

MANGAPAKEHA FOREST

ROBMIJON HOLDINGS LTD

FSC® Forest Management Plan

For the period 2021 / 2026



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1. Introduction

Principles and Criteria

ROBBIJON Holdings 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.

ROBBIJON Holdings 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 Mangapakeha Forest comprises freehold tenure. There are no registered forest reserves or covenants within the title, but 5.7 ha is currently reserved from production.

The legal description of the land on which Mangapakeha Forest lies is:

- Parcel ID: 3951543
 - Title Number: WN20C/248
 - Legal Reference: Part Section 4, Block XV, Mangapakeha Survey District
-

Forest & location Mangapakeha Forest is located off the Masterton Castlepoint Road in the Masterton District. Internal forest roads and tracks provide access to the forest directly from the county road. The forest has previously been harvested so access for road going vehicles has been previously established.

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)	Log Market Type
Wellington	142	Export
Masterton	45	Domestic
Featherston	80	Domestic
Dannevirke	154	Pruned

Topography

Mangapakeha Forest lies on rolling to steep hill country of a generally northerly aspect. Altitude of the forested area ranges from 40m to 205m.

A combination of ground based, and hauler log extraction methods will be utilised at harvesting.

Soils

The soil at Mangapakeha Forest is as follows:

Silty loams over crushed argillite with low to medium fertility.

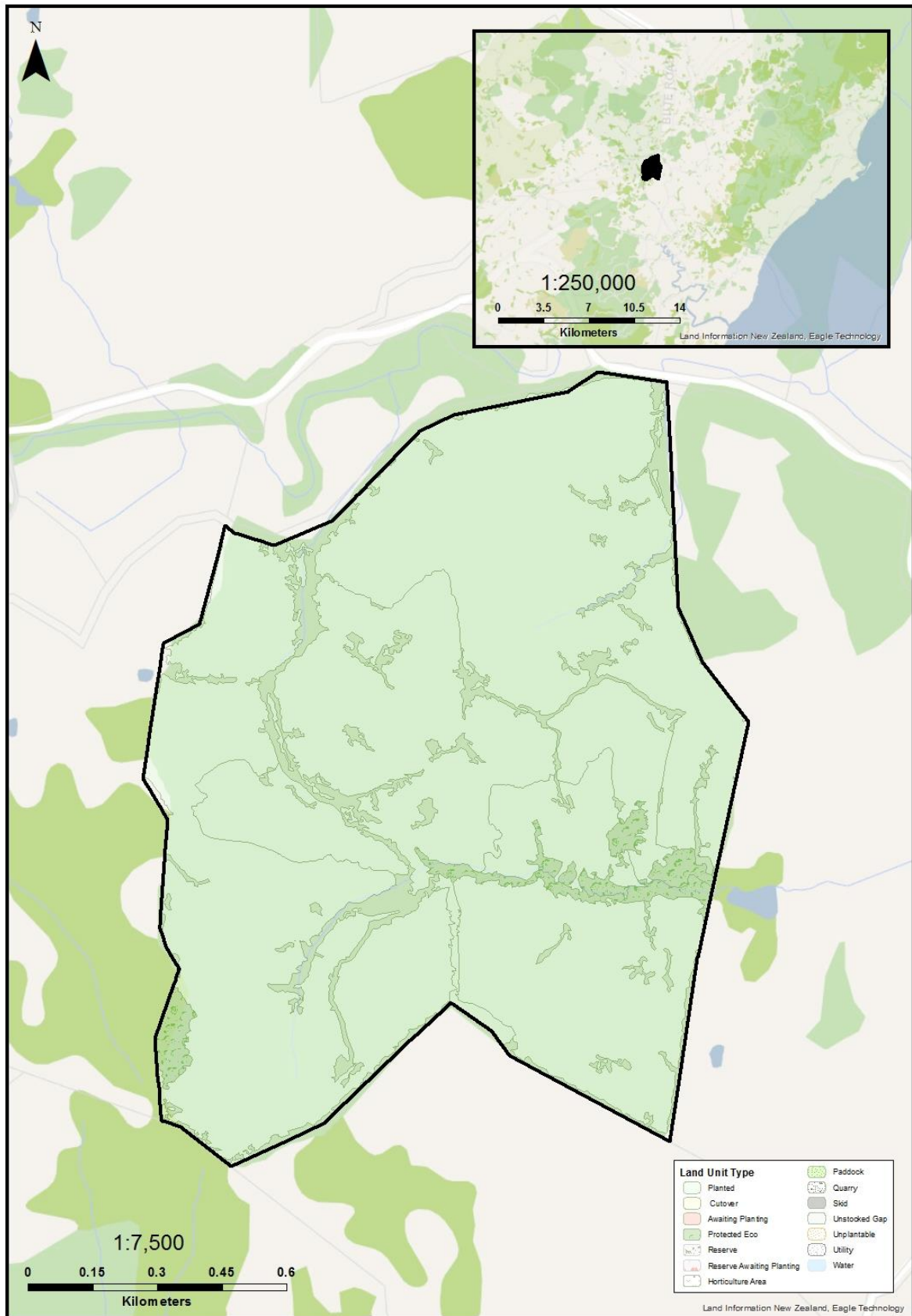
The soil has the potential for severe, deep earthflow erosion and severe wind erosion on ridges.

Climate

Rainfall: The average rainfall at nearby Castlepoint is 1,250mm per year and is concentrated during the winter months. The forest can experience moisture deficits particularly in late summer.

Temperature: The mean annual temperature is around 13.1 degrees Celsius.

Map 1 – Forest Location Map



3. The Ecological Landscape

Ecological landscape

Mangapakeha Forest is located in the Eastern Wairarapa Ecological District (ED). The ED is extensive hill country on the east coast of the southern north island. It is moderately steep, up to 633m a.s.l. The hill country is finely dissected and drained to east and west by small to moderate watercourses. Geology comprises mixed greywacke, limestone, sandstone and siltstone with localised marine and alluvial terraces.

The area was originally entirely podocarp-hardwood forest with podocarp dominance on the valley floors. Today, only scattered forest remnants remain, and the ED is largely semi intensive sheep and cattle farmland, with small (but increasing) areas of exotic forest.

Protective Status

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

The forest falls in the Eastern Wairarapa Ecological District. The reserve area as a percent of the working forest area is 4.1%, which does not meet the 10% threshold as per the NZ FSC standard.

A shortfall of 9.5 ha of reserve area will be offset by funding local ecological projects

Table 3: Protective status of the ecological landscape

Ecological District	Eastern Wairarapa
Original (pre-Maori) percentage of ecosystem type in Ecological District within land title	309,156ha 100%
Natural ecosystem area remaining	151,486ha 49.0%
Proportion of remaining natural ecosystem under protection	46,809ha 30.9%
Protection by certificate holder	6.7 ha
Protected areas as a % of management estate	4.1%
Protected areas as a % of the aggregated Group Scheme management estate by Ecological District	4.1%
Shortfall area (to meet reserve 10% of working area)	9.5 ha

Historic and archaeological sites

The *Heritage New Zealand Pouhere Taonga Act 2014* replaced the *Historic Places Act 1993* on 20 May 2014. Under the *Heritage New Zealand Pouhere Taonga Act* 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 Heritage New Zealand Pouhere Taonga (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 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 HNZ (<http://www.archsite.org.nz/>). These sites are often included in schedules of places and sites of significance in District plans along with sites of cultural significance.

Checks of the NZAA website show no known records within considerable distance of this block. Similarly, a check of the Archaeological Site Probability model published by the Department of Conservation¹ suggests that this very inland location is unlikely to have sites present.

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 HNZ and Iwi or other stakeholders must be observed.

**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.

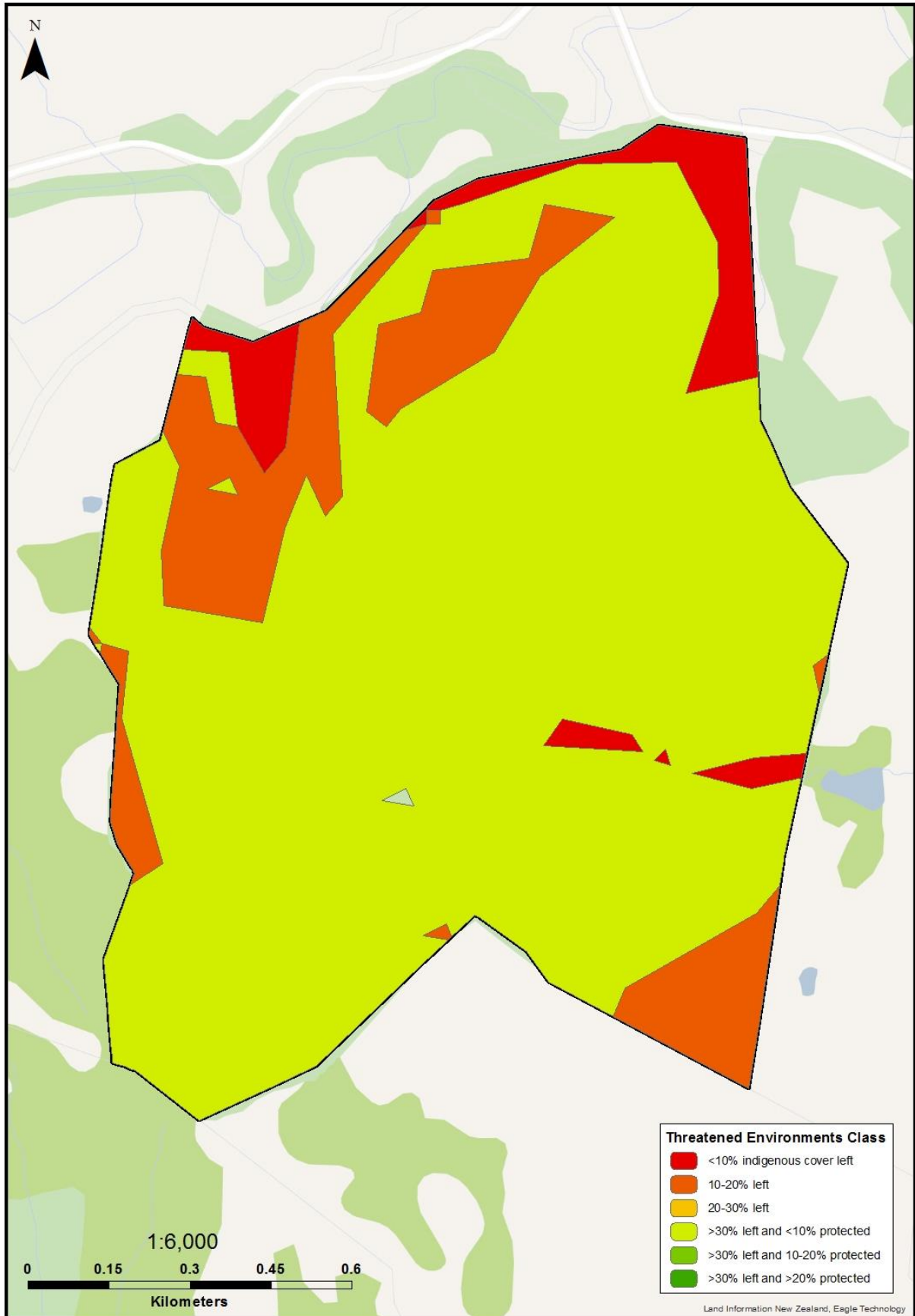
Table 4 shows the threatened environments classifications as they pertain to Mangapakeha Forest (Map 2). The rarest threatened environments (< 10% indigenous cover left) make up 10.02ha of Mangapakeha Forest, while the remaining area is split between less threatened land.

Table 4: Reserve areas by Threatened Environments Classification

Category	Area (ha)	Area (%)
< 10% indigenous cover left	10.02	5.5%
10 - 20% left		
20 - 30% left	24.26	13.3%
> 30% left and < 10% protected		
> 30% left and 10 - 20% protected		
> 30% left and > 20% protected	148.60	81.2%
Total	358.96	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



4. Social-economic Profile and Adjacent Land

Forest history

Mangapakeha Forest is a production forestry operation established with radiate pine. The forest is now in its second rotation having been previously harvested over the period 2003 to 2009.

Forestry was established on the land by a previous owner primarily for investment purposes.

The area established in forest was predominantly a low productivity site in agricultural terms due to the instability of the slopes and potential for slips and erosion.

Current social profile

Mangapakeha Forest is a small, currently passive, incremental contributor to the social profile of the area. The forest is 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 Mangapakeha Forest is located appears to be one of the lesser deprived areas in the region. Age and family statistics for the Wellington region are very similar to national averages.

Table 5. Key statistics as summarised from 2013 Census² data

Census Category	Wellington	New Zealand
Ethnicity: European	77.0%	74.0%
Ethnicity: Māori	13.0%	14.9%
Formal qualifications	84.0%	79.1%
Unemployment	7.2%	7.1%
Dominant occupation	Professionals	Professionals
Median income	\$32,700	\$28,500
Family with children	42.0%	42.1%
Internet access	80.8%	76.8%
Home ownership	64.9%	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**

Greater Wellington regional council have identified two iwi organisations that may have an interest in Mangapakeha Forest:

- Rangitaane O Wairarapa
- Kahungunu ki Wairarapa.

Each group has been included in our stakeholder register and comment sought in respect of this plan. Rangitaane have indicated their support for the FSC registration.

**Tenure & resource
rights**

At February 2016, another search, via Māori Land Online, found that no Māori interest exists for the CT WN20C/248 block.

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.

5. Regulatory Environment & 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 type 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

Mangapakeha 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 Mangapakeha Forest.

Table 7: Regional and District Councils under Mangapakeha Forest

Regional Councils ³	District Councils ⁴
Greater Wellington Regional Council	Masterton 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 rules 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 Mangapakeha Forest, Table 8 below indicates the proportion of the forest by the respective ESC classes.

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

⁴ District Councils responsible for land use and biodiversity issues

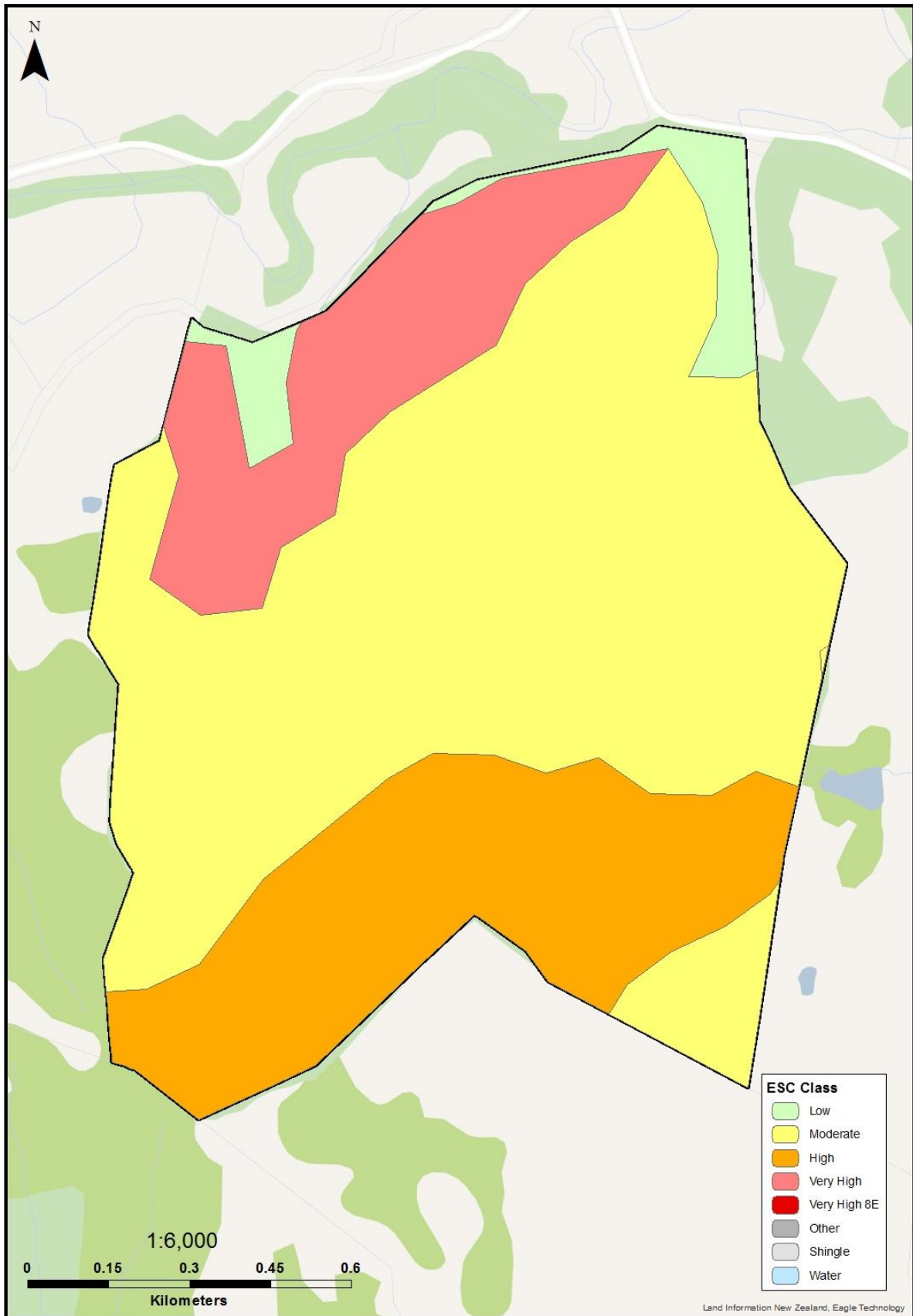
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In broad terms, harvesting, roading (earthworks) and new afforestation operations will need consents in the red zone. Earthworks will need consents in orange, and in the green and yellow zones most operations will be permitted subject to conditions.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

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

	Low	Moderate	High	Very High	Very High (8e)	Undefined
Area (ha)	7.41	108.60	41.45	25.51		
Area (%)	4.0%	59.3%	22.7%	14.0%		

Map 3 – National Environmental Standard Erosion Susceptibility Classes in Mangapakeha 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 no current resource consents or HPT authorities that apply to Mangapakeha Forest.

At the time of harvest planning any required consents will be obtained.

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.

Mangapakeha Forest was established in exotic forest prior to 31st December 1989, therefore all planted areas are liable for a deforestation tax. The forest has been re-established following harvesting to extinguish the liability.

The entire forest area was registered with government under the previous forest owners name as pre-1990 forest land. As such the previous owners will received an allocation of emission credits.

National Policy Statement and NES - freshwater

A National Policy Statement on Freshwater and an associated National Environmental Standard have been issued by the Ministry for the Environment, upgrading an existing NPS. Presently undergoing a period of evaluation in relation to public submissions, it is, at the time of writing, unclear to what extent the final law will impact forestry. As a general tenor, the wider industry submissions on this proposed legislation were that in most cases, provided that the industry codes were adhered to, the standards could be met.

National Policy Statement - Biodiversity

At this time of writing this proposed legislation is about to enter a phase of public consultation. The final form and impact upon forestry operations is unknown.

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.

Mangapakeha Forest contains 61.3 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.

The balance of the forest was planted on “Kyoto compliant” land that was vacant as at 31st December 1989. These forest areas (79.0 hectares) have been registered to participate in the NZ Emissions Trading Scheme and are subject to the accrual of emissions credits and liabilities under that scheme.

Environmental Code of Practice

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.

In addition operations will observe the voluntary protocols of the New Zealand Forest Accord and the Principles of Plantation Management promulgated by the NZ Forest Owners Association.

**Forest Road
Engineering
Manual**

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.

**Other relevant
legislation**

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 ROBMIJON Holdings Ltd retains credible access to its markets.

ROBMIJON Holdings 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

Mangapakeha Forest currently does not have any non-public tracks through the forest. If any infrastructure is installed at a future date, then the risks will be 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 ROBMIJON Holdings 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.

EMP framework

The Environmental Management Process (EMP) 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’⁵. This publicly available document sets out guidelines that underpin the requirements for sound and practical environmental management.

Operations will also be following the Forest Practice Guides⁶ published in support of the National Environmental Standard.

⁵ <https://www.nzfoa.org.nz/resources/file-libraries-resources/codes-of-practice/44-environmental-code-of-practice/file>

⁶ <https://docs.nzfoa.org.nz/forest-practice-guides/>

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 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	H	H	NA	H	L	L	NA	L	H	L	L	H
Earthworks	H	H	H	NA	H	L	L	NA	L	L	L	L	H
Slash Management	L	L	L	NA	H	L	L	NA	L	L	L	L	L
Stream Crossings	H	H	L	NA	H	L	L	NA	NA	NA	NA	NA	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	NA	H	H	L	H	NA
Planting	NA	NA	NA	NA	NA	NA	L	NA	L	L	L	NA	L
Tending	NA	NA	NA	NA	NA	NA	NA	NA	NA	L	L	NA	L
Fertiliser Application	NA	H	NA	L	H	NA	NA	NA	NA	L	L	L	M
Agrichemical Use	NA	H	L	L	H	L	H	NA	L	H	H	H	H
Oil & Fuel Management	NA	H	L	NA	H	NA	L	NA	NA	H	L	NA	L
Waste Management	NA	L	NA	NA	L	NA	NA	NA	NA	L	NA	NA	L
Forest Protection	NA	L	NA	NA	L	L	L	NA	NA	L	NA	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 Mangapakeha Forest are:

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

FSC applies a risk-based approach to rules around the use of Chemical pesticides. The framework defining this approach is documented in new policies released by FSC in 2019⁷. Chemicals are classified according to an FSC Hazard rating. The rating then requires differing levels of actions by managers to enable their use under regionally prescribed situations.

The hazardous rankings run from ‘Prohibited, to ‘Highly Restricted’ to ‘Restricted’ and finally those with no particular FSC obligations.

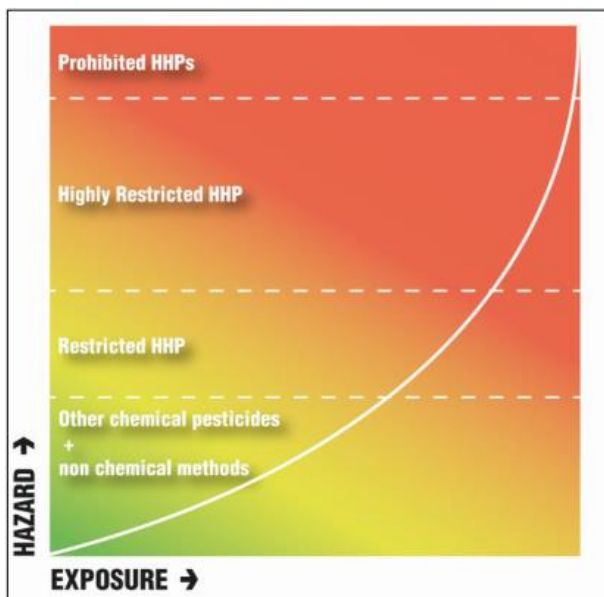


Figure 1: FSC Hazardous Risk Management approach

Of the chemical pesticides used or potentially used in the NCC forest estate, none fall into the Prohibited or Highly restricted categories. Those that fall into the Restricted category are listed in table 10 below.

Most of the Restricted pesticides are vertebrate poisons and insecticides that if used, would be targeted at specific pest problems, such as wasps or high possum or pest predator numbers. In the latter case such use is only likely in conjunction with a wider coordinated application aimed at achieving positive biodiversity outcomes.

Within the herbicides and fungicides, usage is expected at between 1-2 and 2-4 times per radiata rotation respectively.

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.

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⁷ FSC Pesticides Policy FSC-POL-30-001 V3-0 <https://www.fsc.org/en/document-centre/documents/resource/208>

...continued

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

Active ingredient	Purpose	FSC Hazard	Common usage
Boric Acid	Fertilizer	Restricted	Component of micro-nutrient fertilization
Copper based products	Fungicide	Restricted	Needle cast control
Glyphosate	Herbicide	Restricted	Establishment weed control/pest weed control
Haloxfop-methyl	Herbicide	Restricted	Establishment weed control/pest weed control
Picloram	Herbicide	Restricted	Establishment weed control/pest weed control
Animal and insect pest control			
Brodifacoum	Vertebrate pesticide	Restricted	Ground-based Vertebrate pest control
Carbaryl	Insecticide (wasps)	Restricted	Localised wasp control
Cholecalciferol	Vertebrate pesticide	Restricted	Ground-based / Vertebrate pest control
Fipronil	Insecticide (wasps)	Restricted	Localised wasp control
Pindone	Vertebrate pesticide	Restricted	Rabbit and hare control
Sodium Monofluoroacetate (1080)	Vertebrate pesticide	Restricted	Vertebrate pest control / extensive aerial possum control
Sodium cyanide	Vertebrate pesticide	Restricted	Vertebrate pest control, ground-based possum control

NES-CF Red ESC Zone Monitoring

Under the updated FSC Forest Stewardship Standard for New Zealand (FSC-STD-NZL-02-2023 Plantations EN), there are now requirements around the use, management and monitoring of plantation forests on Red ESC zone land. The table below identifies the area of Mangapakeha forest affected by the updated standard. Appendix 4 contains details of each forest's Red ESC areas, as well as monitoring and management activities.

Forest	Area of Red ESC (ha)	Total Productive Area (ha)	Percentage of Forest affected
Mangapakeha	23.3	162.1	14%

9. Forest Estate Description

Productive Capacity strategy

Forest management is carried out to ensure the productive capacity of the Mangapakeha 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: Mangapakeha Forest Area (ha)

Gross area	Net Stocked Area	Area Awaiting Restocking	Reserves
167.7	162.1	0.0	5.6

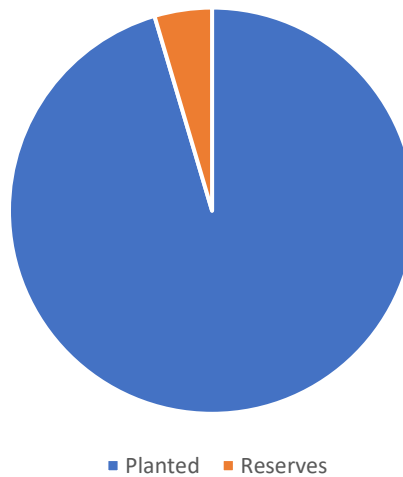


Figure 1: Mangapakeha Forest Area (ha)

Current species The species grown at Mangapakeha Forest is *Pinus radiata* (radiata pine).

Re-establishment has been with high quality treestocks suitable for the site and market. It should be noted that 40 hectares of the current forest has been established from natural regeneration of radiata pine from seed left on site following removal of the previous crop. In 2003 and 2009 two re-establishment has been generated for second rotation. Table 8 summarises the species used for establishment.

Table 12: Species

Species	Net Stocked Area (ha)
Radiata Pine	162.1

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 Mangapakeha Forest is between 27.5 – 32.5 m, while the 300 index is 22.5 – 30.0m³ / ha / year.

Mangapakeha Forest is at the mid-range 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 (Table 13).

Table 13: Current 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)
MPHA – 0001 - 06	2003	24.7	328	11.8	13.7	22.4	300	-
MPHA – 0001 – 07	2003	35.2	545	28.8	13.0	21.6	-	-

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 ROBMIJON Holdings 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

Mangapakeha 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 Mangapakeha Forest, the crop species grown is *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 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.

Pre-establishment considerations

Prior to any 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

Adjustments in planting may be required to accommodate improved environmental outcomes in the subsequent rotation, including the extension of an existing wildlife corridor or riparian area by increasing setbacks at the time of crop replanting.

These considerations are covered by the afforestation checklist and riparian rules contained within the PF Olsen EMS.

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

There is no establishment planned at Mangapakeha Forest during the period of this management plan.

Tending

The tending regime executed at Mangapakeha Forest is a mixed clearwood and framing regime, depending on the stand characteristics. Tending is underway and there are both pruning and waste thinning operations required in future years. Table 15 shows how the final crops in each stand are anticipated.

Table 15: Future tending of each crop stand

Stand	Year Established	Final Stocking	Pruned Stocking	Pruned Height
1/06	2003	350	350	5.5 - 6.5m
1/07	2003	450	-	-
1/08	2009	600	-	-

Tree nutrition

The soils in Mangapakeha 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 The harvesting strategy for radiata pine employed at Mangapakeha Forest is to harvest the tended forest stands as close 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. The optimum rotation length for radiata pine is expected to be from 25 to 30 years. Stands where minimal tending has been completed may be harvested earlier, particularly when relevant markets are favourable.

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.

There is no harvesting planned for Mangapakeha Forest for the duration of this management plan.

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'.

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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.

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

Digital mapping of Mangapakeha Forest currently exists, but will require updating from time to time as the forest changes.

The work involves:

- 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) to an accuracy fit for purpose.

Pruning and thinning contractors are often 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.

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.

Forest records Forest records are essential in monitoring the forest operations by providing a 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.

Mangapakeha Forest records are maintained on PF Olsen’s FIPS system (Forest Information and Planning System). These record systems allow for fast retrieval of information, production of reports and statistics and provide a comprehensive audit trail.

Forest records are essential to understand the status and condition of forest stands, reserves, and important fauna species as well as the retention of inventory data and operation monitoring data.

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.

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; and

Provide data for estimating timing of the next 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.

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

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.

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

Mangapakeha Forest contains 5.6 ha of reserve areas comprising 3.7 ha of riparian remnant Manuka/Kanuka ecosystems and 1.9 ha of open semi-wetland /depleted grassland.

The wetland zones were purposely not re-established following the first harvesting operation while the remnant Manuka/Kanuka areas had not been successfully established in trees during the first rotation. These areas were protected during and retained following the first harvesting operation.

The reserve areas are detailed in Table 10.

Table 16: Protected ecosystems and reserve areas

Stand	Area (ha)	Protective Status	Protective Function	Forest Type Description	LENZ Remaining (%)	LENZ Protected (%)	Protection Category		
MPHA – WETL –01	1.9	Management Plan	Wetland Ecosystem	Adventive and Exotic	49.0	30.9	Limited		
MPHA – SECF – 01	2.4	NZ Forest Accord	Terrestrial Ecosystem	Manuka/Kanuka/Broadleaved Hardwood			49.0	30.9	Passive
MPHA – SECF – 02	1.3								

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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 17). 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.

Table 17: 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
Limited	<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
	<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
Full	<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
	<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
Special	<ul style="list-style-type: none"> Restoration if practical 	As above, plus: <ul style="list-style-type: none"> Fencing Covenanting Co-management agreements Funding where practical 	As above, plus <ul style="list-style-type: none"> As defined in any restoration agreement

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Table 18 details the areas in each protection category within Mangapakeha Forest, categorised by protective function.

Table 8: Protected ecosystems management categories by function and area

Protective Function	Protective Category		
	Passive	Limited	Special
Erosion Control			
Landscape / Amenity			
Non-specific			
Rare Species			
Riparian Ecosystem			
Terrestrial Ecosystem	1.3	2.4	
Wetland Ecosystem		1.9	
Total Area (ha)	1.3	4.3	

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 Mangapakeha Forest are summarised in Table 19. The total length of waterways within the forest is 1.72 kilometres.

Table 19: Length of stream by REC class

REC Class	Length (km)
<i>Very small, mod, dry, hard</i>	0.36
<i>Very small, low, dry, hard</i>	0.24
<i>Small, low, dry, hard</i>	1.11
Total Length	1.72

Rare and threatened species

As of June 2019, no recorded rare or threatened species have been sighted in Mangapakeha Forest.

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. Recorded sightings within the plantations and indigenous reserves are summarised in Table 20. 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](#).

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 riverbed 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 Project⁸.
- 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.

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.

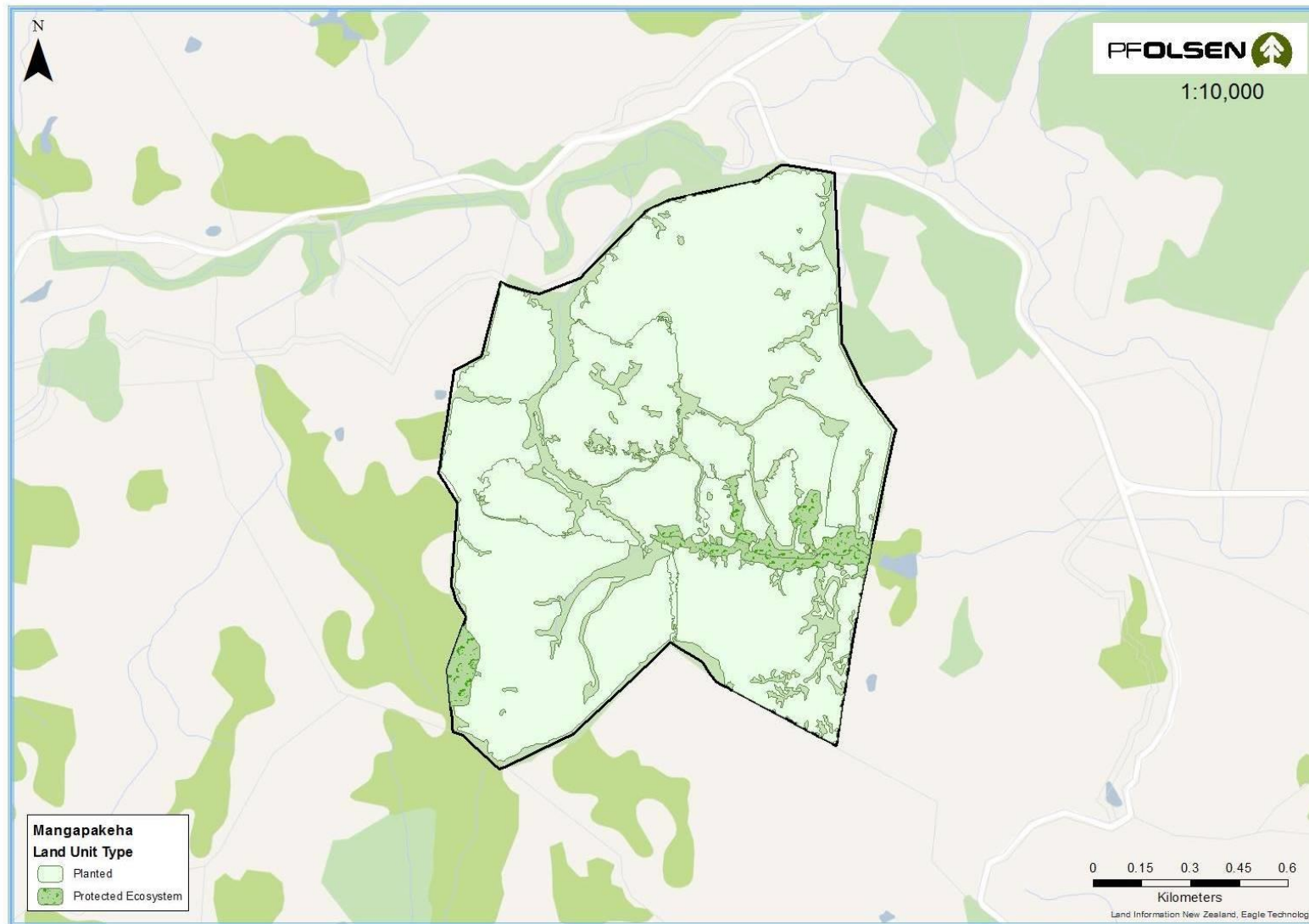
The full list of New Zealand CITES listed species are available on the [Department of Conservation’s website](#).

**High
Conservation
Value Forests**

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

⁸ <https://www.inaturalist.org/projects/biodiversity-in-plantations>

Map 4 - Forest Stands Map



14. Property Management and Protection

Statutory pest obligations

Pest management within Mangapakeha Forest is subject to statutory obligations under the Regional Pest Management Strategy administered by the Greater Wellington 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 Mangapakeha Forest.

The major plant species potentially threatening production values within the forest can be seen in [Appendix 6](#).

Pest control

The main animal pests in Mangapakeha Forest are the introduced possum and feral deer.

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.

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.

Animal pests in Mangapakeha 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 Mangapakeha 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 lies with the respective territorial land authorities where the forest is situated. In the case of Mangapakeha Forest the Rural Fire Authority (RFA) is Wairarapa Rural Fire District (WRFD).

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 firefighting 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.

Protected ecosystems, reserves and species

The reserve areas of Mangapakeha Forest are currently not fenced from stock. The forest owners have no intention to actively graze stock within the forest boundaries. The forest boundaries will require to be maintained in stock proof order at all times as hill grazing land lies to the west, south and east boundaries of the property.

At present the indigenous vegetation remnants in the estate are relatively small individually, fragmented and heavily modified from past farming. As such, the condition of these stands count against their ecological significance albeit they are currently representative of depleted systems in the local sub-regional context.

Despite this, these areas do cumulatively add and are directly associated with riparian and semi wetland systems. As such they have value and overtime, the protected ecosystems will regenerate naturally to, a good quality wetland and ecotonal forest margin. The primary management actions are to be:

- Weed and pine regeneration control.
- Monitoring.

Ecological equivalence

In Mangapakeha Forest total area of reserves is 5.6 ha. At 3.5%, of the total estate, this area does not meet the FSC required condition of 10 % of productive forest area by Ecological District (Eastern Wairarapa ED) to be in set-asides. A shortfall of 10 hectares.

Under the FSC NZ Standard shortfalls in reserve area can be made up by an 'ecological equivalence' investment into other protected ecosystems within the estate, or in other parts of the estate in other Ecological Districts or in other party's lands within the Ecological District. The 'ecological equivalence' value has been benchmarked and calculated against the average annual spend by the Department of Conservation as per their 2013 annual report. To address the shortfall would amount to just over \$300/annum. Such amounts will continue to be spent on an identifiable ecological equivalence basis.

Public liability insurance

In the case of Mangapakeha Forest, ROBMIJON Holdings Ltd have participated Olsen Group Scheme which include fire insurance. The scheme covers:

- Fire loss recover: \$393,650
- Firefighting cost: \$500,000
- Re-establishment cost: \$326,000

ROBMIJON Holding Ltd should liaise with the forest manager at the time of fire insurance renewals and if necessary, instruct the forest manager to keep premiums paid up.

Crop insurance renewal falls annually in May.

Fire insurance

ROBMIJON Holdings Ltd hold fire insurance under the PF Olsen Group Scheme PLI insurance.

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

Forest management, contractor and owner access is by security key only.

The forest will continue to be open to the general public for legitimate use subject to entry by permit though at this point due to the relatively young age of the crop and the very small and unspecialised reserves the forest receives little recreational nor hunting use.

Between 1st January 2016 and 31st December 2018 no access or hunting permits were issued.

Non-timber forest products

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

Other special values

No special values have also been identified in Mangapakeha Forest.

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 website⁹. Any users are expected to abide by the Outdoor access code¹⁰ published by the Walking Access Commission.

⁹ https://www.wams.org.nz/wams_desktop/index.html

¹⁰ <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 ROBMIJON Holdings 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 Mangapakeha Forest is shown below. The monitoring may not include all of these elements.

Table 21: 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>iNaturalist</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

Continued on next page...

...continued

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 ¹¹	- 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 docket 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.

¹¹ 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 ROBMIJON Holdings 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 Mangapakeha 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 April 2026.

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 ROBMIJON Holdings 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.

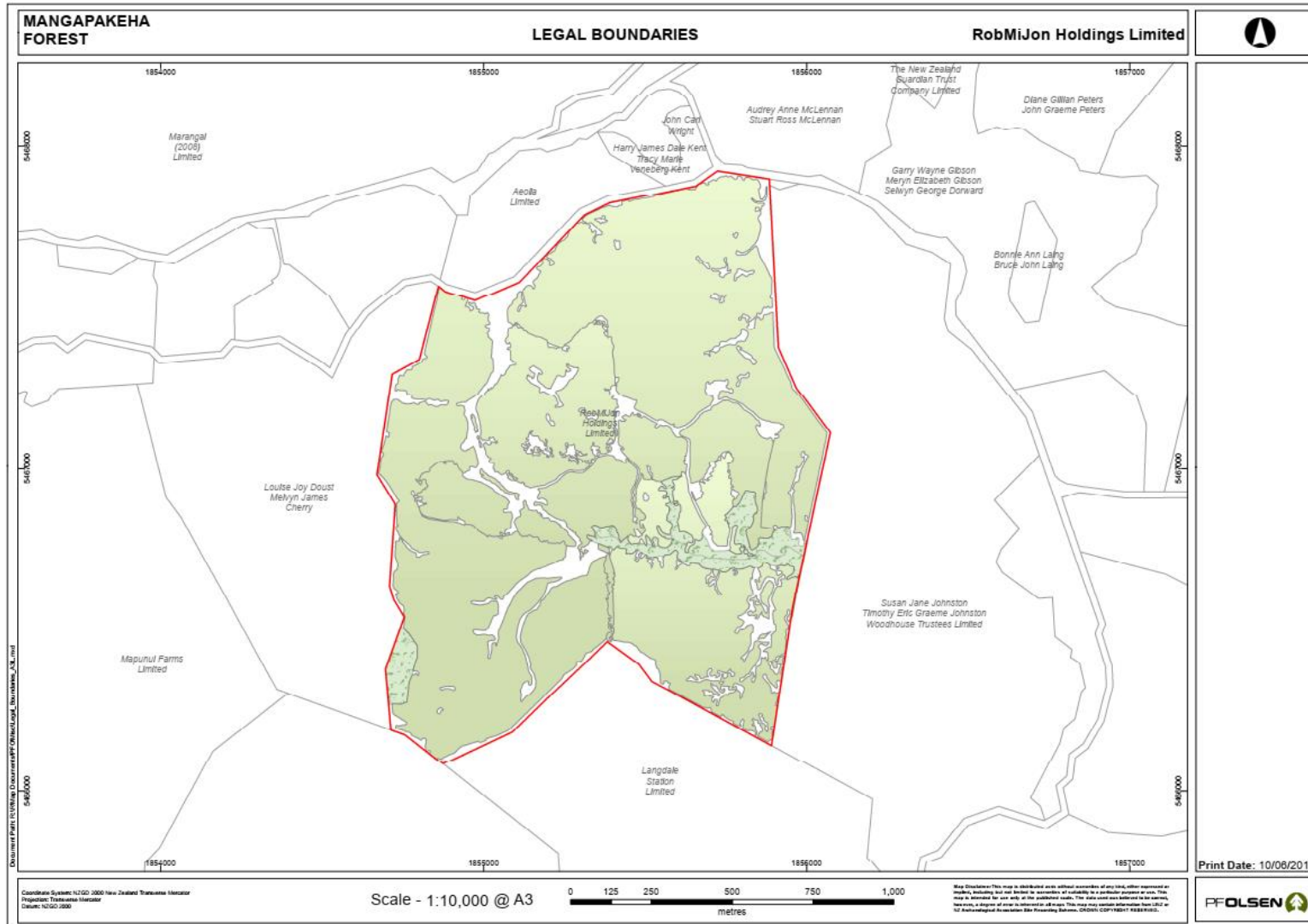
18. Register of Plan Change and Review

Introduction

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

Date	Section / Page	Change
Mar 23	Montoring	Update information

Appendix 1 – Neighbour Location Map



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

Entity	Phone	Email	Website
Greater Wellington Regional Council	0800 496 734	info@gw.govt.nz	http://www.gw.govt.nz/
Masterton District Council	06 370 6300	mdc@mstn.govt.nz	https://mstn.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 – NES-CF Red ESC Zone Monitoring

Monitoring Actions

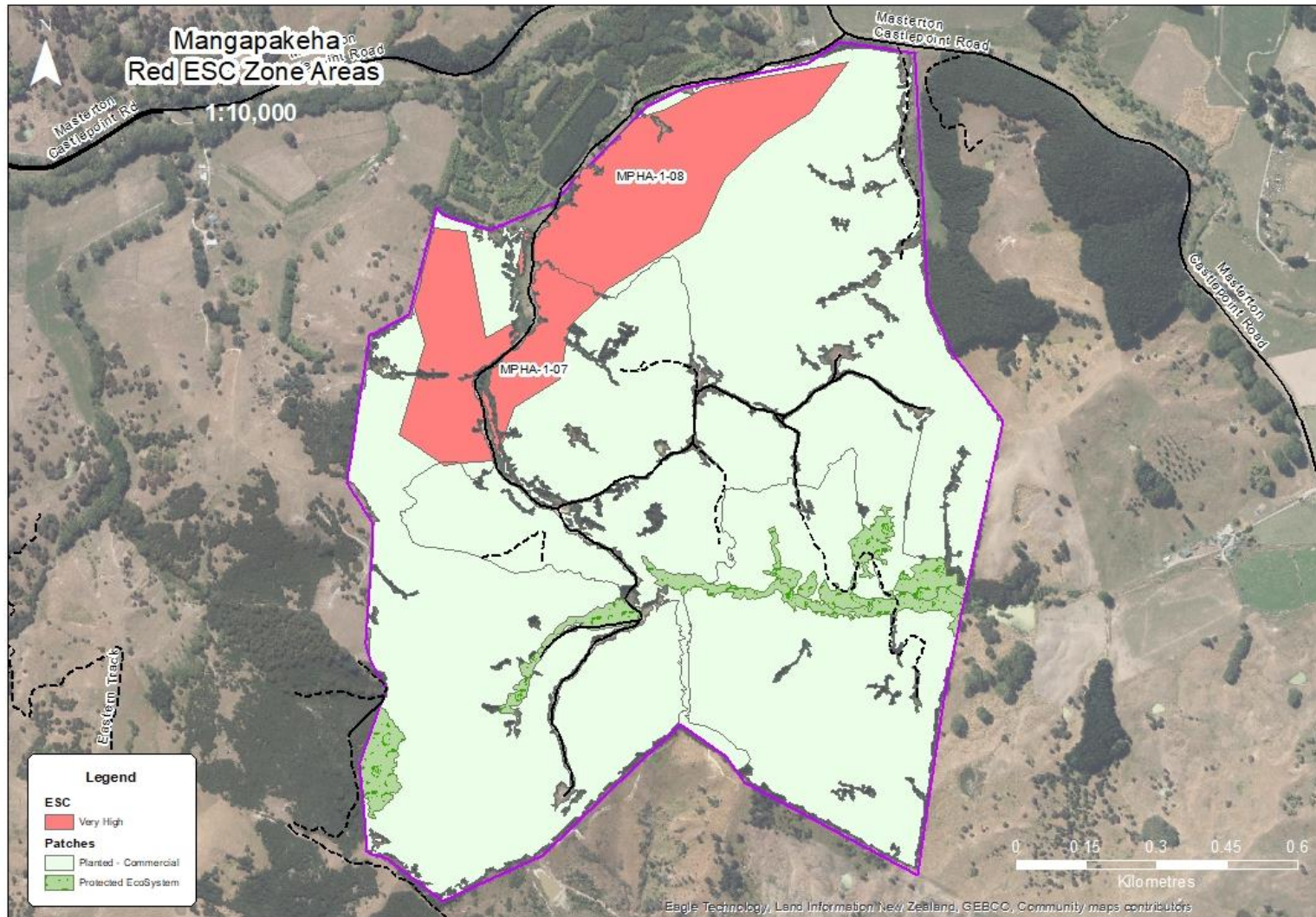
Activity Type	Actions
<p>Monitoring of Red ESC Areas</p>	<p>Orbica monitoring system</p> <ul style="list-style-type: none"> - Take monthly satellite imagery of the identified Red ESC areas within the forest. - Analyse the imagery to determine levels of erosion and revegetation. <p>Using the PF Olsen Red ESC monitoring web tool we will:</p> <ul style="list-style-type: none"> - Document the extent of any erosion and/or revegetation. - Determine if sediment has or will reach any water body. - Take any practicable appropriate steps to disconnect any sediment pathways to water bodies and minimise exacerbation of the erosion where feasible. <p>Harvesting erosion</p> <ul style="list-style-type: none"> - Harvest managers will be aware of Red Zone areas that are being harvested and will follow NES-CF permitted activity regulations OR resource consent conditions. - Prior to harvesting commencing the harvest manger will determine if harvesting activities are likely to result in sediment reaching water bodies, and which water bodies will be affected. All practicable steps will be taken to disconnect harvesting disturbance from water bodies.

Stands to be monitored by forest

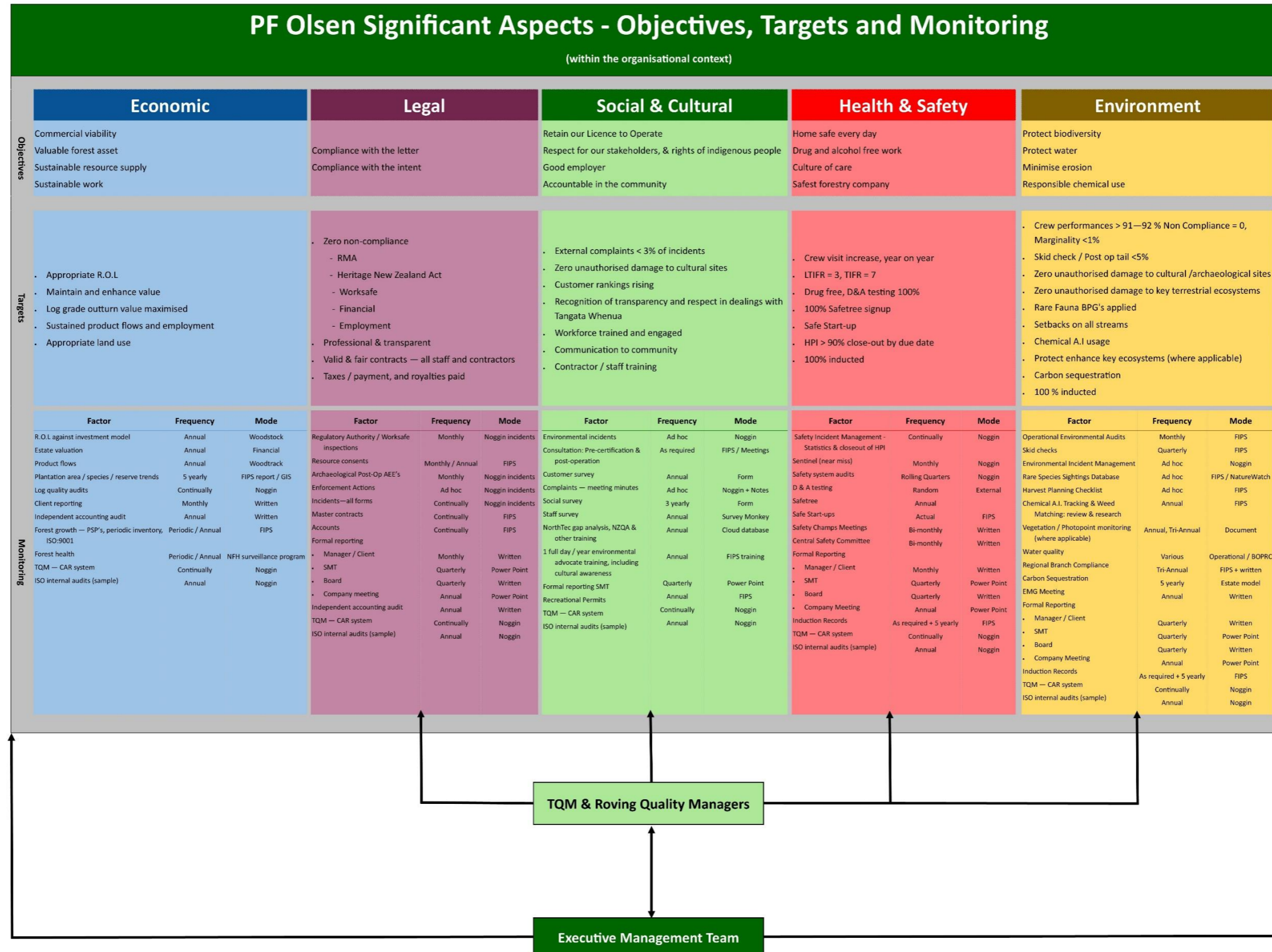
Mangapakeha Forest

The current total productive area of Mangapakeha Forest is 162.1 hectares. Of its current total productive area 14% is Red ESC class.

Stand	Area of Red ESC within the Stand (ha)	Total Stand Area (ha)	Percentage of Stand Affected
MPHA-01-07	3.36	38.82	9%
MPHA-01-08	19.92	94.95	21%
Total Area	23.28	133.78	



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



Appendix 6 – Greater Wellington Regional Pest Management

Plant species to be managed under the Greater Wellington Regional Pest Management Plan

Exclusion Pests

Name	Type	Reference in the Plan
Alligator Weed	Plant	6.1.1
Chilean Needle Grass	Plant	6.1.2
Nassella Tussock	Plant	6.1.3
Wallaby	Animal	6.1.4

Eradication Pests

Name	Type	Reference in the Plan
Moth Plant	Plant	6.2.1
Senegal Tea	Plant	6.2.2
Spartina	Plant	6.2.3
Velvetleaf	Plant	6.2.4
Woolly Nightshade	Plant	6.2.5
Rook	Animal	6.2.6

Progressive Containment Pests

Name	Type	Reference in the Plan
Purple Loosestrife	Plant	6.3.1
Wilding Conifers – European Larch, Douglas Fir and Pine species	Plant	6.3.2

Sustained Control Pests

Name	Type	Reference in the Plan
Blue Passionflower	Plant	6.4.1
Boneseed	Plant	6.4.2
Climbing Spindleberry	Plant	6.4.3
Eelgrass	Plant	6.4.4
Giant Hogweed	Plant	6.4.5
Feral Rabbit	Animal	6.4.6
Wasps	Animal	6.4.7

Site-Led Pests

Name	Type	Reference in the Plan
Banana Passionfruit	Plant	6.5.1
Cathedral Bells	Plant	6.5.2
Old Man’s Beard	Plant	6.5.3
European Hedgehog	Animal	6.5.4
Feral Deer	Animal	6.5.5
Feral Goat	Animal	6.5.6
Magpie	Animal	6.5.7
Mustelids	Animal	6.5.8
Possum	Animal	6.5.9
Pest Cat	Animal	6.5.10
Rats	Animal	6.5.11