stations) used for both farming and forestry.

**Kapiro forest** is located approximately 12km north-west of Kerikeri. The main access is located off Stanners Road which in turn is located off State Highway 10. Internal farm roads and tracks provide access to all parts of the forest.

**Mangatoa forest** is located approximately 6 km west of Kaikohe Township. The main access is located on Jordan Road, off Rakauwahia Road which in turn is located off State Highway 12. Internal farm roads and tracks provide access to all parts of the forest.

**Puketotara forest** is located approximately 20km west of Kerikeri. The main access is located off Mangakaretu Road which in turn is located off Puketotara Road. Puketotara Station is situated over two separate blocks. Internal farm roads and tracks provide access to all parts of the forest.

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**Log Markets**

The location of the forests in relation to potential markets is listed in the table below.

**Table 1: Distances to Log Markets from Landcorp Northland Stations**

| Potential Market or Port                                    | Product Type                  | Distance from Kapiro (km) | Distance from Mangatoa (km) | Distance from Puketotara (km) |
|-------------------------------------------------------------|-------------------------------|---------------------------|-----------------------------|-------------------------------|
| North Port-Marsden Point                                    | Export                        | 120                       | 119                         | 123                           |
| Bay Lumber-Kerikeri                                         | Pruned, part pruned, S30, S25 | 8                         | 15                          | 64                            |
| CHH LVL mill-Ruakaka                                        | S35 and S25                   | 118                       | 118                         | 121                           |
| Crofts Poles-Whangarei                                      | S25                           | 78                        | 88                          | 81                            |
| Pulp- road transport to Moerewa (then by rail to Whangarei) | Pulp                          | 33                        | 39                          | 35                            |

**Topography**

**Kapiro**

The topography of Kapiro is predominantly large flat areas and areas of rolling hill country and these areas are suitable for ground based harvesting. There is a small area of steeper slope that will require cable based harvesting. The altitude ranges from 20 to 220 metres above sea level.

**Mangatoa**

The topography of Mangatoa is rolling to steep hill country. Areas that are currently forested are all suitable for ground based harvesting. Planned establishment over the next 5 years is in areas that will require cable based harvesting at maturity. The altitude ranges from 40 to 260 metres above sea level.

**Puketotara**

The topography of Puketotara is rolling hill country suitable for ground based harvesting. The station is in two pieces- referred to as top farm and bottom farm. The altitude ranges from 100 to 371 metres above sea level.

**Soils**

**Kapiro**

Combination of flat to undulating slopes on strongly weathered basalt rock with Predominantly Okaihau Gravelly Clay with some Ruatangata Gravelly Clay and Hukerenui Silt Loam.

**Mangatoa**

Rolling to moderately steep slopes forming hilly terrain, on siliceous claystone. Flat to easy undulating hills near the road is Wharekohe silt loam with silica pan. Northeast portion is Whirinaki clay loam. The balance is steeper hill country, Waitotira clay loam and Wairiki clay loam.

**Puketotara**

Rolling to strongly rolling slopes on acid to intermediate igneous rocks. The top farm soils are Wharekohe silt loam podzols with a pan. The bottom farm soils are moderately podzolised Pukenamu silt loams and some Ruatangata volcanics. There is potential for erosion.

**Climate**

The climate of the Eastern Northland region is warm and humid with mild winters. Summer droughts occur and occasional tropical storms from the NE and N. The mean annual temperature for the region is around 15.6 degrees Celsius. The Kerikeri region averages only 13 ground frost days per year.

Rainfall data is collected from weather stations onsite at each station:

- Kapiro station has an annual rainfall of 1400-2100mm.
- Mangatoa has an annual rainfall of 1500-1700mm, with a southwest predominant wind.
- Puketotara top farm has an annual rainfall of 2800-3000mm. Very wet winters and moist summers. The bottom farm has an annual rainfall of 2000mm. This area is exposed to easterly winds.

**Legal ownership**

The legal descriptions of the land on which the Kapiro, Mangatoa and Puketotara Stations are situated on are contained in appendix 1.

The tenure of all stations is freehold, and no additional areas are leased to or from other parties.

**The ecological landscape**

**Kapiro**

Kapiro Station falls within the Kerikeri ecological district. The topology of this district is a deeply embayed coastline and mostly low hills (less than 440m a.s.l) and large areas of swampland (largely drained).

The clay textured soils from sedimentary rocks show a complex pattern related to rock type and vegetation, mainly strongly leached and acid soils, developed under a mixed podocarp-hardwood forest with kauri. These soils have impeded drainage. In general, these soils have low natural fertility and are susceptible to drought in summer.

Vegetation of the district was originally kauri dominated species-rich forest. Much of these forested areas have been heavily exploited and burnt. There are large areas of towai shrubland and *Leptospermum* scrub. In areas there is dense kauri and podocarp regeneration (totara, kahikatea and rimu) especially conspicuous between Whangarei and the Bay of Islands. The region contains areas of coastal forest remnants in which puriri and pohutukawa are the dominant species. There is relatively frequent incidence of mangroves lining harbours and river estuaries. The Kerikeri ecological district is home to a significant population of kiwi.

**Puketotara**

Puketotara Station falls within both the Kerikeri ecological district (eastern block) and the Puketi ecological district (western block). The Puketi ecological district is unique in that the land cover is 92% indigenous forest. The Department of Conservation-owned Puketi-Omahuta Conservation Forest, at over 21,000 hectares, makes up a significant proportion of the ecological district. Much of the forest is contiguous primary forest and showcases a range of species assemblages, many of which are not widely repeated throughout Northland. These diverse ecosystems support an equally varied array of native fauna, including kiwi, kokako and short-tailed bats.

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**Mangatoa**

Mangatoa Station falls within the Kaikohe ecological district. This district is flat to rolling with localised steeper slopes with altitude mostly below 300m a.s.l.

Soil differences across the region are due to differences in the parent material and original vegetation. It ranges from weakly leached and fertile soils with well structured subsoils where hardwood trees were dominant and pans where kauri was dominant.

Only small forest remnants remain- important species of inland forests include kahikatea, rimu, rewarewa, puriri, taraire, kohekohe and nikau. There is much secondary forest with good podocarp regeneration on low hilly country. Most of the remaining original indigenous forest area is concentrated in the Pukewharariki Forest, a 2,300 hectare contiguous podocarp/kauri/broadleaf forest; much of it held in private ownership.

**LENZ**

The Land Environments New Zealand (LENZ) classification system is a spatial surface that utilises a large array of physical and environmental attributes to define spatially what are in effect similar growing environments that in the absence of disturbance would support similar associations of indigenous vegetation. The LENZ system provides for both aggregation or finer scales of representation across 4 levels with level 4 being the finest scale. As part of an exercise covering large parts of the country, PF Olsen had landscape evaluations completed at level 3 to provide a percentage breakdown of reserve areas for Kapiro, Mangatoa and Puketotara forests relative to the total station areas as outlined in the table below.

**Table 2: LENZ Level 3 Classification by Station**

| LENZ Level 3    | Kapiro     | Mangatoa    | Puketotara  | Total area (ha) |
|-----------------|------------|-------------|-------------|-----------------|
| A6.1            | 85.4 (46%) | 245.1 (91%) | 49.3 (31%)  | 379.8           |
| A7.1            | 15.3 (8%)  |             |             | 15.3            |
| D1.1            | 83 (44%)   | 24.6 (9%)   |             | 107.6           |
| D1.2            | 3.3 (2%)   |             | 112.1 (69%) | 115.4           |
| Total area (ha) | 187        | 269.7       | 161.4       | 618.1           |

**Threatened  
Environments  
Classification**

The Landcare Threatened Environments Classification (TEC) is a measure of how much indigenous vegetation remains within land environments, its legal protection status, and how past vegetation loss and legal protection are distributed across New Zealand’s landscape. The TEC is a combination of three national databases:

- Land Environments New Zealand (LENZ)
- Landcover Database 2
- Protected Areas Network

The Threatened Environment Classification uses indigenous vegetation cover as a surrogate for indigenous biodiversity, which includes indigenous ecosystems, habitats, and communities; the indigenous species, subspecies and varieties that are supported by indigenous vegetation; and their genetic diversity. It uses legal protection as a surrogate for the relative vulnerability of indigenous biodiversity to pressures such as land clearance, extractive land uses, and the effects of fragmentation. The TEC is therefore most appropriately applied to help identify places that are priorities for formal protection against clearance and/or incompatible land uses, and for ecological restoration to restore lost species, linkages and buffers.

The table on the following page shows the threatened environments classifications as they pertain to Kapiro, Mangatua and Puketotara forests.

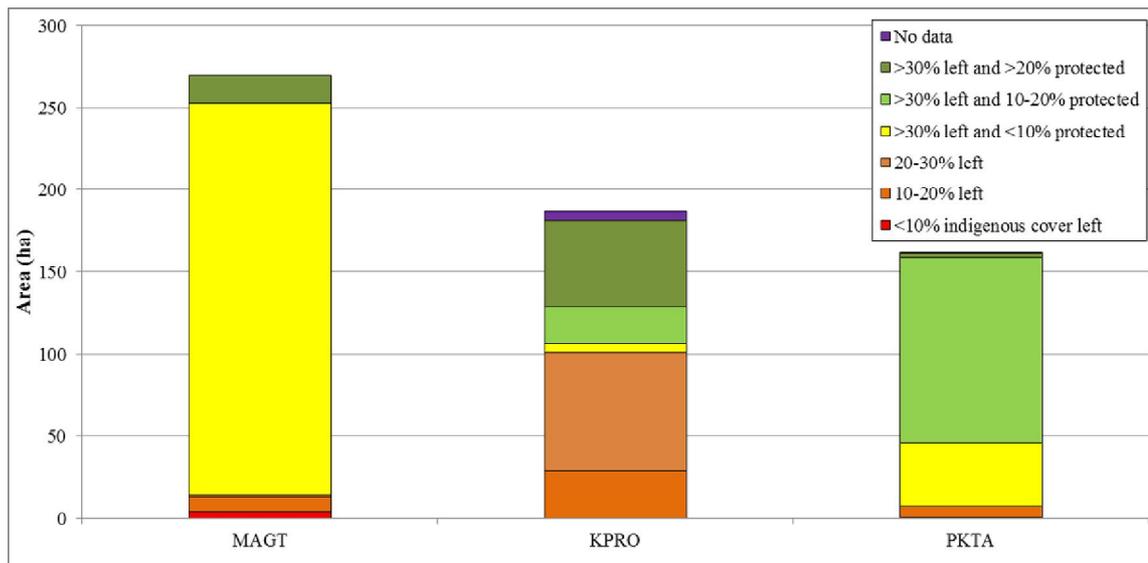
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**Table 3: Area and Percentage of Station Protected Ecosystems in each Threatened Environments Classification**

|                                           | <b>KPRO</b>     | <b>MAGT</b>     | <b>PKTA</b>     |
|-------------------------------------------|-----------------|-----------------|-----------------|
| <b>&lt;10% indigenous cover left</b>      |                 | 3.8 ha          | 0.5 ha          |
|                                           |                 | 1.4%            | 0.3%            |
| <b>&gt;30% left and &lt;10% protected</b> | 5.7 ha          | 239.0 ha        | 38.7 ha         |
|                                           | 3.1%            | 88.6%           | 24.0%           |
| <b>&gt;30% left and &gt;20% protected</b> | 52.1 ha         | 16.8 ha         | 2.7 ha          |
|                                           | 27.8%           | 6.2%            | 1.7%            |
| <b>&gt;30% left and 10-20% protected</b>  | 22.1 ha         |                 | 113.0 ha        |
|                                           | 11.8%           |                 | 70.0%           |
| <b>10-20% left</b>                        | 28.9 ha         | 9.0 ha          | 6.4 ha          |
|                                           | 15.5%           | 3.3%            | 4.0%            |
| <b>20-30% left</b>                        | 72.1 ha         | 1.1 ha          |                 |
|                                           | 38.6%           | 0.4%            |                 |
| <b>No data</b>                            | 6.2 ha          |                 | 0.2 ha          |
|                                           | 3.3%            |                 | 0.1%            |
| <b>TOTAL</b>                              | <b>187.0 ha</b> | <b>269.7 ha</b> | <b>161.4 ha</b> |
|                                           | <b>100.0%</b>   | <b>100.0%</b>   | <b>100.0%</b>   |

**Figure 1: Reserve Area by Threatened Environment Class**



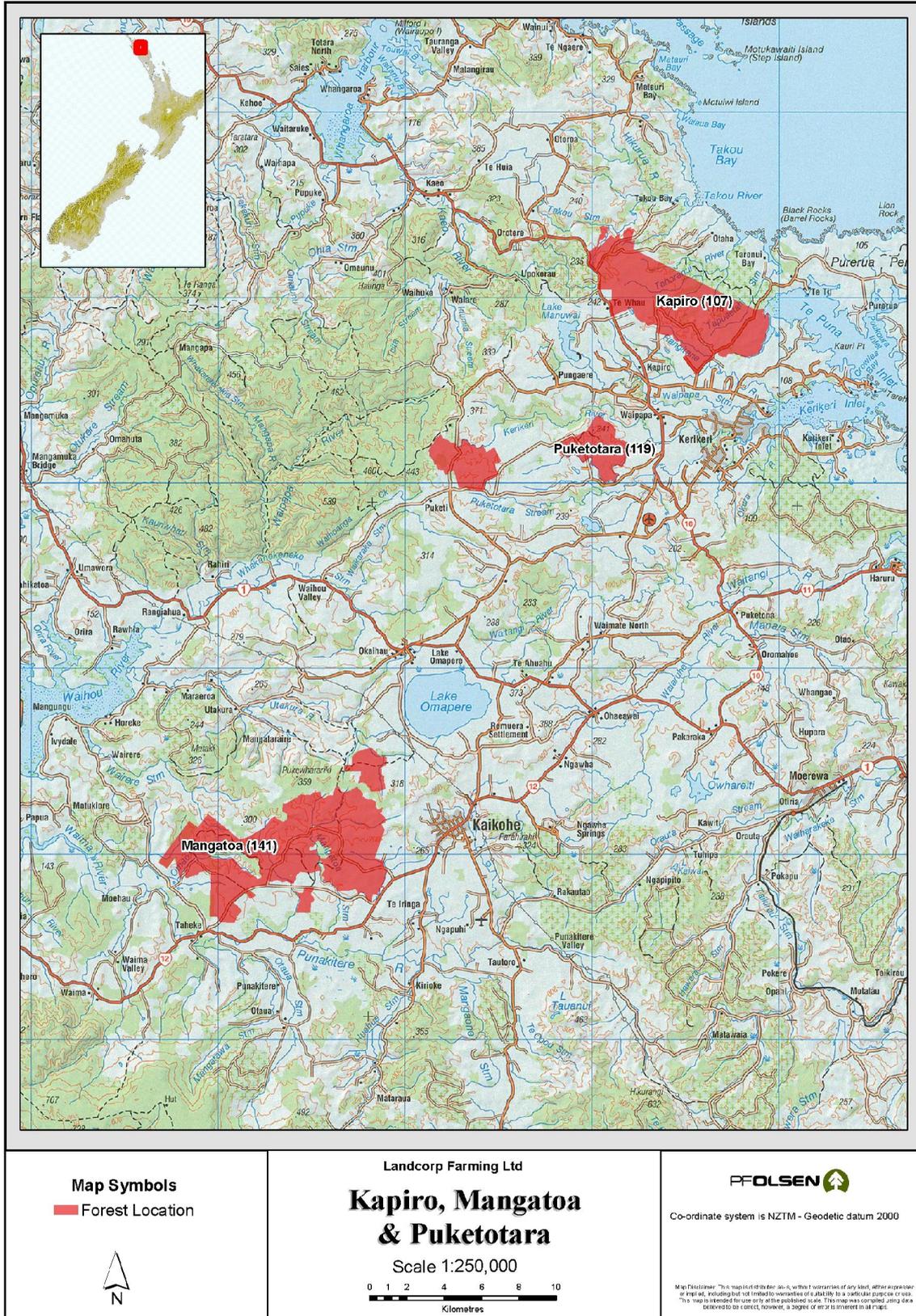
The most at-risk category is the <10% indigenous cover left. There is no area in this category present at Kapiro forest, and only 1.4% at Mangatoya and 0.3% at Puketotara in this category. These areas are very small fragments of larger reserves that mostly fall on better represented TEC classes.

**Protective status** The following table shows vegetation types as required by the Draft National Standard for Plantation Forest Management in New Zealand.

**Table 4: Protective Status of the Ecological Landscape**

| <b>Ecological District or LENZ type:</b>                                      | <b>Kaikohe ED</b> | <b>Kerikeri ED</b>               | <b>Pukete ED</b> |
|-------------------------------------------------------------------------------|-------------------|----------------------------------|------------------|
| <b>Forest</b>                                                                 | <b>MAGT</b>       | <b>KPRO &amp; PKTA</b>           | <b>PKTA</b>      |
| Original (pre-Maori) percentage of ecosystem type in Ecological District      | 62,800 ha         | 67,000 ha                        | 24,000 ha        |
| Natural ecosystem area remaining                                              | 13,188 ha<br>21%  | 14,070 ha<br>21%                 | 22,080 ha<br>92% |
| Proportion of remaining natural ecosystem under protection:                   | 1,950 ha<br>15%   | 3,604 ha<br>26%                  | 16,838 ha<br>76% |
| Protection by certificate holder (KPRO, MAGT & PKTA)                          | 269.7 ha<br>13.8% | 310.2 ha<br>8.6%                 | 38.2 ha<br>0.2%  |
| Protected areas as a % of total Station forested (reserve + plantation) areas | MAGT: 25.8%       | KPRO:<br>37.5%<br>PKTA:<br>58.1% | PKTA:<br>18%     |

**4. MAP 1 - FOREST LOCATION MAP**



## **5. SOCIO-ECONOMIC PROFILE AND ADJACENT LAND**

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### **Forest history**

Landcorp Farming Ltd was formed as a state owned enterprise in 1987 to assume the commercial farming and property activities of the former governmental Department of Lands and Survey.

Kapiro, Mangatoa and Puketotara Stations have existed in various shapes and forms. Areas have been developed, subdivided and separate Landcorp Farming Ltd stations have been amalgamated to form Kapiro, Mangatoa and Puketotara stations as they exist today.

The plantation forested areas of these stations were initially planted for the provision of shelter for stock and soil stabilisation of gullies and waterways. As these first rotation areas have been harvested, replanting has focused on increasing the size of forested areas to result in a profitable forest unit that can be managed effectively.

With the advent of the New Zealand Emissions Trading Scheme there are now plans to increase the forested areas on these Northland stations in areas that are marginal for profitable farming.

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### **Current social profile**

The principal operation of these Northland stations is farming:

- Kapiro station is a sheep, beef and dairy unit. The prime farming function is the Rangitane Angus breeding scheme.
- Mangatoa station is a sheep and beef farming operation with the principal focus of finishing beef.
- Puketotara station is a sheep and beef farming operation. It finishes cattle for local trade and dairy replacements for the Landcorp dairy farms in the region.

The farming operations employ 22 permanent staff, with additional contractors employed as required, e.g. for fencing.

Forestry is a secondary activity on these Northland stations, but of increasing importance to profitability.

The forests are a small incremental contributor to the social profile of the area. The forested areas on Kapiro, Mangatoa and Puketotara stations are a small proportion of forested land in the area. The land and forests are privately owned; contribution to the local economy by way of added incremental employment and infrastructure will be low and intermittent.

The stations do contribute positively to the social profile of the region by active involvement in environmental programmes such as the QEII Trust (Section 8), and social contributions such as involvement in the Te Araroa Trust walkway (Section 10).

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**Associations with  
Tangata Whenua**

Northland Regional Council provided PF Olsen with contacts for a number of Iwi organisations that may have an interest in this land. These Iwi contacts are presented in appendix 2. These Iwi organisations were consulted as part of the stakeholder consultation process.

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**Neighbours**

Neighbours to the forest boundaries have a special relationship to and interest in the management of the forests. Activities within the forest may positively or negatively impact upon their quality of life or businesses in a number of ways, while inappropriately managed operations could create risks of adverse health, safety and environmental hazards. Neighbours may use the forests for recreational purposes or place reliance on the forests for provision of water quality or quantity services. Boundary issues such as weed and pest control, access and boundary alignment issues may also involve neighbours.

Kapiro, Mangatōa and Puketotara forests all have a large number of neighbours due to subdivision of adjacent properties into small ‘lifestyle blocks’. This has important implications for forest operations and some or all of these parties should be consulted when operations are proposed in forest areas adjacent to their boundaries.

Neighbour contacts are contained within PF Olsen’s Forest Information and Planning Database (FIPS). A full list of neighbours and maps of location for Kapiro, Mangatōa and Puketotara forests can be viewed in appendices 3 and 4.

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## 6. THE REGULATORY ENVIRONMENT

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**Regulatory considerations**

In order to minimise the risk to forest owners, managers and contractors, it is important that relevant legislation and agreements are identified and appropriate measures put in place to ensure that breaches of legislation are avoided.

The following legislation and agreements summarise key regulatory and voluntary controls that currently apply to forest operations in the forest.

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**Resource Management Act**

Kapiro, Mangatoa and Puketotara forests are subject to the provisions of the Resource Management Act (RMA) 1991. The RMA sets up a resource management system that promotes the sustainable management of natural and physical resources and is now the principal statute for the management of land, water, soil and other resources in New Zealand.

Under the RMA, Kapiro, Mangatoa and Puketotara forests fall under the Far North District Council for land management issues and the Northland Regional Council for soil conservation and water quality issues.

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**District Plan**

Kapiro, Mangatoa and Puketotara forest fall under the jurisdiction of the Far North District Council. The current plan was notified as operative on 27<sup>th</sup> August 2009.

Under the district plan, Mangatoa forest is zoned 'Rural Production', and forestry is a permitted activity. Puketotara forest is split between 'Rural Production' and 'Mineral Zone'. Kapiro forest is predominantly zoned 'Rural Production with a small area zoned 'General Coastal'. Forestry is a permitted activity.

The table over page lists plan rules as they relate to forestry. This list should not be considered authoritative and any deviations from the descriptions below must be checked against the relevant plan. It is important to note that all regulatory authority plans are checked prior to operations as plans are updated and amended. The table over the page summaries the permitted activity rules as at the time of writing this management plan. If a proposed activity cannot be undertaken within the constraints of a permitted activity and it's associated conditions, then by default, a RECOURCE CONSENT WILL BE NEEDED.

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**Table 5: District Plan Rules as they Affect Forestry- Permitted Activity Limits**

| <b>Far North District Council Plan (August 2009)</b> |                                                        |                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rule Ref</b>                                      | <b>Activity</b>                                        | <b>Requirement</b>                                                                                                                                                                                                                                                                                                                                                  |
| 8.6.5.1                                              | Forestry                                               | Permitted - forestry activity in general                                                                                                                                                                                                                                                                                                                            |
| 8.6.5.1.7                                            | Noise                                                  | Permitted - 0700 to 2200 hours 65 dBA L10                                                                                                                                                                                                                                                                                                                           |
| 8.6.5.1.5                                            | Traffic                                                | Permitted - traffic related to forestry                                                                                                                                                                                                                                                                                                                             |
| 12.2.6.1.1<br>12.2.6.1.2                             | Indigenous clearance-<br>General<br>Production<br>Zone | Long list of permitted situations. Check plan for full list.<br>Permitted - clearance of indigenous vegetation - 2ha/site/year provided older than 10 years and not remnant forest & >20m from lake, wetland or 3m wide permanently flowing river.<br>0.5ha /site/year if remnant forest.<br>Permitted when incidental damage if managed by best practice forestry. |
| 12.2.6.1.3                                           | Indigenous clearance-<br>General<br>Coastal Zone       | Permitted - clearance of indigenous vegetation in the general coastal zone – up to 500m <sup>2</sup> /site/year or the lesser of 15% or 1ha for any site of more than 50% indigenous cover in vegetation < 6m tall or 600mm girth, & >20m from lake, wetland or 3m wide permanently flowing river.                                                                  |
| 12.3.6.1.1                                           | Earthworks                                             | Permitted - excavation & filling <5,000m <sup>3</sup> /site/year with average cut & fill <1.5m height over length of face. Exempts maintenance, construction or upgrading of internal forestry roads in Rural Production zone unless within 20m of any external road or adjoining property.                                                                         |
| 12.3.6.3.1                                           | Quarrying                                              | Requires a “Development Plan” unless normal rural practice (see plan definitions).                                                                                                                                                                                                                                                                                  |
| 12.4.6.1.2                                           | Residential locations                                  | 20m firebreak buffer required from forest.                                                                                                                                                                                                                                                                                                                          |
| 12.5.6.1.2                                           | Cultural & heritage                                    | Consent needed for modification & maintenance of all listed features in appendix 1E, zone maps or heritage precinct maps.                                                                                                                                                                                                                                           |
| 12.5.6.1.3                                           | Registered archaeological sites                        | Consent needed for modification or destruction as well as from Historic Places Trust for all sites listed in Appendix 1G. <b>Note appendix 1G is registered sites only.</b> Many other additional sites are recorded in the NZ archaeological site recording scheme and also require HPT consent to destroy or modify by law.                                       |
| 12.6.6.1                                             | Discharges to air                                      | Permitted if no Regional Council consent required and complies with general zone rules and district wide provisions.                                                                                                                                                                                                                                                |
| 12.7.6.1.1                                           | Riparian setbacks                                      | Impermeable surfaces must be setback 30m from lakes >8ha or permanently flowing rivers >3m wide except at crossing points. Maintenance of existing surfaces is exempt.                                                                                                                                                                                              |
| 12.7.6.1.2                                           | Riparian setbacks                                      | Impermeable surfaces lakes less than 8ha or rivers <3m - must be setback 3x area of lake. For rivers 10x width of river bed or 10m, whichever is the greater & setback of 30m for wetlands >1ha.                                                                                                                                                                    |

**Regional Plans**

Kapiro, Mangatoa and Puketotara forests come under the jurisdiction of the Northland Regional Council.

There are three regional plans that need to be checked prior to commencement of operations. The Regional Water and Soil Plan became operative on 28 August 2004, with further amendments in 2007 and 2010. Forestry is subject to provisions of this Plan but in most cases meets permitted activity conditions.

The Regional Air Quality Plan became operative on 1 August 2005, with further changes made in 2008. This plan covers discharge to air, which includes aerial spraying, dust, and burning. Like the Water and Soil Plan, forestry is a permitted activity provided the relevant standards are met.

The third plan is the Regional Coastal Plan that governs activities below the mean high water springs. This plan is not relevant to activities within Kapiro, Mangatoa and Puketotara forests unless activities occur within this zone (e.g. harvesting adjacent to an estuary or discharges directly to coastal waters).

A summary of permitted activity rules as they currently affect Kapiro, Mangatoa and Puketotara forests are listed below. Any deviations from the descriptions below must be checked against the relevant plans. It is important to note that all regulatory authority plans are checked prior to operations as plans are updated and amended. The table over the page summaries the permitted activity rules as at the time of writing this management plan.

**Table 6: Regional Plan rules as they affect forestry- permitted activity limits**

| <b>Northland Regional Council- Regional Water and Soil Plan</b> |                              |                                                                                                                                                                       |
|-----------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rule Ref</b>                                                 | <b>Status</b>                | <b>Requirement</b>                                                                                                                                                    |
| Sec V.18.1.1                                                    | Vertebrate control chemical  | Permitted – If ERMA approved chemical by ground based application and other standards.                                                                                |
| Sec V.18.1.2                                                    | Herbicides/ agrichemicals    | Permitted – If ERMA approved chemical by ground based application and other standards.                                                                                |
| Sec V.22.1.1                                                    | Discharge of stormwater      | Permitted - from land disturbance activities if land disturbance activity is also permitted – subject to standards                                                    |
| Sec V.22.1.3                                                    | Discharge of stormwater      | Permitted - from roads or tracks – subject to standards.                                                                                                              |
| Sec V.23.1.1                                                    | Discharge of fertilisers     | Permitted – into or onto land provided all reasonable steps taken to ensure fertiliser applied in a manner which minimises potential for contaminants to enter water. |
| Sec V.23.1.2                                                    | Discharge of contaminants    | Permitted – into or onto land not provided for elsewhere in the plan subject to standards                                                                             |
| Sec V.29.1.2                                                    | Structures in beds of rivers | Permitted – use/repair of existing structures subject to conditions and performance standards.                                                                        |

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| <b>Rule Ref</b>         | <b>Status</b>                                                    | <b>Requirement – Regional Land &amp; Water Plan</b>                                                                                                                                                                                                                   |
|-------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sec V.29.1.3<br>-29.1.5 | Culverts,<br>bridges &<br>fords                                  | Permitted - subject to performance standards and design constraints, including not occurring in significant/indigenous wetlands, dune lakes or other scheduled significant areas, and not regulated by V.27.03.02. Compliance with V.29.1.11 Environmental Standards. |
| Sec V.31.1              | Extraction<br>(sand, gravel<br>rock).                            | Permitted – from excavation and disturbance of bed of river subject to standards being met.                                                                                                                                                                           |
| Sec V.32                | Environmenta<br>l standards                                      | All relevant standards must be complied with for all land disturbance activities. If not consent is required.                                                                                                                                                         |
| Sec V.33.1.1            | Vegetation<br>clearance –<br>non erosion<br>zone                 | Permitted – not in Riparian Management Zone subject to standards including Sec V.32.                                                                                                                                                                                  |
| Sec V.33.1.2            | Vegetation<br>clearance –<br>erosion zone                        | Permitted –(except Riparian Management Zone) in plantation forestry subject to standards including Sec V.32 and ground based harvest restricted to 01/Oct – 30/Apr (unless on sand country).                                                                          |
| Sec V.33.1.3            | Earthworks                                                       | Permitted – if - not in Riparian Management Zone, <5000m <sup>3</sup> /12 months outside the erosion zone, or <1000m <sup>3</sup> /12 months and less than 1000m <sup>2</sup> in the erosion zone subject to standards including Sec V.32.                            |
| Sec V.34.1.2            | Vegetation<br>Clearance in<br>the Riparian<br>Management<br>Zone | Permitted - for plantations in existence prior to Aug 2004 and if after Aug 2004 subject to - 5m setback, subject to standards including Sec V.32 and if not plantation clearance is < 200m <sup>2</sup> .                                                            |
| Sec V.34.1.3            | Earthworks in<br>the Riparian<br>Management<br>Zone              | Permitted – area <200m <sup>2</sup> and volume <50m <sup>3</sup> subject to standards including Sec V.32.                                                                                                                                                             |
| Sec V.34.1.4            | Land Prep'n<br>in the riparian<br>zone                           | Permitted – outside a 5m setback from water body and dominant slopes < 15°. Subject to standards of Sec V.32.                                                                                                                                                         |

| <b>Northland Regional Council- Regional Air Quality Plan</b> |                             |                                                                                                                                          |
|--------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rule Ref</b>                                              | <b>Status</b>               | <b>Requirement</b>                                                                                                                       |
| Sec V.10.1.2                                                 | Dust                        | Permitted – from earthworks & road construction/maintenance provided not offensive or objectionable to neighbouring landowner/occupiers. |
| Sec V.10.1.5<br>& 10.1.5.2                                   | Agrichemical<br>application | Permitted – from discharges subject to standards and notification to owners/occupiers of sensitive areas adjacent to area being sprayed. |
| Sec V.10.1.8                                                 | Burning                     | Permitted – subject to standards.                                                                                                        |

If a proposed activity cannot be undertaken within the constraints of a permitted activity and it's associated conditions, then by default, a **RECOURSE CONSENT WILL BE NEEDED.**

**Historic Places**

Under the Historic Places Act 1993 it is the landowner’s responsibility to identify any historic sites on their land prior to undertaking any work which, may disturb or destroy such sites. Where such circumstances exist, an “Authority to Modify or Destroy” will be sought from the Historic Places Trust. Such authorities are similar in function to a resource consent and, if granted, normally come with conditions that must be met. The process to apply for authorities is documented in PF Olsen’s EMS. Note also that consents to modify an archaeological site may sometimes be required from the local District Council.

Records of archaeological and historical places are maintained in the NZ Archaeological Association Site Recording Scheme run by the HPT. These sites are often included in schedules of places and sites of significance in District Plans along with sites of cultural significance. Sites present within or immediately adjacent to the boundaries of this property that may be adversely affected by operations are listed below.

Prior to operations occurring that could affect any archaeological site (e.g. harvesting, roading, afforestation), the forest manager will undertake an assessment of the likelihood of sites occurring on the property. The PF Olsen EMS details the archaeological risk assessment process in full. If a site is found or suspected on any block, the protocols specified in PF Olsen’s EMS and any others specifically developed in conjunction with HPT and Iwi or other stakeholders must be observed.

**Consents & authorities held**

There are no resource consents required for planned harvesting and re-establishment operations at Kapiro, Mangatoa and Puketotara forests for the duration of this plan.

There are no current HPT authorities held for Kapiro, Mangatoa and Puketotara Forests.

A search of the New Zealand Archaeological Association ‘Archsite’ web resource has revealed there are no known historic sites at Mangatoa and Puketotara Forests. There are known historic sites at Kapiro station.

The details of these sites are displayed in the table and map below.

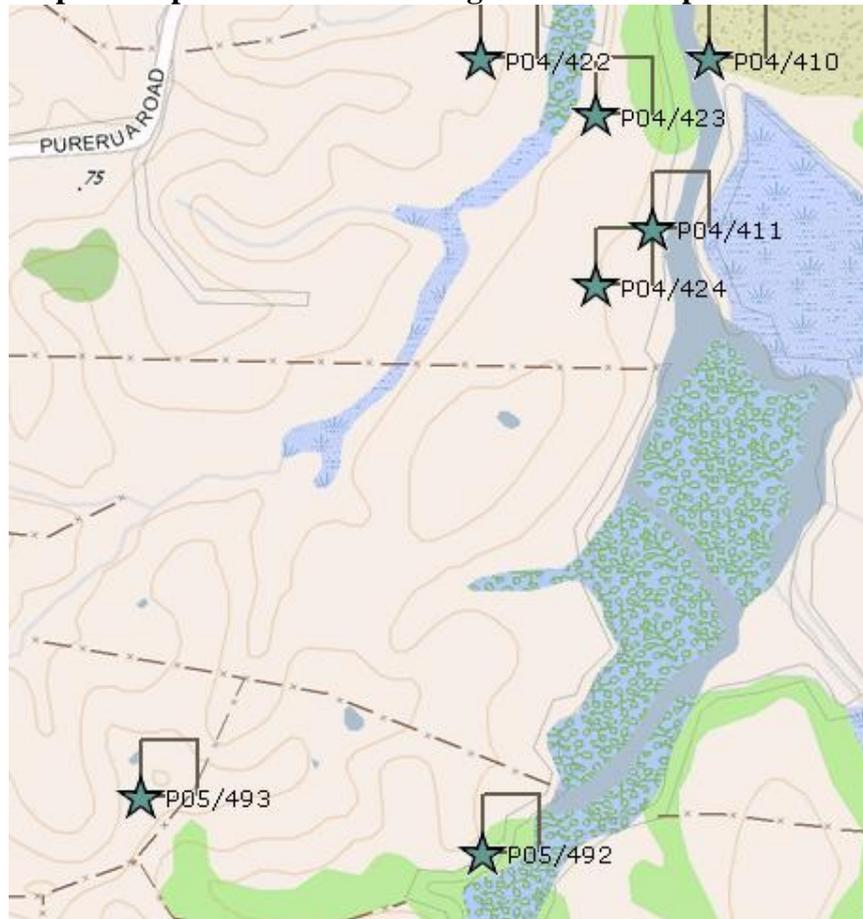
**Table 7: Known archaeological sites at Kapiro Station**

| <b>Reference</b> | <b>Type</b>      |
|------------------|------------------|
| PO4/411          | Midden           |
| PO4/422          | Terraces/ midden |
| PO4/423          | Terraces         |
| PO4/424          | Terraces/ midden |
| PO5/492          | Midden           |
| PO5/493          | Pa               |

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**Map 2: Map of known archaeological sites at Kapiro Station**



Source: NZ Archaeological Association

**The Emissions Trading Scheme**

Forests in New Zealand are governed by legislation, the Climate Change Response Act 2002 (the Act) and associated Emission Trading Scheme (ETS), which is related to New Zealand’s Kyoto commitments to reduce the nation’s carbon emissions and contribution to associated climate change.

Kapiro, Mangatoa and Puketotara contain areas of pre-1990 forest land as defined in the Act, because this land was used for forestry as at 31<sup>st</sup> December 1989. A change in the use of this pre-1990 forest land, deforestation, would require the owner of this land to surrender carbon credits related to the carbon stocks (tonnes of CO<sub>2</sub>) at the time of the clearing. Deforestation is deemed to have occurred if the forest is not replanted or, if left to regenerate naturally does not achieve the regulated heights and stocking densities.

The balance of the forest was planted on land that was eligible as post-1989 forest land, land that was used for farming as at 31 December 1989. These forest areas have been voluntarily registered to participate in the NZ Emissions Trading Scheme and are subject to the accrual of emissions credits and liabilities under that scheme.

The table below details areas of pre-1990 and post-1989 forest land on each station. *NB: these areas are not yet finalised and may be subject to change as the project of submission and approval by the Ministry for Primary Industries (MPI) is currently ongoing.*

**Table 8: ETS registered areas**

| <b>Forest</b>     | <b>Pre-90 Area (ha)</b> | <b>Post-89 Area (ha)</b> |
|-------------------|-------------------------|--------------------------|
| <b>Kapiro</b>     | 90                      | 113                      |
| <b>Mangatoa</b>   | 68                      | 103                      |
| <b>Puketotara</b> | 20                      | 22                       |

**Other relevant legislation**

Other relevant legislation in relation to the growing and harvesting of the tree crop are:

- Animal Welfare Act 1999.
- Biosecurity Act 1993.
- Climate Change Response Act 2002.
- Conservation Act 1987.
- Crown Forest Assets Act 1989.
- Fencing Act 1978.
- Forests Act 1949.
- Forest and Rural Fires Act 1977.
- Forests Amendment Act 1993.
- Forestry Rights Registration Act 1983.
- Hazardous Substances and New Organisms Act 1996.
- Health in Safety in Employment Act 1992.
- Historic Places Act 1993.
- Injury Prevention, Rehabilitation and Compensation Act 2001.
- New Zealand Forest Accord.
- Noxious Plants Act 1978.
- Pesticides Act 1979.
- Reserves Act 1977.
- Resource Management Act 1991.
- Soil Conservation and River Control Act 1971.
- Trespass Act 1980.

For a comprehensive list of relevant legislation refer to PF Olsen’s EMS. Forest owners can be held liable for breaches of these Acts and may be held responsible for damage to third party property. Appropriate protection should be taken to minimise these risks.

**Environmental Code of Practice for Plantation Forestry**

All operations carried out on the property should be undertaken to the standards specified in the New Zealand Environmental Code of Practice for Plantation Forestry. This document sets out guidelines which ensure safe and efficient forest operations that meet the requirements of sound and practical environmental management.

## FOREST MANAGEMENT

### 7. FOREST ESTATE DESCRIPTION

**Forest area** The net stocked areas have been measured from a map produced by PF Olsen. The estimated net stocked areas of each stand are set out in the following table.

**Table 9: Area statement**

| Forest            | Gross Forested Area (ha) | Net Stocked Area (ha) | Area Awaiting Restocking/ New Afforestation (ha) | Reserves (ha) |
|-------------------|--------------------------|-----------------------|--------------------------------------------------|---------------|
| <b>Kapiro</b>     | 498.6                    | 289.2                 | 22.4                                             | 187           |
| <b>Mangatoa</b>   | 1083.2                   | 717.2                 | 96.3                                             | 269.7         |
| <b>Puketotara</b> | 212.2                    | 50.8                  | 0                                                | 161.4         |
| <b>TOTAL</b>      | <b>1794</b>              | <b>1057.2</b>         | <b>118.7</b>                                     | <b>618.1</b>  |

**Current species** The predominant species planted at Kapiro, Mangatoa and Puketotara forests is radiata pine. There are small areas of *Cupressus lusitanica*, *Eucalyptus*, swamp cypress (*Taxodium distichum*) and native totara (*Podocarpus totara*) planted at Kapiro forest.

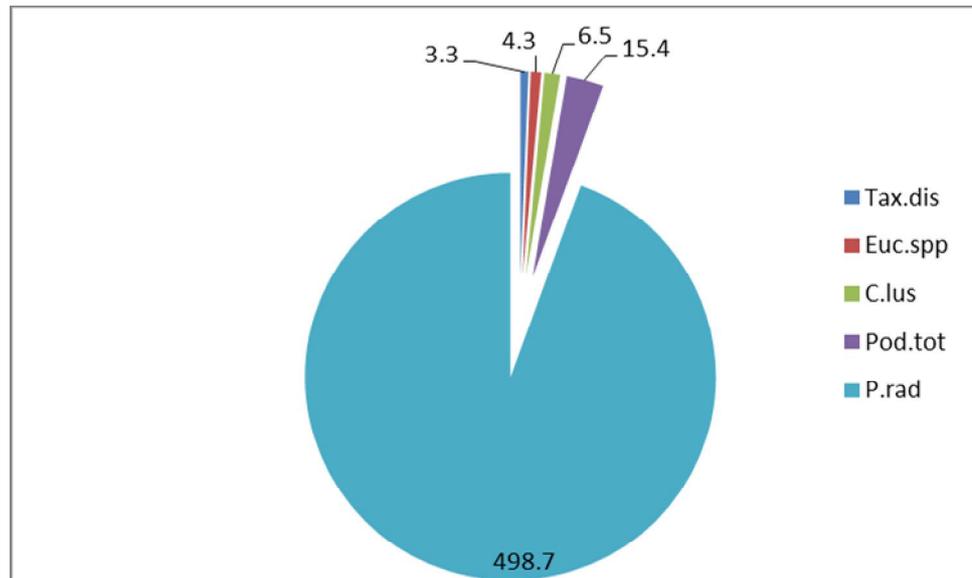
Radiata pine has been selected as it is the most commercially viable species. However, small areas have been planted in a range of species to perform other primary functions such as shelter or riparian protection.

Forests with mixed species help reduce risk, acting as a buffer for market changes and pest and disease threats. Downturn in the markets for radiata pine may be offset somewhat by access to minor species timber resources. The same offsetting in risk could apply if a pest or disease was introduced that caused damage or mortality to radiata pine.

The graph below show the combined species distribution for Kapiro, Mangatoa and Puketotara forests.

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**Figure 2: Species distribution (ha) of Kapiro, Mangatōa and Puketotara forests**

**Treestocks**

For establishment that has occurred since PF Olsen commenced management of these forests, the radiata pine seedlots planted are presented in the table below. Full records of treestocks planted by year and stand are contained within FIPS.

**Table 10: Treestocks planted at Kapiro, Mangatōa and Puketotara forests**

| Seedlot    | Forest Area Planted with Seedlot (ha) |      |      |
|------------|---------------------------------------|------|------|
|            | KPRO                                  | MAGT | PKTA |
| 00/210     | 6.8                                   |      | 19.4 |
| 00/708     | 11.5                                  |      | 4.5  |
| 01/331     | 15.6                                  |      | 1.4  |
| 01/596     | 10.3                                  |      |      |
| 02/307     |                                       | 34.1 |      |
| 04/215     | 21.2                                  | 4    |      |
| 05/208     | 4.6                                   | 11.3 |      |
| 05/780     |                                       | 5.1  |      |
| 07/209     | 61.4                                  | 44.7 |      |
| 08/205     | 30.1                                  | 0    |      |
| 09/206     | 5.1                                   |      |      |
| 10/204     | 24.5                                  | 24.7 | 14.2 |
| 98/819     | 17.9                                  |      |      |
| UNKNOWN4   | 10.5                                  |      |      |
| UNKNOWSCYP | 3.3                                   |      |      |
| UNKNOWTOTR | 1.6                                   |      |      |

**Productivity indices**

The two most common estimators of the productivity of a site for radiata pine are the site index and 300 index.

Site index is a measure of productivity of a site in terms of height growth of radiata pine. The parameter used is the mean height in metres of the largest 100 trees per hectare at age 20 years. Equations exist to predict this height given a measured height at any age.

The 300 index is a measure of productivity of a site based on stem volume growth (mean annual increment) of a defined management regime with a final tree crop stocking at 300 stems per hectare at age 30.

Based on the productivity surfaces produced by Future Forests Research the estimated productivity indices for each forest are illustrated in the table below.

**Table 11: Productivity indices for Kapiro, Mangatoa and Puketotara forests**

| Forest     | Site Index (m) | 300 index (m <sup>3</sup> ) |
|------------|----------------|-----------------------------|
| Kapiro     | 26 to 30       | 23 to 29                    |
| Mangatoa   | 33 to 39       | 30 to 36                    |
| Puketotara | 26 to 30       | 26 to 29                    |

Kapiro and Puketotara have average site productivity compared to other forests in the region, and Mangatoa has above average productivity.

**Current crop status** Measurement data from the most recent inventory is stored in FIPS and summarised in reports to provide the current status of the stands. Due to the large number of stands, data for these forests is not presented in detail. The majority of stands are either currently pruned or planned to be pruned.

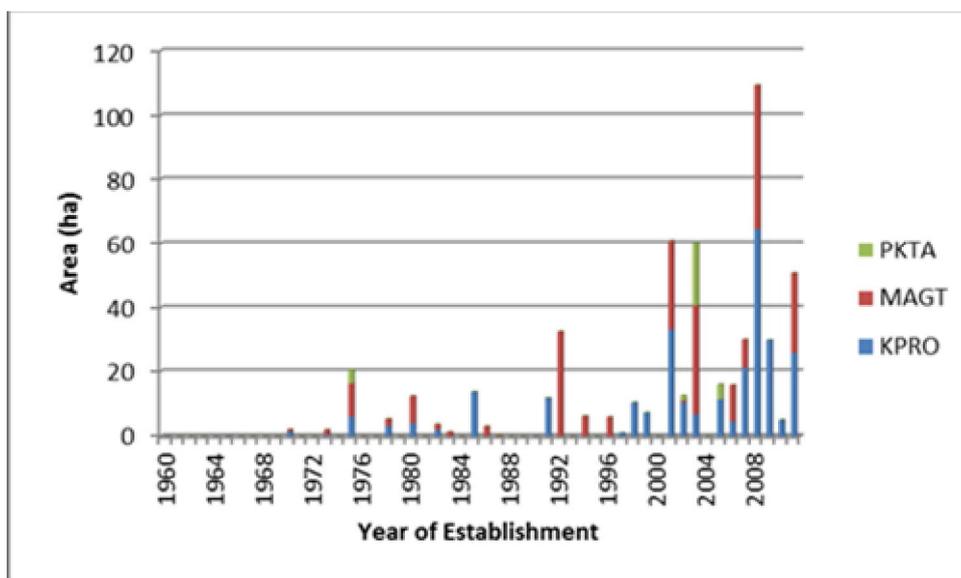
The table below illustrates the area by forest in each National Exotic Forest Description (NEFD) tending regime.

**Table 12: NEFD croptype for Kapiro, Mangatua and Puketotara forests**

| NEFD Regime                                 | Area by Forest (ha) |      |      | Combined Area (ha) |
|---------------------------------------------|---------------------|------|------|--------------------|
|                                             | KPRO                | MAGT | PKTA |                    |
| Pruned without production thinning          | 240.5               | 199  | 28.1 | 467.6              |
| Unpruned without production thinning        | 2.4                 | 28.2 | 1.4  | 32                 |
| Hardwood                                    | 4.3                 |      |      | 4.3                |
| Softwood                                    | 13.6                |      |      | 13.6               |
| Other cypress softwoods eucalypts hardwoods | 15.4                |      |      | 15.4               |

**Age Class Distribution**

The combined age class distribution of Kapiro, Mangatua and Puketotara forests is illustrated in the figure below. There are a number of small older stands that have not been harvested, mostly due to access and poorer quality of these stands. The age class distribution is irregular, but plantings have been increasing overall since 2001.



**Figure 3: Age class distribution of Kapiro, Mangatua and Puketotara forests**

## **8. RESERVE AREAS AND SIGNIFICANT SPECIES**

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### **Introduction**

Indigenous biodiversity management in or associated with exotic forests is an essential component of everyday forest management. Although exotic forests can provide a level of biodiversity, the reserve areas are usually the source of most indigenous biodiversity. Rare and threatened species can also be found associated with exotic forests and require special attention for management.

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### **Protected ecosystems**

Kapiro, Mangatoa and Puketotara forests contain a combined 618.1 hectares of protected ecosystems. The table over page displays the protected ecosystems on Kapiro, Mangatoa and Puketotara forests in order of ranking. The highest ranked legal status is specified. Many blocks are covenanted under a QEII Trust Covenant which involves contractual obligations for protective management between the QEII Trust and the landowner. Many of these protected ecosystems have been protected for the purpose of rare species protection, including the North Island brown kiwi *Apteryx mantelli*. Kapiro Station in particular has areas fenced to provide ‘kiwi corridors’ along the riparian areas which provide a habitat along which kiwi can move freely between the forests adjacent to Kapiro Station.

The protected ecosystems are shown on the forest stands map in Section 9. None are under any sort of management threat from the afforestation that has occurred and may continue within low production pastoral zones.

There has been an extensive programme of fencing completed at Kapiro, Mangatoa and Puketotara forests by Landcorp Farming Ltd in conjunction with the QEII Trust. This provides the single most important action for the remnant indigenous areas as protective action against stock browsing. At the time of writing this management plan QEII have not supplied the shapefile of the areas that have recently been covenanted. These areas will be reviewed and updated at the time of the 5 year review.

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**Table 13: Protected ecosystems of Kapiro, Mangatoa and Puketotara forests**

| GeoUnit      | Area | Protective Status | Protective Function   | Forest Type                           | LENZ %    |           | Ranking | Protection Category |
|--------------|------|-------------------|-----------------------|---------------------------------------|-----------|-----------|---------|---------------------|
|              |      |                   |                       |                                       | Remaining | Protected |         |                     |
| MAGT-SECF-15 | 25.4 | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 8192    | Full                |
| MAGT-SECF-07 | 30.9 | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 4096    | Full                |
| KPRO-SECF-07 | 14.3 | QEII Covenant     | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 77        | 47        | 4096    | Full                |
| MAGT-SECF-11 | 5.3  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 2048    | Limited             |
| MAGT-SECF-17 | 4.3  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 2048    | Limited             |
| MAGT-SECF-05 | 23.3 | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 2048    | Limited             |
| MAGT-SCRB-01 | 18.8 | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 2048    | Limited             |
| MAGT-SECF-09 | 12.6 | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 2048    | Limited             |
| KPRO-SCRB-04 | 20.4 | QEII Covenant     | Rare Species          | Leptospermum/shrub HW/kowhai/podocarp | 77        | 47        | 2048    | Limited             |
| PKTA-SECF-01 | 13.8 | QEII Covenant     | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 2048    | Limited             |
| PKTA-SECF-09 | 19.5 | NZ Forest Accord  | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 2048    | Limited             |
| MAGT-SECF-10 | 10   | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 1024    | Limited             |
| MAGT-SECF-08 | 56.1 | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 1024    | Limited             |
| KPRO-SECF-01 | 25   | QEII Covenant     | Rare Species          | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 1024    | Limited             |
| KPRO-SCRB-03 | 15.3 | QEII Covenant     | Rare Species          | Adventive and exotic weeds & grasses  | 0         | 0         | 1024    | Limited             |
| KPRO-SECF-06 | 15.1 | QEII Covenant     | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 77        | 47        | 1024    | Limited             |
| PKTA-SECF-02 | 22.8 | QEII Covenant     | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 1024    | Limited             |
| PKTA-SECF-03 | 5.2  | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 1024    | Limited             |
| PKTA-SECF-04 | 8    | NZ Forest Accord  | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 1024    | Limited             |
| PKTA-SECF-06 | 37.4 | QEII Covenant     | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 1024    | Limited             |
| MAGT-SECF-13 | 6.1  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 512     | Limited             |
| KPRO-SECF-03 | 13.8 | NZ Forest Accord  | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 512     | Limited             |
| KPRO-SCRB-05 | 2.3  | QEII Covenant     | Terrestrial Ecosystem | Adventive and exotic weeds & grasses  | 77        | 47        | 512     | Limited             |
| MAGT-SECF-14 | 1.3  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 256     | Passive             |
| MAGT-SECF-16 | 8.1  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 256     | Passive             |
| PKTA-SECF-08 | 16.9 | NZ Forest Accord  | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 256     | Passive             |
| PKTA-SCRB-01 | 12.8 | Management Plan   | Non Specific          | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 256     | Passive             |
| MAGT-SECF-12 | 1.5  | Management Plan   | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 128     | Passive             |
| MAGT-SECF-01 | 26.4 | NZ Forest Accord  | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 128     | Passive             |
| KPRO-WETL-01 | 3.3  | Management Plan   | Wetland Ecosystem     | Lake /surface water wetland           | 0         | 0         | 128     | Passive             |
| MAGT-SECF-03 | 24.6 | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 77        | 47        | 64      | Passive             |
| MAGT-SECF-18 | 1.5  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 32      | Passive             |
| MAGT-SECF-19 | 2    | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 32      | Passive             |
| MAGT-SECF-20 | 1.1  | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 16      | Passive             |
| KPRO-SECF-04 | 30.9 | QEII Covenant     | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 77        | 47        | 16      | Passive             |
| KPRO-SCRB-02 | 23.9 | Other             | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 16      | Passive             |
| KPRO-SECF-05 | 1    | QEII Covenant     | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 8       | Passive             |
| KPRO-SCRB-01 | 20.7 | Management Plan   | Riparian Ecosystem    | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 8       | Passive             |
| PKTA-SECF-05 | 4.7  | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 8       | Passive             |
| PKTA-SECF-07 | 15.5 | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 8       | Passive             |
| MAGT-SECF-02 | 3.1  | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 4       | Passive             |
| MAGT-SECF-04 | 2    | NZ Forest Accord  | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 4       | Passive             |
| MAGT-SECF-06 | 5.3  | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 29.5      | 16.3      | 4       | Passive             |
| KPRO-SECF-02 | 1    | QEII Covenant     | Terrestrial Ecosystem | Podocarp/Hardwood                     | 29.5      | 16.3      | 4       | Passive             |
| PKTA-SECF-10 | 4.8  | NZ Forest Accord  | Terrestrial Ecosystem | Leptospermum/shrub HW/kowhai/podocarp | 0         | 0         | 4       | Passive             |

Note: The implications of the Protection categorisations as documented in PF Olsen's Environmental Management System are listed below:

| Protection Category | Primary Management objective                                                                          | Activity level                                                                                                     | Monitoring                                                                                                                      |
|---------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| passive             | Minimise non-essential damage, maintain area, observe regional pest management strategy(RPMS)         | Fire protection<br>3 <sup>rd</sup> party arrangements re pests. Apply RPMS                                         | Area – with adjacent stand assessments.<br>Pests – to meet RPMS.<br>General forest health survey                                |
| limited             | Protect from non-essential damage, maintain area, maintain function (where practical), Observe RPMS   | Fire protection<br>3 <sup>rd</sup> party arrangements re pests. Apply RPMS,<br>Associated maintenance pest control | Sample forest condition monitoring, area monitoring, low level pest monitoring where relevant. Sample related fauna if relevant |
| full                | Protect from all controllable damage, maintain area, maintain function, improve quality, Observe RPMS | Specific management, targeted pest control, 3 <sup>rd</sup> party pest arrangements, fire protection               | Forest condition monitoring, area monitoring, pest monitoring where relevant, related fauna monitoring if relevant.             |
| special             | Restoration if practical                                                                              | Above + Fencing /covenanted                                                                                        | Additional to full requirements as defined in any agreement                                                                     |

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**Rare and  
threatened species**

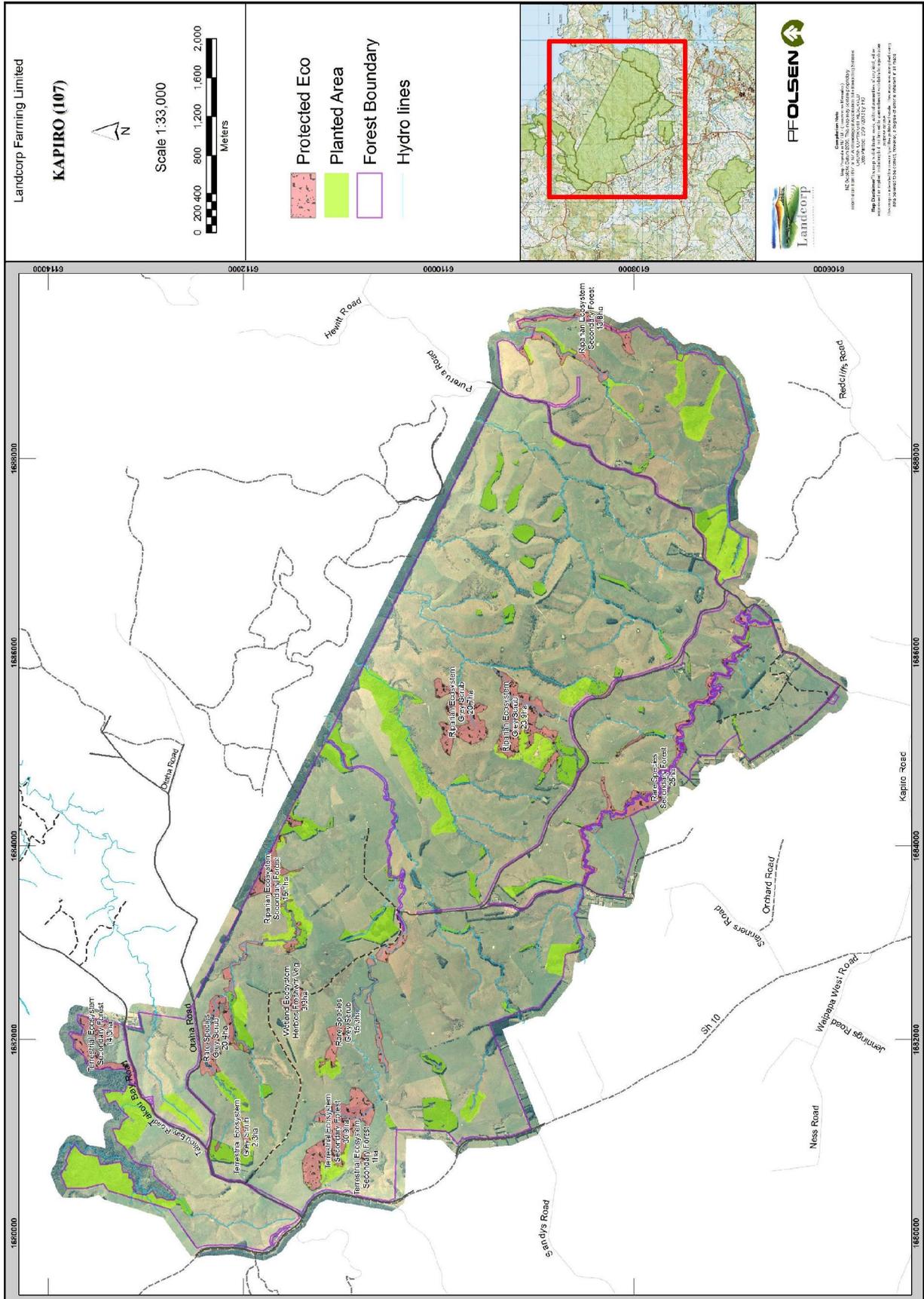
To date, there have been no sightings recorded of rare and threatened species. PF Olsen is aware that kiwi are confirmed present at Kapiro Station, and are likely to be in or adjacent to Puketotara and Mangatua Stations also. Historic reports from Department of Conservation surveys have also indicated that other rare species may be utilising the forests, including the kauri snail, and both long and short tailed bats

Sightings of rare and threatened species are expected to occur and will be recorded and maintained in the FIPS rare species database. Identification and management of rare, threatened and endangered (RTE) species within PF Olsen managed forests is outlined within PF Olsen's Ecological Management Manual. This Manual also refers to agreed industry best practice protocols that can be found on the NZ Forest Owners Association website at <http://rarespecies.nzfoa.org.nz/> .

In particular, prior to harvesting, large reserve blocks or reserve block close to or linked to larger blocks will need to be checked for Kiwi and appropriate protocols followed if found.

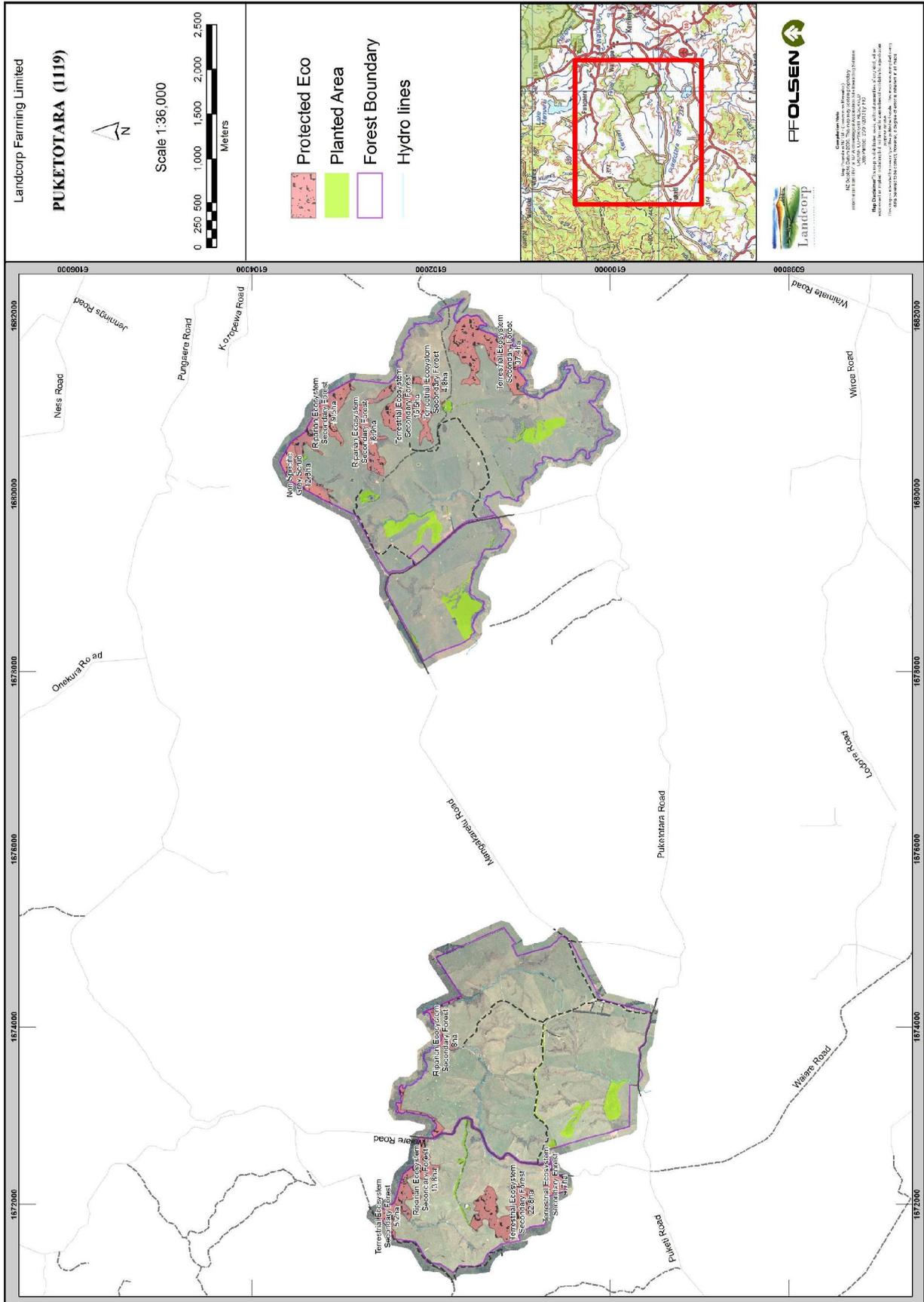
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**9. MAP 3 – KAPIRO FOREST STANDS MAP**





**11. MAP 5 – PUKETOTARA FOREST STANDS MAP**



## **12. NON-TIMBER FOREST PRODUCTS AND OTHER SPECIAL VALUES**

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### **Introduction**

Forest plantations may also provide for non-timber forest products that enhance the economic well being of the owner or legitimate forest users. Non-timber products are an important means of maximising the production capacity of the forest whilst maintaining environmental and social values. The forest management plan provides procedures for developing and managing these resources.

Forests can also provide many other special values, which are also provided for and managed through the forest management plan.

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### **Non-timber forest products**

The following non-timber products are currently being produced or developed in Kapiro, Mangatoa and Puketotara forests, however they are not produced as FSC labelled:

- Commercial possum trappers are employed by the Regional Council. Fur is extracted as a by-product of the pest control.
  - Beehives are situated on each station near the forest edge.
- 

### **Other special values**

The following special values have also been identified in Kapiro, Mangatoa and Puketotara forests:

- Kapiro has been recognised as a ‘kiwi corridor’ by QEII. Large areas of riparian zone throughout the station have been fenced to exclude stock and create a corridor for movement of kiwi between forested areas adjacent to the farmland. In way of further contribution to this special value, Landcorp Farming Ltd contributes c\$5,000 per year to Northland Regional Council for pest control.
  - Puketotara has allowed free public access over the farm as part of Te Araroa- the Cape Reinga to Bluff walkway. Te Araroa, meaning the long pathway, is a continuous 3,000 km walking track that connects settlements, townships and cities. The track corridor showcases a wide variety of New Zealand’s natural, cultural, and historic values.
-

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**Recreational  
usage**

Kapiro, Mangatoa and Puketotara forests receive some recreational demand from the wider public.

- Twice yearly each station is opened to the local hunting club for events.
- Horse trekkers use each of the stations regularly by approval of the farm manager.
- Each year there are pheasants released (500 birds in 2008, 300 birds in 2009) in each forest for hunting. Permits are issued to Fish and Game for redistribution.
- Staff have permission to hunt pigs. Friends of staff can request permission to hunt from the farm manager. On Mangatoa there is an issue with controlling hunting from the general public at the back of the station.
- There are occasionally requests for planned off-road motorbike rides.

In addition to the use of the Te Araroa walkway on Puketotara, the forests will all continue to be open for legitimate recreational use subject to entry by permit. This data will be collated for FSC reporting purposes.

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## **13. ENVIRONMENTAL POLICY AND PRACTICES**

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### **Introduction**

Environmental policy and practices are an integral part of every operation that takes place on the forest. Regular monitoring of key environmental parameters will be undertaken where necessary to ensure that the impact on the forest environment from events such as wind storms, flooding and fire, and of agents such as pests, diseases and weeds are minimised.

The management of the forest recognises the importance of the natural and social environment for the future of its business. The people employed in the forest and processing plants, the neighbouring land owners, the appropriate iwi and the community at large are all recognised as stakeholders.

All activities within Kapiro, Mangatoa and Puketotara forests are subject to management within a framework set by PF Olsen’s environmental policies and Environmental Management System (EMS).

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### **Policy**

#### **PF Olsen Limited Environmental Policy**

*PF Olsen Ltd is committed to:*

- *Sustainable forest and land management;*
- *Promoting high environmental performance standards that recognise the input from the community in which we operate;*
- *Where appropriate applying the Principles and Criteria of the Forest Stewardship Council across forest management.*

Substantial additional detailed policies are contained within PF Olsen’s EMS.

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### **Environmental management goals**

The EMS implemented by PF Olsen has the following objectives:

1. Achieve a greater understanding and ownership of environmental responsibilities and performance by all PF Olsen personnel and contractors;
2. Complete compliance with environmental legislative requirements and non-legislative environmental commitments of the company;

*Continued on next page...*

*...continued*

3. Establishment and maintenance of sound working relationships with each of the regional and district councils that operate rules and performance standards that are applicable to our operations;
4. Establishment and maintenance of sound working relationships with appropriate contractors, Iwi, neighbours, recreation users, community groups, infrastructure authorities (e.g. Transit New Zealand and Transpower) and other stakeholders on which our activities may have effects;
5. Increase awareness of environmental effects of operations among staff and contractors;
6. Use energy effectively and efficiently, and reduce waste and pollution;
7. Promote and undertake sound environmental stewardship of land and other natural resources on or adjacent to this land.

To achieve the objectives listed above, PF Olsen set specific environmental targets against which progress is being measured. These environmental targets are reviewed on an annual basis.

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**The EMS  
framework**

The EMS is a core document defining the policies, processes and procedures that govern the physical implementation of forest management activities. The EMS applies a systematic approach certified to ISO 14001 standards to ensure that prevention of adverse and harmful impacts is effective.

Key elements comprising the EMS are:

- Defined I.T. mounted processes and procedures including flow charts, guiding users through all the steps from planning to implementation of operational activities.
- An operational implementation framework that follows the well recognised management process of planning, doing, monitoring and adjustment.
- Linkages to forms and I.T. based databases to capture information required to monitor environmental aspects.
- Hyperlinks to key internal and external resources required to assist managers to achieve required outcomes in a legally compliant and environmentally sound way.
- Comprehensive I.T based systems for management of environmental incidents, operational monitoring, regulatory compliance, training, corrective actions / quality management and management of protected ecosystems.
- Procedures for managing emergency situations.

*Continued on next page...*

*...continued*

- Procedures and resources for managing and minimising the use of chemicals including compliance with FSC policies related to hazardous chemicals.
- Periodic internal and external auditing. Audits are an integral part of the EMS. The purpose of these audits is:
  - To check compliance with agreed procedures; and
  - Discuss ways to improve the EMS to better achieve its targets and objectives.

An Environmental Management Group (EMG) assists the Environmental Manager, who is responsible for ensuring that the EMS is maintained and implemented to ISO 14001 standards.

Internal audits to ensure compliance with the EMS and to improve the procedures of the EMS are undertaken at least once every two years.

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**Assessment of environmental risks**

Several areas of typical forest management have been identified as posing a possible environmental risk within Kapiro, Mangatoa and Puketotara forests. The Environmental assessment matrix below summarises the identified risks for Kapiro, Mangatoa and Puketotara forests. The level of risk has been evaluated in the matrix as high ‘H’, medium ‘M’, low ‘L’, or not applicable ‘NA’.

Prior to operations such as clearfelling, land preparation and production thinning, an assessment is undertaken to quantify the risks involved in carrying out the particular operation, and steps are implemented to manage the risks. The process for making the assessment is detailed in the EMS and associated manuals.

**Table 14: Assessment of environmental risks**

| <b>Forestry Operational Activities</b> | <b>ENVIRONMENTAL VALUES/ISSUES</b>    |                      |                                        |                    |                     |                        |                          |                                         |                                      |                                            |                         |                          |
|----------------------------------------|---------------------------------------|----------------------|----------------------------------------|--------------------|---------------------|------------------------|--------------------------|-----------------------------------------|--------------------------------------|--------------------------------------------|-------------------------|--------------------------|
|                                        | <b>Erosion &amp; Sediment Control</b> | <b>Water Quality</b> | <b>Soil Conservation &amp; Quality</b> | <b>Air Quality</b> | <b>Aquatic Life</b> | <b>Native Wildlife</b> | <b>Native Vegetation</b> | <b>Historical &amp; Cultural Values</b> | <b>Landscape &amp; Visual Values</b> | <b>Neighbours &amp; other forest users</b> | <b>Public Utilities</b> | <b>Recreation Values</b> |
| <b>Harvesting</b>                      | H                                     | L                    | H                                      |                    | L                   | H                      | L                        | M                                       | L                                    | L                                          | L                       | L                        |
| <b>Earthworks</b>                      | H                                     | H                    | H                                      |                    | M                   | M                      | L                        | H                                       | L                                    | L                                          | L                       | L                        |
| <b>Slash Management</b>                | H*                                    | H*                   | H                                      |                    | L                   | L                      | L                        |                                         | L                                    | L                                          | L                       | L                        |
| <b>Stream Crossings</b>                | M                                     | M                    | M                                      |                    |                     |                        |                          |                                         |                                      |                                            |                         |                          |
| <b>Mechanical Land Preparation</b>     | NA                                    | NA                   | NA                                     | NA                 | NA                  | H                      | NA                       | NA                                      | NA                                   | NA                                         | NA                      | NA                       |
| <b>Burning</b>                         | L                                     | L                    | L                                      | H                  | L                   | H                      | L                        |                                         | H                                    | H                                          | L                       | H                        |
| <b>Planting</b>                        |                                       |                      |                                        |                    |                     |                        | L                        | L                                       | L                                    | L                                          | L                       |                          |
| <b>Tending</b>                         |                                       |                      |                                        |                    |                     |                        |                          |                                         |                                      | L                                          | L                       |                          |
| <b>Fertiliser Application</b>          |                                       | H                    |                                        | L                  | H                   |                        |                          |                                         |                                      | L                                          | L                       | L                        |
| <b>Agrichemical Use</b>                |                                       | H                    | L                                      | L                  | H                   | L                      | H                        |                                         | L                                    | H                                          | H                       | H                        |
| <b>Oil &amp; Fuel Management</b>       |                                       | H                    | L                                      |                    | H                   |                        | L                        |                                         |                                      | H                                          | L                       |                          |
| <b>Waste Management</b>                |                                       | L                    |                                        |                    | L                   |                        |                          |                                         | L                                    | L                                          |                         |                          |
| <b>Forest Protection</b>               |                                       | L                    |                                        |                    | L                   | L                      | L                        |                                         |                                      | L                                          |                         | L                        |

\*Steep areas only

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**Hazardous substances management**

Hazardous substances are any substances which may cause adverse environmental impacts and/or injury or health problems if incorrectly handled or used.

The hazardous materials which may be used on Kapiro, Mangatua and Puketotara forests are:

- Pesticides
- Fuels
- Oils
- Fire retardants
- Surfactants

Transportation, storage and labelling of these hazardous materials must all comply with the provisions of the Health and Safety Manual, which is maintained under ISO 9001 certification. The Health and Safety Manual makes reference to the Hazardous Substances and New Organisms Act 1996 (HSNO).

Furthermore, the forest manager is committed to reducing the use of hazardous substances as much as possible. This involves use of alternative methods for the control of weeds, pests and diseases where these are effective and efficient. The use of fuels and oils is minimised where possible. Fire retardants are only used when required and surfactants are only used to make more efficient use of specific herbicides.

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## **14. COMMERCIAL CROP ESTABLISHMENT AND SILVICULTURAL OPERATIONS**

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### **Introduction**

The choice of species is the most important issue in plantation forestry. The species has to be suitable for the site and meet the objectives of Landcorp Farming Ltd. Also important is to ensure that the planting material is of good quality.

Forest operations are implemented to ensure a good quality crop and maximum growth. These operations include land preparation, establishment, weed control, pest and disease control, fire protection, pruning and thinning.

General property maintenance is also an important factor in forest management and can include maintenance of roads and tracks and other assets such as buildings, fences and water systems.

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### **Crop species**

Radiata pine, when intensively managed, will produce a range of different log types suitable for various processing options. The pruned butt log can be used to make knot-free veneer or decorative timber. The unpruned logs can be used for structural timber, for veneer or as feedstock for fingerjointing. The small logs and those with defects and excessive knots can be used for pulp and paper, MDF and other reconstituted wood products such as tri-board and particle board.

Radiata pine is the most common species processed in New Zealand and export markets are well developed for both finished products and logs.

In New Zealand radiata pine is also the main focus in terms of research and development. Past research and development has resulted in improvements in growth, form and wood characteristics as well as development of a range of finished products, building codes and timber standards.

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### **Other species**

There is some area of alternative species at Kapiro, Mangatoa and Puketotara forests. Recent plantings have been predominantly radiata pine. Alternative species will continue to be considered for future establishment, especially for small areas where other management objectives predominate.

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**Establishment** There is 694.9 hectares of land identified as available to plant of Kapiro, Mangatoa and Puketotara Stations. The majority of this is at Mangatoa with 629.3 hectares of marginal hill country that has been identified as potentially more profitable in forestry when annual carbon sequestration is considered.

The actual post-1989 forest land eligible planting completed depends on nationwide budget constraints and whether establishment on these stations is considered a priority relative to other properties.

All pre-1990 forest land will be re-established following harvesting. The pre-1990 forest land re-establishment over the five years of this management plan is estimated to be 34 hectares in total.

**Pre-establishment forest flora and fauna** Prior to re-establishment of the tree crop, and afforestation of new areas, a review will be conducted to identify whether there are any rare, threatened or endangered species of flora or fauna within the area to be planted.

**Tending** The tending regime executed to date at Kapiro, Mangatoa and Puketotara forests for radiata pine stands is a clearwood regime consisting of 2 pruning lifts and one thinning to waste.

**Tree nutrition** The soils in Kapiro, Mangatoa and Puketotara forests are not likely to be deficient in nutrients for healthy tree growth. However, there are soils within New Zealand that are deficient in one or more nutrients. The most common nutrient deficiencies are likely to be:

- **Phosphate** – Upper North Island, Marlborough and West Coast have marginal available phosphate concentrations. This is often associated with clay soils.
- **Boron** – Boron deficient trees can suffer dieback from the terminal buds and this symptom is closely associated with moisture stress and drought. Trees growing on the drier East Coast of both islands and on the pumice soils of the Central North Island are prone to boron deficiency.

Foliar samples will be taken if nutrient deficiency symptoms are seen or expected. Fertiliser will only be applied if the health and the growth of the trees are significantly affected.

## 15. FOREST INVENTORY, MAPPING AND FOREST RECORDS

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Forest growth and development is monitored through regular forest inventory. Forest inventories providing stand information are required at different times and for different reasons throughout the life of the rotation. PF Olsen have developed procedures for each of the following four types of inventory to be applied on Kapiro, Mangatoa and Puketotara forests:

- pre-assessment;
  - quality control;
  - mid crop; and
  - pre-harvest inventory.
- 

### **Pre-assessment**

Pre-assessment is the collection of stand parameters prior to a tending operation. It allows for:

- The calculation of contract rate for tending.
- A final check on the validity of the regime and timing of commencement of operations i.e. DOS targets can be achieved or crop height is sufficient for pruning lift scheduled.

Sampling intensity is low but pre-assessment does provide good quality information on the work content involved in each tending operation and sets a base price for negotiation.

Pre assessment was completed at Kapiro, Mangatoa and Puketotara forests prior to tending operations commencing.

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**Quality control**

Quality control is carried out during and after a tending operation. The aims of the quality control system PF Olsen have established are to:

- Collect sufficient data to monitor a contractor's performance and correct this if necessary, with minimum delay.
- Collect sufficient quantitative data to provide reliable estimates of the crop state.
- Provide data as input for growth modelling.
- Provide data for estimating timing of the next tending operation.

Sampling intensity is a minimum of 8 full sample plots per stand or one plot per 2 hectares with every fourth plot being a full measurement plot. This provides the data for the current crop status and future growth modelling.

PF Olsen's 'Tending Manual' details the procedures to follow for pre-assessment and quality control plotting.

Quality control was completed at Kapiro, Mangatoa and Puketotara forests at the completion of each tending operation.

**Mid-crop inventory**

The principal aim for the mid-crop inventory is to collect stand data for inputs for growth modelling. Under current tending regimes, mid-crop inventory is scheduled for between 11 and 15 years of age.

Sampling intensity is targeted to achieve 10% confidence limits on basal area on a stand by stand basis. Smaller stands may be aggregated into crop types to achieve this.

**Pre-harvest inventory**

The principal aim for the pre-harvest inventory is to obtain estimates of recoverable volume by log grade. This information can then be used to develop marketing and harvesting strategies. Pre-harvest inventories will be undertaken when stands reach five years or less from harvesting.

Sampling intensity is targeted to achieve 10% confidence limits on basal area on a stand by stand basis. Smaller stands may be aggregated into crop types to achieve this as in mid-crop inventory.

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**Mapping**

Digital mapping of Kapiro, Mangatoa and Puketotara forests currently exists, but will require updating from time to time as the forest changes.

The work involves:

- mapping 10m contours from existing photography;
- mapping forest detail from existing aerial photography; and
- defining legal boundaries.

All the data is supplied in a digital format.

The digital data is retained, processed and managed on PF Olsen’s GIS (Geographic Information System).

Pruning and thinning contractors are commonly paid on an area basis and accurate mapping prevents overpayment and avoids disputes regarding the area actually completed.

Accurate mapping also assists with budgeting, planning and calculation of future revenue/tree crop value, infrastructure and harvesting and also meeting climate change emissions obligations.

After harvesting, the contours and any relevant forest detail are available for planning and management of the second rotation.

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**Mapping updates**

Stands are remapped from new aerial photography around age four (when the trees are visible on aerial photography) to accurately determine boundaries and areas and around two years prior to harvesting to assist with harvest planning.

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**Forest records**

Forest records are essential in monitoring the forest operations by providing an historic perspective to the physical condition of each stand. Forest records should provide the following information:

- An historic record of forest operations for each stand including a summary of quality control data indicating the results and quality of the operation;
- A forest map showing the location, stand boundaries and net stocked area of each stand;
- Crop inventory results;
- Yields achieved from each stand at production thinning or clearfell;
- Costs incurred for each operation.

Kapiro, Mangatoa and Puketotara forest records are maintained on a computerised Land Information database. This customised database is part of PF Olsen's FIPS system (Forest Information and Planning System). Computer record systems allow for fast retrieval of information, production of reports and statistics.

Forest records assist with planning and control of forest operations and provide a means of measuring the performance of a Forest Manager. In a management audit forest records can be verified against the status of the tree crop and unit costs derived for each operation.

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## 16. HARVESTING STRATEGY AND OPERATIONS

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### **Harvesting strategy**

The harvesting strategy employed at Kapiro, Mangatoa and Puketotara forests is to harvest the forest as close as possible to their optimum economic age as practical. This is the age at which the growth in volume and improvement in quality is offset by the cost to maintain the forest for another year.

As stands are dispersed amongst a farming environment, consideration must be given to the farming operation, and how the harvesting may affect this. Examples include the removal of fences for stand access and the effect on grazing area, or the impact of logging trucks using farm access tracks and paddocks in wet weather.

The planned harvesting over the next five years at Kapiro, Mangatoa and Puketotara forests is outlined in the table below. The stands scheduled for harvesting are small and fragmented, and the harvest operations must be carefully managed in conjunction with the farming operations.

**Table 15: Planned harvest schedule**

| <b>Forest</b> | <b>Year of Harvest</b> | <b>Number of Stands</b> | <b>Estimated Area (ha)</b> |
|---------------|------------------------|-------------------------|----------------------------|
| KPRO          | 2014-15                | 15                      | 8.2                        |
| MAGT          | 2012-14                | 31                      | 21.1                       |
| PKTA          | 2015-16                | 11                      | 4.8                        |

Forward planning is essential when considering harvesting activities. Planning should commence two years before harvesting to enable roading infrastructure to be developed and any resource consents, archaeological surveys, kiwi management planning etc. to be undertaken. This reduces the chance of hold-ups to the commencement of harvesting, which can be costly when log prices are fluctuating.

The harvest planning process is comprehensively outlined in the PF Olsen EMS and associated manuals.

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**Getting harvest ready**

Before harvesting commences a harvest plan is prepared. This plan will describe the harvesting method to be used based on the following considerations:

1. **Terrain** - what method can be used that is safe for the operators;
2. **Soil and Water** – the impact on soil and water will be minimised and/or mitigated;
3. **Safety** – to ensure forest operations are carried out safely and comply with all legal requirements;
4. **Wildlife Habitat and Ecosystems** – these will be maintained where possible or the impact on such habitats will be minimised and/or mitigated;
5. **Other Forest Values** – to ensure that other forest values such as recreation and non-timber products are recognised and where practical protected;
6. **Offsite Impacts** – to identify and minimise the adverse impacts of forest operations on people and the environment; and
7. **Financial** – to ensure forest operations are carried out in an efficient and effective manner and consider both short and long term implications.

Harvesting operations will be undertaken by contractors and supervised by the forest manager.

## 17. PROPERTY MANAGEMENT AND PROTECTION

### Statutory pest obligations

Pest management within Kapiro, Mangatoa and Puketotara forests is subject to statutory obligations under the Regional Pest Management Strategies issued by the Northland Regional Council.

The Northland Regional Pest Management Strategies 2010-2015 has been operative from 20 July 2010.

The strategies apply to both pest plants and animals and categorises them in terms of management objectives. The categories and landowner obligations in regards to pests relevant to Kapiro, Mangatoa and Puketotara are summarised below. A full list of Northland Regional Council plant and animal pest species can be found in appendix 5 and 6.

**Table 16: Pest Management Strategies\***

| <b>Northland Regional Council- Pest Management Strategies (July 2010)</b> |                                                                                        |                                                                                                |                                                                                  |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Pest Category</b>                                                      | <b>Plant Pest Objectives</b>                                                           | <b>Responsibilities*</b>                                                                       |                                                                                  |
|                                                                           |                                                                                        | <b>Regional authority</b>                                                                      | <b>Landowner</b>                                                                 |
| <b>Exclusion</b>                                                          | Prevent establishment in region.                                                       | Surveillance and research.                                                                     | Notify council of potential new pests.                                           |
| <b>Eradication</b>                                                        | Remove all individuals where population numbers are small, or distribution is limited. | <b>Plant:</b> Old Man's Beard and Climbing Spindle Berry<br><b>Animal:</b> Feral deer (DOC)    | Notify council of any new infestation.                                           |
| <b>Containment</b>                                                        | Prevent spread of species beyond a defined containment area.                           | <b>Animal:</b> Kauri dieback (Phytopthera)**                                                   | <b>Plant:</b> Nodding Thistle (total control- remove all incidence on property). |
| <b>Suppression</b>                                                        | Widespread pests- reduce densities to a level of reduced impact.                       | <b>Animal:</b> Site led programs for feral cats, goats, possums, mustelids, rabbits and hares. | <b>Plant:</b> Gorse, wild ginger and pampas (20m boundary control).              |

\*Refers to the two Northland Regional Council Pest Management Strategies lists- Plant and Animal.

\*\* Note Phytopthera is a fungus but classified as animal in strategy due to the current understandings about animals as the mode of spread.

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**Integrated Pest Management Manual**

PF Olsen’s Integrated Pest Management (IPM) Manual supports forest managers in applying best management in pest control. The Manual complements statutory pest control obligations by identifying other pest species that may not otherwise have been assessed, as well as providing the framework for choosing the best method of control.

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**Pest control**

The main animal pest in Kapiro, Mangatoa and Puketotara forests is the introduced possum, which can attack the growing tips of both plantation and native trees, causing stem malformation and die back. Possums are also a threat to the Landcorp Station farming operations and to neighbouring property owners who are farmers as they can carry and spread tuberculosis to domestic stock.

Other pests include rabbits and hares at the time of establishment and wild goats during the first half of the crop rotation when bark is soft and palatable. Goats are present at Mangatoa Station.

Wild pigs are a major problem and it is difficult for farm management to maintain control over numbers due to encroachment from adjacent properties. Farm staff and the pig hunting club use recreational hunting as a method to keep numbers down.

Animal pests in Kapiro, Mangatoa and Puketotara forests will be controlled using ground control methods as required, which prevent impacts on non-target species. The forest manager will coordinate operations with organisations such as the Regional Council and the Department of Conservation to achieve effective and efficient control with in the forest area and on neighbouring land, where required.

Current pest control activities at Kapiro, Mangatoa and Puketotara forests include:

- Commercial possum trappers;
  - Bait stations in high value areas, including young crop trees and the ‘kiwi corridors’;
  - Trapping for feral cats by farm manager prior to pheasant release.
-

**Disease control**

Diseases, which can affect the forest trees and adjacent native vegetation, are monitored throughout the year by staff, and once a year by a professional independent forest health assessor. Most diseases cause little damage and do not require control. The exception is *Dothistroma*, a fungus which attacks pine needles. This fungus is controlled using a copper-based fungicide, but only when the infection reaches a critical level.

*Dothistroma* infection can sometimes be controlled though silviculture by timely thinning and pruning operations, which increases air movement and lowers humidity levels within the stands.

**Protected ecosystems, reserves and species**

At present the indigenous vegetation remnants in the estate are fragmented and modified from past farming and logging. Some of the areas are linked to adjacent Department of Conservation ecological areas, allowing native species to move across the boundary into the Landcorp forests. So although in their own right they are not outstanding examples of indigenous ecosystems in most cases, they are important at a landscape level as refugia for species and corridors for dispersal.

A recent programme of stock fencing and covenanting has been completed on all stations. Pest control and a degree of simple forest monitoring are the main focus of management, including monitoring any future weed incursions. An increase in native regenerating scrub and vegetation should be evident during monitoring as a result of the stock exclusion fencing.

The presence of kiwi within at least one of the forests means that extra precautions must be taken when undertaking forest operations. The PF Olsen Conservation and Ecology Manual outlines the process for managing kiwi in plantation forests, which adopts the guidelines contained in two key documents:

1. The New Zealand Forest Owner’s Association (NZFOA) has developed the ‘industry best practice’ guidelines for rare/threatened/endangered species management in plantation forests.
2. The “Forestry Management Guidelines for North Island Brown Kiwi in Exotic Plantation Forests” produced by the BNZ Save the Kiwi Trust, the Department of Conservation and Environment Bay of Plenty.

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**Fire prevention and control**

With the weather patterns normally experienced in New Zealand during the period late spring/summer, fire can be a real threat to the forest. This can be minimised by:

1. Having an effective fire plan;
2. Active prevention measures which include: restrictions on allowable access, fire prevention signage, publicity when fire danger is high, access to adequate water sources, and selective forest grazing to reduce fuel within stands;
3. Effective detection systems which include: good communication systems, mapping, and fire plan alert procedures;
4. A close link with the relevant fire authorities, and an understanding of equipment and trained manpower requirements;
5. Good forest management that recognises the influence of terrain, roading network and accessibility, and fuel build-up from silvicultural practice, that will influence fire prevention and control measures.

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**Forest management requirements**

The following forest management practices may be employed to assist fire prevention measures:

1. Develop suitable internal access systems, predominantly tracking, but road construction at a later stage;
  2. Maintain existing firebreaks and develop others as the need arises;
  3. Time silvicultural operations to minimise the potential of fuel build-up and for better control of work activity;
  4. Have forest areas grazed where fuel build-up can be reduced;
  5. Endeavour to control access, and limit only to legitimate land users. Promote public awareness through appropriate signage; and
  6. Develop a 'fire plan' that encompasses prevention, detection and control procedures.
-

**Fire authority responsibilities**

The legal responsibility for fighting forest fires lies with the respective territorial land authorities where the forest is situated. In the case of Kapiro, Mangatōa and Puketotara forests the Rural Fire Authority (RFA) is the Northland Regional Council.

In the event of a fire that starts within the forest, the RFA is responsible for attending and providing the resources to extinguish the fire. Where a fire starts outside the forested area and moves into the forest, the RFA has recourse to the Rural Fire Fighting Fund to compensate for fire fighting costs.

There is a close liaison with the RFA in terms of developing the ‘fire plan’ and the maintenance of good communication relative to potential risks and fire danger ratings.

**Fire insurance**

With regard to the location of the forest and the high public activity around the fringes, there will always be the potential for fire. If a fire originates within the forest, the owners may be liable for suppression costs. A major fire may cost many thousands of dollars to extinguish, with the main costs being the use of heavy machinery, helicopters, and manpower.

There is no fire insurance held by Landcorp Farming Ltd as they have a policy of self insurance.

**Public liability insurance**

It is recommended that Landcorp Farming Ltd maintain public liability insurance cover with a fire fighting extension, to indemnify against third party claims associated with forestry activities within the forest area and fire fighting costs on adjoining land tenure. In the case of fire spreading from the forest onto adjoining land, Landcorp Farming Ltd would be liable for the fire fighting costs on and any damage to the adjoining property.

Landcorp Farming Ltd holds general indemnity to the limit of \$            for any one occurrence and a fire fighting extension of \$            for any one occurrence.

## 18. MONITORING

### Introduction

To ensure that the management objectives identified in this plan are being achieved, various monitoring exercises outside normal operations management have been developed. Monitoring results are summarised and reported to Landcorp Farming Ltd as and when required and are also, where appropriate, made publicly available through the PF Olsen website.

### Values monitored

Management inspections occur regularly during operations and periodically between times to monitor all aspects of the forest growth, health and conditions. The findings of the inspections are detailed and, where appropriate, summarised on the PF Olsen FSC website. The full monitoring framework implemented and applicable to Kapiro, Mangatua and Puketotara forests is tabulated below. More detailed comments follow.

| <b>Environmental Process Monitoring Framework</b> |                     |                                                                                            |                                                   |                              |                                      |
|---------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------|--------------------------------------|
| <b>Monitored Element</b>                          | <b>Include</b><br>√ | <b>Components</b>                                                                          | <b>Data Source</b>                                | <b>Data medium</b>           | <b>Reporting / Website frequency</b> |
| Chemical usage                                    | √                   | Active ingredient usage/<br>Area overuse.                                                  | operations supervisors                            | FIPS<br><a href="#">Form</a> | On demand / annual                   |
| Consultation Activity                             | √                   | Complaints.                                                                                | operations supervisors & planners                 | <a href="#">Form</a>         | Annual / annual                      |
| Environmental Incidents                           | √                   | Incident number / categories.                                                              | operations supervisors                            | FIPS<br><a href="#">Form</a> | On demand / annual                   |
| Flora & Fauna                                     | √                   | Species & Status frequencies/ new finds.                                                   | operations supervisors, farm staff, public, crews | FIPS<br><a href="#">Form</a> | Annual / annual                      |
| Forest estate Structure                           | √                   | Area (plantation & Protected ecosystem)/ age-class/ species/forest type/protection status. | management plans/stand records                    | FIPS stand records           | On demand / annual                   |
| Forest growth                                     | √                   | Periodic inventory.                                                                        | contractors                                       | Age class dependant          | Periodic-annual – not on web         |
| Forest Health                                     | √                   | Disease & health.                                                                          | National Forest surveillance program <sup>1</sup> | document                     | Periodic-annual – not on web         |

*Continued on next page...*

<sup>1</sup> Forest health inspections are undertaken annually by SPS Biosecurity through the NZ Forest Owners Association forest health scheme.

...continued

|                               |            |                                               |                                  |                                       |                                    |
|-------------------------------|------------|-----------------------------------------------|----------------------------------|---------------------------------------|------------------------------------|
| FSC Membership                | √          | Block/ location/name.                         | FIPS register                    | FIPS client database                  | On demand / annual                 |
| Health and safety statistics  | √          | LTI / accidents & incidents.                  | operations supervisors           | FIPS                                  | Monthly/ annual                    |
| Internal Audit CAR activity   | √          | Frequency * category.                         | Auditors/ees                     | FIPS <a href="#">Form</a>             | Annual / annual                    |
| Log Production                | On harvest | Total log volumes/ FSC markets.               | log docketts                     | Woodtrack                             | On demand / annual                 |
| Operational monitoring        | √          | Audit trends/cause analysis.                  | operations supervisors           | FIPS <a href="#">Form</a>             | Monthly / annual                   |
| Pests                         | √          | Residual trap catch / kill returns or other.  | supervisors /contractors         | FIPS – Kill returns and Council stats | Annual where relevant              |
| Protected Ecosystem Condition | √          | Condition trends.                             | Photo points                     | To be established                     | Bi-annual if restoration initiated |
| Recreational & non-timber     | √          | Permits issued.                               | branch offices / forest security | FIPS <a href="#">Form</a>             | Annual / annual                    |
| Resource consents             | NA         | Number/compliance.                            | operations planners              | FIPS                                  | 6 monthly / annual                 |
| Stream Monitoring             | √          | Clarity +/- other specific during harvesting. | supervisors /contractors         | Spreadsheet                           | Monthly / annual where relevant    |
| Environmental Training        | √          | Courses, numbers, names.                      | Staff                            | FIPS <a href="#">Form</a>             | Annual/as relevant                 |

**Financial**

Budget versus expenditure is monitored through the PF Olsen FIPS system and presented to Landcorp Farming Ltd when requested. This information is not made public.

**Social**

Consultation with stakeholders has been undertaken and constant feedback from these stakeholders (and others as they become apparent) is monitored. This includes actions undertaken to resolves disputes and issues.

## **19. FUTURE PLANNING**

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### **Introduction**

This plan pertains to the management of Kapiro, Mangatoa and Puketotara forests and will be adhered to for the next 5 years. Any deviation from this plan will be justified only on the basis that the changes do not adversely affect the environment. Any changes, which are contrary to the policies contained in this management plan, require a full review of this plan.

The next review date for this plan is March 2018.

The forest management plan is used for both medium and long term planning.

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### **Operation plans**

For the short term PF Olsen uses Operation Plans. These plans are prepared annually in accordance with this Management Plan. This annual operation plan and associated budget are subject to approval by Landcorp Farming Ltd at the beginning of each financial year.

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**Appendix 1: Legal Description of Landcorp Farming Ltd Northland Stations**

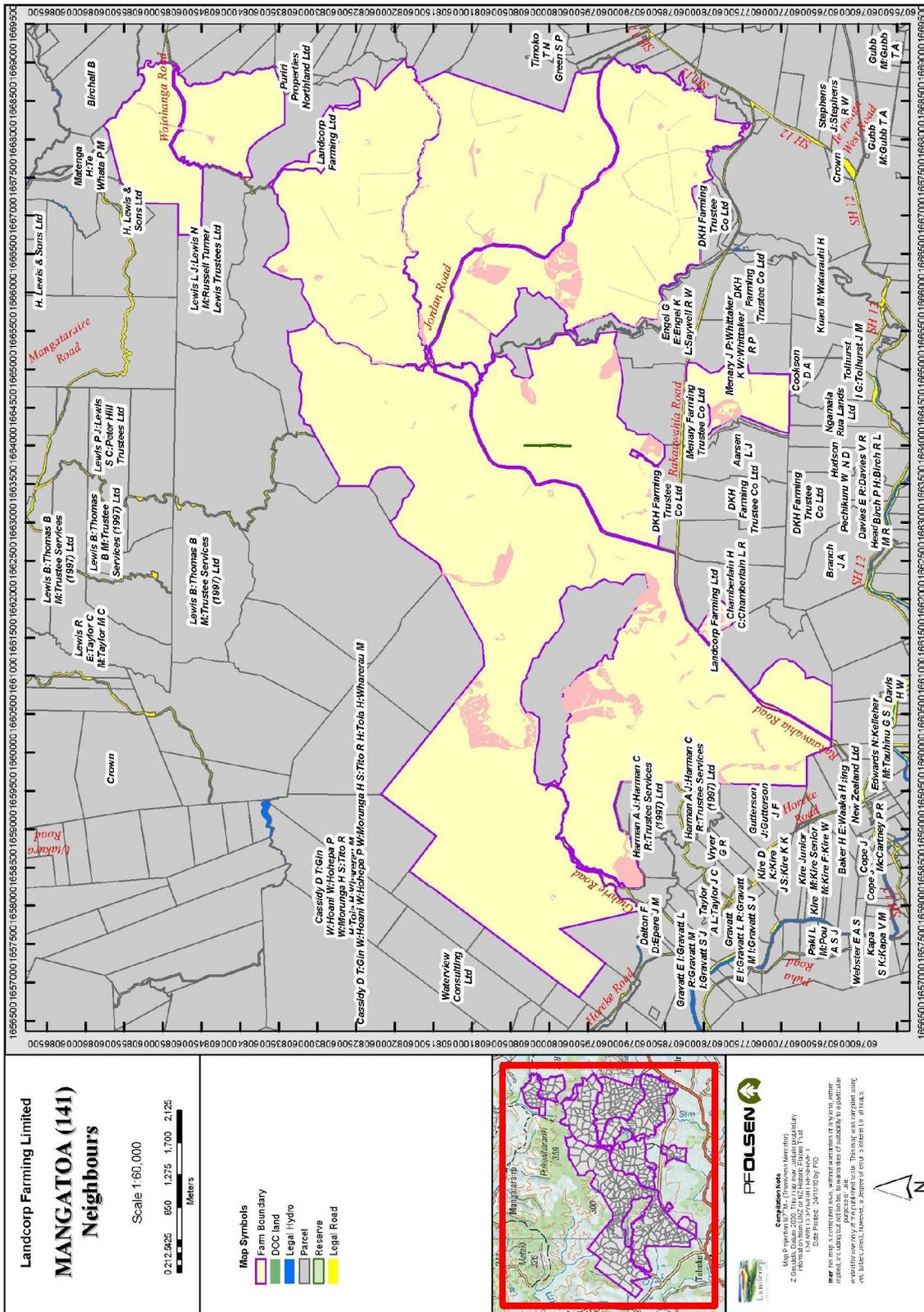
| <b>Forest</b>    | <b>CT</b>  | <b>Legal Description</b>            |
|------------------|------------|-------------------------------------|
| Kapiro (107)     | 36253      | Lot 5 Deposited Plan 309296         |
| Kapiro (107)     | 36251      | Lot 3 Deposited Plan 309296         |
| Kapiro (107)     | 36250      | Lot 2 Deposited Plan 309296         |
| Kapiro (107)     | 36251      | Section 2 Survey Office Plan 64432  |
| Kapiro (107)     | NA100C/244 | Section 2 Survey Office Plan 64139  |
| Kapiro (107)     | NA100C/244 | Section 3 Survey Office Plan 64432  |
| Kapiro (107)     | NA100C/244 | Section 1 Survey Office Plan 64432  |
| Kapiro (107)     | NA100C/244 | Section 1 Survey Office Plan 60929  |
| Kapiro (107)     | NA100C/244 | Section 17 Survey Office Plan 61837 |
| Kapiro (107)     | NA100C/244 | Section 1 Survey Office Plan 61837  |
| Kapiro (107)     | NA100C/244 | Section 16 Survey Office Plan 61837 |
| Kapiro (107)     | NA100C/244 | Section 18 Survey Office Plan 61838 |
| Kapiro (107)     | NA100C/244 | Section 15 Survey Office Plan 61836 |
| Kapiro (107)     | NA135D/780 | Lot 1 Deposited Plan 209464         |
| Kapiro (107)     | NA135D/781 | Lot 2 Deposited Plan 209464         |
| Mangatoa (141)   | NA88C/104  | Section 2 Survey Office Plan 66159  |
| Mangatoa (141)   | NA88C/104  | Section 1 Survey Office Plan 66160  |
| Mangatoa (141)   | NA88C/104  | Section 2 Survey Office Plan 66147  |
| Mangatoa (141)   | NA88C/104  | Section 4 Survey Office Plan 66146  |
| Mangatoa (141)   | NA88C/104  | Section 3 Survey Office Plan 66146  |
| Mangatoa (141)   | NA88C/104  | Section 1 Survey Office Plan 66147  |
| Mangatoa (141)   | NA88C/104  | Section 2 Survey Office Plan 66146  |
| Mangatoa (141)   | NA88C/104  | Section 1 Survey Office Plan 66145  |
| Mangatoa (141)   | NA99C/562  | Section 5 Survey Office Plan 66162  |
| Mangatoa (141)   | NA99C/562  | Section 1 Survey Office Plan 66162  |
| Mangatoa (141)   | NA99C/562  | Section 2 Survey Office Plan 66162  |
| Mangatoa (141)   | NA99C/562  | Lot 2 Deposited Plan 170545         |
| Mangatoa (141)   | NA99C/562  | Lot 1 Deposited Plan 170545         |
| Mangatoa (141)   | NA99C/562  | Section 3 Survey Office Plan 66162  |
| Puketotara (119) | NA86D/222  | Section 1 Survey Office Plan 65641  |
| Puketotara (119) | NA86D/221  | Section 6 Survey Office Plan 64269  |
| Puketotara (119) | NA93B/909  | Lot 2 Deposited Plan 156360         |
| Puketotara (119) | NA86D/221  | Section 2 Survey Office Plan 64266  |
| Puketotara (119) | NA93B/909  | Section 4 Survey Office Plan 64267  |
| Puketotara (119) | NA86D/221  | Section 1 Survey Office Plan 64269  |
| Puketotara (119) | NA93B/909  | Section 5 Survey Office Plan 64268  |

**Appendix 2: Iwi organisations with a potential interest in the land of Kapiro, Mangatua and Puketotara Stations.**

| <b>Station</b>                  | <b>Iwi Organisation</b>                           |
|---------------------------------|---------------------------------------------------|
| Kapiro and Puketotara           | Te Runanga O Ngati Hine                           |
| Kapiro, Mangatua and Puketotara | Te Runanga A Iwi O Ngapuhi                        |
| Kapiro                          | Whitiora Marae                                    |
| Kapiro                          | Ngati Torehina ki Mataka Resource Management Unit |
| Kapiro                          | Huriharama Marae                                  |
| Kapiro and Puketotara           | Te Runanga O Ngati Rehia                          |
| Kapiro and Puketotara           | Te Uri Taniwha Otahuaio Burial Ground Trust       |
| Kapiro and Puketotara           | Kaire Edmonds Trust                               |
| Kapiro and Puketotara           | Kaire Edmonds Trust                               |
| Mangatua                        | Ngapuhi Ki Te Hauauru Takiwa                      |
| Mangatua                        | Te Iringa Marae                                   |
| Mangatua                        | Nga Ngaru O Hokianga Takiwa                       |
| Mangatua                        | Taheke Marae                                      |
| Mangatua                        | Taheke Maori Committee                            |



**Appendix 3(b) Map of Neighbour Locations for Mangatota Station**





**Appendix 4(a) Contact Details for Neighbours of Kapiro Station**

| <b>Kapiro Neighbours</b>                     |                                                                      |              |
|----------------------------------------------|----------------------------------------------------------------------|--------------|
| <b>Name</b>                                  | <b>Address</b>                                                       | <b>Phone</b> |
| GR Lodge                                     | Otaha Road RD 2 Kerikeri 0295                                        |              |
| Brema Stock Ltd                              | PO Box 16 Paihia 0247                                                |              |
| S and R Martin                               | 466 Takou Bay Road RD 2 Kerikeri 0295                                |              |
| R and G Van Den Broek                        | Takou Bay Road RD 2 Kerikeri 0295                                    |              |
| Driver Whitehills Farms Ltd                  | Selwyn and Dawn Driver 3114 State Highway 10 RD 2 Kerikeri 0295      |              |
| GP Colquhoun and DE Moore                    | 2804 State Highway 10 RD 2 Kerikeri 0295                             |              |
| H and J Campbell                             | State Highway 10 RD 2 Kerikeri 0295                                  |              |
| J Bolton and C Mihaere                       | 2740 State Highway 10 RD 2 Kerikeri 0295                             |              |
| PM Screen and JH Thorner                     | State Highway 10 RD 2 Kerikeri 0295                                  |              |
| Perrin Ivy                                   | State Highway 10 RD 2 Kerikeri 0295                                  |              |
| Turners & Growers Horticulture Ltd           | Trading as Kerifresh 153 Waipapa Road RD 2 Kerikeri 0295             |              |
| KM Walshe, MR Walsh and A Richardson         | State Highway 10 RD 2 Kerikeri 0295                                  |              |
| DC Miller                                    | 2624b State Highway 10 RD 2 Kerikeri 0295                            |              |
| KF Adern, KM and SC Lupi                     | Stanners Road RD 2 Kerikeri 0295                                     |              |
| P and G McQuoid                              | 239a Stanners Road RD 2 Kerikeri 0295                                |              |
| S and S Edwards                              | 243 Stanners Road RD 2 Kerikeri 0295                                 |              |
| JM and KT Smitheram                          | Stanners Road RD 2 Kerikeri 0295                                     |              |
| J and J Harrison                             | Stanners Road RD 2 Kerikeri 0295                                     |              |
| The Horticulture and Food Research Institute | Mt Albert Research Centre 120 Mt Albert Road Mt Albert Auckland 1025 |              |
| RJ and SL Ladd                               | 73 Keri Downs Road RD 1 Kerikeri 0294                                |              |
| J Lees                                       | Keri Downs Road RD 1 Kerikeri 0294                                   |              |
| Boi Taxation Trustee Company Ltd             | Boi Taxation Ltd The Meridian 93 Kerikeri Road Kerikeri 0230         |              |
| Site Holdings Ltd                            | 65d Kingfisher Drive Kerikeri 0294                                   |              |
| GC Hewson                                    | Purerua Road RD 1 Kerikeri 0294                                      |              |
| PW Walker and PE Puharich                    | 152b Purerua Road RD1 Kerikeri 0294                                  |              |
| SM Reeve and GD Smith                        | Purerua Road RD 1 Kerikeri 0294                                      |              |
| KJ and SI McInnes                            | Purerua Road RD 1 Kerikeri 0294                                      |              |
| Meridian Farm Ltd                            | Richard Ayton Redcliffs Road RD 1 Kerikeri 0294                      |              |
| HD and SE Corbett and SE Turner              | Purerua Road RD 1 Kerikeri 0294                                      |              |
| Breadon & Cook Ltd                           | T Teixeira 121b Redcliffs Road RD 1 Kerikeri 0294                    |              |
| GB Trustees Ltd                              | Gilmore Brown Ltd Fourth Floor 30-34 Rathbone Street Whangarei 0110  |              |

**Appendix 4(b) Contact Details for Neighbours of Mangatoha Station**

| <b>Mangatoha Neighbours</b>       |                                                                       |              |
|-----------------------------------|-----------------------------------------------------------------------|--------------|
| <b>Name</b>                       | <b>Address</b>                                                        | <b>Phone</b> |
| HC and LR Chamberlain             | Rakauwahia Road RD 3 Kaikohe 0473                                     |              |
| LD Tonner and RM Price            | Rakauwahia Road RD 3 Kaikohe 0473                                     |              |
| J and J Gutterson                 | Horeke Road RD 3 Kaikohe 0473                                         |              |
| GE and KL Engel                   | 346 Rakauwahia Road RD 3 Kaikohe 0473                                 |              |
| LJ and LJ Aarsen                  | Rakauwahia Road RD 3 Kaikohe 0473                                     |              |
| Trustee Services (1997) Ltd       | PKF Poutsma Lemon Ltd 1st Floor 9 Hobson Avenue<br>Kerikeri 0230      |              |
| Russell Turner Lewis Trustees Ltd | Russell Turner Chartered Accountants 58 Otaika Road<br>Whangarei 0110 |              |
| H Lewis & Sons Ltd                | Imms Road RD 1 Okaihau 0475                                           |              |
| Puriri Properties Northland Ltd   | c/- Gordon Heathcote Scarrot Road RD 1 Te Kopuru<br>0391              |              |
| Kakariki Limited                  | PO Box 701 Kaikohe                                                    |              |
| DKH Farming Trustee Company Ltd   | c/- Johnston O'Shea Ltd 9-11 Reyburn Street Whangarei<br>0110         |              |

**Appendix 4(c) Contact Details for Neighbours of Puketotara Station**

| <b>Puketotara Neighbours</b>   |                                                                     |              |
|--------------------------------|---------------------------------------------------------------------|--------------|
| <b>Name</b>                    | <b>Address</b>                                                      | <b>Phone</b> |
| Hanmarc Holdings Ltd           | Level 3 38 Whitaker Place Grafton Auckland 1010                     |              |
| Northridge Farms Ltd           | 1736b Waiare Road RD 2 Kerikeri 0295                                |              |
| MJ Adams and LM Kublack        | 85181 Waiare Road Okaihau 0295                                      |              |
| Lawson Acres Limited           | 934 Waiare Road Okaihau 0475                                        |              |
| R & H Hollister                | 1568 Waiare Road RD 2 Kerikeri 0295                                 |              |
| K Murray and SG Murray         | 1125 Puketotara Road RD2 Kerikeri 0295                              |              |
| Greenacre Heights Ltd          | C/- Raymond & Sheryl Webster 534 Puketotara Road RD 2 Kerikeri 0295 |              |
| RM and RJ Neale                | Tyree Road RD 2 Kerikeri 0295                                       |              |
| MJ Lee and J Worthington       | Mangakaretu Road RD 2 Kerikeri 0295                                 |              |
| PJ and R Olds                  | 106 Mangakaretu Road RD 2 Kerikeri 0295                             |              |
| D L Mapp                       | 68 Mangakaretu Road RD 2 Kerikeri 0295                              |              |
| C and S Wyllie                 | Not found in white pages                                            |              |
| I Stewart                      | 36 Mangakaretu Road RD 2 Kerikeri 0295                              |              |
| Burgoyne Medical Services Ltd  | Peter & Sarah Burgoyne 456 Puketotara Road RD 2 Kerikeri 0295       |              |
| MK McBain and SP Flood         | Puketotara Road RD 2 Kerikeri 0295                                  |              |
| CR Rosenthal                   | Puketotara Road RD 2 Kerikeri 0295                                  |              |
| JM and MJ Wright               | Puketotara Road RD 2 0295                                           |              |
| J and P Whiteman               | Puketotara Road RD 2 Kerikeri 0295                                  |              |
| Waiare Farms Ltd               | 27 Kioreroa Road Whangarei 0110                                     |              |
| SJ Bignell and SM and TJ Brocx | 1124 Waiare Road Okaihau 0475                                       |              |
| GB and PT Kerr                 | Puketotara Road RD 2 Kerikeri 0295                                  |              |
| J and PW Hulmes                | Puketotara Road RD 2 Kerikeri 0295                                  |              |
| P and P Summers                | Puketotara Road RD 2 Kerikeri 0295                                  |              |
| MJ Adams and LM Kublack        | 85181 Waiare Road Okaihau 0295                                      |              |
| S & D Dromgool                 | Mangakaretu Road RD 2 Kerikeri 0295                                 |              |
| KA and RM Jones                | Mangakaretu Road RD 2 Kerikeri 0295                                 |              |
| Waitoto Developments Ltd       | 180 State Highway 16 Whenuapai Auckland 0814                        |              |
| R J Hume                       | Mangakaretu Road RD2 Kerikeri 0295                                  |              |

**Appendix 5: Northland Regional Council Plant Pest Management Strategies**

| Common Name            | Scientific Name                                           | Pest Classification |
|------------------------|-----------------------------------------------------------|---------------------|
| African feather grass  | <i>Pennisetum macrochrysum</i>                            | Containment         |
| Akebia                 | <i>Akebia quinata</i>                                     | Eradication         |
| Alligator weed         | <i>Alternanthera philoxeroides</i>                        | Suppression         |
| Asiatic knotweed       | <i>Fallopia japonica</i>                                  | Exclusion           |
| Bathurst bur           | <i>Xanthium spinosum</i>                                  | Containment         |
| Californian thistle    | <i>Cirsium arvense</i>                                    | Containment         |
| Cape tulip             | <i>Moraea flaccida</i>                                    | Exclusion           |
| Cathedral bells        | <i>Cobaea scandens</i>                                    | Exclusion           |
| Climbing spindle berry | <i>Celastrus orbiculatus</i>                              | Eradication         |
| Eel grass              | <i>Vallisneria australis, V. spiralis</i>                 | Eradication         |
| Entire marshwort       | <i>Nymphoides geminata</i>                                | Exclusion           |
| Evergreen buckthorn    | <i>Rhamnus alaternus</i>                                  | Eradication         |
| Fringed water lily     | <i>Nymphoides peltata</i>                                 | Exclusion           |
| Giant hogweed          | <i>Heracleum mantegazzianum</i>                           | Exclusion           |
| Giant knotweed         | <i>Fallopia sachalinensis</i>                             | Exclusion           |
| Giant reed             | <i>Arundo donax</i>                                       | Containment         |
| Gorse                  | <i>Ulex species</i>                                       | Suppression         |
| Gravel groundsel       | <i>Senecio skirrhodon</i>                                 | Suppression         |
| Holly-leaved senecio   | <i>Senecio glastifolius</i>                               | Exclusion           |
| Houttuynia             | <i>Houttuynia cordata</i>                                 | Exclusion           |
| Hydrilla               | <i>Hydrilla verticillata</i>                              | Exclusion           |
| Johnson grass          | <i>Sorghum halepense</i>                                  | Exclusion           |
| Lantana                | <i>Lantana camara, all varieties</i>                      | Containment         |
| Manchurian wild rice   | <i>Zizania latifolia</i>                                  | Containment         |
| Mexican feather grass  | <i>Nassella tenuissima</i>                                | Eradication         |
| Mickey mouse plant     | <i>Ochna serrulata</i>                                    | Eradication         |
| Mile-a-minute          | <i>Dipogon lignosus</i>                                   | Eradication         |
| Monkey musk            | <i>Mimulus guttatus</i>                                   | Eradication         |
| Nardoo                 | <i>Marsilea mutica</i>                                    | Eradication         |
| Nassella tussock       | <i>Nassella trichotoma</i>                                | Eradication         |
| Nodding thistle        | <i>Carduus nutans</i>                                     | Containment         |
| Old man's beard        | <i>Clematis vitalba</i>                                   | Eradication         |
| Phragmites             | <i>Phragmites australis</i>                               | Exclusion           |
| Pampas                 | <i>Cortaderia jubata and C. selloana</i>                  | Suppression         |
| Privet                 | <i>Ligustrum species</i>                                  | Suppression         |
| Purple loosestrife     | <i>Lythrum salicaria</i>                                  | Exclusion           |
| Pyp grass              | <i>Ehrharta villosa</i>                                   | Exclusion           |
| Ragwort                | <i>Jacobaea vulgaris</i>                                  | Suppression         |
| Royal fern             | <i>Osmunda regalis</i>                                    | Eradication         |
| Salvinia               | <i>Salvinia molesta</i>                                   | Eradication         |
| Senegal tea            | <i>Gymnocoronis spilanthoides</i>                         | Eradication         |
| Skeleton weed          | <i>Chondrilla juncea</i>                                  | Exclusion           |
| Spartina               | <i>Spartina alterniflora, S. anglica, S. x townsendii</i> | Eradication         |
| Water hyacinth         | <i>Eichhornia crassipes</i>                               | Eradication         |
| Water poppy            | <i>Hydrocleys nymphoides</i>                              | Eradication         |
| White bryony           | <i>Bryonia cretica subsp. dioica</i>                      | Exclusion           |
| Wild ginger            | <i>Hedychium flavescens and H. gardnerianum</i>           | Suppression         |
| Yellow flag Iris       | <i>Iris pseudacorus</i>                                   | Eradication         |
| CPCA plants            |                                                           | CPCA                |
| Risk assessment plants |                                                           | Risk Assessment     |

## Appendix 6: Northland Regional Council Animal Pest Management Strategies

| Common Name              | Scientific Name                                      | Pest Classification |
|--------------------------|------------------------------------------------------|---------------------|
| Argentine ant            | <i>Linepithema humile</i>                            | Suppression         |
| Bearded dragon           | <i>Amphibolurus barbatus</i>                         | Risk Assessment     |
| Big headed ant           | <i>Pheidole megacephala</i>                          | Exclusion           |
| Blue-tongued skink       | <i>Tiliqua scincoides and Tiliqua nigrolutea</i>     | Risk Assessment     |
| Brown bullhead catfish   | <i>Ameiurus nebulosus</i>                            | Suppression         |
| Cats - feral and stray   | <i>Felis catus</i>                                   | Suppression         |
| Caudo                    | <i>Phallocerus caudimaculatus</i>                    | Risk Assessment     |
| Common wasp              | <i>Vespula vulgaris</i>                              | Suppression         |
| Crazy ant                | <i>Paratrechina longicornis</i>                      | Exclusion           |
| Darwin's ant             | <i>Doleromyrma darwiniana</i>                        | Suppression         |
| Eastern water dragon     | <i>Physignathus lesueurii lesueurii</i>              | Risk Assessment     |
| Feral deer               | <i>All Cervus and Odocoileus species and hybrids</i> | Eradication         |
| Feral goat               | <i>Capra hircus</i>                                  | Suppression         |
| Feral pig                | <i>Sus scrofa</i>                                    | Suppression         |
| Ferret                   | <i>Mustela furo</i>                                  | Suppression         |
| Gambusia                 | <i>Gambusia affinis</i>                              | Suppression         |
| German wasp              | <i>Vespula germanica</i>                             | Suppression         |
| Ghost ant                | <i>Tapinoma melanocephalum</i>                       | Exclusion           |
| Guava moth               | <i>Coscinoptycha improbana</i>                       | Suppression         |
| Hare                     | <i>Lepus europaeus occidentalis</i>                  | Suppression         |
| Hedgehog                 | <i>Erinaceus europaeus occidentalis</i>              | Suppression         |
| Kauri dieback            | <i>Phytophthora taxon Agathis</i>                    | Containment         |
| Koi carp                 | <i>Cyprinus carpio</i>                               | Containment         |
| Magpie                   | <i>Gymnorhina tibicen</i>                            | Suppression         |
| Marron                   | <i>Cherax tenuimanus</i>                             | Exclusion           |
| Mouse                    | <i>Mus musculus</i>                                  | Suppression         |
| Myna                     | <i>Acridotheres tristis</i>                          | Suppression         |
| Norway rat               | <i>Rattus norvegicus</i>                             | Suppression         |
| Orfe                     | <i>Leuciscus idus</i>                                | Exclusion           |
| Perch                    | <i>Perca fluviatilis</i>                             | Containment         |
| Possum                   | <i>Trichosurus vulpecula</i>                         | Suppression         |
| Rabbit                   | <i>Oryctolagus cuniculus</i>                         | Suppression         |
| Rainbow lorikeet         | <i>Trichoglossus haematodus</i>                      | Exclusion           |
| Rainbow skink            | <i>Lampropholis delicata</i>                         | Risk Assessment     |
| Red-eared slider turtle  | <i>Trachemys scripta elegans</i>                     | Risk Assessment     |
| Rook                     | <i>Corvus frugilegus</i>                             | Exclusion           |
| Rudd                     | <i>Scardinius erythrophthalmus</i>                   | Suppression         |
| Shingleback lizard       | <i>Trachydosaurus rugosus</i>                        | Risk Assessment     |
| Ship rat                 | <i>Rattus rattus</i>                                 | Suppression         |
| Snake-neck turtle        | <i>Chelodina longicollis</i>                         | Risk Assessment     |
| Stoat                    | <i>Mustela erminea</i>                               | Suppression         |
| Sulphur crested cockatoo | <i>Cacatua galerita</i>                              | Risk Assessment     |
| Tench                    | <i>Tinca tinca</i>                                   | Containment         |
| Tropical fire ant        | <i>Solenopsis geminata</i>                           | Exclusion           |
| Tropical grass webworm   | <i>Herpetogramma licarsisalis</i>                    | Suppression         |
| Wallaby                  | <i>Macropus, Petrogale or Wallabia species</i>       | Exclusion           |
| Weasel                   | <i>Mustela nivalis</i>                               | Suppression         |