Wairarapa Estate
Forest Management Plan

For the period 2015 / 2020

Introduction

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

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

Principles and Criteria

The estate will be managed under a FSC Certification Scheme.

The Forest Owners are committed to the Forest Stewardship Council (FSC) Principles, Criteria and standards of good forest management. These standards include ecological, social and economic parameters.

Once FSC Certification is achieved, the Manager will be able to market the forest log products as certified wood for input into domestic processor markets and international log markets where some are seeking Certified wood inputs for manufacture of certifiable end-use products to international consumer markets.

Maintenance of the Certified status is managed through the The Manager's Environmental Management System (EMS) and associated documents and I.T. based support tools and by a process of internal and independent third party external audit undertaken at least annually.

About the Plan

This plan is a broad document defining the management structures and vehicles in place to manage an aggregation of individual forests subject to different ownership structures or relationships. Each forest or group of forests have its own detailed management plan which describes basic but specific management details.

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

- Ownership, management and management planning structure;
- Management objectives;
- A description of the land and forest resources;
- Environmental safeguards;
- Identification and protection of rare, threatened and endangered species;
- Management regimes and harvest planning;
- Forest Health;
- Management of reserve areas;
- Maps showing plantation area, legal boundaries and protected areas;
- Provisions for monitoring and protection.

Management and Ownership Structure

The estate is owned by Wairarapa Estate Limited, which is wholly owned by ANZFOF2 NZ Pty Ltd, situated at Level 23, 141 Walker Street, North Sydney, 2060 , Australia

At the time of writing all the estate was held via forestry rights. However the owner is currently applying to the New Zealand Overseas Investment Office (OIO) to purchase the land under the forest.

Wairarapa Estate will protect any resource and tenure rights of tangata whenua.

Wairarapa Estate have appointed The Manager as "Property Managers" to manage day to day operational activities and manage the estate in general to standards required to maintain FSC.

The Manager operates out of a office in the Southern North Island. The people responsible for enacting this plan are:

James Treadwell - GM Southern North Island
Steve Coulston - Regional Manager
Maureen MacLean - Office manager and HS&E co-ordinator
Chris Gibbons - Forester
Mitchell Haberkorn - Asset Information analyst.

Management Objectives

Economic and Social

The forests are managed to provide environmental benefits, including:

- Enhanced water quality;
- Soil, stabilisation and conservation;
- A buffer against flooding during storms;
- Shading waterways for aquatic life;
- Enhance wildlife and plant habitat leading to increased biodiversity;
- A reduction in greenhouse gases;
- Providing economic and social benefits to the community.

The forests are all managed to the Managers environmental standards manual.

Management

The Manager is committed to ensuring the management of the forest is sustainable, achieves economic sustainability and provides the best possible returns for the forest owner. In addition the Manager will ensure all forests retain the capacity to do the above while meeting a range of environmental, social, and cultural perspectives.

The estate will be managed to:

- Grow trees and produce logs for wood products in New Zealand and overseas;
- Ensure productivity of the land does not decline;
- Ensure environmental values are identified and maintained;
- Ensure historic sites are identified and protected;
- Harvest trees as close as possible to their economic optimum age and achieve the best possible financial returns to the owners;
- Replant following harvesting;
- Meet all statutory requirements and comply with forest industry best practice;
- Act as a good corporate citizen and neighbour;
- Ensure all forest management practices are consistent with the principles of the Forest Stewardship Council.

Wairarapa Estate and the Manager is committed to ensure the management of the forest is sustainable, from an environmental, social, cultural and economic perspective. These perspectives underpin the FSC management culture.

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

2. Social perspective
Includes ensuring contractors and their workers adhere to health and safety standards, consultation with neighbours and stakeholders in respect of operations on the forest occur.

3. Cultural perspective

Includes consultation with the appropriate iwi to ensure culturally significant resources, land, historic and archaeological sites are identified and appropriately managed.

Wairarapa Estate will be managed to protect any resource and tenure rights of tangata whenua.

Tangata whenua are being identified for each area. However at time of writing no cultural important areas had been identified.

4. Economic perspective

Refers to the selection of a species, ensuring management and harvesting regimes, provide a reasonable return on investment while minimising the risks of investment.

Implementation

The forest management objectives described above are implemented by The Manager. The Manager applies best forestry management practice within a quality management framework to plan for and deliver the required forest management objectives.

The Quality management framework includes:

- A forest management system, ensuring the forest management planning is up to date and operations are scheduled and undertaken according to the plan.
- The Environmental standards manual, ensuring operations follow the manual, ensuring high standards of environmental management is integrated into all areas of forest and operational planning and management.
- FSC environmental certification, ensuring management principles and practice adhere to internationally recognised and adopted standards for environmental management.

Forest Description

Location

The Wairarapa Estate currently extends over two regions and four districts. A summary table is presented below.

<table>
<tr><td>Region</td><td colspan="3">Greater Wellington</td><td>Manawatu-Wanganui</td></tr>
<tr><td>District</td><td>South Wairarapa</td><td>Carterton</td><td>Masterton</td><td>Manawatu</td></tr>
<tr><td rowspan="6">Forest</td><td rowspan="6">Ruakokoputuna</td><td>Dunolly</td><td>Hawkins</td><td rowspan="6">Beehive Creek</td></tr>
<tr><td rowspan="2">Glenburn</td><td>Kaiwhata Pines</td></tr>
<tr><td>Ngahape</td></tr>
<tr><td rowspan="2">Land's End</td><td>Tinui</td></tr>
<tr><td>Woodford Green</td></tr>
</table>

Topography

All forests with the exception of Beehive Creek are located in the Wairarapa. The Wairarapa comprises four broad, readily identifiable landscape types:

- Ranges: Tararuas, Rimutakas and Aorangi.
- Plains and Lowlands
- Hill Country.
- Coast.

All Wairarapa Estate forests located in the Wairarapa are located on land being described as Hill Country, approximately 60% of the land in the Wairarapa meets this classification. The southernmost end of the Glenburn forest lies where Hill Country meets Coastal Wairarapa.

Beehive Creek is located on Hill Country in the Manawatu.

Soils

The soils of the eastern Wairarapa hill country are dominated by siltstone and mudstone lithologies. When undisturbed, these hill soils have a distinct topsoil overlying paler lower horizons. However, in general these soils are prone to both shallow soil slips and mass movement erosion, and restorations rates of the soil are very slow.

The uses of land restricted by regional Plan are as follows:

Soil disturbance

Rule 1 - Restricted Discretionary Activity - Roading and tracking

Rule 2 - Restricted Discretionary Activity - Disturbance of more than 1,000 cubic metres of soil on erosion prone land

Vegetation Disturbance

Rule 3 - Permitted Activity - Disturbance of more than one hectare of vegetation on erosion prone land

Rule 4 - Restricted Discretionary Activity -Disturbance of more than one hectare of vegetation on erosion prone land and not complying with the conditions of Rule 3

Climate

The Wairarapa, where the majority of Wairarapa Estate is situated, varies considerably in its climatic extremes with wind flow, sunshine hours and rainfall all depending on proximity to the Rimutaka Ranges to the south and the Tararua Ranges to the west.

Temperature

Mean daily maximum: January 23.8°C, July 11.8°C
Mean temperature: 12.8°C
Mean daily minimum: January 10.9°C, July 2.5°C

Sunshine

Average bright sunshine: 2008 hours annually.

Rainfall

Average rain days: 0.2mm or more, 171 per annum
Average wet days: 2.5mm or more, 90 per annum
Mean annual rainfall: 969mm (Masterton) (ranges from 1,520mm to 890mm, from West to East)

Frost

Average days of frost: 28 per annum
Frosts of up to 6°C occur in months of April through to October

Stakeholders

Tangata Whenua
Wairarapa Estate will protect any resource and tenure rights of tangata whenua.

Neighbours
Most neighbours are rural dwellers and are involved in a range of rural economic activities from farming, tourism, horticulture, agriculture or other small businesses. Corporate neighbours are usually other forest owners.

Neighbour contact details are maintained through databases. Some or all of these parties will be consulted when operations are proposed in forest areas adjacent to their boundaries.

Research Organisations
GNS (Geological and Nuclear Sciences) are very interested in the Saline Springs in Glenburn forest. The manager will ensure they have access to these springs at all times.

Regulations

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

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

Resource Management Act

The estate is subject to the provisions of the Resource Management Act (RMA) 1991. The RMA is a resource management system which promotes the sustainable management of natural and physical resources and is now the principal statute for the management of land, water, soil and other resources in New Zealand.

Under the RMA, each council has its own plans and rules, which must be adhered to. The estate covers a number of councils as listed below:

Regional Councils	District Councils
Greater Wellington	Carterton
Horizons	South Wairarapa
	Masterton
	Palmerston North

The District Councils look after land management issues such as land use, landscapes and biodiversity, whilst the Regional Council deal with soil conservation, water quality issues, discharges to the air, water and land and the coastal marine environment.

Heritage New Zealand Act

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. Where such circumstances might exist, an "Authority to Modify or Destroy" will be sought from Historic Places Trust (HPT). Such authorities are similar in function to a resource consent and if granted, normally come with conditions which must be met.

Records of archaeological and historical places are maintained in the New Zealand Archaeological Association Site Recording Scheme run by the HPT. There is searchable register maintained online on the HPT website. To search in this register follow the link below:

http://www.historic.org.nz/en/TheRegister/RegisterSearch.aspx.

Registered historic sites are also often included in schedules of places and sites of significance in District Plans along with sites of cultural significance.

If a site is found or suspected on any block, the protocols specified in the The Manager environmental standards manual, and any others specifically developed in conjunction with HPT and iwi or other stakeholders must be observed.

Resource Consents

There are currently no Resource Consents held for the estate.

The Emissions Trade Scheme

Forests in New Zealand are governed by rules related to New Zealand's commitments to reduce greenhouse gas emissions.

Any existing forest originally planted prior to 1st January 1990 will be required to cover all their emissions if the forest is deforested. Deforestation occurs if the forest is not replanted or, if left to regenerate naturally, does not achieve the regulated heights and stocking densities as required under the Climate Change Response Act 2002.

All post 1989 forest in Wairarapa Estate is not registered in the ETS.

Wairarapa Estate owns no Pre 1990 NZUs

Other Relevant Legislation

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

Environmental Code of Practice

All operations carried out on the property must be undertaken to the standards specified in the New Zealand Environmental Code of Practice for Plantation Forestry and the New Zealand Code of Practice for Forest Engineering.

Health and Safety

All operations managed by the Manager are subject to the Managers Health and Safety management programme. This programme includes active accident prevention programmes, training, injury management and drug and alcohol testing.

Health and Safety statistics are reported quarterly to Wairarapa Estate.

Responsibilities and authorities

All staff are responsible for ensuring operations under their immediate control are planned and carried out to meet relevant requirements of any Resource Consent or Permitted Activity Conditions.

Staff are also required to ensure the Managers crews and/or Contractors carrying out these operations are to be fully aware of these requirements and the steps required to comply.

Any breach of these requirements is deemed a Significant Environmental Event and shall be dealt with as such.

Environmental Policy and Practices

Environmental policy and practices are an integral part of every operation which takes place on the forest. The Manager maintains an Environmental Policy Statement signed by the Managing Director and followed by all staff. Regular monitoring of key environmental parameters will be undertaken where necessary to ensure the impact on the forest environment from events such as wind storms, flooding and fire, or of agents such as pests, diseases, and weeds are minimised.

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

All activities within the estate are subject to the Managers environmental standards.

Environmental Goals

1. Achieve a greater understanding from all persons working within the forest of their environmental responsibilities.
2. Establish working relationships with all councils.
3. Establish relationships with iwi, neighbours, and other stakeholders.
4. Promote and undertake sound environmental stewardship of land and other natural resources on, or adjacent to, this land.

Environmental Standards Manual

The Managers environmental standards manual sets out the expectations in regards to managing the environment during forest operations. The manual is designed to communicate expectations for environmentally sound forestry operations. Included at the back of the manual are standard operating procedures (SoPs), forms, policies and maps.

SoPs guide all operations and an continuously reviewed and updated.

Assessment of environmental risks due to operations are covered within the manual along with other specific form related to harvest operations.

The manual covers hazardous substances management and clearly outlines the expectations the Manager has of all staff, contractors and suppliers in relation to hazardous substance management. Hazardous materials which may be used within Wairarapa Estate are:

- Herbicides
- Pesticides
- Fuels
- Oil
- Fire retardants
- Surfactants
- Paint

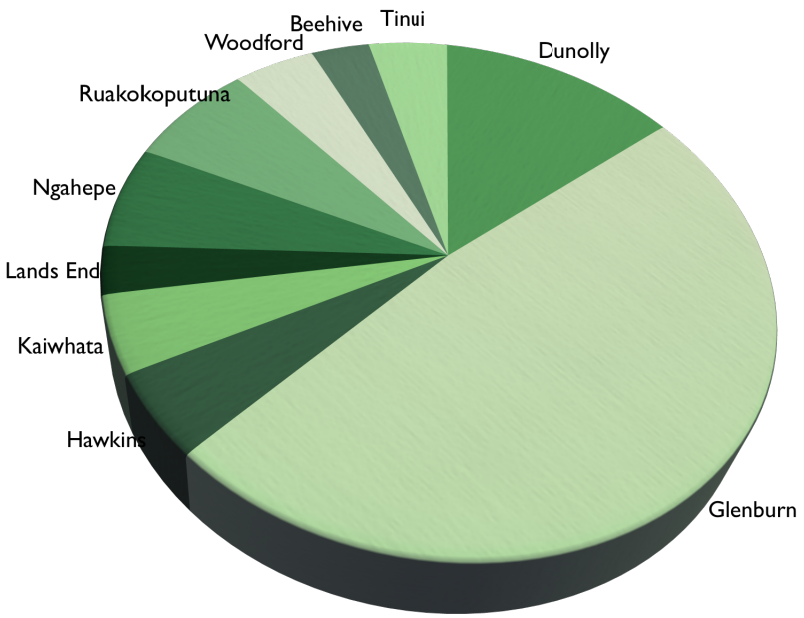
The Manager is committed to reducing the use of hazardous substances. All aspects of chemical use are reported annually.

Estate Description

Forest Area

Wairarapa Estate is made up of 10 forests with a total Gross area of 4202.2 hectares. The table below shows the breakdown of the estate by forest and type.

Forest	Gross area (ha)	Net planted area (ha) *All species*	Net productive area (ha) *P.radiata*	Area thinned (ha)	Area pruned (ha)	FSC RSAA (ha)	RSAA (% of net productive area)	RSAA (% per Ecological District)
Beehive Creek	166.6	106.3	106.3	106.3	106.3	49	46.1%	46.1%
Dunolly	602.2	425.6	423.1	423.1	415.8	82.9	19.6%	
Glenburn	2031.6	1,546.3	1452.1	1,359.3	985.3	256.4	17.7%	
Hawkins	176.2	153.4	153.4	153.4	111.0	17.3	11.3%	
Kaiwhata Pines	215.7	146.3	146.3	146.3	146.3	64.6	44.2%	18.2%
Land's End	117.4	91.4	91.4	69.2	69.2	6.4	7%	
Ngahape	276.5	206.5	205.5	205.5	205.5	49.7	24.2%	
Ruakokoputuna	263.6	231.4	224.3	204.1	177.4	22.1	9.9%	
Tinui	190.1	142.5	142.5	142.5	91.1	32	22.5%	
Woodford Green	162.3	148.4	148.4	148.4	133.4	12.1	8.2%	



Species

Wairarapa Estate is primarily Pinus radiata, with some minor species planted in patches. All radiata crops are managed either on a pruned, framing or untended regime. It is intended to replant all areas after harvest with improved genetics.

Age class

Wairarapa Estate is a basically a mid rotation forest. The following table shows the break down of the estate by age class.

Year planted	Area
Fallow	0
1-5	17.1
6-10	7.9
11-15	13.2
16-20	2089.3
21-25	1,018.1
26-30	22.8
30+	7.7

Reserve Areas

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

The Manager contracts Wildland Ltd to identify high conservation areas and reserves. As forests have been added to the estate the Manager has identified reserves within the new forests. Wildland's will be contracted every two years to check and monitor the high reserve and high conservation areas areas and every five years for the remaining reserve areas.

The Wairarapa Estate consists of 593 hectares of reserves. All reserve areas have been mapped and recorded with the Managers GIS.

High value conservation areas

There are 2 high conservation areas with the estate. These are described as:

1. Saline Springs in Glenburn
2. River area in Dunolly

Both areas have a management protection plan in place and have been mapped (see Appendix for maps and plan).

High and moderately high reserves

All these reserves have been mapped and identified and recorded on the GIS. The Manager will protect these reserves. Wildland Ltd will monitor the reserves on a two year cycle for pests, weed and rare and threatened species.

Moderate reserves

All these reserves have been mapped and identified and recorded on the GIS. The Manager will protect these reserves, however the reserves can be crossed for operational purposes if this is the best environmental result. Any crossing of the reserve will require a management plan. Wildland Ltd will monitor the reserves on a two year cycle for pests, weed and rare and threatened species.

Low reserves

All these reserves have been mapped and identified and recorded on the GIS. The Manager will protect these reserves, however the reserves can be crossed for operational purposes if this is the best environmental result. Any crossing of the reserve will require a management plan. Wildland Ltd will monitor the reserves on a five year cycle for pests, weed and rare and threatened species.

Rare and threatened species

All contractors and staff are given identification forms of known rare and threatened species. If any species are found the Manager is to be notified immediately and a species sighting form filled in.

Protection requirements are assessed at the time of re-establishment where additions to riparian or buffering setbacks are often recommended.

In the case of fauna, records of sighting and locations are stored within Geomaster and GIS.

Establishment and Silviculture

All forest operations are planned to ensure the crop achieves maximum growth and is of high quality. Typical operations within Wairarapa Estate include:

- land preparation
- planting
- weed control
- pest and disease control
- fire protection
- pruning
- thinning

In addition to the above the Manager follows a maintenance plan which includes road, track, fence and water way maintenance.

All operations must follow the standards set within the Managers environmental manual.

Establishment

All harvested areas will be replanted the winter following the first spring after harvest. Establishment may include:

- Raking of slash
- Spot mounding
- Aerial desiccation spraying
- Planting of genetically improved seedlings (generally Pinus radiata at 1000 - 1250 stems per hectare)
- Animal pest control
- Fertilising
- Aerial or spot releasing of weed competition.

Prior to any establishment a review of the area will be conducted to identify if there are any risks to rare or threatened species of flora or fauna. At the same time consideration will be made of riparian buffer sizes and hard to harvest areas.

All establishment sites will be reviewed to ensure reserves are maintained, there is a mix of age classes throughout Wairarapa Estate, and correct genotypes are used.

Silviculture

There are two main tending regime within Wairarapa Estate, pruned and framing. Some areas are left untended as a protection crop or for other reasons, however this is not the norm.

Future regimes will depend on Wairarapa Estate's and the Managers assessment of market opportunities, site factors and slope.

Regimes

PRUNED

Year	Operation	Stems per ha	Details
0	Establish	1000 - 1250	Improved genetics
5 - 6	Prune 0-2.2m	375	Minimum green crown must be 3.0m
7 - 8	Prune 2.2-4.2m	375	Minimum green crown must be 3.5m
7 - 8	Thin to waste	650 - 700	Thin dominant not pruned stems
9 - 10	Prune 4.2-6m	350 - 375	Minimum green crown must be 4m
9 - 10	Thin to waste	350 - 375	Thin all non pruned stems to waste when mean crop height 11m
25-30	Clearfell		

FRAMING

Year	Operation	Stems per ha	Details
0	Establish	1000 - 1250	Improved genetics
8 - 10	Thin to waste	500-60	Thin all non dominant stems to waste when mean crop height 11m
25-30	Clearfell		

Forest Health

Forest health inspections are undertaken annually by either an independent professional assessor or through the New Zealand Forest Owners Association Forest Health Scheme. During forest visits the Manager will complete their own health assessments.

Inventory, mapping and forest records

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

The following inventory is applied to Wairarapa Estate

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

Pre-assessment

Pre-assessment is the collection of parameters prior to a tending operation to help calculate contract rates for tending, and to take a final check on the timing of the operation.

Sampling intensity is low with a minimum of five plots per stand and data is collected from six - ten trees per plot. Data collected is then used to calculate a man-day target and hence a contract rate per hectare. Contract rates are often set by tender or negotiation, reducing the need to pre-assess every block.

Pre-assessment is completed on the forests prior to tending operations commencing.

Quality Control

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

- Collect sufficient data to monitor a contractor's performance and correct performance if necessary.
- Collect quantitative data to provide reliable estimates of the crop.
- Provide data as input for growth modelling.

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

Data is summarised by Forest/Compartment/Stand prior to being entered into Geomaster where it is retained as a permanent record. The records can then be directly accessed for annual reports and valuations and stand growth simulation modelling.

Quality control plots are completed at the stand level at the completion of each tending operation.

Mid-rotation inventory

The principal aim for the mid-rotation inventory is to collect stand data for inputs into estate modelling and long term harvest planning and marketing. The objective is to get accurate stand data summaries which will be used for crop typing, estate modelling and valuation.

This is a low intensity inventory, but with full log type cruising. This will enable summary to stand level, and more accurate yield projections for the estate model. Mid-rotation inventory is scheduled for between 12 and 16 years of age.

Pre-harvest inventory

The principal aim of 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.

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.

Pre-harvest

After harvest reconciliation of data of the harvest area is undertaken to help improve records and to ensure harvesting has met the standards expected.

Mapping

Updating forest maps is required from time to time as the forest changes. The work involves:

- updating topographic detail;
- remapping forest stand boundaries from aerial photography;
- updating stand and forest attributes such as roads, landings, protected ecosystems and archaeological sites; and
- defining legal boundaries.

The data is kept and managed in the Managers GIS system.

Stands are remapped from new aerial photographs around the age of four, when the trees are visible, to accurately determine boundaries. They are also remapped within 2 years of harvest to assist with harvest planning.

Forest records

Forest records are essential to provide a historic perspective to the physical condition of each stand.

Forest records should provide the following information:

- Record of forest operations for each stand including a summary of quality control data;
- 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;
- Protected ecosystems attributes;
- Threatened species records;
- Archaeological and Wai Tapu sites and other potential features; and

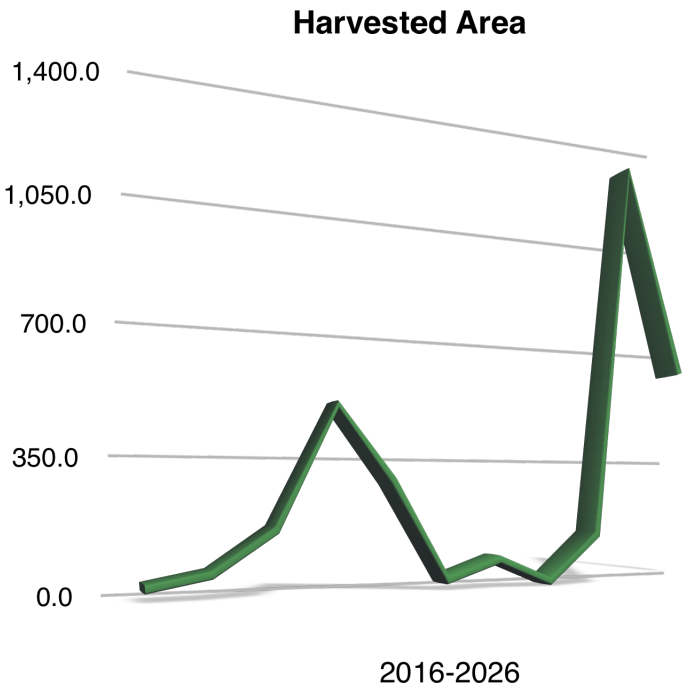
- Chemicals used.

The Manager maintains forest records in Geomaster.

Harvesting

Currently harvesting is scheduled by age class. However as the estate grows the Manager will attempt to smooth the harvest profile, to ensure continuous harvesting with a similar volume harvested per annum.

The current harvest profile is shown on the graph on the right.



Harvest Planning

All harvest planning and operations will follow the environmental standards set out in the environmental manual. Planning is essential to ensure roading infrastructure is developed in a timely manner and any resource consents and surveys are completed on time.

Harvest planning must consider:

- Slope, what equipment can be used.
- The Resource Management Act, the historic places Act and any other relevant legislation.
- Safety, how to ensure the operation is completed in a safe and legal manner.
- Soil and water, how to avoid, remedy or mitigate impacts on soil and water.
- Ecosystems, potential rare or threatened species and how to manage, managing in accordance with the New Zealand Forest accord 1990 and the Code of Environmental Practice (ECoP).
- Financial, plan the operation to ensure it meets current market demand and provides a return on investment.
- Offsite impacts, plan to minimise any adverse impacts on people or the environment outside of the forest.

Harvesting Operations

All operations will be undertaken by harvest and transport contractors who have been selected for their quality of service and understanding of the Managers environmental standards, associated SoP's and health and safety standards.

All operations will be supervised by the Manager, who has the right to stop the operation at any time if they feel the operation is having or has the potential to have an adverse impact on safety or the environment. All operations will be regularly audited as per the Managers health and safety and environmental systems.

Protection and maintenance

The Manager will maintain roads, track, fences and water systems. The Manager will ensure pest and disease control, fire protection and management of protected areas occurs at all times.

Pest management within the estate is subject to statutory obligations under the Regional Pest Management Strategy administered by the regional council. The strategy applies to both pest plants and animals and categorises them in terms of management objectives. The categories, objectives and land owner obligations are summarised below for each Regional Pest Management Strategy Plan.

Wairarapa Estate has applied to join the Forest Owners Association (FOA). Once a member they will come into the FOA's biosecurity scheme which uses independent professional assessors to monitor members forests.

Weeds

The overall objective in managing weeds is to:

- Meet statutory obligations under the Regional Pest Management Strategy;
- Reduce direct impacts on both plantations and indigenous biodiversity values;
- Ensure impacts on neighbouring properties are promptly dealt with; and
- Reduce the abundance and distribution of these species within the forest estate.

The major species within Wairarapa Estate are various grasses, gorse, broom, blackberry and wilding conifers.

Competition from colonising weeds will limit tree growth in their first few years after establishment. Control of these weeds involves chemical application which will occur pre planting and may occur post planting.

Gorse and broom threaten indigenous biodiversity in open communities where they can smother native species, however they can also act as a nurse crop in some areas for native regeneration. Blackberry can displace native species by outcompeting and smothering them.

A list of pest weeds appears in the appendix of the Wairarapa Estate environmental manual and this plan. All weeds will be controlled within Wairarapa Estate as follows.

Total Control

Any weeds discovered under this category must be reported to the regional council. The council is responsible for controlling these weeds.

Regional Surveillance

Weeds under this category should be reported to the council so the council can monitor them.

Containment

Weeds under this category should be contained and removed if possible

Site-led

These plant will be cleared by the Manager if within 50m of a neighbour.

Disease

Diseases, which can affect the forest trees and adjacent native vegetation are monitored throughout the year 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 pini, a fungus which attacks pine needles and is associated with wet, warm conditions.

Dothistroma pini is the most commonly occurring fungal disorder within New Zealand's pine plantation. This fungus is controlled using an aerially applied copper-based fungicide spray, but only when the infection reaches a critical level. Dothistroma pini infection can also be controlled via silviculture by timely thinning and pruning operations, which increases air movement and lowers humidity levels.

There has been no need for Dosthistroma control within the Wairarapa Estate forests.

No control is currently completed on other fungal disorders.

Any unusual mortality or colouring discovered within Wairarapa Estate will be reported to Ministry for Primary Industries.

Chemical Control

All chemical applications are managed in accordance with the Managers environmental manual, the Managers Pesticide Policy and Chemical use SoP, the NZ Standard for Agrichemical Application, HSNO regulations and the obligations conferred by FSC to manage and minimise the use of chemicals; including use of alternatives where available. As part of the FSC commitment:

- All chemical usage is tracked by active ingredient and application area to enable reporting and monitoring of trends.
- At the time of writing the Manager has applied to be a participant in the Forest Owners environmental group which is undertaking research into chemical reduction, efficacy and safety issues related to the "restricted use" derogations applied by FSC to various activities pursuing biological control agents.
- No chemicals classified by FSC as "Highly Hazardous:" are used other than under the terms of any derogations applied by FSC.

Pest animals

Forests provide habitat for unwanted pest animals, and in most cases a refuge from which such pests can spread. Animals pest can substantially reduce the productivity of the forest. The Manager will attempt to identify all pests present, and manage them within the relevant regional council pest management strategies. The Manager will work to control or

eradicate such species in accordance with these plans, to prevent spread and nuisance to neighbouring properties.

The most cost effective long term control is often achieved with the co-operation of neighbours, regional authorities and pest control agencies. The Manager will keep all these skateholders informed of pest management operations.

Fire Prevention

The Manager complies with the Rural Fire authorities and Wairarapa Estate's fire plan which is reviewed by the Manager each year before October.

The threat of fire is minimised by:

- Having an effective fire plan which encompasses prevention, detection and control procedures;
- Active prevention measures which include restrictions on access, fire prevention signage, publicity when fire danger is high and access to water sources;
- Effective detection systems which includes good communication systems, mapping, and fire plan alert procedures;
- A close link with the relevant fire authorities, and an understanding of equipment and trained manpower availability;
- Good forest management which recognises the influence of terrain, the road network and accessibility on fire prevention and control measures; and
- Suitable internal access systems of roads and tracks, and maintenance of fire breaks as the need arises.

The legal responsibility for fighting forest fires lies with the respective territorial land authorities where the forest is situated. In the case of the current Wairarapa Estate portfolio the relevant Rural Fire Authorities (RFA's) are the Wairarapa Rural Fire Authority and the Manawatu District Council (which contracts its responsibilities to the Horizons Regional Council).

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

The Manager maintains 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. This includes annual forest visits prior to the fire season.

All neighbours are contacted prior to the fire season to check the Managers records of contact numbers and other details are correct.

Monitoring

Every year the Manager and Wairarapa Estate will meet to discuss this plan and associated annual plans. A annual field trip will take place to check on agreed monitoring. A review of measures taken to met objectives will be undertaken at this time and outcomes recorded.

All monitoring will follow the Managers monitoring plans and SoP.

Discussion will be held on the following:

Health and Safety

All contractors and staff will be audited as per the Managers health and safety manual. All near misses, incidents and property damage will be recorded. The Manager will run a random drug and alcohol sampling program.

Environmental

The Manager will ensure all monitoring as specified in Wairarapa Estate's environmental manual occurs. In particular the SHMAK testing and Wildland Ltd reporting on reserves.

Financial

The Manager will monitor budget versus expenditure quarterly and report variances to Wairarapa Estate within the quarterly report and at quarterly meetings. Annual reports will be provided and periodic review meeting will be held when requested.

Stakeholders

Consultation will occur with stakeholders as per the environmental manual and this management plan. Feedback from stakeholders will be sought and monitored. This includes actions undertaken to resolve disputes and issues, monitoring of externally generated complaints and client satisfaction surveys.

Consultation will occur with stakeholders during resource consent applications, annual and periodic meetings, contributions to Council processes and interactions with forest recreational users and iwi.

Planning

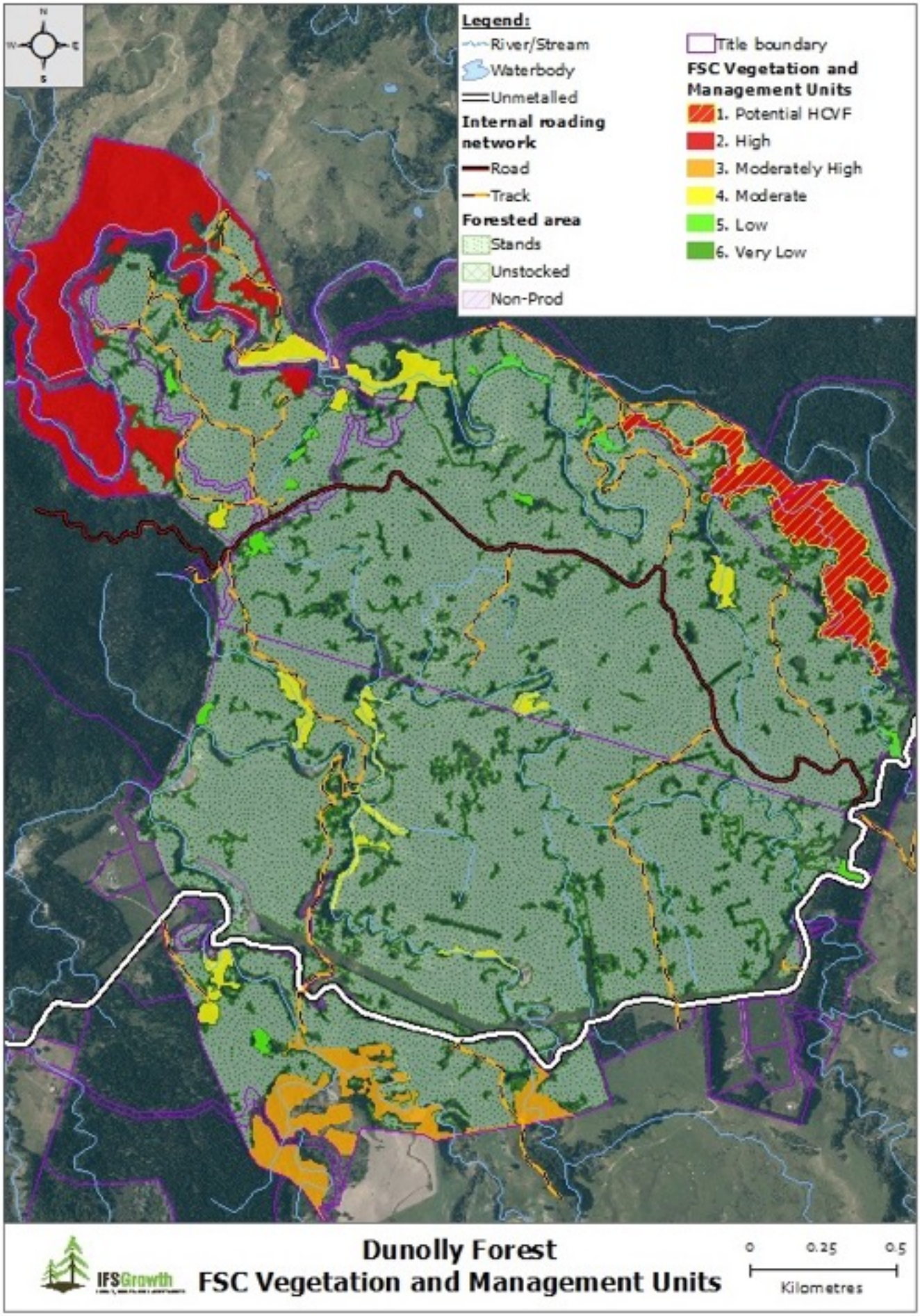
This plan pertains to the management of Wairarapa Estate and will be adhered to for the next 5 years. Any deviation from this plan will be justified only on the basis the changes do not adversely affect the environment. Any changes, which are contrary to the policies contained in this management plan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

The next review date for this plan is: **July 2020**.

The review will include review of planned monitoring, reserve protection, stakeholder engagement and financial performance.

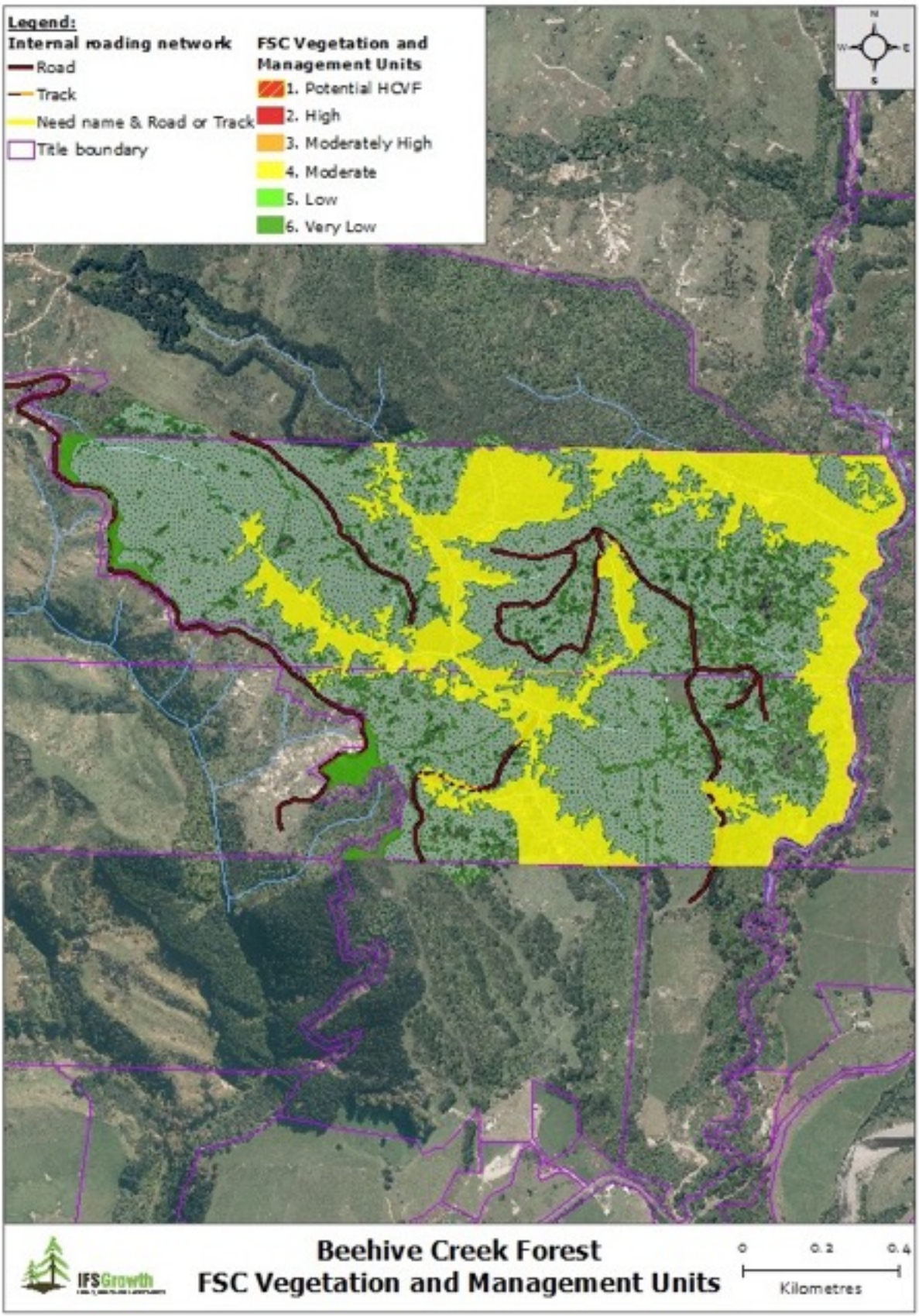
The forest management plan is used for both medium and long term planning.

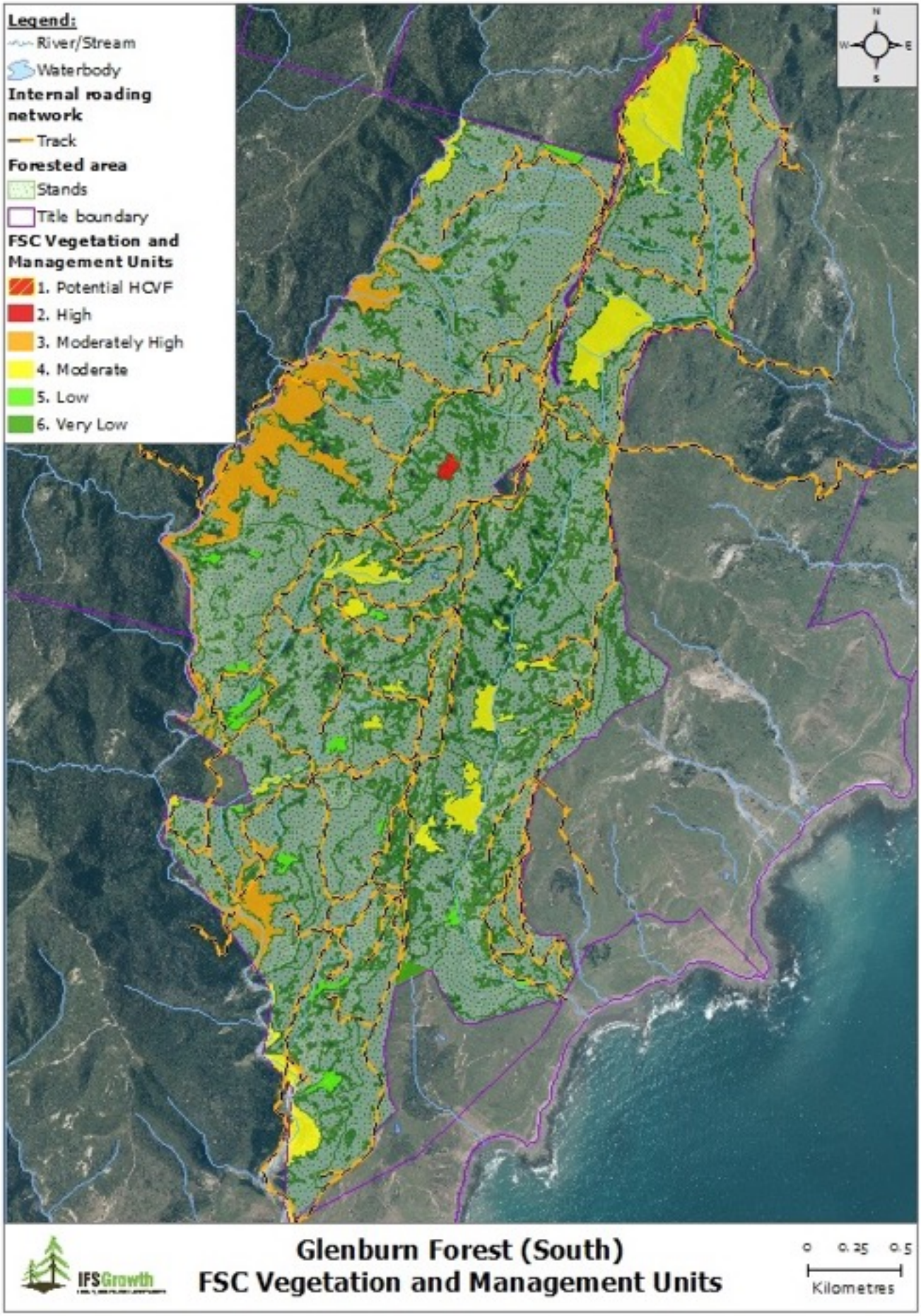
For short term operational and budgetary control planning, operations plans are prepared on an annual or as necessary basis. These plans are prepared annually and in accordance with this management plan. Operations plans and associated budgets are subject to approval by Wairarapa Estate at the beginning of each financial year.

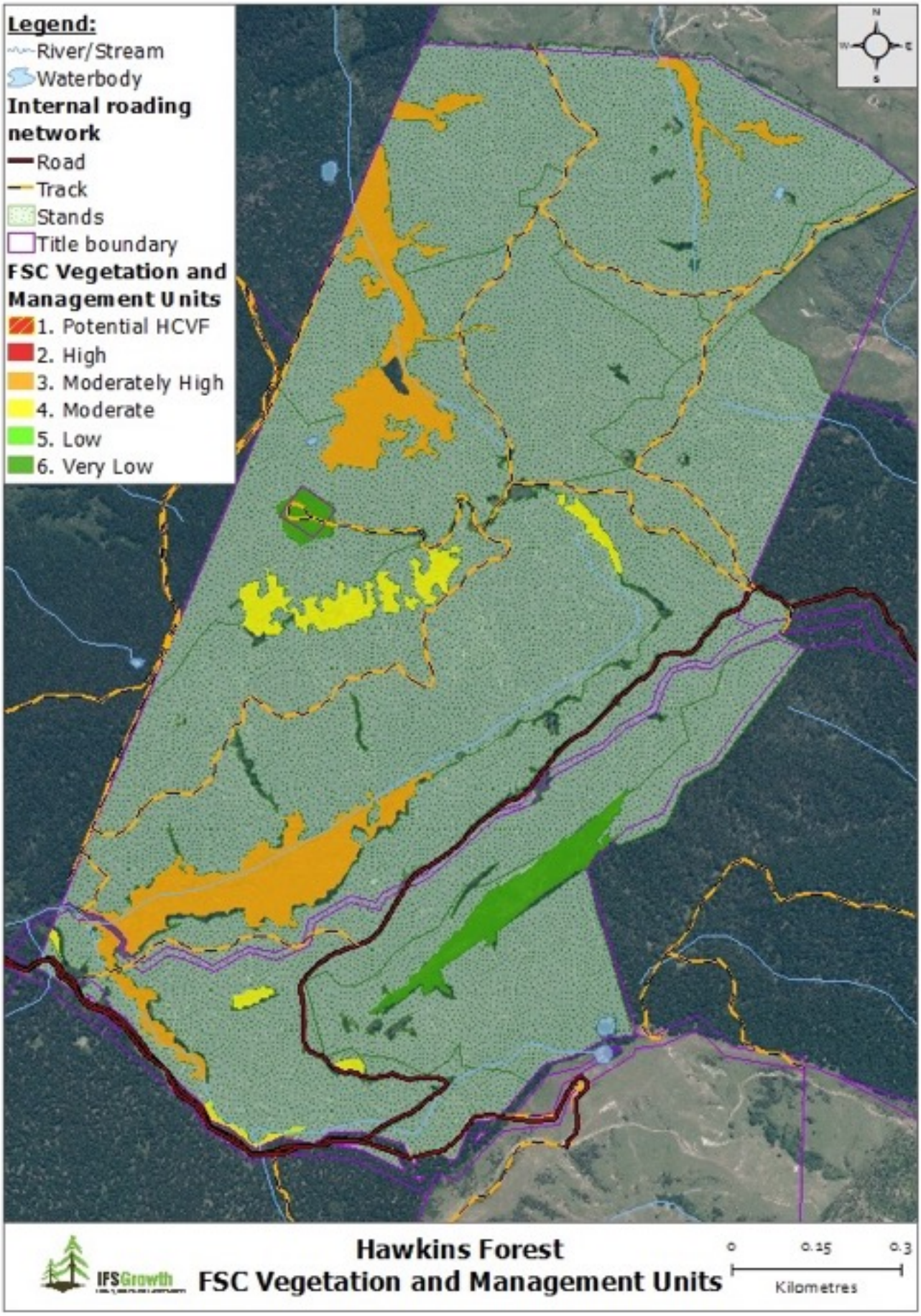

Legend:
River/Stream
Waterbody
Unmetalled
Internal roading network
Road
Track
Forested area
Stands
Unstocked
Non-Prod
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
IFSGrowth
Dunolly Forest
FSC Vegetation and Management Units
0
0.25
0.5
Kilometres

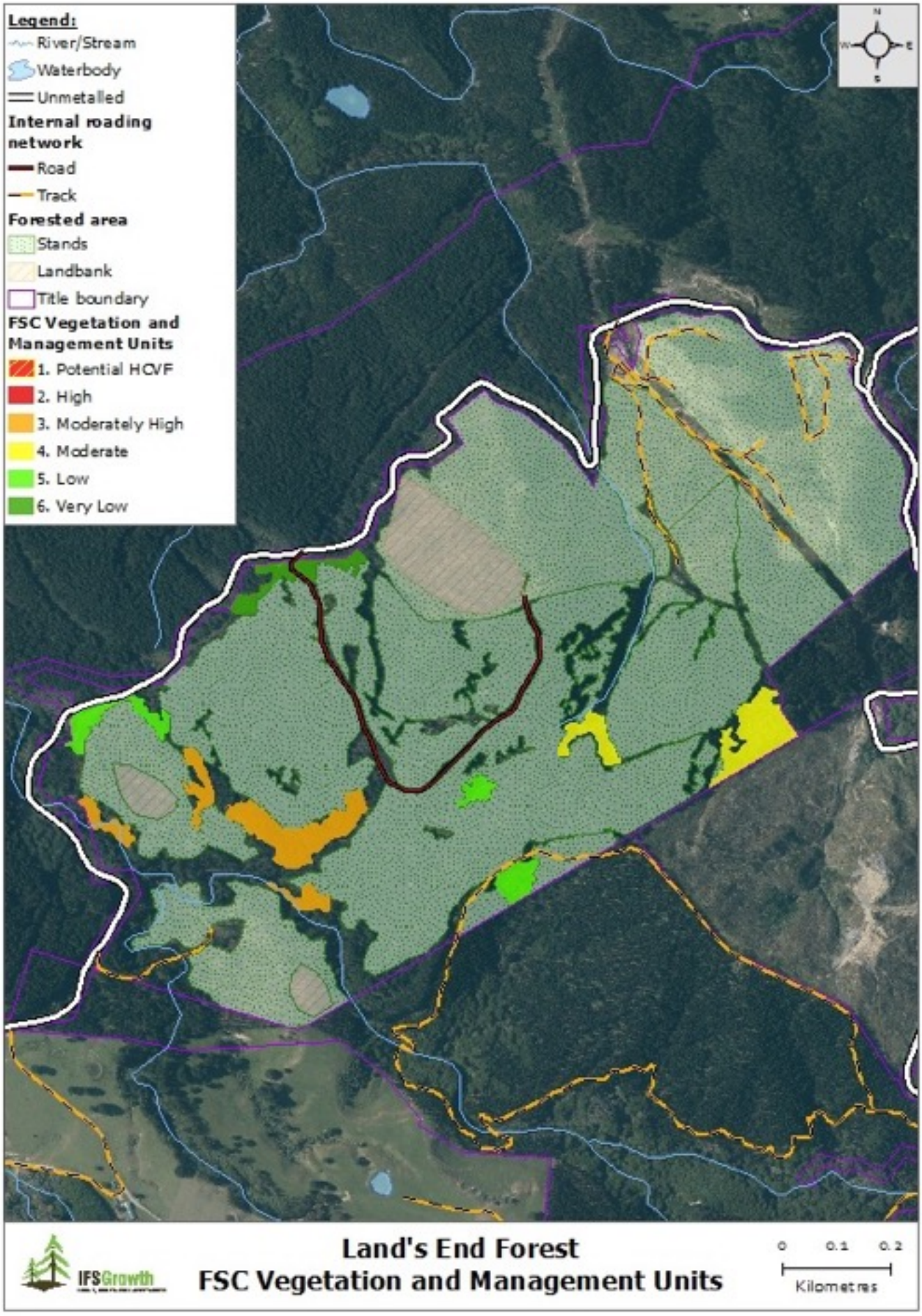
APPENDIX

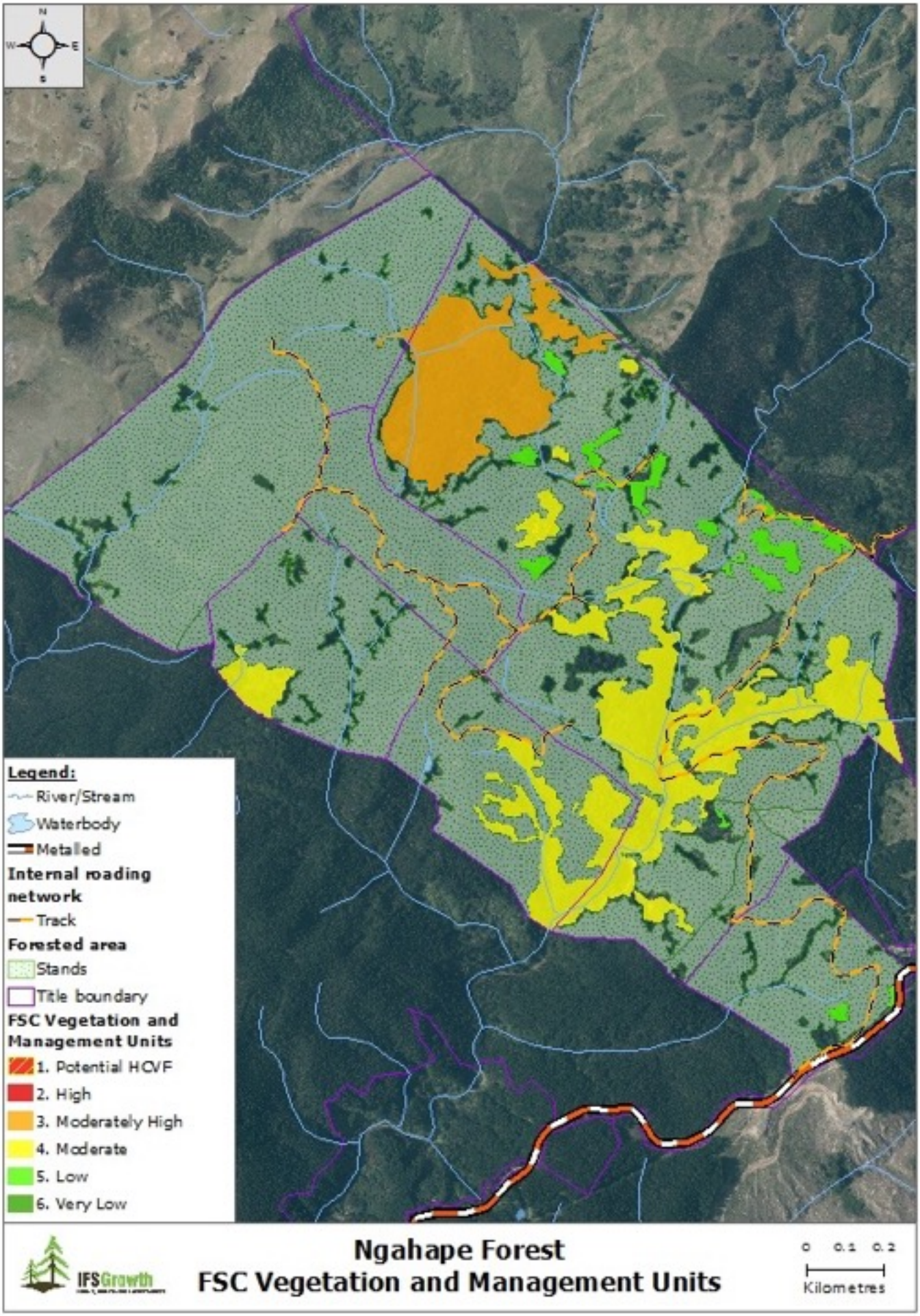
Maps

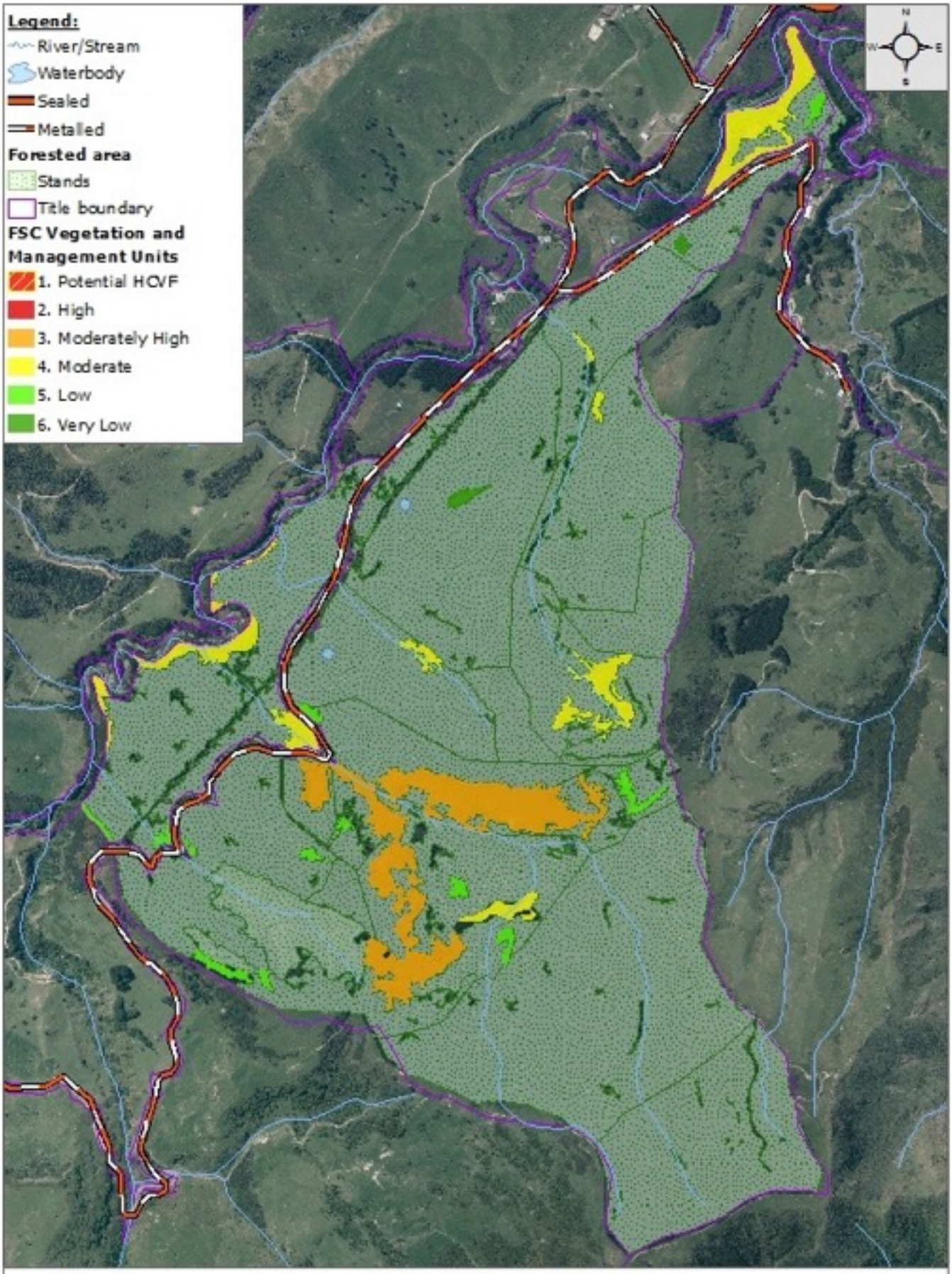


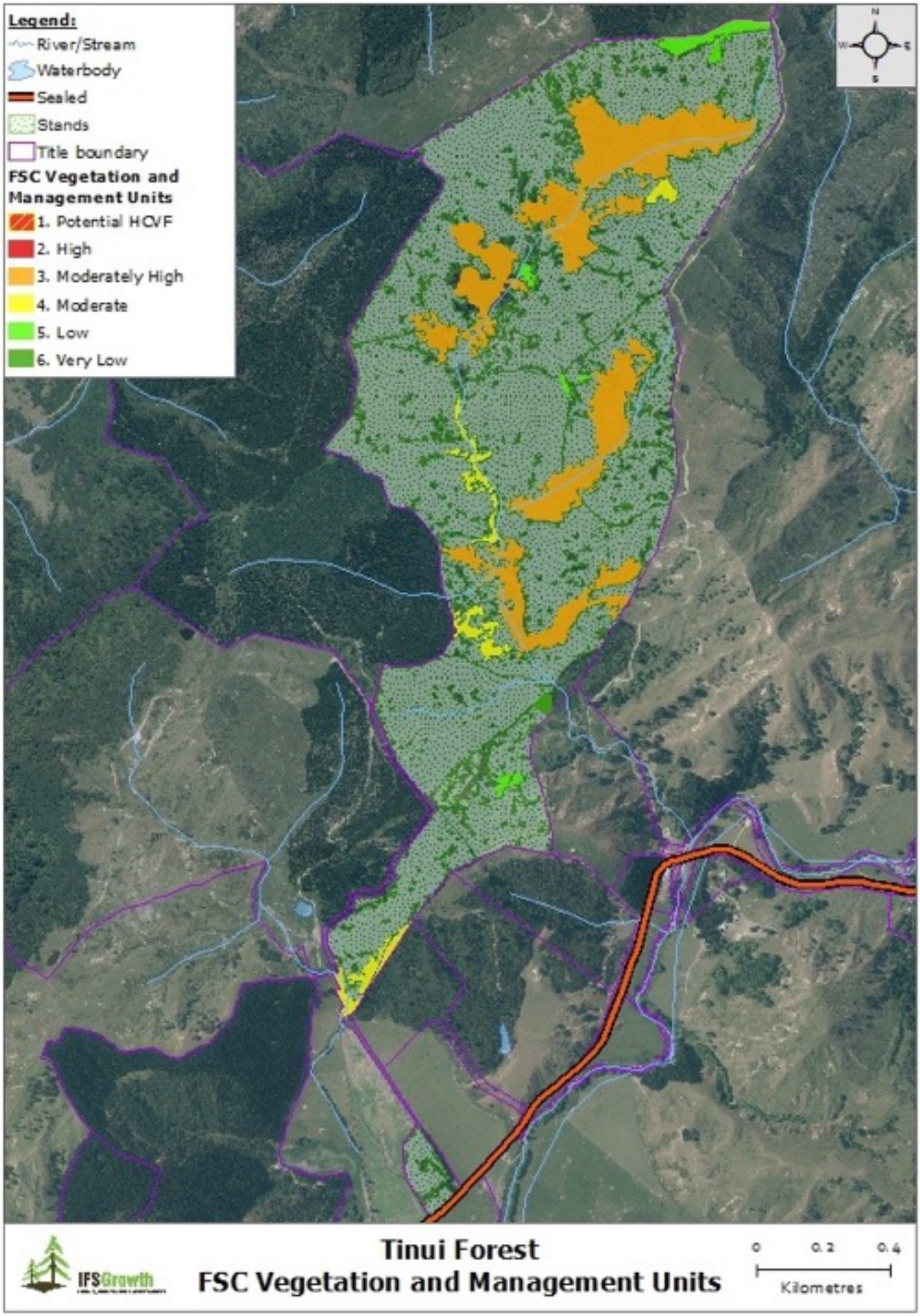

Legend:
River/Stream
Waterbody
Internal roading network
Track
Forested area
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
N
W
E
S
IFSGrowth
Glenburn Forest (South)
FSC Vegetation and Management Units
0 0.25 0.5
Kilometres

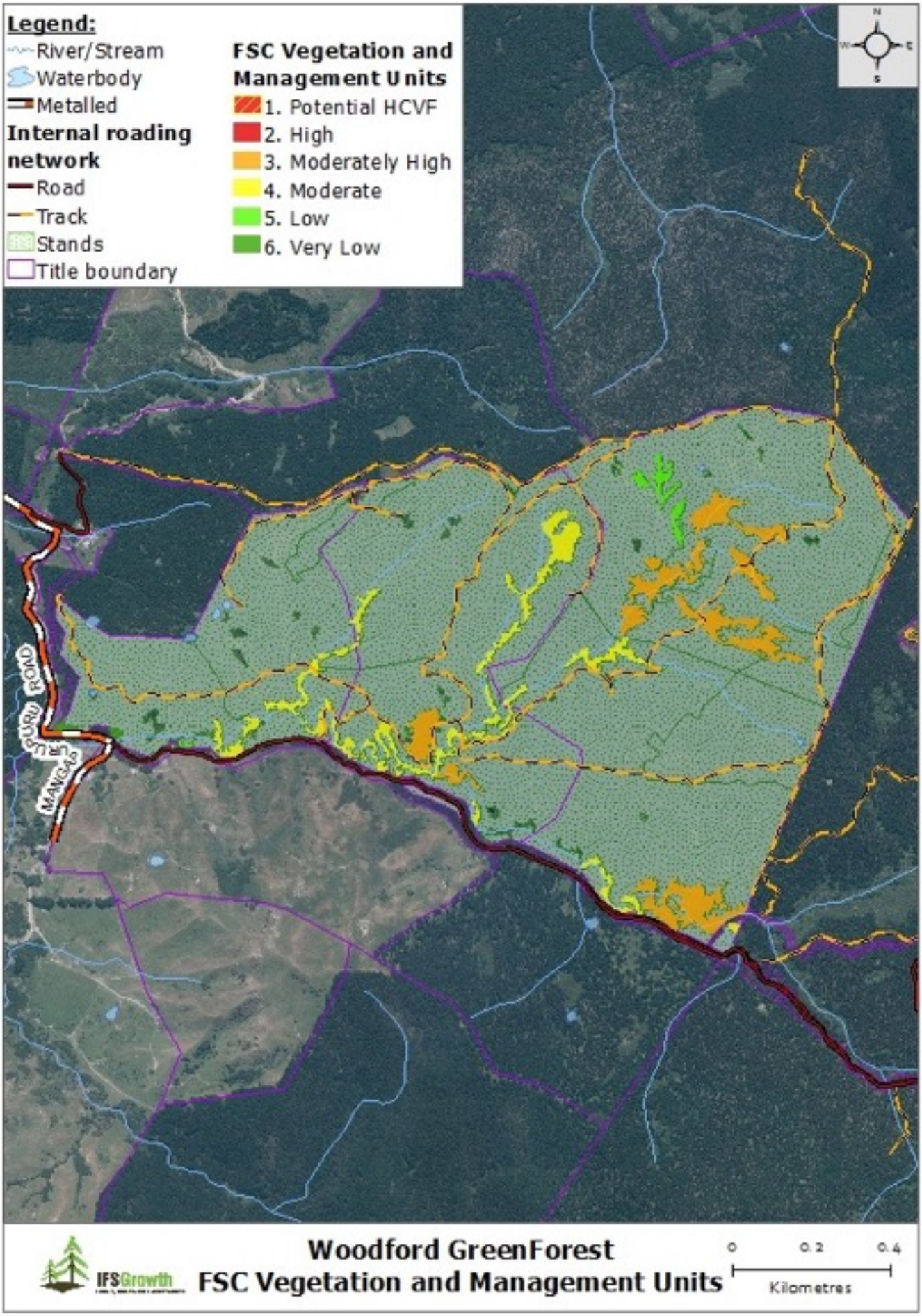

Legend:
River/Stream
Waterbody
Internal roading network
Road
Track
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
N
W
E
S
IFSGrowth
Hawkins Forest
FSC Vegetation and Management Units
0
0.15
0.3
Kilometres


Legend:
River/Stream
Waterbody
Unmetalled
Internal roading network
Road
Track
Forested area
Stands
Landbank
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
N
W
E
S
IFSGrowth
Land's End Forest
FSC Vegetation and Management Units
0
0.1
0.2
Kilometres

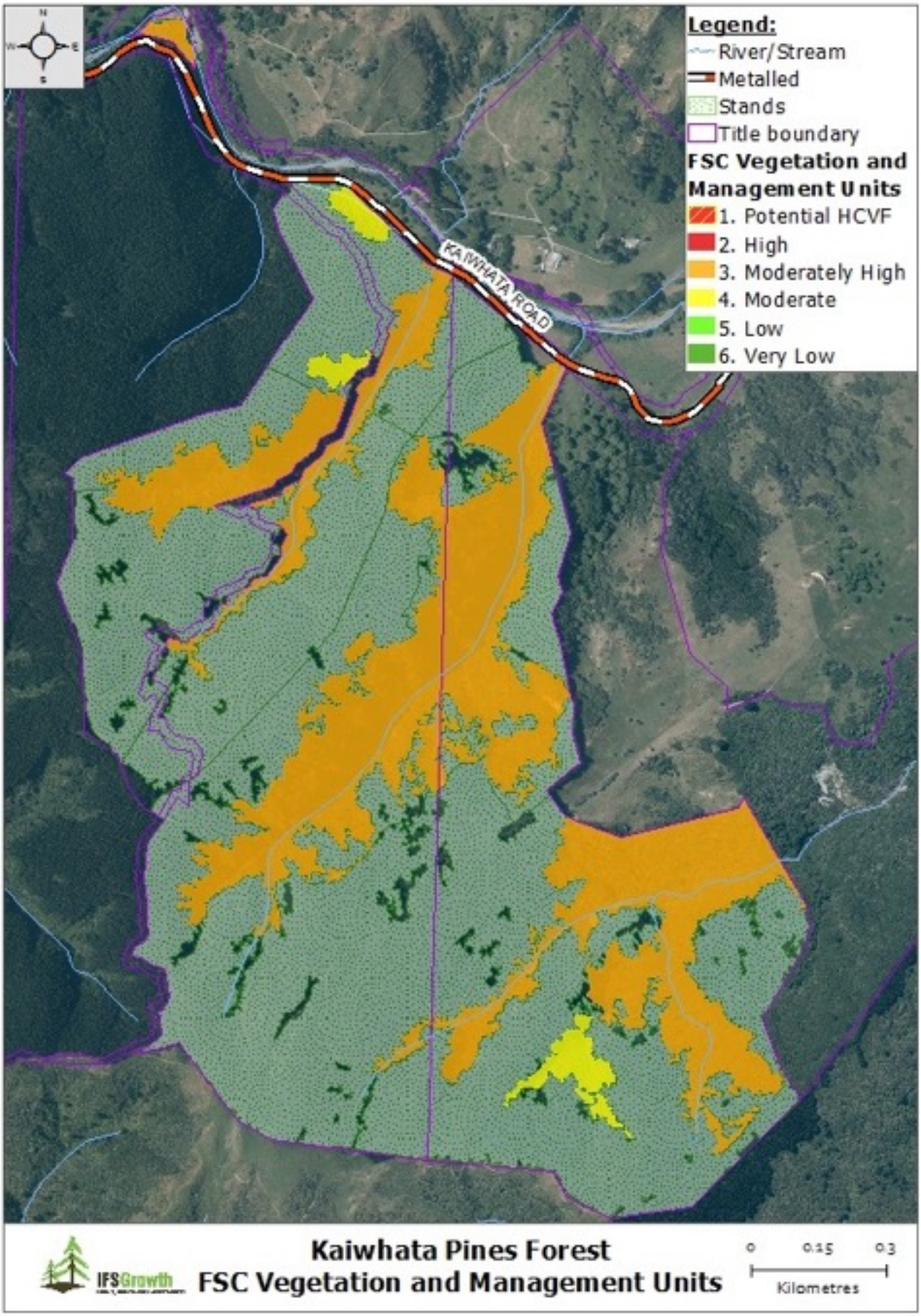

N
W
E
S
Legend:
River/Stream
Waterbody
Metalled
Internal roading network
Track
Forested area
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
IFSGrowth
Ngahape Forest
FSC Vegetation and Management Units
0 0.1 0.2
Kilometres


Legend:
River/Stream
Waterbody
Sealed
Metalled
Forested area
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
N
W
E
S
IFSGrowth
Ruakokoputuna Forest
FSC Vegetation and Management Units
0
0.2
0.4
Kilometres


Legend:
River/Stream
Waterbody
Sealed
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
N
W
E
S
IFSGrowth
Tinui Forest
FSC Vegetation and Management Units
0
0.2
0.4
Kilometres


Legend:
River/Stream
Waterbody
Metalled
Internal roading network
Road
Track
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
N
W
E
S
SPURU ROAD
MANGAS
IFSGrowth
Woodford GreenForest
FSC Vegetation and Management Units
0
0.2
0.4
Kilometres


Legend:
Markets
Wairarapa Estate Limited
Plantation forests
N
W
E
S
Beehive Creek (106.3 ha)
Dannevirke
Kiwi Lumber
PALMERSTON NORTH
Levin
TARARUA RANGE
Tinui (142.5 ha)
Woodford Green (148.4 ha)
Kiwi Lumber
Hawkins (153.4 ha)
MASTERTON
Carterton
Davis Sawmilling
Ngahape (205.5 ha)
Kaiwhata Pines (146.3 ha)
Dunolly (423.3 ha)
Lands End (91.4 ha)
CentrePort
WELLINGTON
RIMUTAKA RANGE
Ruakokoputuna (224.2 ha)
Glenburn (1452.1 ha)
IFS Growth
Wairarapa Estate
Forest location and Net Plantable Area
0
10
20
Kilometres


Legend:
River/Stream
Metalled
Stands
Title boundary
FSC Vegetation and Management Units
1. Potential HCVF
2. High
3. Moderately High
4. Moderate
5. Low
6. Very Low
KAIWHATA ROAD
IFSGrowth
Kaiwhata Pines Forest
FSC Vegetation and Management Units
0
0.15
0.3
Kilometres

Pest Plants of the Wellington Region

Total Control

African feathergrass *(Pennisetum macrouroum)*
Bathurst bur *(Xanthium spinosum)*
Blue passionflower *(Passiflora caerulea)*
Climbing spindleberry *(Celastrus orbiculatus)*
Eelgrass *(Vallisneria spiralis and V.gigantea)*
Perennial nettle *(Urtica Dioica and subspp)*
Madeira vine (Anredera cordifolia)
Saffron thistle *(Carthamus lanatus)*
Manchurian wild rice *(Zizania latifolia)*
Woolly nightshade *(Solanum mauritianum)*
Moth plant *(Araujia sericifera)*

Containment

Boneseed *(Chrysanthemoides monilifera)*
Evergreen buckthorn *(Rhamnus alaternus)*
Hornwort *(Ceratophyllum demersum)*
Sweet pea shrub *(Polygala myrtifolia)*

Site Led

Banana passionfruit *(Passifloa mixta, P.mollissima,P.tripartita)*
Cathedral bells *(Cobaea scandens)*
Gorse *(Ulex europaeus)*
Nodding thistle *(Carduus nutans)*
Old man's beard *(Clematis vitalba)*
Ragwort *(Senecio jacobaea)*
Variegated thistle *(Silybum marianum)*
Wild ginger *(Hedychium gradnerianum, H.flavescens)*
Blackberry *(Rubus spp. Barbed cultivars)*
Hemlock *(Conium maculatum)*

Regional Surveillance

African feathergrass *(Pennisetum macrouroum)*
Alligator weed *(Alternanthera philoxeroides)*
Apple of Sodom *(Solanum linnaeanum)*
Asiatic knotweed *(Reynoutria japonica and hybrids)*
Australian sedge *(Carex longebrachiata)*
Bomarea *(Bomarea caldaasii,B. multiflora)*
Californian arrowhead *(Sagittaria montevidensis)*
Californian bulrush *(Schoenoplectus californicus)*
Chilean flamecreeper *(Tropaeloum speciosum)*
Chilean needle grass *(Nassella neesiana)*
Chinese pennisetum *(Pennisetum alopecuroides)*
Chocolate vine *(akebia quinata)*
Delta arrowhead *(Sagittaria playphylla)*
Giant knotweed *(Reynoutria sachalinensis and hybrids)*
Hawian arrowhead *(Sagittaria sagittifolia)*
Houttuynia *(Houttuynia cordata)*
Nassella tussock *(Nassella trichotoma)*
Noogoora bur *(Xanthium occidentale)*
Polypodium *(Polypodium vulgare)*
Purple loosestrife *(Lythrum salicaria)*
Senegal tea *(Gymnocoronis spilanthoides)*
Spartina *(Spartina spp.)*
White edged nightshade *(Solanum marginatum)*

Saline Springs in Glenburn

The reserve is to be protected with a deer fence erected around the actual springs. There will be a gate on which the Manager will place a lock.

The Manager will remove all exotic vegetation from within the fence and also around the fence.

Access to the springs will be limited.

A photo point will be set up within the reserve to help with monitoring. Photos will be taken annually.

The reserve will be monitored for
- weed growth - which the Manager will remove
- native growth of saline species

River area in Dunolly.

The reserve is to be protected.

The Manager will remove all weed species within the reserve and will manage animal pests. The Manager will set and monitor bait stations within the reserve

Access to the reserve will be limited.

The reserve will be monitored for
- weed growth - which the Manager will remove
- damage from pests.

Relevant Regulations, Standards and Guidelines

A.	NATIONAL LEGISLATION
	Legal Rights to Harvest: • **Land tenure and management rights** • **Concession licenses** • **Management and harvest planning**
	Treaty of Waitangi Act 1975
	Resource Management Act 1991
	Forests Act, 1949
	Conservation Act 1987
	Crown Forests Asset Act 1989
	Forestry Encouragement Act 1962
	Forestry Rights Registration Act 1983
	Local Government Act 2002
	Public Works Act 1981
	Commerce Act 1986
	Companies Act 1993
	Trespass Act 1980
	Cooperative Companies Act 1996
	Crown Minerals Act 1991
	Income Tax Act 2007
	Overseas Investment Act 2005
	Walking Access Act 2008
	Te Turi Whenua Maori Act 1993
	Fencing Act 1978
	Historic Places Act 1993
	Foreshore and Seabed Act 2004
	Land Act 1948
	Land Transfer Act 1952
	Machinery Act 1950
	Native Plants Protection Act 1934
	Personal Property Securities Act 1999
	Plant Variety Rights Act 1987
	Taxes and Fees • **Payment of royalties and harvesting fees** • **Value added and sales taxes** • **Income and profit taxes**
	Minimum Wage Act 1983
	Workplace Relations Act 2000
	Employment Relations Act 2000

	Accident Compensation Act 2001
	Holidays Act 2003
	Treaty of Waitangi Act 1975
	Overseas Investment Act 2005
	Income Tax Act 2007
	Cooperative Companies Act 1996
	Companies Act 1993
	Commerce Act 1986
	Forestry Rights Registration Act 1983
	Crown Forests Asset Act 1989
	Forestry Encouragement Act 1962
	Forestry Encouragement Loans Regulations 1967
	Forests Act, 1949
	Injury Prevention, Rehabilitation, and Compensation Act 2001
	Sale of Goods Act 1908
	Timber Harvesting Activities • **Timber harvesting regulations** • **Protected sites and species** • **Environmental requirements** • **Health and safety** • **Legal employment**
	Health & Safety in Employment Act 1992
	Forest and Rural Fires Act 1977
	Fire Service Act 1975 as Amended 1990
	Hazardous Substances and New Organisms Act 1996
	Wildlife Act 1953
	Wild Animal Control Act 1977
	Biosecurity Act 1993
	Climate Change Response Act 2002
	Misuse of Drugs Act 1975
	Transport Act 1962
	Forest and Rural Fires Regulations 2005
	Forest Disease Control Regulations 1967
	Climate Change (Forestry Sector) Regulations 2008
	The New Zealand Forest Accord, 1991
	New Zealand Forest Code of Practice, June 1993
	Code of Practice for the Management of Agrichemicals, 2004. (NZS8409:2004)
	Safety and Health in Forestry Operations: Code of Practice and Best Practice Guidelines
	Principles for Commercial Plantation Forest Management in New Zealand, 1995
	NZ Environmental Code of Practice for Plantation Forestry,2007

	N.Z. Threat Classification system (2005)
	Ecological Regions and Districts of NZ
	Treaty of Waitangi Act 1975
	Holidays Act 2003
	Accident Compensation Act 2001
	Employment Relations Act 2000
	Workplace Relations Act 2000
	Minimum Wage Act 1983
	Fencing Act 1978
	Historic Places Act 1993
	Walking Access Act 2008
	Income Tax Act 2007
	Forestry Rights Registration Act 1983
	Forests Act, 1949
	Resource Management Act 1991
	Soil Conservation and Rivers Control Act 1941
	Third Party Rights • **Customary rights** • **Free prior and informed consent (FPIC)** • **Rights of indigenous peoples**
	Treaty of Waitangi Act 1975
	Fencing Act 1978
	Historic Places Act 1993
	Resource Management Act 1991
	Walking Access Act 2008
	Forestry Rights Registration Act 1983
	Forests Act, 1949
	Trespass Act 1980
	Maori Reserved Land Act 1955
	Te Turi Whenua Maori Act 1993/Maori Land Act 1993
	Trade and Transport • **Classification of species, quantities, qualities** • **Trade and transport** • **Offshore trading and transfer pricing**
	The New Zealand Forest Accord, 1991
	Forests Act, 1949
	Transport Act 1962
	Forest Produce Import & Export Regulations 1989
	Trade Marks Act 2002
	Custom regulations

	The New Zealand Forest Accord, 1991
	Forests Act, 1949
	Biosecurity Act 1993
	Customs and Excise Act 1996.
	Forest Produce Import & Export Regulations 1989
	CITES
	Convention on the International Trade in Endangered Species (CITES)
	Other
	Not applicable at this stage. All relevant legislation has been stated.
B.	**REGULATIONS PERTINENT TO FORESTRY RELATED TO AND EMERGING FROM NATIONAL LEGISLATION AND OTHER LEGISLATIVE INSTITUTIONS:**
	The New Zealand Forest Accord, 1991
	New Zealand Forest Code of Practice, June 1993
	Forest Produce Import & Export Regulations 1989
	Ecological Regions and Districts of NZ
	N.Z. Threat Classification system (2005)
	NZ Environmental Code of Practice for Plantation Forestry,2007
	Principles for Commercial Plantation Forest Management in New Zealand, 1995
	Code of Practice for the Management of Agrichemicals, 2004. (NZS8409:2004)
	Safety and Health in Forestry Operations: Code of Practice and Best Practice Guidelines
	Forests Act, 1949
	Forestry Rights Registration Act 1983
	Resource Management Act 1991
	Forestry Encouragement Loans Regulations 1967
	Forest Disease Control Regulations 1967
	Forest and Rural Fires Regulations 2005
	Forest and Rural Fires Act 1977
C.	**INTERNATIONAL AGREEMENTS PERTINENT TO FORESTRY**
	Convention on Biological Diversity
	Convention on the International Trade in Endangered Species (CITES)
	IUCN Red List of threatened species
	ICOMOS New Zealand Charter, 1993
	Kyoto protocol
	ITTA

	International Labour Organisation (ILO) conventions: • 29 Forced Labour Convention, 1930. • 87 Freedom of Association and Protection of the Right to Organise Conventions, 1948. • 97 Migration for Employment (Revised) Convention, 1949. • 98 Right to Organise and Collective Bargaining Convention, 1949. • 100 Equal Remuneration Convention, 1951. • 105 Abolition of Forced Labour Convention, 1957. • 111 Discrimination (Occupation and Employment) Convention, 1958. • 131 Minimum Wage Fixing Convention, 1970. • 138 Minimum Age Convention, 1973. • 141 Rural Workers' Organizations Convention, 1975. • 142 Human Resources Development Convention, 1975. • 143 Migrant Workers (Supplementary Provisions) Convention. 1975 • 155 Occupational Safety and Health Convention, 1981. • 169 Indigenous and Tribal Peoples Convention, 1989. • 182 Worst Forms of Child Labour Convention, 1999. • ILO Code of Practice on Safety and Health in Forestry Work (ILO 1998) • Recommendation 135 Minimum Wage Fixing Recommendation, 1970. • ILO Declaration on Fundamental Principles and Rights at Work, 1998 and its Follow-up. ILO member states are expected to promote and realize these principles, even if they have not ratified the Conventions. • The ILO Code of Practice is not a legal instrument, but it provides authoritative guidance on forest work.
D.	**LOCAL STANDARDS AND BEST OPERATING PRACTICES**
	The New Zealand Forest Accord, 1991
	New Zealand Forest Code of Practice, June 1993
	Code of Practice for the Management of Agrichemicals, 2004. (NZS8409:2004)
	Safety and Health in Forestry Operations: Code of Practice and Best Practice Guidelines
	Principles for Commercial Plantation Forest Management in New Zealand, 1995
	NZ Environmental Code of Practice for Plantation Forestry,2007
	N.Z. Threat Classification system (2005)
	Ecological Regions and Districts of NZ