Wellington Regional Forests

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The Landscape Context

2. The Forest Land

Overview

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

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

Legal ownership

The plantation forests, the subject of this Plan are owned by RMS via two long term "Forestry Rights" covering the western 'Metro' forests and the eastern 'Wairarapa' forests. The underlying land is owned by Greater Wellington Regional Council (GWRC). The list of land titles forming the land holdings underlying this forest estate are listed in Appendix 1.

The obligations and responsibilities between the Land owner (GWRC) and the "Forestry Rights" owner (RMS) are laid out in a "Memorandum of Transfer Creating a Forestry Right", a comprehensive commercial legal agreement that lays out mutual obligations in respect of:

- Land rentals,
- Access rights and usage
- Covenants
- Third party rights and other commercial and non-commercial obligations including reporting requirements.

The Forestry Right

There are two Forestry Rights, one covering plantations in the Hutt Valley, Rimutaka and Kapiti Coast areas, the other forests in the eastern Wairarapa. Each is for an initial term of 60 years, with options to seek renewal for a further term 0f 30 years.

RMS is required to replant the land other than specific listed situations such as riparian setbacks and powerline corridors, or if the land is not to be used, to relinquish that area from the Right, though this cannot happen until year 32 of the initial term. Rental on the land is payable annually with an inclusive process for annual review.

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Forest land use capability

Forest Name	Dominant Code	Description
Akatarawa Saddle	6c1	Kapiti Coast
Hiwinui Forest	6s3 + 7e5	South Wairarapa
Hukinga	6s1 + 7e2	Upper Hutt City
Mangaroa	7e2 + 6e7	Upper Hutt City
Maungakotukutuku	7e1	Kapiti Coast
Pakuratahi East	7e5 +6e+ 6s7	Upper Hutt City
Pakuratahi West	6e2+6s1+7e2	Upper Hutt City
Puketiro	7e2+6e8+7e1	Porirua City / Upper Hutt City
Stoney Creek	7e6+6e+6s3	South Wairarapa
Tauanui	6e+7e13	South Wairarapa
Valley View Forest	7e2+6c1+6e8	Upper Hutt City
Whakatikei	6c1+6e8	Upper Hutt City / Kapiti Coast
Grand Total		

Climate

The RMS estate is set across three climatic areas strongly influenced by the geography and topography of the surrounding areas and in particular the influence of the Rimutaka and Tararua ranges and their interaction with the prevailing westerly and southerly wind patterns.

The climate zones are temperate and suitable to plantation forest growth with no water nor temperature constraints. There is a general eastward gradient toward lower total rainfall and higher winds and summer temperatures.

Forest climate

Forest Name	Territorial authority	Climatic description
Akatarawa Saddle Maungakotukutuku Whakatikei Puketiro	Kapiti Coast Upper Hutt City / Kapiti Coast Porirua City / Upper Hutt City	The Kapiti coast climate is warm and temperate. The rainfall is significant, with precipitation even during the driest month. The average annual temperature is 13.3 rising to a summer monthly average if 17.7^{0}C. The average annual rainfall is 1,177 mm.
Hukinga Mangaroa Pakuratahi East Pakuratahi West Valley View Forest	Upper Hutt City	The climate is warm and temperate with significant rainfall throughout the year in Upper Hutt, even in February, the driest month when 64mm falls on average. In Upper Hutt, the average annual temperature is 13.0 °C, 17.5 0C in summer. About 1,403 mm of precipitation falls annually.
Hiwinui Forest Tauanui Stoney Creek	South Wairarapa	The climate is mild, and generally warm and temperate. There is still an average of 814mm of rainfall during the year, though it averages 40-60mm per month in summer & Autumn. The average temperature in the area is 13.0 °C though it averages 17.6^0 c in January.
Grand Total		*Source: https://en.climate-data.org/location/33719/*

4. The Broader Landscape.

The ecological landscape

The RMS estate comprises plantation Forestry Rights only and does not include indigenous forest or natural ecosystem areas other than those associated with streams and rivers traversing between parts of the plantation estate, small unstocked or failed restocking patches, or those created in an ongoing fashion as setbacks are established upon restocking around streams that previously had none.

Western Forests

While containing very little in the form of natural indigenous vegetation environments, the RMS forests in the Hutt and Kapiti Coast areas are embedded within a wider natural landscape comprising native forests managed by the Department of Conservation in the Tararua and Rimutaka ranges and the Pakuratahi and Akatarawa Regional Forest Parks managed by the Greater Wellington Regional Council(GWRC). There are small areas of plantation in close proximity to the Conservation estate but most are substantially embedded within the wider boundaries of the Regional Forest Parks.

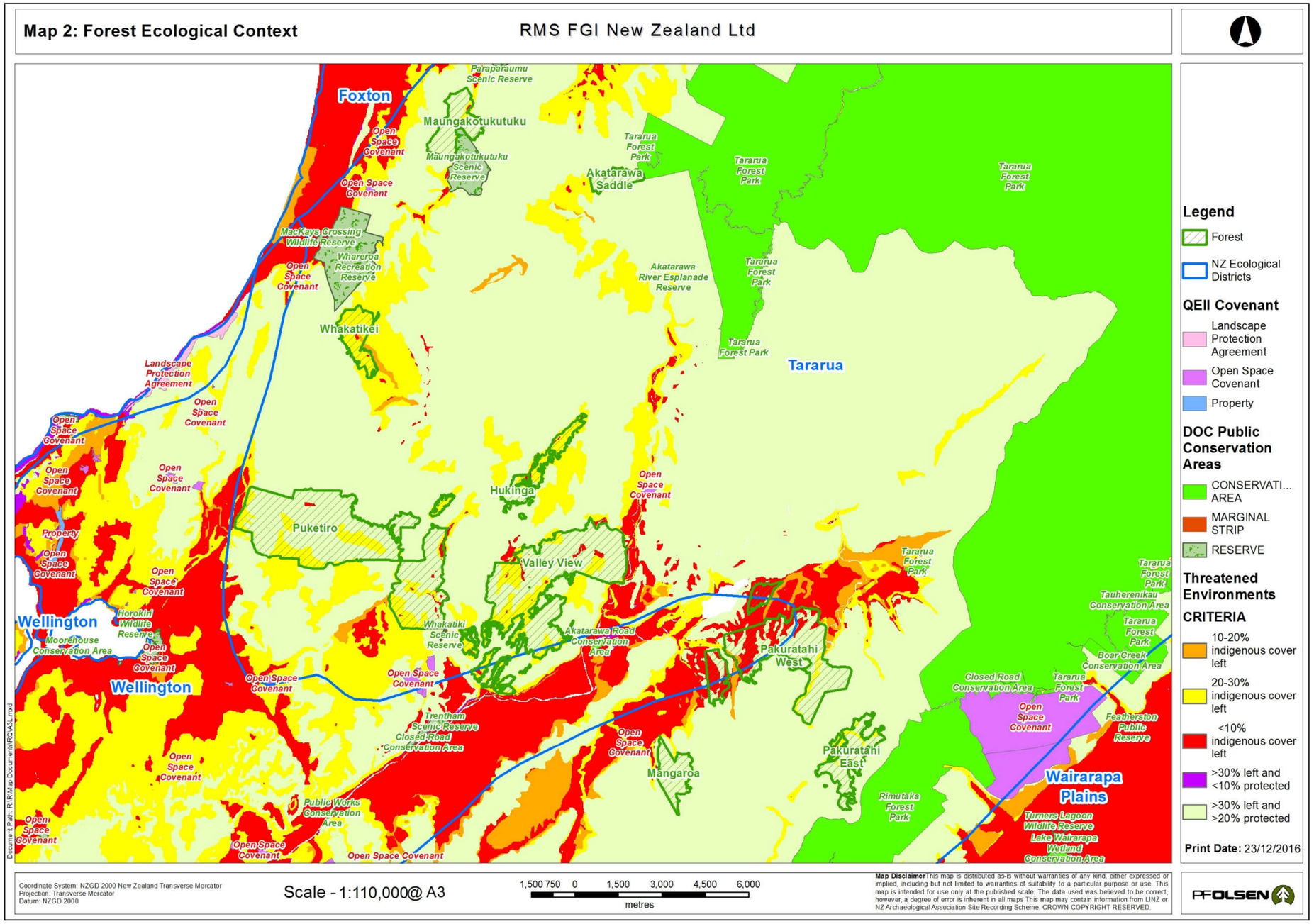
These conservation and parklands are extensive and embody a wide range of ecological and conservation values. There are specific protocols to manage the boundary interface between these public conservation and recreational lands. The small remnant, regenerating or riparian areas embedded within the plantation areas are almost entirely classified as the least threatened ecosystems under the New Zealand Threat Classification system with >20% of such ecosystems class being formally protected and >30% of that original class remaining today. There are small overlaps with much more threatened classes where only 20-30% of that cover remains and none is formally protected.

Eastern Forests

The RMS forests in the Eastern Wairarapa are in a very different bioclimatic zone. While the Stoney creek forest is physically separated from other conservation lands, Hiwinui and Tauanui both directly abut Conservation estate in the form of the Aorangi Forest park. The three forests together are located across a mix of environments from threatened (at 10-20% of original cover remaining with no formal protection) to the least threatened (with >30% remaining and >20% protected). The mix of threat classes near or overlain by the forest boundaries are highly reflective of the history of intense land clearance for pastoral agriculture.

The spatial location of the RMS forests in relation to the public conservation lands, and threatened environment classes is illustrated in Map 2

5. Map 2 - Forest Ecological Context.



6. Socio-economic profile and adjacent land

Forest history

The RMS estate was established by the Wellington Regional Council

Greater Wellington's plantation forests were originally planted to provide regional employment opportunities, to suppress gorse, for soil conservation purposes and to protect water sources for the surrounding urban areas. The forests west of the Rimutakas were originally authorised under Part III of the *Wellington Regional Water Board Act 1972*.

Management policies applied up until the time of the sale of Forestry Rights included statements pertaining to :

- Management of the exotic plantation forests for commercial return for Greater Wellington while following best practice and with due regard to soil and water values.
- To take into account the potential effect of the proposed forestry developments and operations on the quality and quantity of water available from catchments for future water supply purposes.
- Ensuring legal compliance during all operations.
- To minimise disturbance to ecosystems and to soil and water values through the application of best industry practice including provision of buffer zones on streams and key recreational and heritage values such as the Rimutaka Rail Trail.
- The desirability of allowing compatible recreation activities.

In short the expected result was that[3]:

> "*Plantation forestry activities will be sustainably managed into the future. The forestry tracks and exotic forests provide opportunities for recreation, which in turn contribute to the following quality of life outcomes; culture, meeting needs locally, leisure, safety, distinctive sense of place, and health".*

[3] http://www.gw.govt.nz/assets/council-reports/Report_PDFs/2005_197_3_Attach.pdf

Associations with Tangata Whenua

Official information indicates Maori with affiliations to the areas over which the RMS estate covers are:

Iwi	Land area
Ngāti Toa, Muaūpoko	Hutt valley through to Kapiti Coast
Ngāti Kahungunu ki Wairarapa Rangitane o Wairarapa	The Wairarapa

Representatives of these Iwi are considered stakeholders with a potential interest in the management of the forests

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Tenure & resource rights

A review of the forest areas within the Maori Tenure website[7] reveal there are no areas of Maori Land currently registered within the bounds of the RMS forested estate.

There are numerous Licences and agreements pertaining to existing uses with the forests that prevail through the 'Forestry Rights Agreements' (See Section 19), while the Forestry Rights also make specific reference to the provision of options for supply of forest timber products to specified previously existing domestic users.

Neighbours

Neighbours to the forest estate boundaries may 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 and biosecurity hazards. As such, neighbours are considered stakeholders with a potential interest in the management of the forests.

The RMS estate, being partly embedded within a peri-urban context, has large numbers of neighbour stakeholders and interest groups. Where possible, publicly available details of these groups, their representatives or the individuals concerned are gathered and held in a stakeholder register database for the purposes of engagement where relevant, over forest management matters that may affect them such as operations over the adjacent boundary.

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[7] *http://www.maorilandonline.govt.nz/gis/map/search.htm*

Regulatory Environment & Risk Management

7. The Regulatory Environment & Risk

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 RMS estate.

Health and Safety at Work Act 2015

- RMS and PF Olsen management, leadership and constant focus, including the strong message that safety rates as the No. 1 priority ahead of any other business driver.
- Contractor selection process including emphasis on:
  - safety systems and track record
  - worker skills and training
  - 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 (annual) review and update of the critical risks as identified in RMS NZ estate 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.

Health and Safety is also subject matter reported to the GWRC as a condition of the Forestry Rights as part of the joint 'Principal's Duties' under the Act.

The National Environmental Standard for Plantation forestry (NESPF)

Planned to come into law in 2017, the NESPF will, if passed, establish 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 some transitional arrangements will apply.

The core underpinning the structure of the NESPF 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 and again recently updated has 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 (1) to very high (4).

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 the RMS estate, the table below indicates the breakdown of the estate into the respective ESC classes.

Forest Name	ESC 1 - %	ESC 2- %	ESC 3- %	ESC 4- %	Total ha
Akatarawa Saddle	99	1			39
Hiwinui Forest	61	27		13	438
Hukinga	61	39			123
Mangaroa	37	63			148
Maungakotukutuku	8	92			188
Pakuratahi East	12	38	50		187
Pakuratahi West	30	68	2		440
Puketiro	37	63			1,232
Tauanui	55			45	180
Stoney Creek	12	3	28	58	1,153
Valley View Forest	51	49			984
Whakatikei	98	2			155

In broad terms, harvesting, roading (earthworks) and new afforestation operations will need consents in the ESC 4 class. Earthworks will need consents in class 3 and in the class 1 & 2 terrains, most operations will be permitted subject to conditions. The coverage of the erosion classes within the estate are illustrated in Map 3.

The Emissions Trading Scheme

Forests in New Zealand are governed by rules related to New Zealand's Climate Change Response Act (CCRA) to reduce the nation's carbon footprint and contribution to associated climate change.

Much of the RMS Estate lands were existing forest as at 31st December 1989. At harvest, these stands can be subject to a deforestation tax equivalent to the tonnes of CO_2 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 obligation falls on the Forestry Rights owner (RMS FGI Ltd) who is required to report any deforestation of this land to Greater Wellington Regional Council (GWRC).

Deforestation during the first rotation is not permitted under the Forestry Rights other than in specific situations that make provision for certain infrastructure and or wider riparian setbacks on rivers.

Within the estate approx. 1,500 ha are forests planted after Dec 1989. These are accruing carbon units and are entered into the NZ Emissions Trading Scheme (see Carbon sequestration)

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.

9. 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 RMS retains credible access to it's markets.
- RMS is seeking to attain Independent third party environmental certification for it's estate under the Programme for Endorsement of Forest Certification (PEFC). PF Olsen Ltd acting under the instruction of its client will be responsible for the excecution and maintenace of the required PEFC 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 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

The RMS estate is traversed by a number of 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.

Additionally, specific enhanced corridor setbacks after harvest are provided for in the terms of the Forestry Rights for the national high tension lines passing through Puketiro forest. These corridors are shown in Appendix 4

Fire

Fire is always a risk to the forests. The RMS estate has additional particular risks related to the presence of power transmission lines, high proximate public usage and climatic characteristics of high wind velocities and in the eastern parts of the estate in particular, very dry conditions over summer.

Fire risk is managed through:

- Protocols to restrict work hours or to stop work in periods of extreme fire risk.

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10. 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 RMS's Statement of Intent are considered to be well in alignment.

RMS Statement of intent

RMS has a published 'Statement of Intent' in respect of sustainable forest management that states RMS's commitment to environmentally sound and sustainable forest management practices on all forest lands under its management authority.

More specifically RMS will:

- Provide a safe and healthy work environment for its employees, suppliers and contractors and operate as a socially responsible corporate citizen.
- Undertake operations in an environmentally responsible manner.
- Proactively engage with stakeholders.
- Continuously improve the productivity and utilisation of its forestlands in a responsible manner.
- Comply with the intent, as well as the letter of all applicable national or local laws, regulations and other external compliance requirements.
- Provide adequate resources to meet the requirements of the Certification Standard.
- To only undertake forest operations that do not degrade native forest or convert native forests to alternative land use.
- Provide its employees, contractors and suppliers with and understanding of the requirements of the Forest Management Plan.

Exercising good environmental stewardship through responsible management of forest resources meets the needs of our clients, customers, employees, society and future generations.

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 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.

As a broad assessment over the total estate, the **potential** for adverse impacts across the range of operations and forest sites is indicated in the Environmental Assessment matrix below, which summarises the identified risks. 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.

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Hazardous substances management

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

The hazardous materials which may be used within RMS estate 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.

Management Objectives

11. Forest Investment Objectives.

Management structure

In common with the approach taken by many Timber Investment Management Organisations (TIMO's), the NZ forest holdings of RMS are managed as a financial asset, the key features of which are:

1. Financial structuring, tax, accounting plus log marketing and land/lessor management as well as oversight of property management.
2. Actual property management to manage day-to-day forestry and harvesting operational planning and execution is contracted to a reputable local forestry management company, in this case PF Olsen Ltd.

PF Olsen Ltd is a NZ owned and NZ resident forest management company based in Rotorua but an operational presence in every region of NZ[10].

Business objectives

RMS FGI NZ Ltd owns its NZ Forestry Rights as a financial asset from which it expects to maximise financial returns while concurrently managing the associated statutory, reputational and commercial risks.

RMS FGI NZ Ltd, as a socially responsible owner, places equal priority on health, safety, environmental and financial management as clearly described in its charters. Maximising returns will be understood and applied within this context.

The objectives of RMS FGI NZ Ltd are to maximise its financial returns from its business of growing a commercial tree crop on GWRC land by:

1. Ensuring compliance with the terms and conditions of the two 'Forestry Right' agreements.
2. Enhanced value - protecting the existing forest and adding value through best practice silviculture of its commercial tree crop investment.
3. Management excellence – including giving precedence to our over-arching values, attitudes and beliefs that serve to keep our workers and the environment safe from harm.
4. Obtaining best available stumpage returns.[11]

[10] www.pfolsen.com

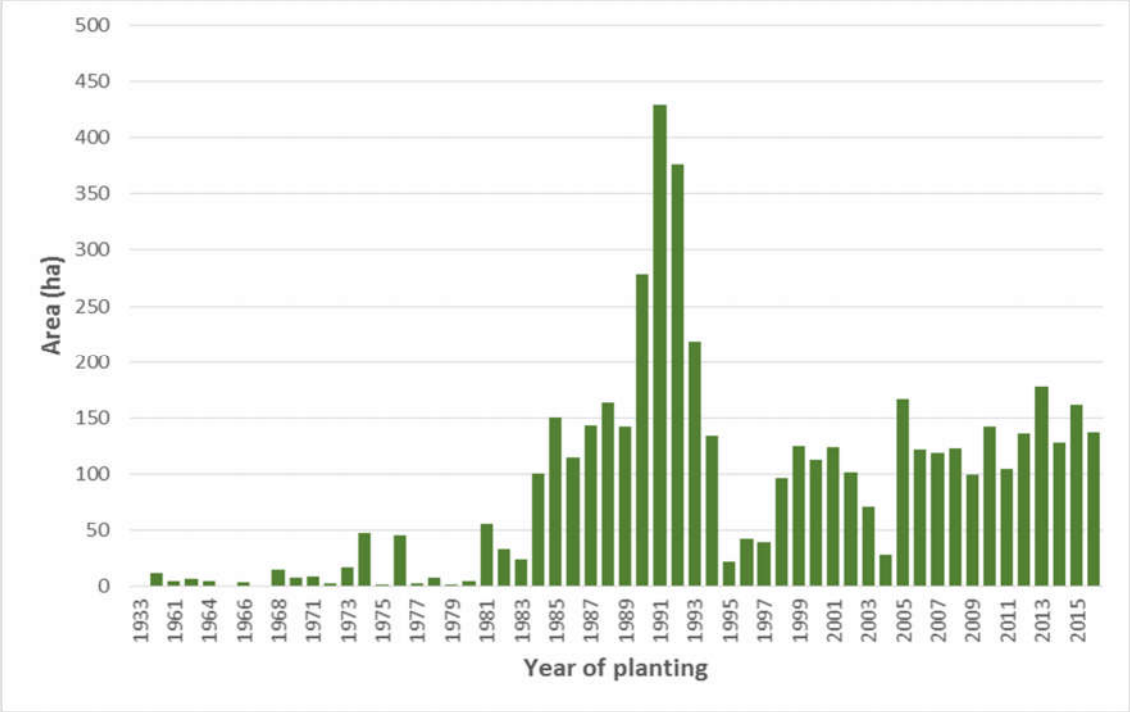
[11] Sales prices less costs of sales from harvesting trees.

Age class distribution

The age class – area distribution of the RMS estate displays a quite consistent distribution by area other than a three year peak in area that is approaching harvestable age and a similar sized gap that will influence available harvest volumes 2 years later.

The distribution does provide the owner with flexibility in the options for harvest levels according to market prices.

Area / Age-class distribution within the RMS estate.



Productivity indices

A standardised estimator of the productivity of a plantation site in NZ for radiata pine is the 300 index[12].

The 300 index for the RMS estate is generally in the 20-25m3/ha/yr range but with increasing proportions rising into the 27-30m3/ha/yr ranges in the more eastern and lower altitude coastal western forests.

Site index, another productivity measure sits between 25m and 30m across the range of forest sites.

In both cases, such figures would be at the lower to mid productivity range for radiata pine in the North Island. This is due to the harsher climatic conditions and shallow soils at higher altitudes (in some areas).

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

Carbon sequestration

Carbon levels within the forest are monitored on the basis of a regular snapshot of expected carbon held within the estate. These estimates are based upon the estate yield model that is reviewed on an annual basis and provides the basis for conversion of standing volume estimates into carbon sequestration estimates based on formulae recognised under the Climate Change Response Act.

In order to incorporate visibility of the effects of forest management on the estates sequestered carbon, estimates of carbon will be monitored long term by way of the current estimate at the start of this five year management planning period and a forecast five years hence based on the estate model standing crop forecasts five years hence. These calculations will be repeated every five years providing a basis for monitoring and will include estimates from native reserves existing or created within the estate.

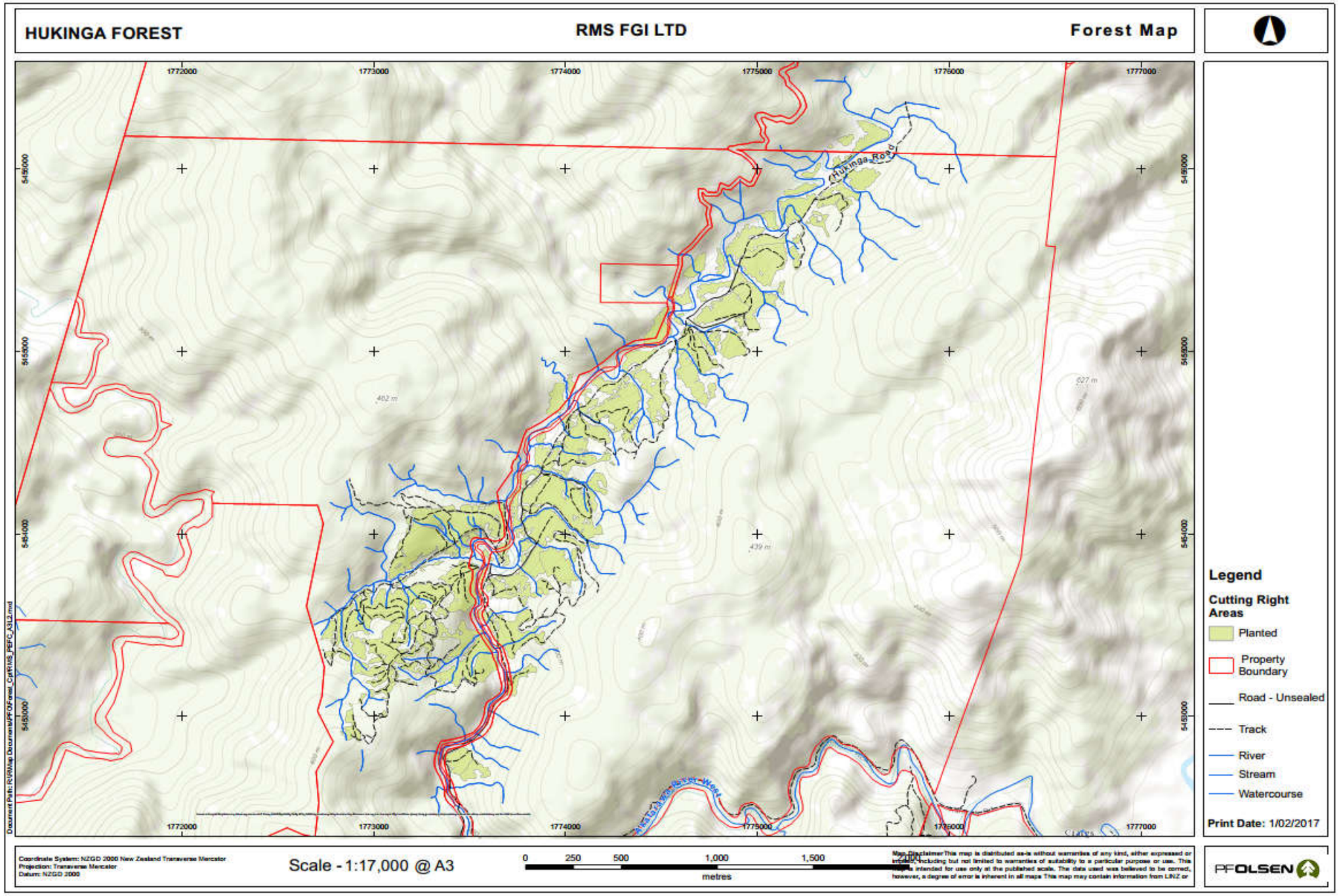
RMS have no benefit in carbon from forests in existence as at January 1st 1990, but are liable for any deforestation penalties incurred over such areas of the estate if areas outside those specified in the Forestry Rights Agreements are not replanted or satisfactorily regenerated.

RMS do have a commercial interest in the carbon stored in the post December 1989 forest areas as listed below. These form part of the RMS asset base.

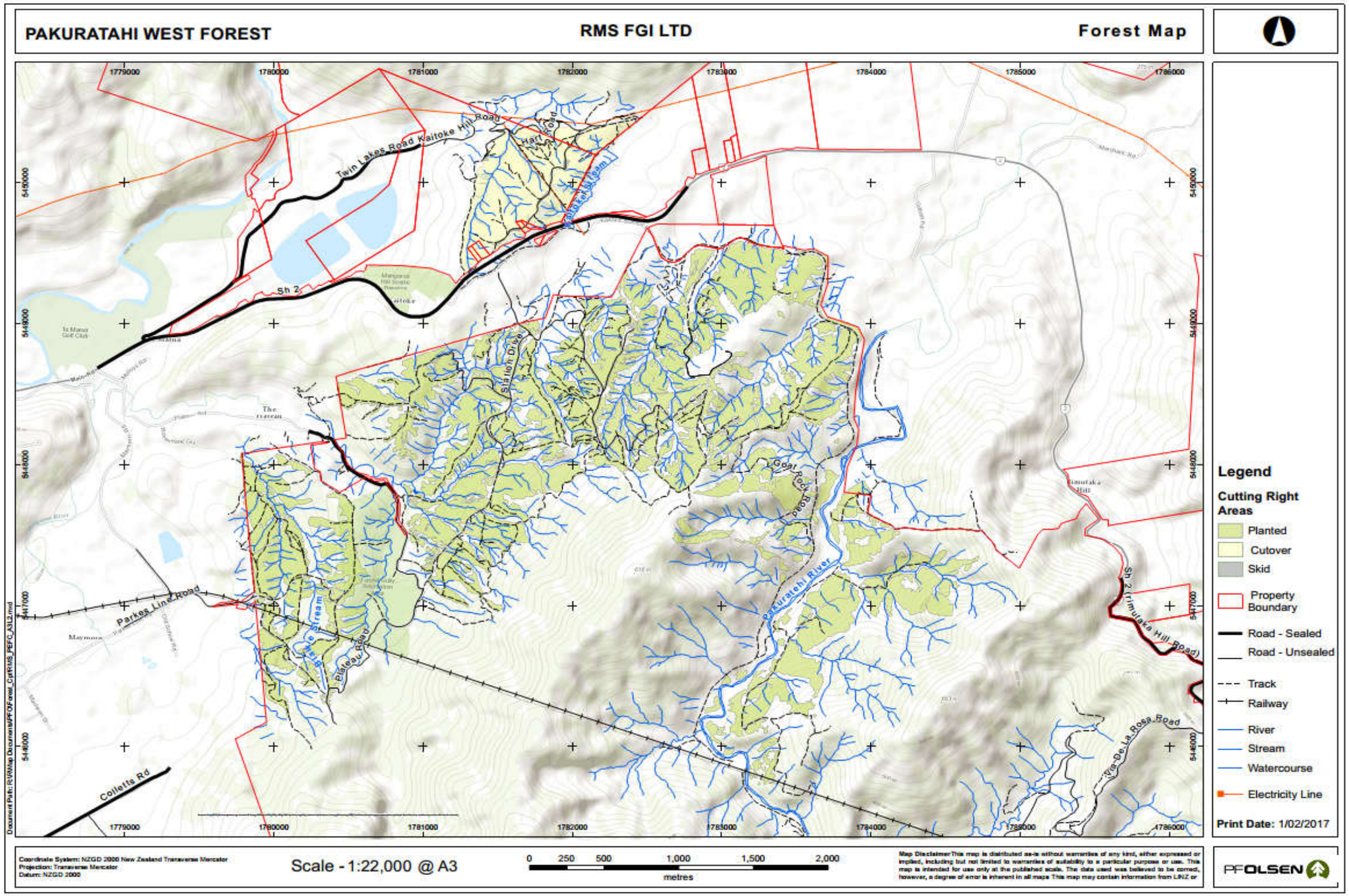
Post December 1989 forest areas in the RMS estate

Forest	Post 89 Area
Akatarawa	43
Puketiro	293
Stoney Creek	1,137
	1,473

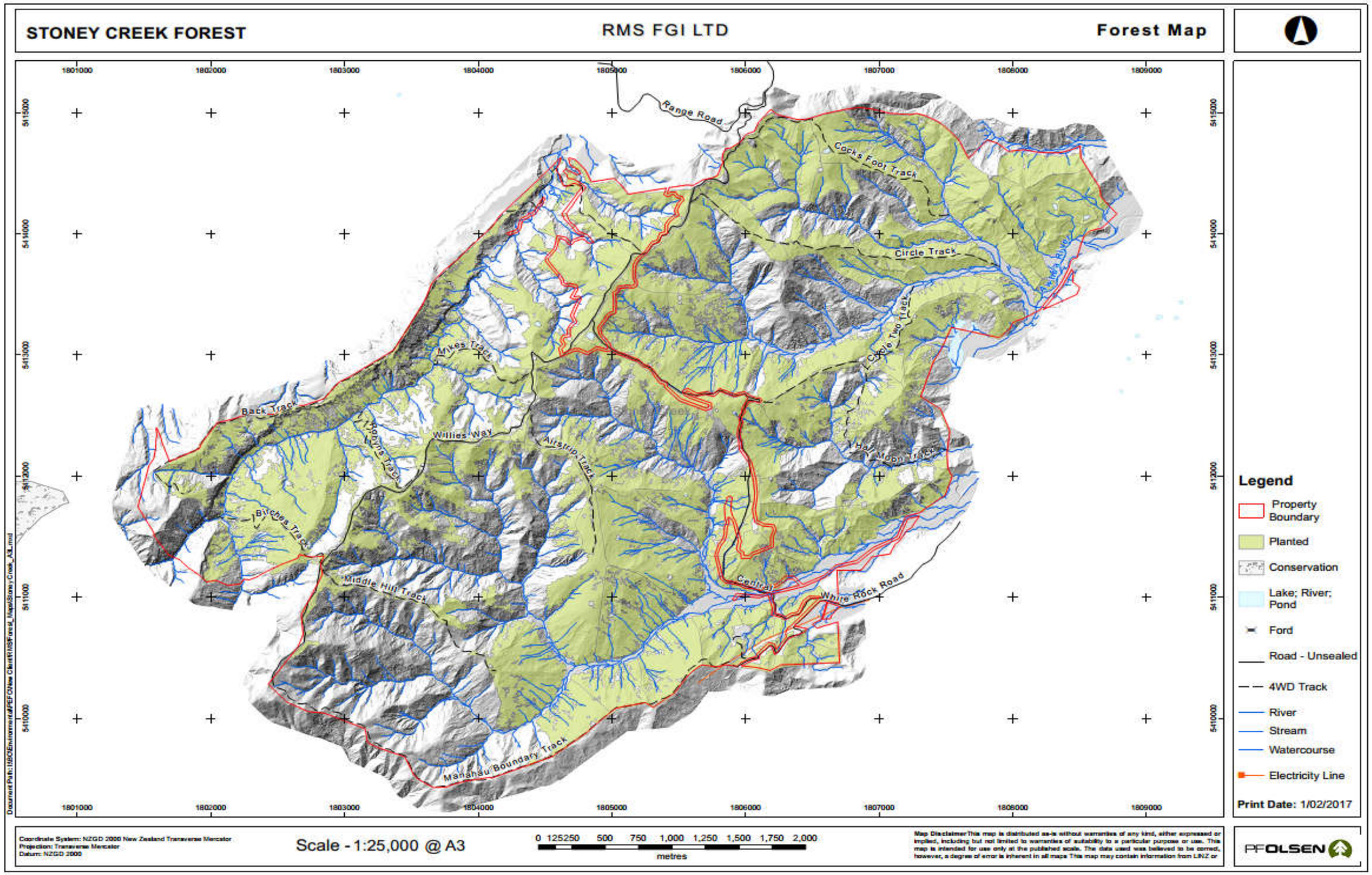
Map 2c Hukinga Forest Map



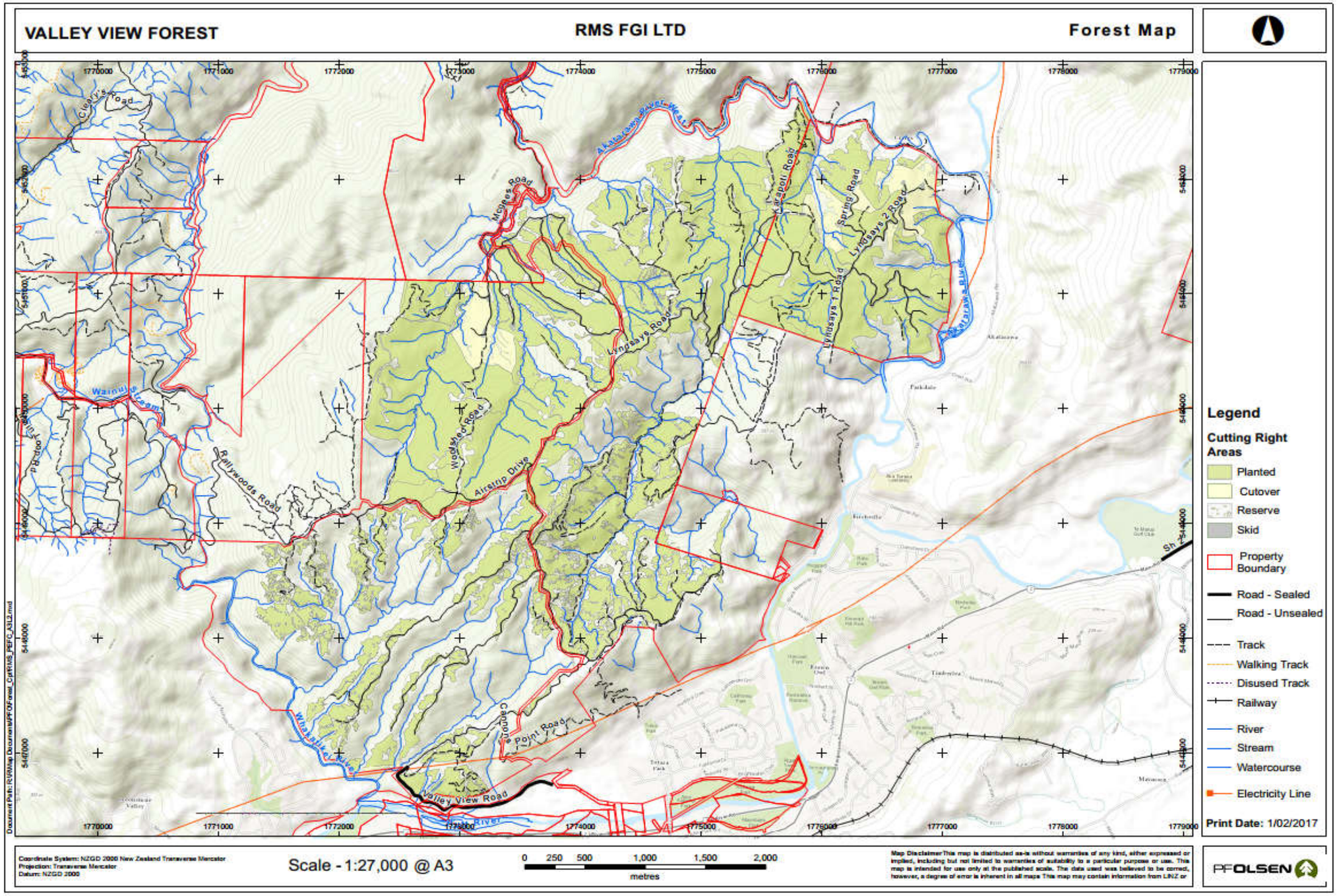
Map 2e Pakuratahi West Map



Map 2g Stoney Creek Forest Map



Map 2i Valley View Forest Map



14. Commercial Crop Establishment and Silvicultural Operations

Introduction

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 asset maintenance.

Forest management goals

The forests of the RMS estate are to be managed to:

- Grow trees and produce logs for the manufacturing of different wood products in New Zealand and overseas with a focus on described primary products;
- Ensure that the productivity of the land does not decline;
- Replant following harvesting;
- Ensure that environmental values are identified and maintained;
- Ensure that historic and culturally important sites are identified and protected;
- Ensure that other forest values and products are identified, protected and where possible enhanced;

Future crop species

As an already established estate, the species planted has already been predetermined well into the future. Based on performance histories of other species in these areas in the past, the proximity to well established domestic and export market opportunities, the general site characteristics and economic and productivity expectations, radiata pine will over the term of this plan, remain the predominant species of choice upon replanting within the RMS estate.

Unwanted pine spread

In most parts of the wetter cooler, Rimutaka /Hutt valley/Kapiti Coast forests, vigorous native hardwood regeneration will normally out compete most radiata pine that might naturally regenerate following harvest in newly created streamside setbacks. Some basic monitoring and if required regeneration pulling can be undertaken if required to maintain a native cover status.

In the drier, windier eastern forests, 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.

Pre-establishment considerations

There may be situations arising from pre-harvest assessments, ecological or archaeological surveys, post-harvest operational review or other activities, including consultation with stakeholders, where small areas are retired from production after harvest for practical, safety, environmental or heritage reasons.

These situations will normally only become apparent during the planning phases ahead of harvesting and other operations.

Tending

Thinning:
A single waste thinning operation is assumed at around age 10. The actual timing of this will vary depending on the growth and condition of the crop. Thinning to a final crop stocking of between 450 and 550 stems per hectare should produce a high quality unpruned tree crop.

Waste thinning of naturally regenerated stands in the Wellington and Wairarapa forests is more costly than thinning a planted tree crop, since more stems will need to be removed. These stands can carry 2,000 stems per hectare or more. Thinning of naturally regenerated stands or stands with above average stocking will be conducted when proven to be financially viable.

Pruning:
The economic viability of pruning has been tested using a cost-benefit analysis, assuming three pruning lifts and a single waste thin. At current costs and prices, the additional costs of this pruning regime exceed the increase in the tree crop value. Therefore, for this 5 year period no pruning is anticipated. This assumption will be re-tested periodically.

Tree nutrition

As a general rule in plantation forestry in New Zealand, fertiliser use is very low or non-existent except in some specific soil types. However, relatively shallow soils and the underlying geologies in some parts of the RMS estate are leading to signs of nutrient stress in some forest stands.

Metro Forests:
Much of Pakuratahi appears to be phosphorous deficient. Growth appears to be significantly impacted. It is likely nitrogen will also be low in this forest.

Wairarapa forests:
Symptoms consistent with both nitrogen and phosphorous deficiency were observed in all stands. It is likely that these deficiencies are limiting growth.

Nutrient deficiency symptoms will be monitored by foliar sampling. Fertiliser will only be applied if the health and the growth of the trees are significantly adversely affected without it <u>and</u> if a significant beneficial economic and health response can be expected based on current scientific understandings.

Planning and preparing for harvest

With estate model derived schedules providing short and medium term forecasts from which operational budgets and activities are driven, the ideal to achieving an optimal harvesting solution in terms of the forest owner's health and safety, environmental and commercial objectives is developed through the harvest planning more or less reflecting the process below:

Strategic (Paper) Plan – (3-5 year horizon)

This will involve a desk top assessment of harvest options to determine the:

- preferred harvest system,
- preliminary harvest area and setting boundaries,
- preliminary road and skid layout,
- consent and statutory risks and environmental requirements.

Draft harvest Plan (18 month horizon)

The strategic harvest plan will be developed in detail and in consultation with contractors wherever possible, to produce a draft harvest plan to finalise;

- the harvest area and setting boundaries,
- the preferred logging system, including recommended rigging system (based on analysis of critical cable logging settings),
- the road and skid layout, including any specific engineering (RoadEng or CAD/Civil 3D) designs for critical roads,
- key operational requirements/conditions to ensure compliance with resource consent and statutory requirements,
- the preferred timing and sequence of road-line salvage, road construction and harvest operations

Final Harvest Plan and Prescriptions (2month horizon)

Detailed work instructions, in the form of a final harvest plan and prescription, will be provided for each of key operations (road-line salvage, road construction and clearfell harvest). These will reflect the agreements made with the contractors and include:

- 1:5,000 scale planning maps (detailing harvest area and setting boundaries, road and skid layout, extraction lines/corridors, operational constraints and hazards),
- Specific operational notes and instructions (project requirements),
- Specific management plans (Traffic Management Plan, Power Line Management Plan, Archaeological Management Plan),
- Specific design (RoadEng and CYANZ/CHPS Cable Analysis)
- Resource consent conditions

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Proposed harvest

The aggregated harvest being planned for the next five years is tabulated below:

Year	Area (ha)		
	Metro	Wairarapa	Total (ha)
2017	148.5	100.4	248.9
2018	156.5	96.1	252.6
2019	162.3	82.0	244.3
2020	198.9	96.5	295.4
2021	191.7	120.1	311.8

Proposed roading and other infrastructure work

The roading and other infrastructure work proposed for the areas to be harvested in the first year are detailed in the Annual Cutting Plan. There are presently no plans for the construction of any other roading, infrastructure or improvements to the land.

Land handback

Land hand back during the term of this five year plan is not envisaged. In accordance with the two Forestry Right Agreements, the Rights holder is required to replant harvested areas less any documented exclusions. Beyond the first 32 years (or 63 years if the term is extended), the Rights holder may elect not to replant and such areas will be handed back.

Contractor management

Prior to engaging any new contractor a comprehensive review of the contractor's safety systems, safety record, systems of work organisation, general performance record and equipment is carried out. PF Olsen must be satisfied on this review, regardless of the tendered price. For safety and productivity reasons, where topography and terrain allows, mechanised felling, extraction and processing is being encouraged.

Upon appointment all new contractor crews undergo a comprehensive safety and environmental induction, while PF Olsen Ltd, in conjunction with its contractors and NorthTech, runs a comprehensive programme of training to ensure the workforce is competent for the work they are required to perform. These 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 operational 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.

Non-commercial Estate Management &Protection

17. Protected Forests, Habitats, Ecosystems and Species.

Introduction

Indigenous biodiversity management in or associated with exotic forests is a normal component of everyday forest management. PEFC places 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 if located.

Terrestrial reserves

The Forestry Rights plantation areas are embedded within a wider native forest landscape. By nature of the way the RMS Forestry Rights were put up for sale by GWRC, the Rights in themselves do not contain anything other than small fragments of unstocked gaps and failed establishment that is returning to native shrubland forest. As indicated in Section 4, the substantial bulk of the plantations occur within land environments where the indigenous forest that would have been supported in these area still has between 20-30% remaining or more, and in the latter case, more than 20% formally protected. Nevertheless small areas of the estate do occur in much more highly threatened environments and small remnant patches given time and protection can revert to much higher valued ecosystems.

GIS layers from the GWRC Proposed Natural Resources Plan 2015 produced as part of that Council's statutory obligations under the RMA do not reveal any specific natural terrestrial habitats or areas designated for protection within the plantation estate nor its general vicinity. However, the Hukinga, Puketiro, Whaikatikei and Valley View forests are all part of a landscape linked with the GWRC Akatarawa "Key Native Ecosystem". This is a large 12,430 ha native forest area that forms the southern extent of the Tararua range, contains a mosaic of native forest types and includes 1,000ha of near natural lowland podocarp forest and 500 ha of beech podocarp forest. This whole area is the subject of a specific GWRC management plan[13]

Continued on next page...

[13] http://www.gw.govt.nz/assets/council-publications/Key-Native-Ecosystem-Plan-for-Akatarawa-Forest.pdf

Water & streams

In the matter of water and water quality, the RMS estate has extensive direct and indirect connection with waterbodies that are important within the region not least due to the relevance of these areas to current and future urban water supplies.

Larger streams that generally have wide native vegetation riparians are well protected by that vegetation which falls outside the Forestry Rights. There are however large numbers of small waterbodies connecting to the larger streams and some of these have had no riparian margins setbacks created at the time of original planting.

GWRC have acquired and developed a lot of information on the values of the waterbodies of the region. In relation to the RMS estate this is summarised below.

Water Quality:
GWRC have a significant number of long term water quality monitoring sites throughout the region that inform the Council's State of the Environment reporting.

Of all the sites, only three have potential relevance, RS25 & 26 because the sites, while dominated by indigenous vegetation, directly abut two of the plantation areas where operations have been ongoing for some years. Both sites are representative of the higher order streams that are indirectly linked to the plantations over short sections of their length. Site RS44 is a plantation dominated catchment though not related to the RMS estate.

Site RS52 is immediately adjacent to but upstream of the RMS Tauanui forest. The river is important to local iwi, and while no inference can be made from the data below, the forest has been harvested in the period 2006 - 2012 and is now regrowing. Most stream margins are well buffered.

Water Quality at sites of potential relevance to the RMS estate[14].

GWRC site	Name	Dominant vegetation		Geology	Water quality index	Rank of 53 sites	MCI	Habitat quality score
RS25	Akatarawa R @Hutt confluence	Indigenous	Adjacent to Vally view	Hard	Excellent	5=	Excellent	204
RS26	Whakatikei	Indigenous	Adjacent to Puketiro	Hard	Excellent	9=	Excellent	196
RS44	Totara S	Exotic	NA. East Coast.	Hard	Excellent	18 =	Good	152
RS52	Tauanui R	Indigenous	Upstream Tauanui	Hard	Excellent	8	Excellent	190
						53 sites		Range 60-217 Median 147

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[14] Rivers State of the Environment monitoring programme
Annual data report, 2014/15
GW/ESCI-T-15/146

…continued

Minimum planting setbacks as defined in the Forestry Rights Agreements are:

- 5m for streams less than 1.0m wide and by virtue of clauses within the Forestry Rights…..
- 10m for all streams between 1 & 3m wide.
- 20m for all streams wider than 3.0m wide.

The morphology of streams can mean that the minimum set back is wider in many instances.

The stream REC categories actually within the RMS estate provide thresholds based on stream width for other considerations aside from the setbacks. The total length of each class is summarised below:

Length (m) of Stream Categories informing riparian management.

Stream class	Stream width	Akatarawa Saddle	Hiwinui	Hukinga	Mangaroa	Maungakot	Pakuratahi East	Pakuratahi West	Puketiro	Stoney Creek	Tauanui	Valley View	Whakatikei	Grand Total
Large_Low_Wet_Hard	>3.0m							168		1,886				2,053
Large_Low_Wet_Soft	>3.0m			119								110		229
Large_Mod_Wet_Hard	>3.0m			1,322		1,151	1,782	3,628	7,572	3,880	2,612	241		22,189
Large_Mod_Wet_Soft	>3.0m			1,044		148			132					1,324
Large_Steep_Wet_Hard	>3.0m						30		226					255
Med_Low_Wet_Hard	1.5-3.0m	564						3,905	1,169	502		3,898		10,039
Med_Low_Wet_Soft	1.5-3.0m							277	315			964	801	2,357
Med_Mod_Dry_Hard	1.5-3.0m		1,816											1,816
Med_Mod_Wet_Hard	1.5-3.0m		375	819	1,352		1,852	1,358	6,367	15,333	3,357	4,533	596	35,941
Med_Mod_Wet_Soft	1.5-3.0m			405				60	1,574					2,039
Med_Steep_Wet_Hard	1.5-3.0m						691	1,268	94					2,052
Small_Low_Dry_Hard	0.75-1.5m		435											435
Small_Low_Wet_Hard	0.75-1.5m	102						622		814		754		2,293
Small_Low_Wet_Soft	0.75-1.5m	42		388					647			435	1,271	2,783
Small_Mod_Dry_Hard	0.75-1.5m		4,363											4,363
Small_Mod_Wet_Hard	0.75-1.5m		3,575	41		1,080	306	1,233	3,900	4,716	145	445	560	16,002
Small_Mod_Wet_Soft	0.75-1.5m			219					37					255
Small_Steep_Wet_Hard	0.75-1.5m				651	23	272	125						1,071
VSmall_Low_Wet_Hard	< 0.75m									94				94
VSmall_Mod_Wet_Hard	< 0.75m									475				475
Grand Total		**709**	**10,563**	**4,357**	**2,002**	**2,403**	**4,932**	**12,645**	**22,032**	**27,699**	**6,114**	**11,381**	**3,229**	**108,065**

Native fish habitats

Migratory and Threatened Native Fish.

In addition the GWRC has, as part of its regional planning processes under the RMA, modelled stream reaches on the basis of distance to coast and catchment size and proportion under native vegetation to classify stream reaches into those that potentially provide habitat for migratory fish and those that potentially harbour threatened native fish species.

The results tabulated below show, in lineal metres, the interface between identified streams and the RMS estate.

Length (m) of rivers of importance for migratory fish (GWRC Plan)

	Akatarawa Saddl	Hukinga	Maungakotuk	Puketiro	Stoney Creek	Tauanui	Valley View	Grand Total
Akatarawa River	964	11,708					13,257	**25,930**
Awhea River					23,338			**23,338**
Horokiri Stream				3,619				**3,619**
Maungakotukutuku Stream			4,481					**4,481**
Whangehu Stream						5,355		**5,355**
Grand Total	**964**	**11,708**	**4,481**	**3,619**	**23,338**	**5,355**	**13,257**	**62,723**

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Management for fish

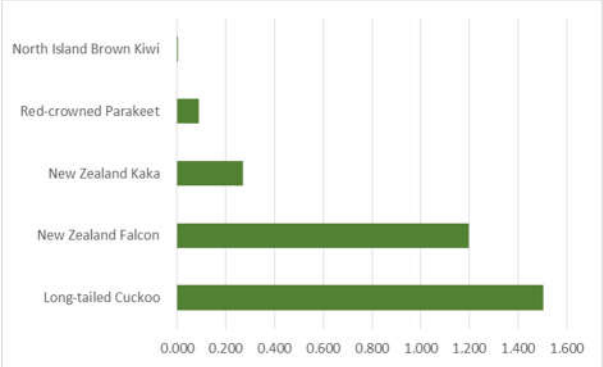
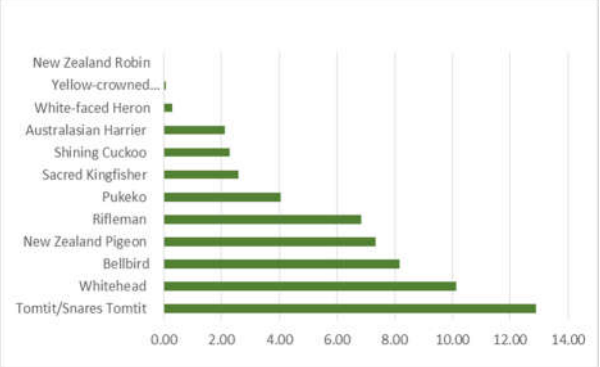
PF Olsen uses the Freshwater Environments of New Zealand (FWENZ) models to inform the potential for threatened fish species that may be present in streams affected by operations and if necessary any response to such a presence.

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	No specific surveys have been conducted within the RMS plantation estate for threatened native bird species. In general, as a relatively small component within a wider matrix of natural forests (western areas) and farmland (eastern Wairarapa), the fragmented nature of the plantation blocks means that at best they will only provide habitat for native species that is reflective of the wider landscape. A review of data[15] for the Hutt Valley area and the Wairarapa area provides some good base line on the likely forest inhabitants in these regions.

Bird observation frequencies (Hutt Valley Council areas)

Threatened	**Common**
	

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[15] http://ebird.org/content/newzealand/

…continued

- Promotion of the development of improved riparian corridors after harvest.
- Co-operation with GWRC and other bodies undertaking vertebrate pest control within the wider GWRC property holdings within which the plantations are embedded.

Bats & management

The river systems running within or adjacent to the RMS estate that also have large well developed natural forest surrounds may also provide potentially good feeding corridors for native bats.

Research has also shown that large 'old-man' radiata pine can provide good roost habitat.

Primary management actions in relation to bats are:

- The forest industry currently has draft protocols for management of bats in plantain forests. Once published, these will underpin management actions.
- Bat detection boxes will be deployed around the forests in a prioritised programme with the aim of establishing those parts (if any) of the plantation forests that may harbour bats. The immediate focus will be to get ahead of the future harvesting programme where bats may be present. Detections will be recorded in the NZ Forest Owners NatureWatch – Biodiversity in Plantations Project[17]
- Co-operation with GWRC and other bodies undertaking vertebrate pest control within the wider GWRC property holdings within which the plantations are embedded.

Herpetofauna and management

A desktop review of the likelihood of presence and distribution of native lizards and frogs within the RMS estate was commissioned to inform future strategies for management if any.

Most NZ lizard species are now threatened, principally due to predation but also habitat loss. The wide range of habitat specialisation by some lizards and the highly variable bio-climatic regimes across the RMS estate suggested a presence of lizards within the actual plantation boundaries was a possibility.

The desktop review[18] based on past recorded sightings within a 5km radius of each of the RMS forest blocks confirmed a possibility for lizards to be present in or around most forest areas. Past sighting records indicated a potential for nine lizard species (of which six had a threat classification) to be found within the Ecological Districts within which the forest are located.

Continued on next page...

[17] http://naturewatch.org.nz/projects/biodiversity-in-plantations
[18] EckoGecko Ltd

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 in the EMS, or online at http://www.doc.govt.nz/about-doc/role/international/endangered-species/cites-species/nz-cites-listed-species/.

…continued **Forest Owner responsibilities**

	Pest Plants	***Pest Animals***
Boundary Control / Supression	*Destroy pests within boundaries of plantations.*	*Destroy pests within boundaries of plantations. Note- any shooting and poisoning operations are controlled by GWRC.*
Site Led	*Monitor for presence,* *Notify Council of any locations.* *Observe biosecurity protocols.*	*NA - Council*
Surveillance	*Monitor for presence,* *Notify Council of any locations.* *Observe biosecurity protocols.* *Control unauthorised domestic dumping*	*NA - Council*

Note: Site led pest control operations are conducted by GWRC within the Akatarawa Key Native Ecosystem area. These operations include a number of specific plant pest locations and general pest animal control and are inclusive of portions of the RMS estate embedded within the Akatarawa Forest[21]

Pest control

Aside from specific pest control obligation under the Regional Pest Management Strategy, control and containment of certain forest pests will be sought as a concurrent part of management of the estate where or if they become present.

Key pests in this respect are:

Plants	**Animals – Where damaging to plantation productivity**
Banana passionfruit Blue passion flower Broom Buddleia Climbing spindleberry Gorse Old man's beard Pampas grass Wild ginger Woolly nightshade	Hares, Rabbits, Goats, Possum, Deer.

An adjunct to the EMS, PF Olsen's Integrated Pest Management Document provides guidance on decision making around the application and execution pest control operations and chemical use.

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[21] http://www.gw.govt.nz/assets/council-publications/Key-Native-Ecosystem-Plan-for-Akatarawa-Forest.pdf

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 is especially the case in forest subject to high public recreational use and access. This can be minimised by:

1. Having an effective fire plan and rural fire control organisation;
2. A close link with the relevant fire authorities, and an understanding of equipment and trained manpower requirements, and
3. Active prevention measures which include restrictions on allowable access, fire prevention signage, publicity when fire danger prevails, access to adequate water sources, and if required constructing and maintaining firebreaks;
4. Effective fire reporting communications systems, mapping, and fire plan alert procedures;
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 the respective territorial land authorities (TA's) where the forest is situated. In this region TA's have coordinated efforts to create single larger Rural Fire Authorities (RFA's) (see Appendix 6). There is a close liaison with the RFA in terms of developing the 'fire plans' and the maintenance of good communication relative to potential risks and fire danger ratings.

In the case of the RMS estate, the RFA's are as tabulated below:

Forest	Rural Fire Authority
Akatarawa Saddle	**Wellington RFD[22]**
Hukinga	
Mangaraoa	
Maungakotukutuku	
Pakuratahi E & W	
Puketiro	
Whakatikei	
Valley View	
Hiwinui	**Wairarapa RFD[23]**
Stoney Creek	
Tauanui	

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[22] http://www.wrfa.org.nz/uploads/docs/Fire-Plan.pdf
[23] http://www.wrfd.org.nz/sites/default/files/WRFD%20Fire%20Plan%20%28Part%201%2C%20Sep%202016%29.pdf

Other Benefits from the Forest

19. Forest Products and Other Special Values

Introduction

Forest plantations can provide non-timber forest products and special values that enhance the economic wellbeing 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.

Non-timber forest products

The primary commercial non- timber (lumber and pulp) uses arising from the forests are:

- Sites for apiarists. These are licenced by GWRC and revenues held by GWRC.
- Commercial firewood dealers who may be licensed to pick up low grade residues for resale to domestic households.
- Permitted collections of pine cones for community fundraising events.

None of these products hold any forest certification status.

Other special values

The Western 'Metro' Forests Forestry Right, provides for a total of 19 licences and agreements in relation to access, communications infrastructure and recreational club activities and occupancy.

There is one Right of Way Agreement applying in the eastern Tauanui forest.

In addition provision has been made for potential developments of wide community importance in the form of:

- The Transmission gully motorway,
- Wind farm development.
- Water supply infrastructure.
- Transmission line maintenance and avoidance.

Heritage values, such as the Rimutaka incline route are well recognised and PF Olsen has well established policies and processes for accidental discovery and ensuring legal compliance with the legislation.

Management of recreational use

Western 'Metro' Forests:

Under the Forestry Rights Agreement terms, recreational use management is and will remain the prime responsibility of the GWRC through its "Parks Department". However, the interfacing of public use and commercial forestry requires particular attention to management for health and safety.

The GWRC publishes management plans, brochures and maintains significant website resources for the key recreational assets managed by the Parks department. They are:

Forest	GWRC Recreational Asset Management Plan
All incl Akatarawa	Regional Forests Land Plan. http://www.gw.govt.nz/assets/Parks-and-Recreation/Misc/Regional-Forest-Lands-Plan.pdf
Kaitoke	http://www.gw.govt.nz/assets/Parks-and-Recreation/Misc/Kaitoke-management-plan-2005.pdf
Pakuratahi	Not currently on line
Specific webpages and brochures related to each forest are available covering access, permit applications, maps, available activities, Public access times and points and events calendars. These can be accessed below:	
Akatarawa	http://www.gw.govt.nz/akatarawa/
Kaitoke Regional Park	http://www.gw.govt.nz/Kaitoke/
Pakuratahi	http://www.gw.govt.nz/pakuratahi/

Additionally the Parks Department undertakes multiple interactions with recreational stakeholders and stakeholder group representatives in issues ranging from consultation over recreational policy, strategy and plans to finer details such as site usage, development or events management.

Eastern (Wairarapa) Forests:

Specific clauses in the Forestry Rights govern the management of recreational use. The forest assets (for public road use see next section) will continue to be open for legitimate use subject to entry by permit.

All Forests

Managing the interface between the commercial plantation operations and the public recreational usage is an area of substantive focus between the Forestry Rights owner's agent, PF Olsen Ltd, and the GWRC Parks Department.

Continued on next page...

Looking Ahead

21. 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 as and when required and are also, where appropriate, made publicly available through the PF Olsen webpage.

Values monitored

Management inspections are completed regularly during operations and periodically between times to monitor all aspects of the forest growth, health and conditions. The findings of the inspections are detailed and, where appropriate, summarised on the PF Olsen Certification website. The full monitoring framework implemented and applicable to the RMS estate is tabulated below.

Environmental Process Monitoring Framework

Monitored Element	Include √	Components	Data Source	Data medium	Reporting / Website frequency
Chemical usage	√	A.I usage/ Area overuse	operations supervisors	FIPS Form	On demand / annual
Consultation activity	√	Complaints/ other interaction	operations supervisors & planners	FIPS Form/ meeting minutes	Annual / annual
Environmental incidents	√	Incident number / categories	operations supervisors	FIPS Form	On demand / annual
Environmental Goals	√	All	Env Management Group	Meeting Minutes	Annual/
Flora & fauna	√	Species & Status frequencies/ new finds	operations supervisors, public, crews	FIPS /Form Naturew'tch	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
Forest growth	√	PSP protocols / periodic inventory. ISO 9001	contractors	Volume reconcilit'ns /Estate model	Periodic-annual – not on web

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Other monitoring

GWRC State of the Environment Monitoring:
Where relevant, data gathered by the Council's SOE monitoring programme will be incorporated into management knowledge and further sites (e.g.water) encouraged.

Soil:
The GWRC undertakes long term soil monitoring[27] the results of which are published. The graph below indicates in terms of soil factors and acknowledging a small sample size, plantation forest sites appear not to be any cause for concern.

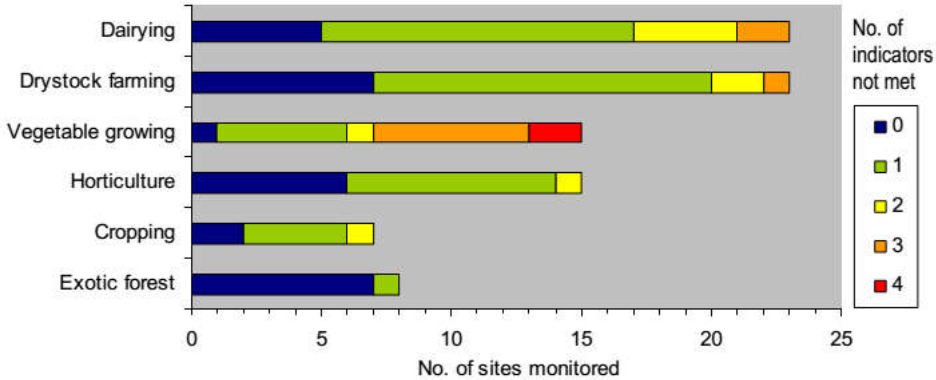


Figure 4.3: Summary of compliance with target range values for seven key soil quality indicators (bulk density, macroporosity, total carbon, total nitrogen, anaerobic mineralisable nitrogen, soil pH and Olsen P), based on the most recent round of soil quality monitoring across different land uses

Note: There are no target range values for native forest soils.

Operational standards and practice:
Other operational standards are monitored through a variety of concurrent and post operational assessment procedures that cover all operations from planting to harvesting and log production.

This information which includes log manufacturing quality performance, safety performance and other private or commercially sensitive is not made public.

Budget and physical programme versus expenditure and forecast:
Also monitored and reported monthly through the PF Olsen FIPS system concurrently with all operations. This information is not made public.

Formal Reporting to GWRC
The terms of the Forestry Right include obligations to provide quarterly Health and Safety reports and rolling 5 year Annual Plan reports to GWRC.

[27] Soil quality and stability in the Wellington region: state & trends 2012 WGN_DOCS-#878729-V3

Additional representation	Other bodies that either or both the TIMO and Property Manager are active in, that bring benefit to RMS FTG NZ include: Wood Council of New Zealand (Woodco) Business Leaders' Health and Safety Forum NZ Forest Nursery Growers' Association Forest Health and Biosecurity Committee Log Transport Safety Council Port of Wellington Users Group NZ Institute of Forestry Inc. NZ International Business Forum NZ China Council Various organisations dealing with fresh water quality regulations Wellington and Wairarapa Rural Fire Authorities National Environmental Standard for Plantation Forestry (setting new legislation).

Appendix 1 – Land Titles over which Forestry Rights exist.

METRO FOREST BLOCKS

Pakuratahi West Forest

TITLE	Legal Description	Area
WN20C/497 Part-Cancelled	Lot 3-5, 8-10, 20, 28, 32-34, 36 and Part Lot 2, 6, 25, 38 Deposited Plan 111 and Part Section 420, 420 Hutt District	37.4182 hectares (more or less)
WN20C/498 Part-Cancelled	Lot 30 Deposited Plan 111	1.2596 hectares (more or less)
WN20C/499 Part-Cancelled	Part Lot 1 and Part Lot 19 Deposited Plan 111	1.1987 hectares (more or less)
WN20C/1015 Part-Cancelled	Section 3 Deposited Plan 1820	394.9731 hectares (more or less)
WN20C/1018 Part-Cancelled	Lot 31 Deposited Plan 111	6297 hectares (more or less)
649519	Part Section 787 Hutt District and Part Section 1-2 Survey Office Plan 30094 (strata sections) and Lot 2 Deposited Plan 47840 and Section 3, 8, 12 Survey Office Plan 459776.	6837.0325 hectares (more or less)
WN29F/193 Part Cancelled	Lot 39 Deposited Plan 111	0.5059 hectares (more or less)

Pakuratahi East Forest

TITLE	Legal Description	Area
649519	Part Section 787 Hutt District and Part Section 1-2 Survey Office Plan 30094 (strata sections) and Lot 2 Deposited Plan 47840 and Section 3, 8, 12 Survey Office Plan 459776.	6837.0325 hectares (more or less)

Mangaroa Forest

TITLE	Legal Description	Area
WN44B/133	Lot 1 Deposited Plan 77737 and Lot 3 Deposited Plan 61445	333.2182 hectares (more or less)

Puketiro Forest

TITLE	Legal Description	Area
WN20C/477	Section 2-3 Block IX Akatarawa Survey District	257.9870 hectares (more or less)
WN18B/963	Section 12 Block VII Paekakariki Survey District	83.7699 hectares (more or less)

TITLE	Legal Description	Area
WN31A/562	Section 21 Block IX Akatarawa Survey District	1.7839 hectares (more or less)
WN226/68	Part Section 354 Hutt District	59.2966 hectares (more or less)

Whakatikei Forest

TITLE	Legal Description	Area
535245	Lot 1 Deposited Plan 71399 and Section 2 Survey Office Plan 431609 and Section 1 Survey Office Plan 431263	5578.4817 hectares (more or less)
WN13C/916	Section 97, Part Section 96 and Part Section 98-99 Block IV Paekakariki Survey District	97.3933 hectares (more or less)

Maungakotukutuku Forest

TITLE	Legal Description	Area
614103	Section 8 Survey Office Plan 455384	12.7310 hectares (more or less)
WN20C/506	Section 3-5 Deposited Plan 670	114.6778 hectares (more or less)
614104	Lot 12 Deposited Plan 611 and Section 9 Survey Office Plan 455384	217.0745 hectares (more or less)

Hukinga Forest

TITLE	Legal Description	Area
WN19C/1400	Lot 1 Deposited Plan 631, Part Section 6-10 Block IX Akatarawa Survey District and defined On Deposited Plan 4705	471.1553 hectares (more or less)
WN411/118	Section 11-13 and Part Section 6 - 10 Defined On Deposited Plan 631 and Section 1-5 Defined On Deposited Plan 613	1634.1813 hectares (more or less)
WN437/134	Section 1-5 Block V Akatarawa Survey District, Defined On Deposited Plan 614, Section 1-7 Block VI Akatarawa Survey District and Defined On Deposited Plan 620	2165.4729 hectares (more or less)
WN814/4	Section 18 Block I Akatarawa Survey District, Section 8 Block VI Akatarawa Survey District and Section 18-20 Block IX Akatarawa Survey District	50.3834 hectares

Appendix 2 – Regulatory Issues

RMA plans

The table below lists the key RMA planning documents that may need to be referenced when planning forestry operations within parts of the RMS estate.

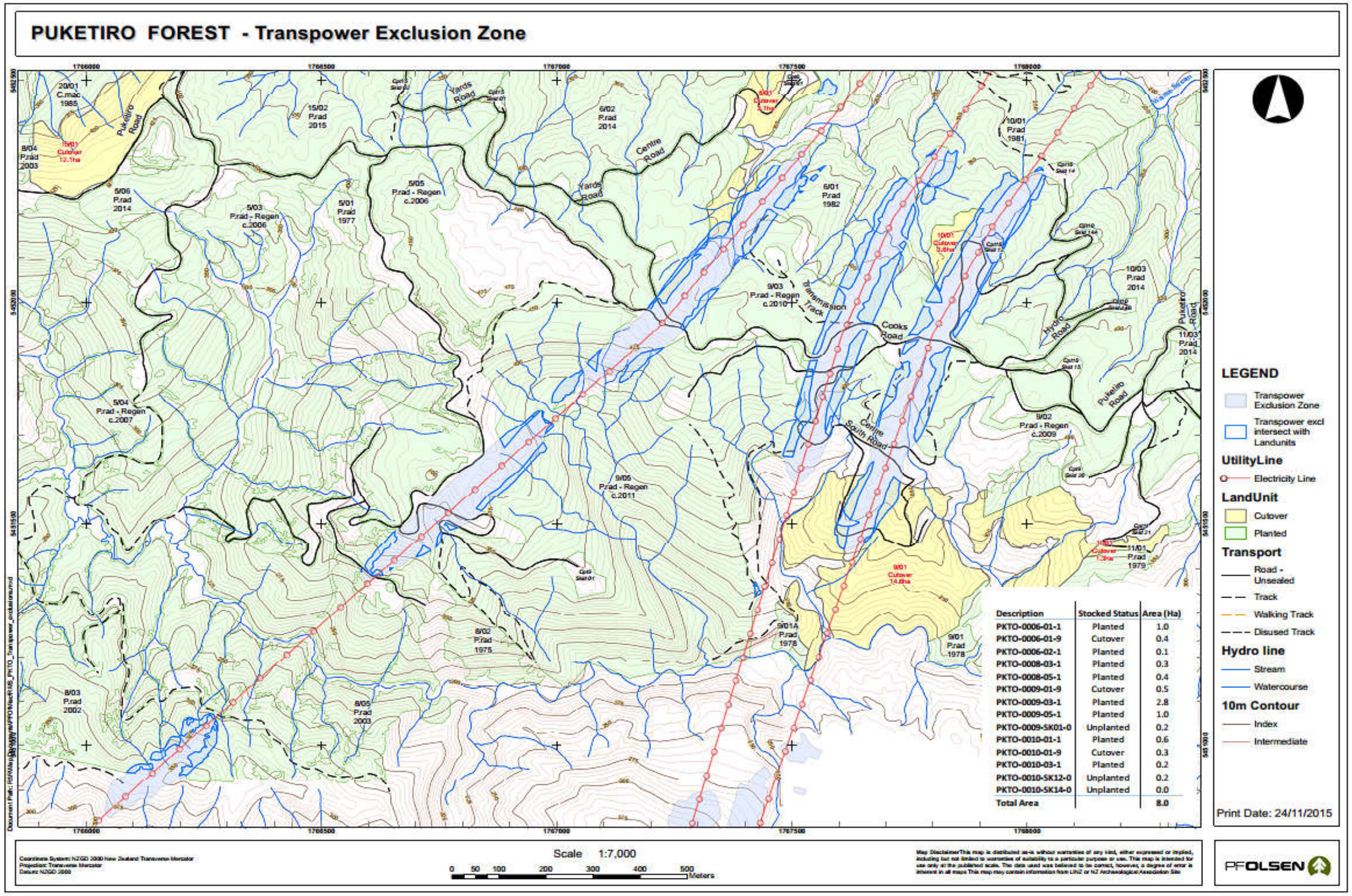
Planned operations in a particular forest will be subject to the rules only of the Territorial Authority within which the forest is located for issues of land use, terrestrial biodiversity, heritage issues, noise and dust.

All forest are subject to the Regional rules which address issues related to soil and water protection, discharges to land, water and air as well as biosecurity through the Regional Pest Management Strategy.

District & Regional Plans to be referenced

Territorial Authority	Status	Requirement
Kapiti Coast	Mostly operative	Plan Kapiti Plan Maps
Porirua City	Operative	Plan Porerua Plan Maps
Upper Hutt City	Operative	Plan Upper Hutt Plan Maps
South Wairarapa	Operative	Plan South Wairarapa Maps
Regional Authority		
Greater Wellington Regional Council	Operative Operative Operative Operative Proposed Operative	Regional Soil Plan Regional Freshwater Plan Regional Plan - Discharges Regional Air Quality Plan Combined Natural Resources Plan Regional Pest Management Maps

Appendix 4 – High Tension Lines Corridors.



Description	Stocked Status	Area (Ha)
PKTO-0006-01-1	Planted	1.0
PKTO-0006-01-9	Cutover	0.4
PKTO-0006-02-1	Planted	0.1
PKTO-0008-03-1	Planted	0.3
PKTO-0008-05-1	Planted	0.4
PKTO-0009-01-9	Cutover	0.5
PKTO-0009-03-1	Planted	2.8
PKTO-0009-05-1	Planted	1.0
PKTO-0009-SK01-0	Unplanted	0.2
PKTO-0010-01-1	Planted	0.6
PKTO-0010-01-9	Cutover	0.3
PKTO-0010-03-1	Planted	0.2
PKTO-0010-SK12-0	Unplanted	0.2
PKTO-0010-SK14-0	Unplanted	0.0
Total Area		8.0

Appendix 5 – Pest Plants and Animals.

Pest Plants

Pest plants (taru) included in the RPMS and their management – table 3

Common Name	Scientific Name	Regional Surveillance	Total Control	Containment				Suppression		Site-Led Management				
			Service Delivery	Service Delivery	Biological Control	Boundary Control	Occupier Responsibility	Biological Control	Occupier Responsibility	Boundary Control	Human Health	Biodiversity	KNE Service Delivery	Biological Control
Alligator weed	*Alternanthera philoxeroides*	✓											✓	
African club moss	*Selaginella kraussiana*												✓	
African feather grass	*Pennisetum macrourum*		✓										✓	
African fountain grass	*Pennisetum setaceum*	✓											✓	
Apple of Sodom	*Solanum linneanum*	✓											✓	
Artemisia	*Artemisia spp.*												✓	
Artillery plant	*Galeobdolon luteum*												✓	
Arum lily	*Zantedeschia aethiopica*												✓	
Asiatic knotweed	*Reynoutria japonica*	✓											✓	
Australian sedge	*Carex longebraciata*	✓											✓	
Banana passionfruit	*Passiflora mixta; P. mollisima, P. tripartita*									✓			✓	
Barberry	*Berberis glaucocarpa*												✓	
Bathurst bur	*Xanthium spinosum*		✓										✓	
Blackberry	*Rubus spp.barbed cultivars*									✓	✓		✓	

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Pest plants (taru) included in the RPMS and their management – table 3 (continued)

Common Name	Scientific Name	Regional Surveillance	Total Control	Containment				Suppression		Site-Led Management				
			Service Delivery	Service Delivery	Biological Control	Boundary Control	Occupier Responsibility	Biological Control	Occupier Responsibility	Boundary Control	Human Health	Biodiversity	KNE Service Delivery	Biological Control
Blue morning glory	*Ipomoea indica*												✓	
Blue passion flower	*Passiflora caerulea*		✓										✓	
Boneseed	*Chrysanthemoides monilifera*			✓	✓		✓						✓	
Bomarea	*Bomarea caldasii, B. multiflora*	✓											✓	
Boxthorn	*Lycium ferocissimum*												✓	
Broom	*Cytisus scoparius*												✓	✓
Brush wattle	*Paraserianthes lophantha*												✓	
Buddleia	*Buddleja davidii*												✓	
Californian arrowhead	*Sagittaria montevidensis*	✓											✓	
Californian bulrush	*Schoenoplectus californicus*	✓											✓	
Cape honey flower	*Melianthus major*												✓	
Cape ivy	*Senecio angulatus*												✓	
Cape tulip	*Moraea flaccida (syn.Homeria collina)*	✓											✓	
Cathedral bells	*Cobaea scandens*									✓			✓	
Chilean flame creeper	*Tropaeolum speciosum*	✓											✓	

Pest plants (taru) included in the RPMS and their management – table 3 (continued)

Common Name	Scientific Name	Regional Surveillance	Total Control	Containment				Suppression		Site-Led Management				
			Service Delivery	Service Delivery	Biological Control	Boundary Control	Occupier Responsibility	Biological Control	Occupier Responsibility	Boundary Control	Human Health	Biodiversity	KNE Service Delivery	Biological Control
Madeira vine	*Anredera cordifolia*		✓										✓	
Manchurian wild rice	*Zizania latifolia*	✓	✓										✓	
Marram grass	*Ammophila arenaria*												✓	
Mexican daisy	*Erigeron karvinskianus*												✓	
Mile-a-minute	*Dipogon lignosus*												✓	
Mist flower	*Ageratina riparia*							✓					✓	
Monkey apple	*Acmena smithii*												✓	
Montbretia	*Crocosmia x crocosmifolia*												✓	
Moth plant	*Araujia sericifera*		✓										✓	
Nassella tussock	*Nassella trichotoma*	✓											✓	
Nasturtium	*Nasturtium officinalis*												✓	
Nodding thistle	*Carduus nutans*									✓			✓	✓
Noogoora bur	*Xanthium occidentale*	✓											✓	
Old man's beard	*Clematis vitalba*									✓			✓	
Pampas grass	*Cortaderia jubata; C. selloana*												✓	
Parrot's feather	*Myriophyllum aquaticum*												✓	

Pest plants (taru) included in the RPMS and their management – table 3 (continued)

Common Name	Scientific Name	Regional Surveillance	Total Control	Containment				Suppression		Site-Led Management				
			Service Delivery	Service Delivery	Biological Control	Boundary Control	Occupier Responsibility	Biological Control	Occupier Responsibility	Boundary Control	Human Health	Biodiversity	KNE Service Delivery	Biological Control
Perennial nettle	*Urtica dioica (sub spp)*		✓										✓	
Periwinkle	*Vinca major*												✓	
Phragmites	*Phragmites australis*	✓											✓	
Plectranthus	*Plectranthus ciliatus*												✓	
Polypodium (Common polypody)	*Polypodium vulgare*	✓											✓	
Purple loosestrife	*Lythrum salicaria*	✓											✓	
Purple ragwort	*Senecio glastifolius*												✓	
Pyp grass	*Ehrharta villosa*	✓											✓	
Ragwort	*Senecio jacobaea*									✓			✓	✓
Saffron thistle	*Carthamus lanatus*		✓										✓	
Salvinia	*Salvinia molesta*	✓											✓	
Senegal tea	*Gymnocoronis spilanthoides*	✓											✓	
Silver poplar	*Populus alba*												✓	
Smilax	*Asparagus asparagoides*												✓	✓
Spanish heath	*Erica lusitanica*												✓	
Spartina	*Spartina spp.*	✓											✓	

Pest animals (kararehe nanakia) included in the RPMS and their management – table 2 (continued)

Common name	*Scientific name*	Regional Surveillance	Total Control	Containment	Suppression			Site-Led Management				
			Service Delivery	Service Delivery	Service Delivery	Biological Control	Occupier Responsibility	Boundary Control	Human Health	Biodiversity	KNE Service Delivery	Biological Control
House mouse	*Mus musculus*										✓	
Koi carp	*Cyprinus carpio*									✓	✓	
Magpie	*Gymnorhina tibicen tibicen, Gymnorhina tibicen hypoleuca*								✓		✓	
Norway rat	*Rattus norvegicus*										✓	
Possum	*Trichosurus vulpecula*									✓	✓	
Rainbow lorikeet	*Trichoglossus haematodus*	✓									✓	
Rainbow skink	*Lampropholis delicata*	✓									✓	
Red-eared slider turtle	*Trachemys scripta elegans*	✓									✓	
Rook	*Corvus frugilegus*		✓								✓	
Rudd	*Scardinius erythropthalmus*										✓	
Ship rat	*Rattus rattus*										✓	
Stoat	*Mustela erminea*										✓	
Sulphur crested cockatoo	*Cacatua galerita*										✓	
Tench	*Tinca tinca*										✓	
Wasp	*Vulpecula germanica; V. vulgaris*								✓		✓	
Weasel	*Mustela nivalis*										✓	