

RANGITAIKI FOREST

LANDCORP FARMING LTD

FSC® Forest Management Plan

For the period 2019 / 2023



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1. Introduction

Principles and Criteria

Landcorp Farming Ltd is committed to adopt the Forest Stewardship Council (FSC) Principles and to meet their Criteria and the FSC standards of good forest management. These standards include ecological, social and economic parameters.

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

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. Forest Landscape Description

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.
-

Legal ownership

The forest is legally described as follows:

- Section 1 SO 50992
- Section 1 SO 51504
- Section 1 SO 55210
- Section 1 SO 58815
- Section 1 SO 58835
- Section 1 SO 58836
- Section 1 SO 58909

The tenure is freehold.

Location and access

Rangitaiki Forest is located off Matea Road, which in turn is located off SH5 between Taupo and Napier about 52 kilometres east of Taupo. Internal forest roads provide access to all parts of the forest.

The location of the forest in relation to potential markets is listed in the Table 1 below and shown in Map 1.

Table 1: Distances from forest to log markets

Potential Market or Export Port	Distance from Forest (km)	Market Type
Kawerau	184	Pulp
Kinleith	112	Pulp
Mount Maunganui	209	Export
Napier	103	Export
Rotorua	133	Domestic
Taupo	52	Domestic

Topography

The topography of the forestland is predominantly flat to rolling contour. Whilst this is not difficult harvesting terrain, wet weather poses challenges for lower cost harvesting options. Therefore, harvesting would be targeted for the drier period of the year if possible, specifically the October to April period.

The harvesting method most suitable would be predominantly ground based harvesting, which may include tracked extraction machines e.g. tracked excavators and bulldozers

Altitude is 660 to 880 m above sea level.

Soils

The major soil type throughout the Rangitaiki Station is a Taupo and Kaharoa ash base. The flatter areas consist of undulating valley systems infilled with coarsely textured Taupo breccia, dissected by shallow ephemeral waterways. The steeper areas consist of a mantle of Taupo ash overlying deep deposits of Waimahia lapilli.

There is a potential for severe gully and sheet erosion in the steeper areas, and consequently many forested areas are already subject to a soil conservation covenant.

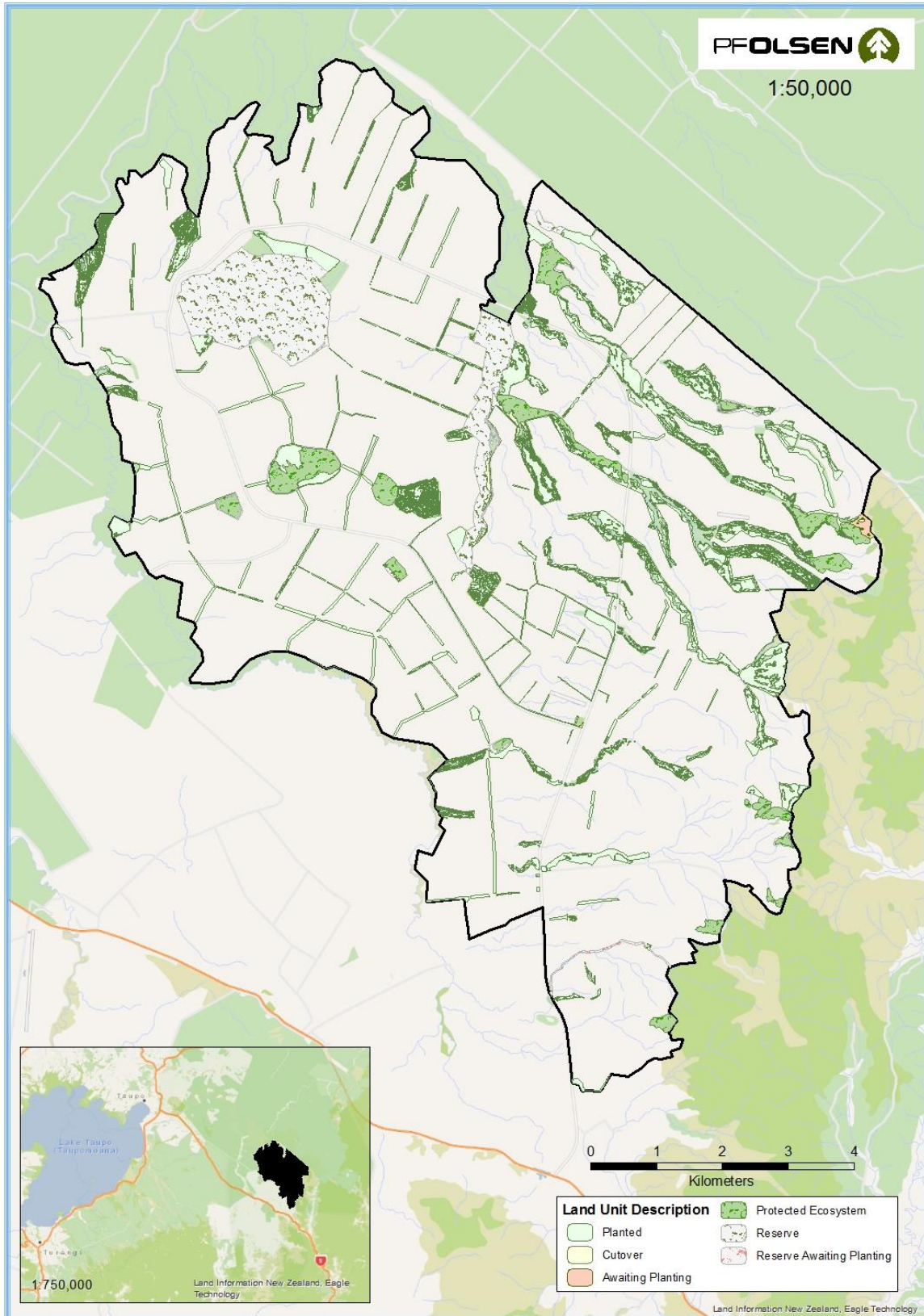
Harvesting and roading methods will need to be respectful of the potential for erosion. In particular, exposure of bare ground must be minimised by management activities to reduce the risk of sheet erosion. Any cultivation should be carefully considered as there is the potential for severe sheet, rill and gully erosion.

Climate

Rainfall: The average rainfall at nearby Atiamuri power station is about 1340mm per year and is relatively evenly distributed during the year. January to March is the driest period.

Temperature: The mean annual temperature is around 18.1 degrees Celsius. Ground frosts can occur throughout the year (except January and February) with an average of 53 ground frosts per year.

Map 1 – Forest Location Map



3. The Broader Landscape

Ecological landscape

Rangitaiki forest is located on SH5 approximately 50 km from Taupo. This range is a tilted rift ridgeline of volcanic origin with an overall north-facing slope.

Rangitaiki forest falls within the southern end of the Kaingaroa Ecological District, in the Eastern Volcanic Plateau Ecological Region. This district is characterised by a volcanic history, owing to the 186 AD Taupo eruption that completely destroyed all forests within an 80 km radius. The resulting Kaingaroa Ignimbrite plateau is dominantly covered in coarse volcanic ash soils with variable drainage.

Historically, the landscape had sparse pockets of podocarp forest and scattered wetlands within a vast matrix of lowland tall tussock, scrub and fernland. Following Polynesian and European settlement, extensive clearance of native scrub and forest occurred to provide land for agriculture and forestry in the Central Volcanic Plateau region. Much of the indigenous vegetation in the District has been cleared for plantation forestry, with very little *Dracophyllum*, tussock, scrub and wetland areas remaining intact, and most is severely degraded.

Protective Status Table 3 shows vegetation types as required by the National Standard for Plantation Forest Management in New Zealand revised in 2013.

Table 3: Protective status of the ecological landscape

LENZ type	LENZ F7.1	LENZ P7.1
Original (pre-Maori) percentage of ecosystem type in Ecological District within land title	494,186 ha 100%	411,457 ha 100%
Natural ecosystem area remaining	75,610.5 ha 15.3%	428,326.7 104.1%
Proportion of remaining natural ecosystem under protection	59,807.9 ha 79.1%	273,700.8 ha 63.9%
Protection by certificate holder	189.4 ha 0.25%	6.9 ha 0.002%
Protected areas as a % of management estate	196.2 ha 18.1%	
Protected areas as a % of the aggregated Group Scheme management estate by Ecological District	196.2ha 18.1%	

**Historic and
archaeological
sites**

Records of known archaeological and historical places are maintained in the NZ Archaeological Association (NZAA) Site Recording Scheme. The Archaeological Site Probability model published by the Department of Conservation¹ provides further guidance on the probability of pre-European archaeological evidence existing based on the geographical location of the forest and historical occupation of the local area.

The site recording scheme has revealed no known sites within Rangitaiki Forest. 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 Heritage New Zealand (HNZ) and Iwi or other stakeholders must be observed. Where such circumstances require, an ‘Authority to Modify or Destroy’ will be sought from HNZ. 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 Authorities to Modify an archaeological site may sometimes be required from the local District Council and sites of cultural significance are often included in schedules of places and sites of significance in District Plans. Update checks for any sites will be required before any harvesting or related earthworks commences.

**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 TEC 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.

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¹ Arnold, G.; Newsome, P.; Heke, H. 2004: Predicting archaeological sites in New Zealand. *DOC Science Internal Series 180*. Department of Conservation, Wellington. 24 p.

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Table 4 shows the threatened environments classifications as they pertain to Rangitaiki Forest (Map 2). The rarest threatened environments (< 10% indigenous cover left) make up 82.5% of Rangitaiki Forest, while the remaining area is split between less threatened land.

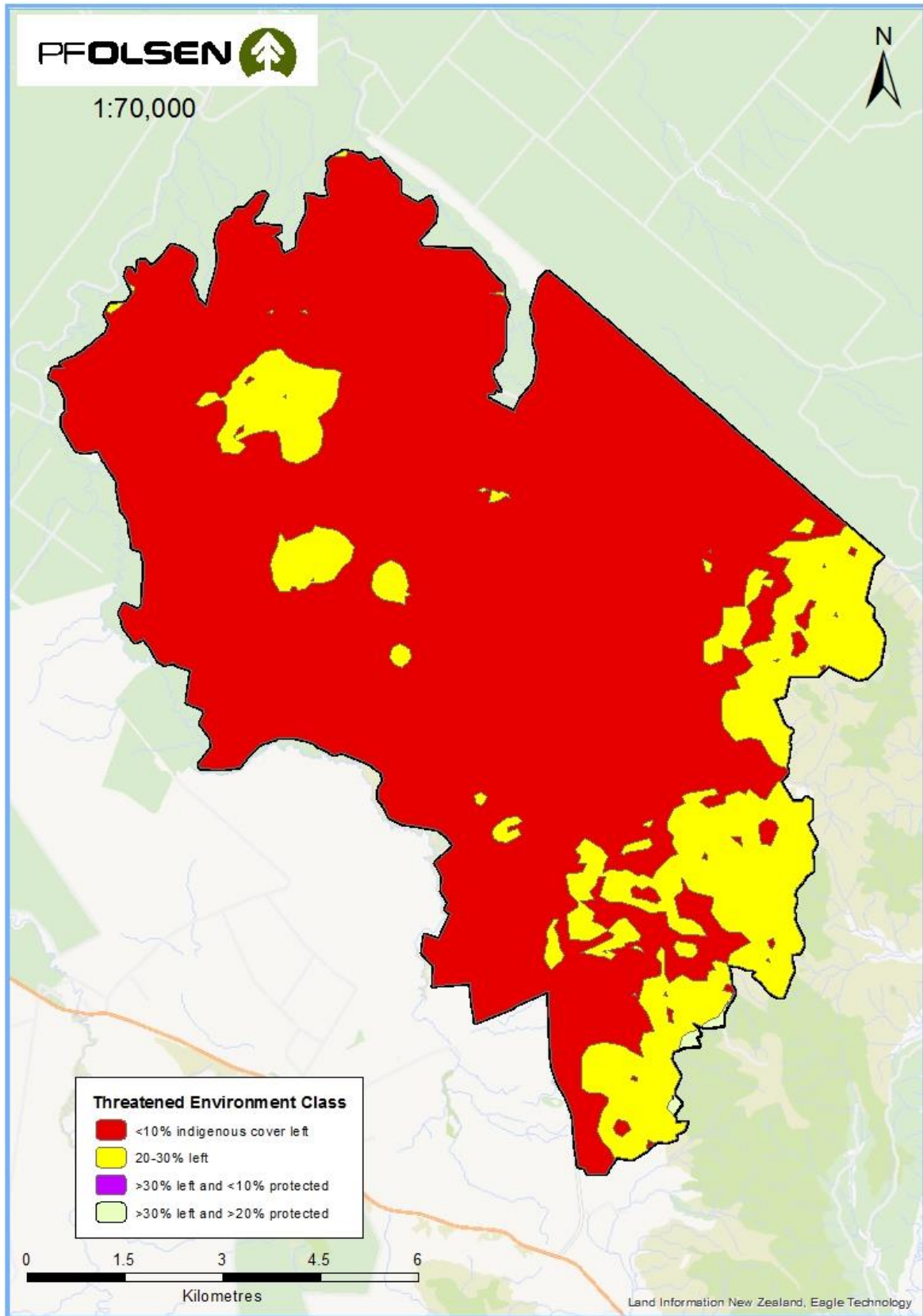
Table 4: Reserve areas by Threatened Environments Classification

Category	Area (ha)	Area (%)
< 10% indigenous cover left	8416.04	82.5%
10 - 20% left		
20 - 30% left	1775.83	17.4%%
> 30% left and < 10% protected		
> 30% left and 10 - 20% protected	0.38	0.004%
> 30% left and > 20% protected	14.84	0.1%
Total	10,207.09	100.0%

The TEC status of the small reserves reflects the history of intensive pastoralism in the area. The reserves thus have value due to their paucity in the overall landscape.

Map 2 – Forest by Threatened Environment

Classifications



5. Socio-economic profile and adjacent land

Forest history

Rangitaiki Station is a sheep, beef and deer pastoral farming operation.

Forestry has been established on the station primarily for the purpose of soil conservation (protection against wind erosion and gully and rill erosion in ephemeral waterways), but also as shelter for stock and alternative species have been established for farm aesthetics. Pastoral growth is also improved through shelter from the wind.

Areas established in forest were predominantly low productivity sites in agricultural terms due to the instability of the slopes and potential for erosion on the ephemeral waterways.

Current social profile

Rangitaiki Forest is a small, currently passive, incremental contributor to the social profile of the area. The forests are very small in comparison to large forestry players in the region. The land and forests are privately owned; contribution to the local economy by way of added incremental employment and infrastructure is negligible.

Combining data from the Atlas of Deprivation (Ministry of Health) and average income from Statistics NZ, it is apparent that wealth varies widely across the region. The area of the region where Rangitaiki Forest is located appears to be one of the more deprived areas in the region. Age and family statistics for the Bay of Plenty region are very similar to national averages.

Table 5. Key statistics as summarised from 2013 Census² data

Census Category	Bay of Plenty	New Zealand
Ethnicity: European	75.7%	74.0%
Ethnicity: Māori	27.5%	14.9%
Formal qualifications	75.5%	79.1%
Unemployment	9.0%	7.1%
Dominant occupation	Professionals	Professionals
Median income	\$26,200	\$28,500
Family with children	35.9%	42.1%
Internet access	72.6%	76.8%
Home ownership	64.7%	64.8%

² http://archive.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-about-a-place.aspx?request_value=13631&tabname=

Associations with Tangata Whenua The land at Rangitaiki is freehold. Iwi associated with the region is Tuwharetoa. No specific concerns in respect of this land title are currently known.

Tenure & resource rights The land tenure is freehold. A search of the Maori Land Online website (<http://www.maorilandonline.govt.nz/gis/map/search.htm>) returned no results.

Neighbours Neighbours to the forest estate boundaries have a special interest in the management of the forest. 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.

Table 6 lists the forest neighbours and their primary activities ([Appendix 1](#)). Some or all of these parties should be consulted when operations are proposed in forest areas adjacent to their boundaries.

Table 6: Forest neighbours

Not Publicly Available

Regulatory Environment and Risk Management

6. The Regulatory Environment

Regulatory considerations

Forestry operations throughout New Zealand are undertaken within the context of a regulatory framework that aims to ensure wider economic, social and environmental goals are achieved for the populace as a whole.

Failure to meet regulatory requirements is a key business risk that must be managed. The following section summarise key regulatory requirements and risk management controls exercised over forestry operations in the forest.

Health and Safety at Work Act 2015

Leadership, a constant focus on health and safety, and the strong message that safety rates as the number one priority ahead of any other business driver are all highly important for PF Olsen management. The company also takes the following steps to ensure worker health and safety:

- Contractor selection process including emphasis on:
 - safety systems and track record;
 - worker skills and training; and
 - equipment types and standard.
- Work planning.
- Contractor induction.
- Monitoring, including random and reasonable cause drug testing, safe work practices and PPE.
- Incident investigation and reporting, including investing in software, training and processes development to enable good transparency on lag and lead indicators.
- Regular reporting to and interaction with the Client on matters related to safety.
- Regular (annual) review and update of the critical risks as identified in PF Olsen data sets and from Industry indicators. Such a review shall focus on incidents that have caused harm and/or loss, any known cause factors and mitigations and revised controls.

Resource Management Act

Rangitaiki Forest is 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. Table 7 lists the organisations relevant to Rangitaiki Forest.

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Table 7: Regional and District Councils under Rangitaiki Forest

Regional Councils ³	District Councils ⁴
Bay of Plenty Regional Council	Taupo District Council

Under the RMA, each Council has its own planning documents and associated rules that have been developed through public process. Any forestry operations must comply with the rules relevant to the Council area in which the operations are to take place. The contact details for the relevant councils can be seen in [Appendix 2](#).

**National
Environmental
Standard for
Plantation
Forestry (NES-PF)**

Coming into law on 1 May 2018, the NES-PF is a whole new rule hierarchy that applies the same rule set uniformly across most forestry operations in all parts of New Zealand. Operations will come under the legal force of this RMA instrument, though local Councils will retain the ability to regulate specific areas outside the NES-PF, e.g. Significant Natural Areas, Outstanding Landscapes, giving effect to the Coastal Policy Statement etc.

The underpinning the structure of the NES-PF is a rule hierarchy linked to the erosion susceptibility of the lands upon which forestry operations are to be conducted.

Work commissioned by the Ministry of Primary Industries led to the creation of a national spatial map, the ‘Erosion Susceptibility Layer’ (ESC) that classifies all of New Zealand into a series of four classes of erosion susceptibility from low (green) to very high (red).

The stringency of the rule’s hierarchy, i.e. whether consents are needed and the degree to which Councils can apply discretion to the conditions attached to a consent, is then tied closely to the recognised erosion susceptibility of the lands involved and the risks created by the operations. In the case of Rangitaiki Forest, Table 8 below indicates the proportion of the forest by the respective ESC classes.

In broad terms, harvesting, roading (earthworks) and new afforestation operations will need consents in the red zone. Earthworks will need consents in orange, and in the green and yellow zones most operations will be permitted subject to conditions. The coverage of the erosion classes within the estate are illustrated in Map 4.

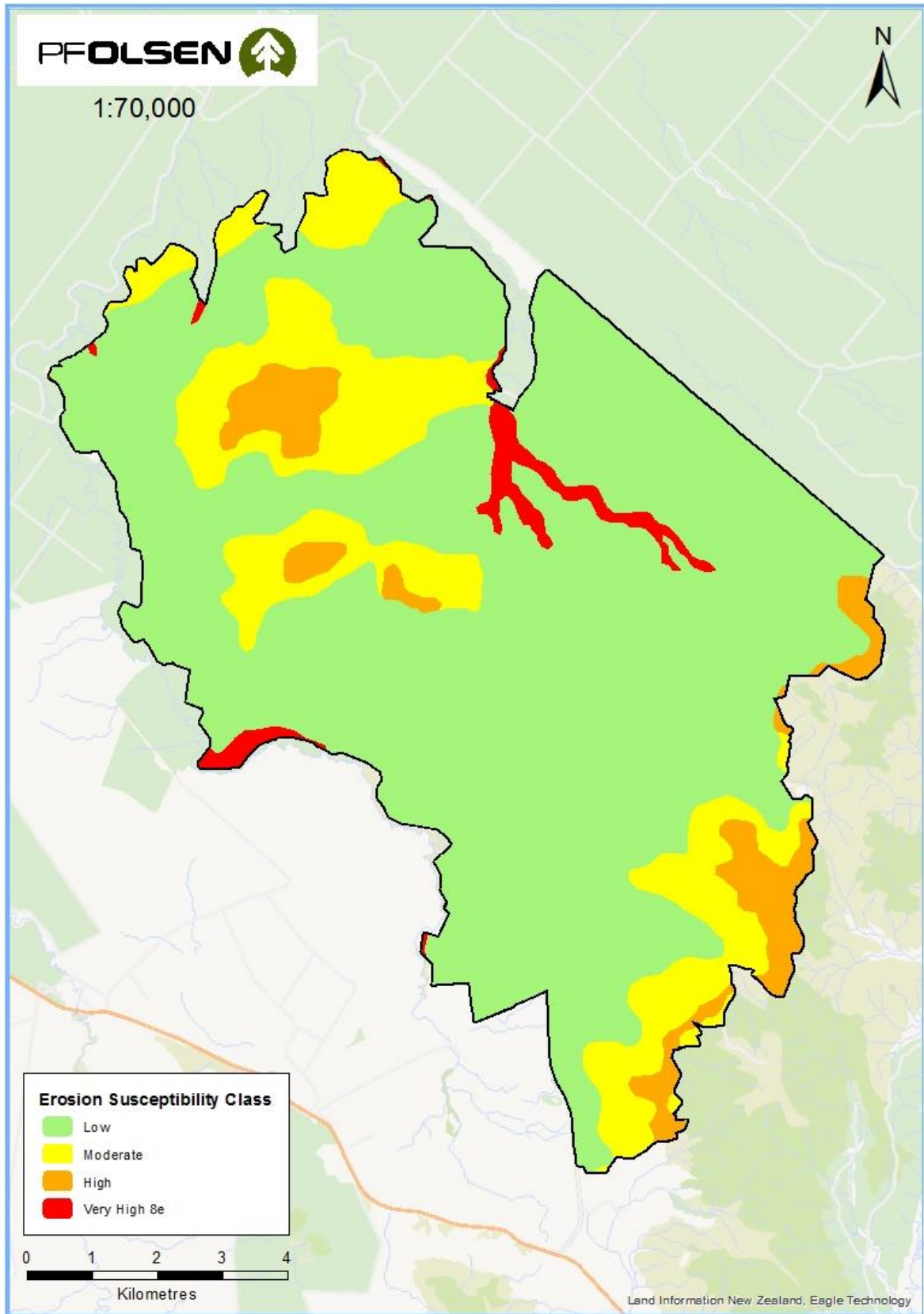
Table 8: ESC Classes (Erosion Risk) for Rangitaiki Forest

	Low	Moderate	High	Very High	Very High (8e)	Undefined
Area (ha)	7613.61	1796.35	584.76		212.37	
Area (%)	74.6%	17.6%	5.7%		2.1%	

³ Regional Councils responsible for soil conservation and water and air quality issues

⁴ District Councils responsible for land use and biodiversity issues

Map 3 – National Environmental Standard Erosion Susceptibility Classes in Rangitaiki Forest



Heritage New Zealand Pouhere Taonga Act 2014

Under the Heritage New Zealand Pouhere Taonga Act 2014 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. Records of archaeological and historical places are maintained in the NZ Archaeological Association (NZAA) Site Recording Scheme <http://www.archsite.org.nz/>.

If a site is found or suspected on any block, protocols specified in PF Olsen’s EMS, and any others specifically developed in conjunction with Heritage New Zealand (HNZ), archaeologists and Iwi or other stakeholders, will be observed and the necessary Archaeological Authorities obtained with HNZ, and if necessary the local Territorial Authority.

These responses may include, but are not limited to:

- Map and ground surveys to identify, mark and protect known heritage sites.
- Iwi consultation and surveys for unknown sites.
- Archaeological Authorities to modify sites if required.

Accidental Discovery Protocols to stop work and engage experts if sites are discovered during operations.

Consents & authorities held

There are currently no resource consents and HNZ authorities that apply to Rangitaiki Forest.

The Emissions Trading Scheme

Forests in New Zealand are governed by rules related to New Zealand’s Kyoto commitments to reduce the nation’s carbon footprint and contribution to associated climate change.

Rangitaiki Forest contains 58.1 hectares of forest that was existing forest as at 31st December 1989. At the time of harvest, these stands will be subject to a deforestation tax equivalent to the tonnes of CO₂ projected to be released from decomposition of the forest at a unit financial value determined by the internationally traded emission units. This tax is payable if the forest is not replanted or, if left to regenerate naturally, does not achieve the regulated heights and stocking densities.

Four hundred and eighty-six hectares of forest which was planted after the 31st December 1989 has been registered to participate in the NZ Emissions Trading Scheme and is subject to the accrual of emissions credits and liabilities under that scheme. Ninety one percent of this area is *P. radiata*, 4 % is *Eucalyptus spp.* and 3 % is *P. menziesii*.

**Other relevant
legalisation**

There are numerous other statutes and regulations that impact on forest operations. Forest owners can be held liable for breaches of these Acts and may be held responsible for damage to third party property. Management processes seek to manage and minimise these risks.

Other relevant legislation is listed in [Appendix 3](#).

7. Commercial Risk Management

Market access retention

It is a major focus of the Property Manager to ensure contracted products are delivered on time and in specification to ensure Landcorp Framing Ltd retains credible access to its markets.

Landcorp Farming Ltd maintains independent third party environmental certification for its estate under Forest Stewardship Council certification (FSC). PF Olsen Ltd acting under the instruction of its client will be responsible for the execution and maintenance of the required FSC certification elements of which this management plan forms an important component.

Log customer credit risk

There have been a number of NZ sawmills fail in recent years leaving log customers unpaid for the last month's deliveries. The PF Olsen Investment Manager manages customer credit risk exposure and mitigation measures for export markets while PF Olsen manages these risks for domestic log customers.

Infrastructure damage or service disruption

Rangitaiki Forest is traversed by several powerline utilities. Risks around these are managed by:

- Identification on maps and on the ground any utilities at planning stage.
 - Early engagement with utility owner to plan operations to minimise risks.
 - Operational execution of agreed plans with parties specifically qualified for the tasks involved when working close to utilities.
-

Pests and diseases

Pests and diseases are managed according to any statutory obligations and best practices as identified by scientific research and past experience, with the type and intensity of treatment (if any) subject to what is at risk and the age of trees (see [Section 14](#)).

8. Environmental Risk Management

Environmental risk

Environmental risk is managed by PF Olsen as appointed property manager, through a cascade framework from high level 'intent' determined by the Forestry Rights owner, through PF Olsen's own environmental policies, thence through defined and documented processes constituting an Environmental Management System (EMS), supported by monitoring and reporting. PF Olsen's policies and Landcorp Farming Ltd's business objectives are considered to be well in alignment.

Environmental policy

PF Olsen Limited is committed to:

- *Sustainable forest and land management;*
- *Promoting high environmental performance standards that recognise the input of the community in which we operate;*
- *Supporting an environment of continuous improvement in environmental performance;*
- *Obtaining and retaining independent 3rd party forest certification in conformance with the Principles and Criteria of the Forest Stewardship Council and / or the Programme for Endorsement of Forest Certification as specified by forest owning clients, or in any case ISO:14001 Environmental Management Systems.*

In order to achieve these commitments **PF Olsen** (and PF Olsen Certification Scheme Members) will undertake the following:

- Where applicable to a particular forest, comply with the presiding **Certification Standards** as set out in any agreements between the forest owners and PF Olsen.
 - **Planning** of operations to avoid, mitigate or remedy degradation of **ecological, heritage** and **amenity** values;
 - Compliance with all relevant **legislation** and where appropriate exceed environmental statutory requirements;
 - **Training** for all employees and contractors to ensure an understanding of certification member's commitments to high standards of environmental performance, their responsibilities under the environmental legislation and to assist the implementation of sound environmental practices;
 - **Monitoring** environmental and socio-economic research and international agreements that may improve PF Olsen environmental and certification performance;
 - Regular environmental performance **audits** of operations;
 - Support for environmental **research**;
 - Undertake forest management in accordance with the principles and ethics of the **NZ Forest Accord the Principles for Commercial Plantation Forest Management in NZ**, and other relevant agreements, conventions and accords.
 - Promotion of the prevention of **waste** and **pollution**; and efficient use of **energy**;
 - Due regard for the well-being of the **community**.
-

Objectives, targets and monitoring

PF Olsen’s objectives, targets and monitoring categorised across 5 key aspects of the business:

1. Economic
2. Legal
3. Social
4. Health & safety
5. Environment

A systematic management approach ensures these objectives and targets remain the cornerstone of PF Olsen’s business, backstopped by monitoring processes that form a regular review of practices.

EMS framework

The Environmental Management System (EMS) is an integrated set of cloud based, defined and documented policies, processes and activities 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.

The framework is reviewed annually with the input of an Environmental Management Group (EMG).

Environmental Code of Practice

As a member of the New Zealand Forest Owners Association, all operations carried out on the property should be undertaken in conformance to the NZ Forest Owners Association ‘New Zealand Environmental Code of Practice for Plantation Forestry’. This publicly available document sets out guidelines that underpin the requirements for sound and practical environmental management.

Forest Road Engineering Manual

As a member of the New Zealand Forest Owners Association, roading and engineering techniques employed within the forest should conform to the industry best practice as outlined in the New Zealand Forest Owners Association publication, ‘NZ Forest Road Engineering Manual’, published 2012.

Assessment of environmental risks

Environmental risks arising from forest operations are assessed and managed on a site-by-site basis prior to execution. The relative probability and magnitude of adverse effect attributable to any particular operation on any particular site is highly variable.

Earthworks, planting and harvesting have the potential to destroy or damage any historic places that may be present. Native vegetation has the potential to be killed by harvesting into the reserve or spraying of the reserve. Water quality can be negatively affected by sediment runoff

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because of harvesting, stream crossing and earthwork operations. In addition, the entry of oil and fuel and fertilisers will reduce the quality of water.

The level of potential risk has been evaluated in the matrix as high ‘H’, medium ‘M’ or low ‘L’, or not applicable ‘NA’ and is thus indicative of the level of care that might need to be applied to ensure the potential for adverse effects is minimised (Table 9).

Table 9: Risk assessment for key aspects involved in forest management activities

Forestry Operational Activities	Environmental Values / Issues matrix												
	Erosion & Sediment Control	Water Quality	Soil Conservation & Quality	Air Quality	Aquatic Life	Native Wildlife	Native Vegetation	Historical & Cultural Values	Landscape & Visual Values	Neighbours	Public Utilities	Recreation Values	Threatened Species
Harvesting	H	M	M	L	M	L	L	L	M	H	L	L	H
Earthworks	H	H	M	L	H	L	L	L	H	L	L	L	H
Slash Management	H	M	L	L	M	L	L	L	L	L	L	L	L
Stream Crossings	H	H	L	L	H	L	L	L	L	L	L	L	L
Mechanical Land Preparation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	H
Burning	L	L	L	H	L	L	L	L	H	H	L	H	NA
Planting	L	L	L	L	L	L	L	L	L	L	L	L	L
Tending	L	L	L	L	L	L	L	L	L	L	L	L	L
Fertiliser Application	L	H	L	L	H	L	L	L	L	L	L	L	M
Agrichemical Use	L	H	L	L	H	L	H	L	L	H	H	H	H
Oil & Fuel Management	L	H	L	L	H	L	L	L	L	H	L	L	L
Waste Management	L	L	L	L	L	H	L	L	L	L	L	L	L
Forest Protection	L	L	L	L	L	L	L	L	L	L	L	L	L

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 within Rangitaiki Forest are:

- Pesticides
 - Herbicides: for commercial and ecological weeds;
 - Fungicides : for forest fungal disease control; and

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- Vertebrate or Invertebrate Toxins : used for control of pest mammals (e.g hares and possum or wasps).
- Fuels and oils
- Fire retardants : (only ever used if there is a fire)
- Surfactants: to increase herbicide efficacy

Transportation, storage and labelling of these hazardous materials must all comply with the provisions of legislative controls under the Environmental Protection Agency (EPA) and the NZS 8409:2004 Management of Agrichemicals code of practice.

During actual usage, the highest risks are associated with chemical trespass or bulk fuel spillages. These risks are managed by:

- Neighbour consultation over planned spray operations.
- Careful planning and timing of any aerial operations having regard to wind and spray drift.
- Unsprayed buffer strips on neighbour boundaries and riparian or other protected reserves.
- GPS flight path control and records.
- Monitoring and recording of weather conditions during the operation, including using smoke bombs and photos/video.
- Moving contractors into the use of double skinned bulk fuel storage tanks as the preferred method of containment for all larger capacity tanks.
- Tracking of all active ingredient usage within the estate.

Risk management includes active involvement in and review of technologies and research into alternative methods for the control of weeds, pests and diseases where these are effective and efficient.

Fuel use is directly related to the machinery used in forestry operations and the market locations. Using modern efficient machine technology is still the primary area where efficiency gains can be made. There is a steady programme to transfer chain bar oils to vegetable based low toxicity oils.

Highly hazardous chemicals

There are five agrichemicals that have been classified ‘highly hazardous’ (HH) by FSC that are used in forestry and conservation operations within PF Olsen group certified forests. All these five have recently been added to FSC’s HH list. Special derogations to continue usage of these chemicals, subject to conditions, are being applied for by PF Olsen as FSC Group Manager in conjunction with the wider NZ certified industry. The derogation process is run according to specific policies put in place by FSC, including extensive canvassing of stakeholder views. These chemical pesticides are listed in Table 10.

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All the classes of formulations used are registered and legally approved for in use New Zealand by the NZ Environmental Protection Agency, subject to various controls, and for the purposes to which they are applied as listed below.

Table 10: FSC Highly Hazardous chemicals used or potentially used in Rangitaiki Forest

Active Ingredient	Purpose	Common Usage
Copper based Products	Fungicide	Needle cast control
Picloram	Herbicide	Establishment weed control
Carbaryl	Insecticide	Localised wasp control
Cholecalciferol	Vertebrate pesticide	Localised possum control
Pindone	Vertebrate pesticide	Rabbit and hare control
<i>Use subject to Animal Health Board emergency provisions only</i>		
Sodium Cyanide	Vertebrate pesticide	Animal Health Board only, ground based possum control
Sodium Monofluoroacetate (1080)	Vertebrate pesticide	Animal Health Board only, extensive aerial possum control

The Managed Plantation Estate

9. Commercial Plantation Estate

**Productive
Capacity strategy**

Forest management is carried out to ensure the productive capacity of the Rangitaiki Forest is not compromised. This encompasses multiple aspects that include:

- Pests and weeds and forest health: can reduce productivity
- Inventory: to feed into growth estimation, a core step in timing silviculture and formulating the cutting strategy
- Silviculture: to enhance the value of the resource
- Harvesting: achieving a successful harvest in terms of the forest owner’s health and safety, environmental and commercial objectives.

Forest area

The net stocked areas have been measured from a map produced by PF Olsen (Table 11, Figure 2).

Table 11: Rangitaiki Forest Area (ha)

Gross area	Net Stocked Area	Area Awaiting Restocking	Reserves
1,062.0	847.6	18.2	196.2

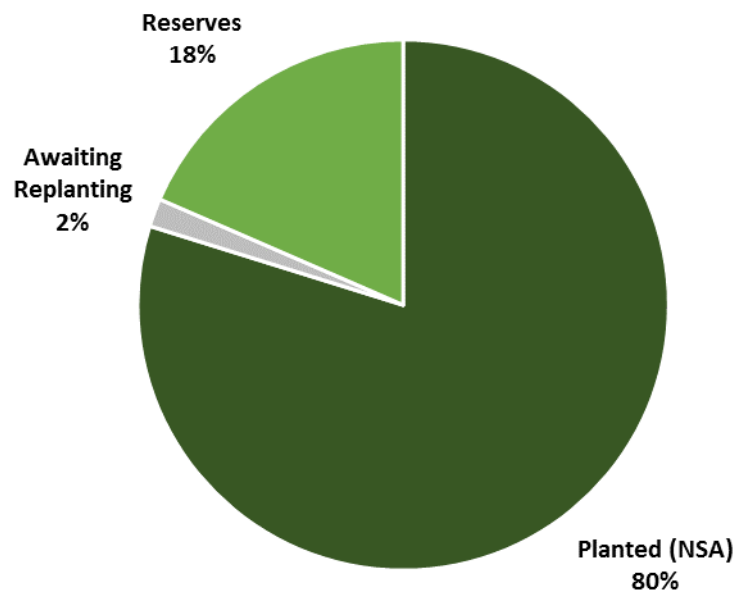


Figure 1: Rangitaiki Forest Area (ha)

Current species

There are a range of species grown in Rangitaiki Forest predominantly Radiata Pine (Table 12). These species have been chosen to best meet the management objectives set out above, given the characteristics of the forest land.

As all forests were purchased as existing planted and often semi-mature stands, the current ownership has inherited the historical decisions of past management. Radiata pine had been selected to best meet the management objectives of the previous owners. Subsequently purchased by the current owners, these forests were acquired because they generally continued to meet the investment criteria of the new owners.

Table 12: Species

Species	Area (ha)
Radiata Pine	828.2
Douglas-fir	9.5
Eucalypts	7.9
Larch	2
Redwoods	1.5
Ovens cypress	0.2

The species mix of Rangitaiki Forest is Figure 3 below.

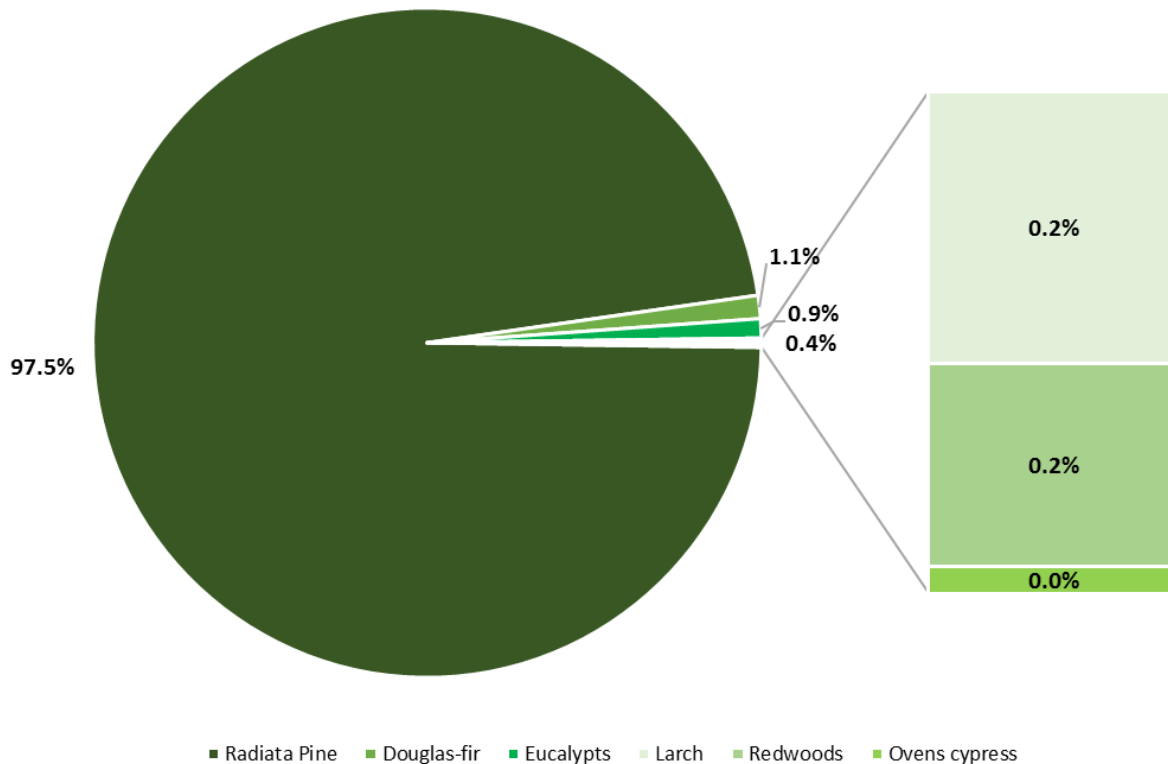


Figure 3: Species composition by area for Rangitaiki Forest

Productivity indices

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 another measure of productivity of a site based on stem volume growth (mean annual increment) of 300 stems per hectare.

The site index for Rangitaiki Forest is between 22.5 – 27.5 m, while the 300 index is 17.5 – 25m³ / ha / year.

Rangitaiki Forest is at the lower end of site productivity in the general area for coniferous forestry sites.

Current crop status

Measurement data from the most recent inventories is summarised to give the current status of the crop. The table can be found in [Appendix 4](#).

10. Commercial Crop Establishment and Silvicultural Operations

Introduction

The choice of species is the most important issue in plantation forestry. The species must 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 and general property maintenance.

Forest management goals

Rangitaiki Forest's owners are committed to ensure that the forest will be managed to:

- Grow trees and produce logs for the manufacturing of different wood products in New Zealand and overseas with a focus on 'fit for purpose' log production;
- Ensure that the productivity of the land does not decline;
- Ensure that environmental values are identified and maintained;
- Ensure that historic sites are identified and protected;
- Ensure that other forest values and products are identified, protected and where possible enhanced;
- Ensure that the forest estate's contribution to carbon cycles is maintained or enhanced;
- Harvest the trees as close as possible to their economic optimum age and achieve the best possible financial returns to the owners;
- Replant following harvesting where agreements require;
- Meet all statutory requirements and comply with forest industry best practice;
- Provide recreational opportunities where practical;
- Act as a good corporate citizen and neighbour; and
- Ensure all forest management practices are consistent with the principles of the Forest Stewardship Council and NZS AS:4708:2014

These goals are further detailed in 'PF Olsen Key Aspects - Objectives, Targets and Monitoring' ([Appendix 5](#)).

Crop species

In Rangitaiki Forest, the main crop species grown *Pinus radiata*.

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 for 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 have resulted in improvements in growth, form and wood characteristics as well as development of a range of finished products, building codes and timber standards.

Pre-establishment considerations

Prior to re-establishment of the tree crop, 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 and what, if any, adjustments in planning may be required. A plantation crop is likely to confer beneficial habitat buffering rather than cause adverse effects.

Unwanted pine spread

Re-establishment programmes will include a spread risk assessment using the Wilding Spread Risk Calculator to inform decisions about replant boundaries and monitoring or other control strategies if required. There is no intention to plant or replant in other species with known high spread risk. The use of the Calculator is also a requirement under the NES-PF, and this will be adhered to.

Re-Establishment

The establishment planned at Rangitaiki Forest during the period of this management plan includes replanting of any harvested areas and the planting of some soil conservation areas in manuka.

Re-establishment will aim to use high quality treestocks suitable for the site and market. These will be investigated at time of establishment.

Tending

The current tending regime implemented in Rangitaiki forest is a pruned log regime for the larger non-shelterbelt stands, consisting of two to three pruning operations and a waste thinning operation. The shelterbelt stands are generally not pruned due to form issues from exposure.

The tending regime of any new stand established during the period of this plan will be considered on a standby stand basis at the time of establishment and reassessed prior to the tending operations falling due.

Tree nutrition

The soils in Rangitaiki Forest 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:

- **Magnesium** – Magnesium deficiency is a particular problem of the Central North Island and is associated with the phenomenon known as mid crown yellowing where the middle of the tree crown turns a yellow colour. Heavily pruned trees and some seedlots are more predisposed to the deficiency than others.
- **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.

Site productivity and tree nutrition are actively researched components of industry research programmes in which PF Olsen is an active stakeholder and all harvesting entities are a financial contributor through the Forest Research Levy Fund.

11. Harvesting Strategy and Operations

Harvesting strategy As a plantation with a non-normalised age-class structure, the harvesting strategy employed at Rangitaiki Forest is to harvest the forest or constituent stands as close as possible to the 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.

Of importance in this assessment is the actual growth of the tree crop, the market for the wood at the time of the harvest and the outlook then and for the near future. These factors, together with logistics such as the availability of suitable harvest contractors and the requirements of resource consents, will determine the actual harvest time.

Planning and preparing for harvest

Forward planning is essential when considering harvesting activities. Harvest planning should ideally commence two years before harvesting to enable roading infrastructure to be developed and any resource consents, archaeological surveys, 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.

Harvest planning is conducted within a detailed structured framework controlled within the PF Olsen FIPS system. Planners are guided through a total of 100 elements involving environmental, cultural, community, infrastructural, and safety issues that must be addressed as well as direct operational and economic considerations, prior to the issuing of final prescriptions.

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

Infrastructure

The roading and other infrastructure work proposed for the areas to be harvested in the first year are detailed in the Annual Cutting Plan.

Forest infrastructure includes roads, tracks, landings, bridges and culverts. Design specifications for these are outlined in the 'PF Olsen Standard Specifications for Road and Landing Construction'.

Typically, infrastructure within an early- to mid-rotation age 'greenfields' forest is limited to access for a 4WD vehicle. During harvest planning, upgrades of existing roads/culverts/bridges and planning for new roads, landings and crossings will be identified and scheduled. The type of infrastructure designed and constructed is influenced by topography, harvest duration and intensity of use.

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Once established, these require maintenance. The PF Olsen Asset Hazard Register is a GIS-linked database of forest assets that includes bridges, culverts and crossings under resource consent. This provides the framework for a record of the asset attributes, and its associated maintenance schedule, some of which are required under consent conditions.

Land hand back

The process for land handback is unique to each individual forest agreement. They can involve quite a few steps and vary from block to block.

Contractor management

Prior to engaging a new contractor, a comprehensive review of the contractor’s safety systems, safety record, systems of work organisation and equipment is carried out. With regard to crew configuration, where topography and terrain allows, mechanised felling, extraction and processing is a mandatory requirement. PF Olsen as the Property Manager must be satisfied on this review, regardless of the tendered price.

Upon appointment all new contractor crews undergo a comprehensive safety and environmental induction, while PF Olsen Ltd, in conjunction with its contractors and NZQA training providers NorthTec, runs a comprehensive programme of training to ensure the workforce is competent for the work they are required to perform. The formal NZQA qualifications are supplemented periodically by internally run training courses including those on environmental matters.

All harvesting, engineering and silviculture contractors are subject to quarterly contractor monitoring audits and random drug testing. A full safety systems audit is scheduled and carried out annually. Full crew re-inductions take place every 5 years.

Weekly crew visits and monthly (or fortnightly according to risk) KPI assessments including environmental audits pick up corrective actions and follow-up on those. WorkSafe undertakes audits on an unannounced basis from time to time.

12. Forest Inventory, Mapping and Forest Records

Inventory

Forest growth and development is monitored through forest inventory. Forest inventories providing stand information are required at different times and for different reasons throughout the life of the rotation:

- Pre-assessment: for silviculture rate setting and validating operational timing vs silvicultural targets;
 - Quality control: to check contractor's performance and update stand records;
 - Mid-crop: to collect measurement inputs for growth modelling;
 - Pre-harvest inventory is scheduled for stands around age 24, to collect measurement data on the crop. This is used for harvest planning, marketing and revenue estimation.
 - New technologies may see some of this information gathered and analysed using remote sensing in the future.
-

Mapping

All mapping of Rangitaiki Forest is in digital format and is constantly updated in a Geographic Information System (GIS) that is linked to FIPS. The GIS system spatially records a vast array of forest data, from stand and legal boundaries, to reserves, rivers, roads, infrastructure, topography and soils.

Accurate mapping also assists budgeting, planning, calculation of future revenue/tree crop value, calculation of payments, infrastructure location, and harvest planning.

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

Forest records

Detailed records of each stand's silvicultural management history, productivity, inventory and other attribute data are compiled and maintained in a stand records database and Geographic Information System (GIS). These records form the basis for informing silvicultural scheduling, harvesting schedules and other management activity.

Non-commercial Estate Management & Protection

13. Protected Forests, Habitats, Ecosystems and Species

Introduction

Indigenous biodiversity management in or associated with exotic forests is a normal component of everyday forest management. Environmental certification systems place obligations upon the forest manager to be aware of and, where required, enact procedures to assist with the maintenance and protection of important biodiversity where they are able.

Exotic forests can and do provide a level of biodiversity, though this is often enhanced by natural forest ecosystem remnants embedded within the plantation matrix. These are often the most important contributor to the total of the productive landscape’s biodiversity. However, rare and threatened species can also be found associated with exotic forests and may require special attention for management.

Protected ecosystems

Rangitaiki Forest contains eleven reserve areas with a total area of 198.7 ha. The forest includes both Significant Natural Areas (SNA) and QEII covenanted areas. The predominant reserve type is a grey scrub cover which consists largely of bracken ferns and small leaved Coprosmas, and dracophyllum, accounting for 96 % of the total reserve area. It is these dracophyllum associations that have been almost entirely depleted within the Kaingaroa ED. There are also two smaller areas of Leptospermum spp. which account for the remaining area. The protected ecosystems are shown on the Forest Stands Map and in the Table 16.

Table 16: Protected ecosystems and reserve areas

Stand	Area (ha)	Protective Status	Protective Function	Forest Type Description	LENZ Remaining (%)	LENZ Protected (%)	Protection Category
RATK – SCRB – 08	54.3	SNA	Terrestrial Ecosystem	Subalpine Mixed	15.3	79.1	Special
RATK – SCRB – 01	22.1	SNA QE II Covenant					
RATK – SCRB – 02	37.3						
RATK – SCRB – 05	6.9						
RATK – SCRB – 04	6.1						
RATK – SCRB – 10	31.0						
RATK – SCRB – 07	9.4	SNA			15.3	79.1	Limited
RATK – SCRB – 03	16.6	SNA – QE II Covenant					
RATK – SCRB – 06	5.7	SNA					
RATK – LEPT – 12	2.7	SNA			Terrestrial Ecosystem	Manuka/Kanuka/Broadleaved Hardwood	15.3
RATK – LEPT – 11	4.1	QE II Covenant					

Additionally, Rangitaiki Station has the following 474.2 ha that are under DOC and QEII National Trust covenants (Table 17):

Table 17: Protected Ecosystems Management Categories

Stand	Area (ha)	Protective Status	Protective Function
RATK-0059-02	4.8	DOC	Erosion Control
RATK-0059-03	1.2	DOC	Erosion Control
RATK-0085-05	13.4	QEII Covenant	Terrestrial Ecosystem
RATK-0088-10	2.1	QEII Covenant	Erosion Control
RATK-0088-12	3.2	QEII Covenant	Riparian Ecosystem
RATK-0089-05	3.2	DOC	Erosion Control
RATK-0097-20	7	QEII Covenant	Terrestrial Ecosystem
RATK-0097-21	1.1	QEII Covenant	Terrestrial Ecosystem
RATK-0700-RS01	1.4	QEII Covenant	Erosion Control
RATK-0702-RS01	0.7	QEII Covenant	Erosion Control
RATK-0706-RS01	3.1	DOC	Erosion Control
RATK-0999-RS12	287.1	DOC	Terrestrial Ecosystem
RATK-0999-RS13	101.5	DOC	Erosion Control
RATK-0999-RS15	4.9	QEII Covenant	Riparian Ecosystem

All protected ecosystems are recorded and ranked on the basis of ecological criteria reflecting the stands representativeness, rarity of species, size and connectivity, function and landscape values. Relative value in terms of the ‘ecological landscape’ (Section 4) also informs that process.

Actions are prioritised according to the ‘Protection Category’ status allocated to the areas from the assessments and classifications undertaken (Table 18). The management implications pertinent to each status are summarised in the table below. Prioritisation of work effort will also be based on the principle of ensuring successful and maintainable outcomes at limited scales as a priority over wide scale but marginally beneficial outcomes.

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Table 18: Protected Ecosystems Management Categories

Protection Category	Primary Management Objective	Activity Level	Monitoring
Passive	<ul style="list-style-type: none"> Minimise non-essential damage maintain area 	<ul style="list-style-type: none"> Fire protection 	<ul style="list-style-type: none"> Area- with adjacent stand assessments
	<ul style="list-style-type: none"> Observe RPMS obligations 	<ul style="list-style-type: none"> 3rd party arrangements re: pests Apply RPMS 	<ul style="list-style-type: none"> Pests- to meet RPMS General forest health survey
	<ul style="list-style-type: none"> Protect from non-essential damage Maintain area Maintain function (where practical) 	<ul style="list-style-type: none"> Fire protection 	<ul style="list-style-type: none"> Sample forest condition monitoring
Limited	<ul style="list-style-type: none"> Observe RPMS obligations 	<ul style="list-style-type: none"> 3rd party arrangements re: pests, Apply RPMS Associated maintenance pest control 	<ul style="list-style-type: none"> Low level pest monitoring where relevant Sample related fauna if relevant
	<ul style="list-style-type: none"> Protect from all controllable damage Maintain area and function 	<ul style="list-style-type: none"> Fire protection 	<ul style="list-style-type: none"> Area monitoring
Full	<ul style="list-style-type: none"> Improve quality 	<ul style="list-style-type: none"> Specific management 	<ul style="list-style-type: none"> Forest condition monitoring
	<ul style="list-style-type: none"> Observe RPMS obligations 	<ul style="list-style-type: none"> Targeted pest control 3rd party arrangements re: pests. 	<ul style="list-style-type: none"> Pest monitoring where relevant Related fauna monitoring if relevant
	<ul style="list-style-type: none"> Restoration if practical 	As above, plus: <ul style="list-style-type: none"> Fencing Covenanted Co-management agreements Funding where practical 	As above, plus <ul style="list-style-type: none"> As defined in any restoration agreement

Table 19 details the areas in each protection category within Rangitaiki Forest, categorised by protective function.

Table 19: Protected ecosystems management categories by function and area

Protective Function	Protective Category		
	Full	Limited	Special
Erosion Control			
Landscape / Amenity			
Non-specific			
Rare Species			
Riparian Ecosystem			
Terrestrial Ecosystem	44.0	38.5	113.7
Wetland Ecosystem			
Total Area (ha)	44.0	38.5	113.7

Management and riparian setbacks

A standardised GIS-based stream classification system based on NIWA’s River Environment Classification (REC) has been used to develop a rationale for defining riparian management with a set of rules in the EMS that apply to operations occurring near the riparian corresponding with each stream category. Categorisation of each stream reach is done by the physical characteristics of the particular reach, e.g. underlying geology, streambed slope, climate, and reach order.

It also provides the minimum setbacks upon establishment or reestablishment of forest after harvest where riparian setbacks had not existed before. The morphology of streams can mean that the minimum set back is wider in many instances.

The stream categories within Rangitaiki Forest are summarised in Table 20. The total length of waterways within the forest is 158.93 kilometres.

Table 20: Length of stream by REC class

REC Class	Length (km)
<i>Large, Low, Wet, Hard</i>	20.55
<i>Medium, Low, Wet, Hard</i>	105.08
<i>Medium, Low, Wet, Soft</i>	0.43
<i>Small, Low, Wet, Hard</i>	32.34
<i>Small, Low, Wet, Soft</i>	0.53
Total Length	158.93

Rare and threatened species

Records of sightings and locations were originally collected and reported in FIPS, but an app call iNaturalist is now used. Over time these databases have enabled the build-up of a spatial distribution picture of species within different geographical locations. These records are made available to conservation authorities.

A listing of key species of interest is held by all contractors and staff, along with the login details for [iNaturalist](#).

A list of rare or threatened species have been reported for Rangitaiki Forest can be found [in Appendix 6](#).

Fish

PF Olsen uses the Freshwater Environments of New Zealand (FWENZ) models to inform the potential for threatened fish species that may be present in streams affected by operations and if necessary, any response to such a presence. The Fish Spawning Indicator published by NIWA to accompany the NES-PF is also used, particularly for works over/in stream beds.

Primary management actions in relation to fish, in addition to those already covered under water quality are:

- Development and maintenance of a register of crossings and an inspection routine to ensure fish passage,
 - Sound design and construction of all new stream crossings,
 - Timing of in bed crossing construction to avoid peak spawning period,
 - Minimising damage to streamside environments and provision of setbacks where they were not originally present,
 - Identification of, and avoidance and/or buffering of waterbodies during aerial spraying for replanting and *Dothistroma* control or aerial fertilisation if ever required,
 - Protection of any wetlands identified within the plantation matrix.
-

Avifauna

While the local lists of threatened bird species are much more extensive, most of those species' habitats are shore, sea, estuarine and river bed focussed. Of the forest birds, many of the more common species listed can be expected to be regularly within or transient through the plantation forest.

Primary management actions in relation to avifauna are:

- Adherence to industry protocols developed for management of NZ falcon kiwi, bats and shortly, lizards.
 - Inclusion of threatened species sightings into the PF Olsen sightings database, and subsequently into the NZ Forest Owners iNaturalist – Biodiversity in Plantations Project⁵,
 - Minimising damage to natural forest areas and any small wetlands and scrublands during harvest and reforestation, particularly any gully systems that already form natural corridors through the larger plantation areas,
 - Promotion of the development of improved riparian corridors after harvest,
 - Co-operation with neighbouring landowners undertaking vertebrate pest control within the wider area.
-

⁵ <https://www.inaturalist.org/projects/biodiversity-in-plantations>

CITES species

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments.

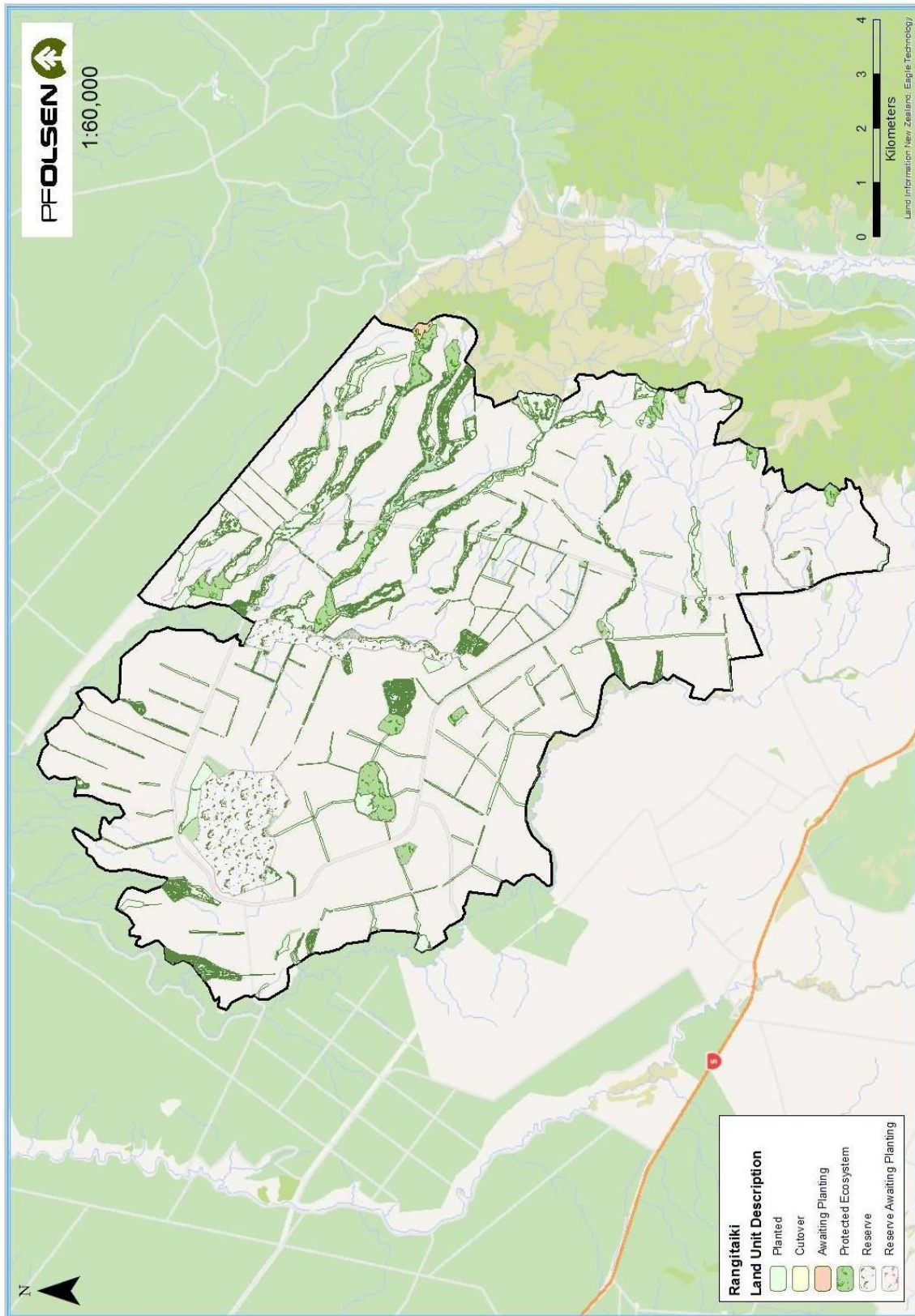
Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild, and it accords varying degrees of protection to more than 34,000 species of animals and plants.

The full list of New Zealand CITES listed species are available on the [Department of Conservation's website](#).

**High
Conservation
Value Forests**

To date, no High Conservation Value Forests have been identified.

Map 4 - Forest Stands Map



14. Property Management and Protection

Statutory pest obligations

Pest management within Rangitaiki Forest is subject to statutory obligations under the Regional Pest Management Strategy administered by the Bay of Plenty Regional Council.

The strategy applies to both pest plants and animals and categorises them, in terms of management objectives. The categories, objectives and landowner obligations are summarised the Regional Pest Management Plan. These plans are [maintained online](#) by the relevant Regional Council.

Plant Pests

The overall objective in managing plant and animal pests is to:

- Meet statutory obligations under the Regional Pest Management Strategy,
- Reduce their direct impacts on both plantations and indigenous biodiversity values,
- Ensure that any impacts on neighbouring properties are promptly dealt with,
- Monitor the abundance and distribution of these species within Rangitaiki Forest.

The major plant species potentially threatening production values within the forest can be seen in [Appendix 7](#).

Pest control

The main animal pest in Rangitaiki Forest are the introduced possum, rabbits and hares. Deer and pigs are also present.

Possums attack the growing tips of both plantation and native trees, causing stem malformation and die back. Possums are also a threat to neighbouring property owners who are farmers as they can carry and spread tuberculosis to domestic stock.

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.

Animal pests in Rangitaiki Forest 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 within the forest area and on neighbouring land, where required.

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Diseases, which can affect the forest trees and adjacent native vegetation, are monitored throughout the year by the forest manager, 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 also be controlled through silviculture by timely thinning and pruning operations, which increases air movement and lowers humidity levels.

Depending on the results of the annual infection inspections there may be a need for *Dothistroma* control to take place in Rangitaiki Forest.

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 increases, access to adequate water sources, and selective forest grazing to reduce fuel within stands.
 3. Effective detection systems 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.
-

Fire authority responsibilities

The legal responsibility for fighting forest fires and the development of fire plans lies with Fire and Emergency New Zealand (FENZ) created under the Fire and Emergency Act (2017). Rangitaiki Forest now comes under the [Ngā Tai Ki Te Puku FENZ Region](#) which covers the Waikato, Bay of Plenty, Rotorua and Gisborne regions. PF Olsen remains engaged with FENZ over fire and emergency matters relevant to the forest industry. There is a close liaison with FENZ in terms of developing the 'fire plans' and the maintenance of good communication relative to potential risks and fire danger ratings.

**Public liability
insurance**

Not Publicly Available

Fire insurance

Not Publicly Available

Other Benefits from the Forest

15. Recreation, Forest Products and Other Special Values

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.

Recreational usage

Rangitaiki Forest receives periodic recreational demand from farm staff and some community members. Current recreational activities are as follows:

- Hunting for deer and pigs
- Rabbit and hare shooting

Hunting return information from 2014 showed that 30 pigs and 7 deer were taken from the forest.

The forest will continue to be open for legitimate use subject to entry by permit. A sign-in system is utilised to ensure hazards are notified and accepted.

Non-timber forest products

There are no non-timber products for certified, commercial production currently being produced or developed in Rangitaiki Forest.

Other special values

The following special values have also been identified in Rangitaiki Forest:

- Hunting
 - Possum fur
-

Public access roads

There are no public tracks and trails near or within the forest as the forest is located on privately owned farmland. All signage of roads and tracks must be followed and those using the routes will still require a permit if there is any intention to access the forest from the road routes.

These public road locations are publicly viewable in the Walking Access Commission website⁶. Any users are expected to abide by the Outdoor access code⁷ published by the Walking Access Commission.

⁶ https://www.wams.org.nz/wams_desktop/index.html

⁷ <http://www.walkingaccess.govt.nz/walkways-and-access/outdoor-access-code>

16. 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 webpage.

Values monitored

Management inspections are undertaken regularly. The forest monitoring framework that would generally be applied to Rangitaiki Forest is shown below. The monitoring may not include all of these elements.

Table 20: Environmental process monitoring framework

Monitored Element	Components	Data Source	Data Medium	Reporting / Website Frequency
Chemical Usage	- A.I Usage - Area Overuse	- Operational Supervisors	- FIPS - <u>Form</u>	- On Demand - Annual
Client Satisfaction	- Post-operation client survey	- Clients	- Survey Form	- Post-operational - Annual
Consultation Activity	- Complaints - Other Interactions	- Operational Supervisors - Planners	- FIPS - <u>Form</u> - <u>Meeting Minutes</u>	- Annual - Annual
Environmental Incidents	- Incident Number - Categories	- Operational Supervisors	- FIPS - <u>Form</u>	- On Demand - Annual
Environmental Goals	- All	- Environmental Management Group	- Meeting Minutes	- Annual
Environmental Training	- Courses - Numbers - Names	- Staff	- FIPS - NZQA	- Annual - Individual
Flora & Fauna	- Species & Status - Frequencies - New Finds	- Operational Supervisors - Public - Crews	- FIPS - <u>Form</u> - <u>Naturewatch</u>	- On Demand - 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

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Monitored Element	Components	Data Source	Data Medium	Reporting / Website Frequency
Forest Growth	- PSP Protocols - Periodic Inventory - ISO 9001	- Contractors	- Volume Reconciliations - Estate model	- Periodic-annual - Not on web
Forest Health	- Disease & health	- NFH Surveillance Program ⁸	- Document	- Periodic-Annual - Not on web
FSC Membership	- Block - Location - Name	- Certifying Body	- Certificate	- On Demand - Annual
Health & Safety Statistics	- LTI / MTI / TIFR - Accidents & Incidents - Initiatives	- Operational Supervisors	- Assura	- Monthly - Annual
High Conservation Value Forests	- Condition Trends - Photopoint Monitoring	- Contractors - Supervisors	- Spreadsheet	- Annual
Internal Audit CAR Activity	- Frequency * - Category	- Auditors(ees) - Operational Supervisors	- Assura	- Annual
Log Production	- Total Logs - FSC Certification	- Log dockets at harvest	- Woodtrack	- On Demand - Annual
Operational Monitoring	- Audit Trends - Cause Analysis	- Operational Supervisors	- FIPS - <u>Form</u>	- Monthly - Annual
Pests	- RTC / RTI - Kill Returns - Other	- Contractors - Supervisors - Permitees	- FIPS - Various	- Annual - Where Relevant
Protected Ecosystem Condition	- Condition Trends - Photopoint Monitoring	- Contractors - Supervisors	- Spreadsheet	- Bi-annual if restoration initiated
Recreational & Non-Timber	- Permits Issued	- Branch Offices - Forest Security	- FIPS	- Annual
Resource Consents	- Number - Compliance	- Operational Planners	- FIPS	- Monthly - Annual
Social Survey	- Demographics, - Values - Work Conditions	- Contractors	- Survey form	- 3 yearly
Stream Monitoring	- Clarity +/- other specific - Full NOF	- Supervisors - Contractors - BOPRC	- Various	- Operational - BOPRC S.o.E.

⁸ Forest health inspections are undertaken annually, by an independent specialist forest health assessor, through the NZ Forest Owners Association forest health scheme.

Other monitoring 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.

Other operational standards are monitored through a variety of concurrent and post operational assessment procedures that cover all critical aspects of the business of the forest. This information which includes log manufacturing quality performance, safety performance, financial and budget performance as well as stakeholder feedback and client satisfaction surveys and other private or commercially sensitive is not made public.

17. Future Planning

Introduction

This plan pertains to the management of Rangitaiki Forest 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, will require a full review of this plan. The next review date for this plan is June 2024.

Deviations from this plan will be justified on the basis that the changes do not adversely affect the environment and are necessary or beneficial to achieving the management goals and objectives.

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

Operation plans

Short term tactical planning is accomplished through development of annual operations plans in conjunction with detailed budgeting. These plans are prepared in accordance with this Management Plan. Harvesting operations are also planned on a block by block basis because of the level of detail required.

This operation plan and associated budget are subject to approval by Landcorp Farming Ltd at the beginning of each financial year.

Stakeholder consultation

Consultation with key stakeholders has been enabled as part of the development of this plan which will be publicly available on the PF Olsen Certification website. Feedback from stakeholders (and others as they become apparent) is monitored, including actions undertaken to resolve disputes and issues and may inform changes in operational practice or future plan reviews.

18. Register of Plan Change and Review

Introduction

This plan pertains to the management of Rangitaiki Forest and will be reviewed on an annual basis. This section documents specific changes made during each review.

Date	Section / Page	Change
Mar 23	HCV & monitoring	Update information

Appendix 1 – Neighbour Location Map

Appendix 2 – Contact details for Regional and District Councils with jurisdiction over Rangitaiki Forest

Entity	Phone	Email	Website
Bay of Plenty Regional Council	0800 884 800	info@boprc.govt.nz	https://www.boprc.govt.nz/
Taupo District Council	07 376 0899	info@taupo.govt.nz	https://www.taupodc.govt.nz/

Appendix 3 - Other Relevant Legislation

Commercially Relevant Statutes & Regulations

- Accident Compensation Act 2001 #49
- Animal Welfare Act 1999
- Biosecurity Act 1993
- Climate Change Response Act 2002
- Conservation Act 1987
- Crown Forest Assets Act 1989
- Fencing Act 1978.
- Fire and Emergency New Zealand Act 2017
- Forestry Rights Registrations Act 1983
- Forests Act 1949
- Forest and Rural Fires Act 1977.
- Forests Amendment Act 1993.
- Freshwater Fisheries Regulations 1983
- Hazardous Substances and New Organisms Act 1996
- Health and Safety at Work Act 2015
- Heritage New Zealand Pouhere Taonga Act 2014
- Noxious Plants Act 1978.
- Pesticides Act 1979.
- Protected Objects Act 1975
- Reserves Act 1977
- Resource Management Act 1991 regulations
- Soil Conservation and Rivers Control Act 1941
- The Treaty of Waitangi Act 1975

- Trespass Act 1980
- Wildlife Act 1953

Relevant regulations to the above legislation also apply as well as various industry Accords, Codes of Practice as listed below:

- New Zealand Forest Accord
 - Principles of Commercial Plantation Forest Management
 - New Zealand Environmental Forestry Code of Practice
 - New Zealand Code of Practice for the Management of Agrichemical
 - Climate Change Accord
 - NZ Log Transport Safety Accord
 - Eliminating Illegal Forest Products in New Zealand
 - MoU Federated Farmers and Forest Owners Association and Farm Forestry Association
 - New Zealand Forest Road Engineering Manual
 - Forest Practice Guides
-

Appendix 4 – Crop Status

Stand	Year Planted	NSA (ha)	Tot. Stocking (sph)	BA (m ² /ha)	MTH (m)	Mean DBH (cm)	Pruned Stocking (sph)	Pruned Height (m)
RATK – 0006 – 02	2007	16.5	493	16.9	13.7	20.9	493	-
RATK – 0012 – 02	2010	0.8	708	5.8	8.2	14.9	333	3.7
RATK – 0012 – 03	2010	1.5	817	7.1	8.4	15.4	383	3.7
RATK – 0017 – 02	2002	0.6	840	13.8	11.9	20.9	402	5.8
RATK – 0018 – 02	2002	0.5	906	15.4	12.7	21.1	438	5.8
RATK – 0051 – 02	2008	3.0	475	14.5	11.8	19.7	475	-
RATK – 0059 – 02	2001	1.3	658	15.3	12.3	22.0	400	6.0
RATK – 0059 – 03	2001	1.2	483	8.5	9.7	19.8	275	5.4
RATK – 0068 – 02	2010	0.9	717	5.0	7.4	14.2	317	3.4
RATK – 0084 – 03	2006	17.1	506	17.2	14.6	20.8	506	-
RATK – 0085 – 05	2005	13.5	504	12.5	13.5	17.7	504	-
RATK – 0085 – 06	2010	4.8	689	7.6	8.8	16.9	333	3.6
RATK – 0086 – 02	2001	17.3	926	9.6	12.2	17.5	398	5.8
RATK – 0086 – 03	2003	0.1	400	12.7	13.6	20.1	400	-
RATK – 0086 – 04	2003	0.5	500	16.7	16.1	24.1	367	-
RATK – 0086 – 05	2005	2.9	558	10.8	12.2	15.7	558	-
RATK – 0086 – 06	2010	5.3	892	7.1	9.0	14.6	425	3.8
RATK – 0088 – 08	2006	8.6	511	19.8	15.0	22.2	511	-
RATK – 0088 – 09	2009	1.2	733	5.7	7.8	15.5	300	-
RATK – 0088 – 10	2009	2.1	883	5.1	8.4	14.0	333	4.1
RATK – 0088 – 11	2010	1.7	808	7.8	9.3	17.9	308	3.8
RATK – 0089 – 05	1983	0.0	728	60.8	28.3	32.6	728	-
RATK – 0089 – 08	2006	20.9	470	16.2	13.0	21.1	470	-
RATK – 0089 – 09	2009	0.4	867	5.5	8.3	13.9	367	3.7
RATK – 0090 – 03	2001	0.8	800	15.0	10.6	21.8	400	6.6
RATK – 0090 – 04	2007	6.4	511	16.5	15.4	20.2	511	-
RATK – 0090 – 05	2005	22.3	487	14.4	12.4	19.5	487	-
RATK – 0092 – 04	2009	3.9	417	12.1	10.3	19.2	417	-
RATK – 0093 – 02	2003	1.8	483	18.3	14.7	22.0	483	-
RATK – 0093 – 03	2009	5.8	544	14.3	10.4	18.4	544	-
RATK – 0095 – 03	2006	6.5	483	15.8	12.4	21.2	450	-
RATK – 0095 – 04	2010	2.7	744	9.0	9.6	18.2	344	3.9
RATK – 0096 – 06	2005	10.0	489	17.0	12.7	21.2	483	-

Stand	Year Planted	NSA (ha)	Tot. Stocking (sph)	BA (m ² /ha)	MTH (m)	Mean DBH (cm)	Pruned Stocking (sph)	Pruned Height (m)
RATK – 0096 – 07	2008	6.5	517	18.8	13.5	21.5	517	-
RATK – 0096 – 08	2007	3.4	492	14.5	13.9	19.4	492	-
RATK – 0097 – 11	1998	7.4	385	30.2	20.3	31.6	385	-
RATK – 0097 – 12	2001	27.6	694	8.4	10.7	18.2	320	5.5
RATK – 0097 – 13	2005	1.0	-	-	8.7	14.4	-	4.0
RATK – 0097 – 14	2005	3.5	525	11.6	12.1	16.8	525	-
RATK – 0097 - 15	2007	1.1	433	13.4	12.1	19.9	433	-
RATK – 0097 – 16	2009	6.2	711	6.7	8.3	16.0	333	3.9
RATK – 0097 – 17	2009	10.8	746	6.9	9.1	15.5	363	3.9
RATK – 0097 – 18	2009	5.3	517	17.2	13.1	20.6	517	-
RATK – 0097 – 20	2009	7.0	821	7.5	10.3	16.8	338	4.1
RATK – 0097 – 21	2009	1.1	783	9.4	13.5	18.9	333	6.3
RATK – 0097 – 22	2010	1.7	733	6.5	8.2	16.1	317	3.5
RATK – 0098 – 03	2010	4.2	783	7.6	8.7	16.5	356	3.6
RATK – 0102 – 02	2001	1.2	917	10.7	9.8	16.4	508	5.2
RATK – 0109 – 06	2000	2.5	266	5.4	11.8	16.0	266	5.5
RATK – 0109 – 07	2000	1.4	234	5.2	-	16.9	234	5.1
RATK – 0121 – 02	2009	0.5	633	4.0	8.7	12.4	333	3.8
RATK – 0121 – 03	2009	0.2	950	5.8	9.2	13.5	400	3.7
RATK – 0123 – 02	2006	1.2	433	12.0	10.7	18.8	433	-
RATK – 0136 – 03	2001	13.6	1017	8.5	10.8	17.3	357	5.8
RATK – 0136 – 04	2010	0.6	800	5.8	8.3	15.7	300	3.6
RATK – 0137 – 05	2001	11.9	797	8.5	11.0	19.2	297	5.5
RATK – 0137 – 06	2009	6.2	483	13.4	11.4	18.8	483	-
RATK – 0137 – 07	2009	2.6	500	14.5	12.0	19.2	500	-
RATK – 0137 – 09	2009	1.1	800	7.6	9.0	15.6	400	4.0
RATK – 0138 – 05	2001	5.4	756	8.1	10.6	17.1	356	5.8
RATK – 0138 – 07	2009	3.0	758	5.2	7.9	13.9	342	3.7
RATK – 0138 – 08	2009	0.3	733	4.6	7.8	13.2	333	3.6
RATK – 0140 – 03	2006	1.1	417	20.0	15.8	24.7	417	-
RATK – 0140 – 04	2009	1.6	717	3.4	7.0	11.9	308	3.2
RATK – 0140 – 05	2010	0.4	750	5.7	7.7	15.6	300	3.5
RATK – 0140 – 06	2010	1.1	767	6.5	7.7	16.2	317	3.4
RATK – 0140 – 07	2009	2.0	833	5.9	7.7	14.0	383	3.6
RATK – 0141 – 03	2009	5.7	556	17.0	12.8	19.8	556	-
RATK – 0147 – 02	2006	1.3	300	7.4	13.0	17.7	300	-

Stand	Year Planted	NSA (ha)	Tot. Stocking (sph)	BA (m ² /ha)	MTH (m)	Mean DBH (cm)	Pruned Stocking (sph)	Pruned Height (m)
RATK – 0147 – 03	2004	0.6	300	12.8	16.7	23.3	300	-
RATK – 0149 – 07	2005	4.8	533	10.9	10.6	16.4	517	-
RATK – 0149 -08	2009	1.9	575	3.8	8.1	13.2	275	3.5
RATK – 0152 – 03	2001	5.1	808	7.0	9.3	19.8	217	5.0
RATK – 0154 – 02	2000	0.6	222	4.8	-	16.6	222	6.4
RATK – 0154 – 03	2000	0.2	620	12.8	12.1	16.2	620	-
RATK – 0155 – 02	1999	0.8	186	3.6	-	15.6	186	5.7
RATK – 0156 – 06	2001	3.3	1066	19.4	16.5	23.6	446	5.9
RATK – 0156 – 07	2009	14.0	500	11.7	11.7	17.3	500	-
RATK – 0159 – 02	2006	5.2	483	14.2	12.6	19.4	483	-
RATK – 0161 – 02	2001	0.7	240	7.0	-	19.3	240	5.7
RATK – 0161 – 03	2002	10.5	773	9.4	10.2	20.0	300	5.7
RATK – 0161 – 04	2007	10.9	508	17.8	11.2	21.1	508	-
RATK – 0170 – 03	2000	0.7	917	12.5	12.5	19.3	425	5.8
RATK – 0170 – 04	2000	1.6	201	4.3	10.8	16.5	201	5.4
RATK – 0191 – 02	2006	8.6	525	16.1	9.8	19.8	525	-
RATK – 0199 – 02	2009	0.2	667	5.9	7.3	15.1	333	3.5
RATK – 0199 – 03	2009	2.2	461	9.7	10.5	16.4	461	-
RATK – 0206 – 02	2009	2.1	583	5.9	7.0	14.9	333	3.3
RATK – 0206 – 03	2009	2.1	492	10.7	10.5	16.6	492	-
RATK – 0211 – 02	2010	0.5	350	5.1	8.9	17.7	206	3.8
RATK – 0245 – 03	2003	15.3	576	6.7	10.4	16.8	298	5.8
RATK – 0260 – 02	2007	0.3	417	6.5	9.0	170.0	283	4.6
RATK – 0283 – 01	2000	22.8	797	8.6	10.3	17.3	376	5.5

Appendix 5 – PF Olsen Significant Aspects: Objectives, Targets and Monitoring

PF Olsen Significant Aspects - Objectives, Targets and Monitoring																	
(within the organisational context)																	
Economic					Legal			Social & Cultural			Health & Safety			Environment			
Objectives																	
Commercial viability Valuable forest asset Sustainable resource supply Sustainable work					Compliance with the letter Compliance with the intent			Retain our Licence to Operate Respect for our stakeholders, & rights of indigenous people Good employer Accountable in the community			Home safe every day Drug and alcohol free work Culture of care Safest forestry company			Protect biodiversity Protect water Minimise erosion Responsible chemical use			
Targets																	
<ul style="list-style-type: none"> Appropriate R.O.L Maintain and enhance value Log grade outturn value maximised Sustained product flows and employment Appropriate land use 					<ul style="list-style-type: none"> Zero non-compliance <ul style="list-style-type: none"> RMA Heritage New Zealand Act Worksafe Financial Employment Professional & transparent Valid & fair contracts — all staff and contractors Taxes / payment, and royalties paid 			<ul style="list-style-type: none"> External complaints < 3% of incidents Zero unauthorised damage to cultural sites Customer rankings rising Recognition of transparency and respect in dealings with Tangata Whenua Workforce trained and engaged Communication to community Contractor / staff training 			<ul style="list-style-type: none"> Crew visit increase, year on year LTIFR = 3, TIFR = 7 Drug free, D&A testing 100% 100% Safetree sign-up Safe Start-up HPI > 90% close-out by due date 100% inducted 			<ul style="list-style-type: none"> Crew performances > 91—92 % Non Compliance = 0, Marginality <1% Skid check / Post op tail <5% Zero unauthorised damage to cultural /archaeological sites Zero unauthorised damage to key terrestrial ecosystems Rare Fauna BPG's applied Setbacks on all streams Chemical A.I usage Protect enhance key ecosystems (where applicable) Carbon sequestration 100 % inducted 			
Factor			Frequency		Mode	Factor			Frequency		Mode	Factor			Frequency		Mode
R.O.L against investment model			Annual		Woodstock	Regulatory Authority / Worksafe inspections			Monthly		Noggin incidents	Environmental incidents			Ad hoc		Noggin
Estate valuation			Annual		Financial	Resource consents			Monthly / Annual		FIPS	Consultation: Pre-certification & post-operation			As required		FIPS / Meetings
Product flows			Annual		Woodtrack	Archaeological Post-Op AEE's			Monthly		Noggin incidents	Customer survey			Annual		Form
Plantation area / species / reserve trends			5 yearly		FIPS report / GIS	Enforcement Actions			Ad hoc		Noggin incidents	Complaints — meeting minutes			Ad hoc		Noggin + Notes
Log quality audits			Continually		Noggin	Incidents—all forms			Continually		Noggin incidents	Social survey			3 yearly		Form
Client reporting			Monthly		Written	Master contracts			Continually		FIPS	Staff survey			Annual		Survey Monkey
Independent accounting audit			Annual		Written	Accounts			Continually		FIPS	NorthTec gap analysis, NZQA & other training			Annual		Cloud database
Forest growth — PSP's, periodic inventory, ISO-9001			Periodic / Annual		FIPS	Formal reporting						1 full day / year environmental advocate training, including cultural awareness			Annual		FIPS training
Forest health			Periodic / Annual		NFH surveillance program	• Manager / Client			Monthly		Written	Formal reporting SMT			Quarterly		Power Point
TQM — CAR system			Continually		Noggin	• SMT			Quarterly		Written	Recreational Permits			Annual		FIPS
ISO internal audits (sample)			Annual		Noggin	• Board			Annual		Power Point	TQM — CAR system			Continually		Noggin
						• Company meeting			Annual		Power Point	ISO internal audits (sample)			Annual		Noggin
						Independent accounting audit			Annual		Written	Induction Records			As required + 5 yearly		FIPS
						TQM — CAR system			Continually		Noggin	TQM — CAR system			Continually		Noggin
						ISO internal audits (sample)			Annual		Noggin	ISO internal audits (sample)			Annual		Noggin
												Operational Environmental Audits			Monthly		FIPS
												Skid checks			Quarterly		FIPS
												Environmental Incident Management			Ad hoc		Noggin
												Rare Species Sightings Database			Ad hoc		FIPS / NatureWatch
												Harvest Planning Checklist			Ad hoc		FIPS
												Chemical A.I. Tracking & Weed Matching: review & research			Annual		FIPS
												Vegetation / Photopoint monitoring (where applicable)			Annual, Tri-Annual		Document
												Water quality			Various		Operational / BOPRC
												Regional Branch Compliance			Tri-Annual		FIPS + written
												Carbon Sequestration			5 yearly		Estate model
												EMG Meeting			Annual		Written
												Formal Reporting					
												• Manager / Client			Quarterly		Written
												• SMT			Quarterly		Power Point
												• Board			Quarterly		Written
												• Company Meeting			Annual		Power Point
												Induction Records			As required + 5 yearly		FIPS
												TQM — CAR system			Continually		Noggin
												ISO internal audits (sample)			Annual		Noggin

TQM & Roving Quality Managers

Executive Management Team

Appendix 6 – Reported Species

NZ Threat Classification System Category	Species	No Sightings
Nationally Critical	Long-tailed bat	2
Nationally Vulnerable	Kanuka / Makahikatoa	1
	Turner's Kohuhu	2
Range Restricted	Moss	1
Declining	Lesser Short-tailed Bat - Central	2
	Manuka	1
	Matata / Fernbird	2
	New Zealand Pipit	2
	Sand Coprosma	1
	Speckled Skink	1
Not Threatened	Alpine Clubmoss	1
	Androstoma empetrifolium	1
	Australasian Harrier / Kahu	2
	Bellbird / Korimako	2
	Bidibid / Piripiri	1
	Broadleaf	1
	Bush Lawyer / Tataramoa	1
	Bush Snowberry	1
	Cabbage Tree / Ti Kouka	1
	Chaerophyllum ramosum	1
	Climbing Clubmoss / Waewaekoukou	1
	Common Mountain Daisy / Pekapeka	1
	Coprosma dumosa	1
	Coprosma tenuifolia	1

NZ Threat Classification System Category	Species	No Sightings
Not Threatened	Creek Fern / Kiwikiwi	1
	Creeping Pohuehue	1
	Crown Fern / Piupiu	1
	Dainty Brittle Grass	1
	Fantail	2
	Five-finger	1
	Frost Flat Hook Grass	1
	Geranium potentilloides	1
	Haumakoroa	1
	Holy grass / Karetu	1
	Houhere / Lacebark	1
	Hypolepis ambigua	1
	Kaikomako	1
	Karamu	1
	Kereru / NZ Wood Pigeon	2
	Kohuhu / Black Matipo	1
	Koromiko	1
	koropuka	1
	Kotukutuku / Tree Fuchsia	1
	Kowaowao / Hounds Tongue	1
	Lace Fern	1
	Lancewood / Horoeka	1
	Large-leaved Muehlenbeckia / Pohuehue	1
Leatherleaf Fern	1	
Lichen - Cladia retipora	1	

NZ Threat Classification System Category	Species	No Sightings
Not Threatened	Little Hard Fern	1
	Matai	1
	Mingimingi	1
	Miro	1
	Monoao	1
	Mountain Horopito	1
	Mountain Oat Grass	1
	Mountain or Hall's Totara	1
	Mountain Wineberry	1
	Narrow-leaved Mahoe / Mahoe-wao	1
	Narrow-leaved Maire	1
	New Zealand Jasmine	1
	North Island Eyebright	1
	Northern Grass Skink	1
	Palm Leaf Fern / Kiokio	1
	Pate / Seven-finger	1
	Patotara / Dwarf Mingimingi	1
	Peka-a-waka / Bamboo Orchid	1
	Perching Lily / Kaiwharawhara	1
	Pokaka	1
	Prickly Mingimingi	1
	Prickly Shield Fern	1
	Puawananga / White Clematis	1
Putaputaweta / Marbleleaf	1	
Rimu	1	

NZ Threat Classification System Category	Species	No Sightings
Not Threatened	Rough Tree Fern / Wheki	1
	Silver Tussock	1
	Silvereye	2
	Square Sedge	1
	Stinkwood / Hupiro	1
	Tall Mingimingi	1
	Tangle Fern	1
	Tawheowheo / Quintinia	1
	Tui	2
	Twiggy Tree Daisy	1
	Waxweed	1
	Wheki-ponga / Golden Tree Fern	1
	White Maire	1
	Wineberry / Makomako	1
Unknown	Euchiton species	1
	Hybrid - <i>C. robusta</i> & <i>C. propinqua</i>	1
	Lichen species	1
	Unknown bat species	1
Exotic Plantation Species	Douglas-fir	1
	Lodgepole Pine	1
	Radiata Pine	1
Introduced and Naturalised	Australian Magpie	2
	Blackbird	2
	Broad-leaved Dock	1
	Browntop	1

NZ Threat Classification System Category	Species	No Sightings
Introduced and Naturalised	Catsear	1
	Cocksfoot	1
	Common Pheasant	2
	Eurasian Skylark	1
	Hawkweed species	1
	Himalayan Honeysuckle	1
	Kentucky Bluegrass	1
	Mouse-ear Hawkweed	1
	Scotch Thistle	1
	Sheep's sorrel	1
	Song Thrust	2
	Sweet Vernal	1
	Wall Lettuce	1
	White clover	1
	Wild Broom	1
Yorkshire Fog	1	
Total		130

Appendix 7 – Bay of Plenty Regional Pest Management

Agency Pests

Pests of national significance that are managed by or subject to programmes co-ordinated by the Crown.

Pest Name	Type
Cape Tulip	Plant
Didymo	Plant
Hydrilla	Plant
Johnson Grass	Plant
Manchurian Wild Rice	Plant
Phragmites	Plant
Pyp Grass	Plant
PTA	Disease
Salvinia	Plant
Water Hyacinth	Plant
White Bryony	Plant
Rainbow Lorikeet	Animal
Feral Sika Deer	Animal

Exclusion and Eradication Pests

Pests we want to prevent from entering the region or eradicate from the region

Pest Name	Type
Alligator Weed	Plant
Horse Nettle	Plant
Kudzu Vine	Plant
Marshwort	Plant
Nassella Tussock	Plant
Noogora bur	Plant
Purple Loosestrife	Plant
Senegal Tea	Plant

Spartina	Plant
Water Poppy	Plant
White Edged Nightshade	Plant
Brown Bullhead Catfish	Animal
Koi Carp	Animal
Perch	Animal
Rooks	Animal

Containment Pests

Pests that we want to minimise the effects of and prevent their further spread

Pest Name	Type
African Feather Grass	Plant
Apple of Sodom	Plant
Asiastic knotweed	Plant
Blackberry	Plant
Boneseed	Plant
Chilean Rhubarb	Plant
Climbing spindle berry	Plant
Coast tea tree	Plant
Darwin’s barberry	Plant
Egeria Densa	Plant
Gorse	Plant
Green goddess lily	Plant
Hornwort	Plant
Italian buckthorn	Plant
Lagarosiphon	Plant
Lantana	Plant
Lodgepole pine	Plant
Old Man’s beard	Plant
Ragwort	Plant
Royal Fern	Plant
Variegated thistle	Plant

Wild ginger – yellow and kahili	Plant
Wild kiwifruit	Plant
Woolly nightshade	Plant
Yellow flag iris	Plant
Feral goats	Animal
Rudd	Animal
Tench	Animal
Wallabies	Animal

Restricted Pests

Pests that we want to reduce the further spread of and will support community and occupier efforts to control in places where they are a problem

Pest Name	Type
Agapanthus	Plant
Aluminium plant	Plant
Arum lily	Plant
Banana passionfruit	Plant
Blue morning glory	Plant
Bushy asparagus	Plant
Californian bulrush	Plant
Cathedral bells	Plant
Cestrum species	Plant
Chilean flame creeper	Plant
Chinese fan palm	Plant
Climbing asparagus	Plant
Climbing dock	Plant
Coastal banksia	Plant
Crack willow	Plant
Elaeagnus	Plant
Elephant’s ear	Plant
Elodea Canadensis	Plant
English ivy	Plant

Firethorn	Plant
German Ivy	Plant
Grey Willow	Plant
Heather	Plant
Himalayan Balsam	Plant
Houttuynia	Plant
Japanese honeysuckle	Plant
Japanese spindle tree	Plant
Japanese walnut	Plant
Jasmine	Plant
Lilium formosanum	Plant
Mexican feather grass	Plant
Mexian water lily	Plant
Mignonette vine	Plant
Mile-a-minute	Plant
Mistflower	Plant
Monkey apple	Plant
Pampas	Plant
Parrot's feather	Plant
Periwinkle	Plant
Plectranthus	Plant
Prickly pear cactus	Plant
Privet	Plant
Purple nutsedge	Plant
Rum Cherry	Plant
Saltwater Paspalum	Plant
Selaginella	Plant
Shield pennywort	Plant
Smilax	Plant
Snow poppy	Plant
Strawberry dogwood	Plant
Sydney golden wattle	Plant

Tree of heaven	Plant
Taiwan cherry	Plant
Thistle species other than variegated thistle	Plant
Tradescantia	Plant
Tuber ladder fern	Plant
Velvet groundsel	Plant
Wilding conifers	Plant
Wonder Tree	Plant
Argentine and Darwin ants	Animal
Eastern rosella	Animal
Hedgehog	Animal
Ferrets	Animal
Feral cats	Animal
Gambusia	Animal
Magpies	Animal
Wild mice	Animal
Possoms	Animal
Wild rabbits	Animal
Rainbow skinks	Animal
Rats (Ship and Norway)	Animal
Stoats	Animal
Wasps	Animal
Weasels	Animal