

HERITAGE FOREST

Owned by
**HERITAGE FORESTRY NGATAPA
PARTNERSHIP**

Forest Management Plan

For the period June 2018 – June 2023



Prepared by L F Dine
PO Box 1127 | ROTORUA
Tel: 07 921 1010 | Fax: 07 921 1020
info@pfolsen.com | www.pfolsen.com

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1. INTRODUCTION

Foundation Principle

Heritage Forestry Ngatapa Partnership is committed to adopt the Forest Stewardship Council (FSC®) Principles and to meet their Criteria and the FSC standards of good forest management. The standards include ecological, social and economic parameters.

Heritage Forestry Ngatapa Partnership is committed to the PF Olsen FSC Group Scheme that is implemented through the Group Scheme Member Manual and associated documents.

Heritage Forest is managed under the PF Olsen Ltd FSC Group Scheme certificate RA-FM/COC-000190 issued by the Rainforest Alliance.

About this plan

This Management Plan provides a summary of the forest management plan, and contains:

- A description of the land and its landscape context;
- A description of the external operating environment;
- Management objectives;
- A description of the commercial plantation estate and its non-commercial elements and obligations;
- Forest management, harvesting, protection and land management intentions;
- Provisions for monitoring and protection and public usage;
- Maps showing plantation area, legal boundaries and protected areas.

This plan pertains to the management of Heritage Forest and will be current for the next 5 years. The next major review date for this plan June 2023. Minor annual revisions will be made to this plan in the interim are recorded in Section 18: Register of Plan Change and Review.

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; and
 - Climate.
-

Legal ownership

The legal description of the land on which the forest is situated is:

6A/834 Lot 2 on DP 8243 and Lot 3 DP 8906, Blocks XI and XV Waikohu SD

The tenure is freehold.

Forest location & access

Heritage Forest is located off Hillside Road, Ngatapa, 35 kilometres west of Gisborne port. Hillside Road is a short county road of less than 1.0 kilometre, which services just two other properties. The road has recently undergone upgrades and a new network of internal forest roads has been created. All other county roading leading to Hillside Road is in good repair and suitable for all traffic. A short Right of Way (ROW) exists from Hillside Road to the forest property. This ROW is registered on the Title 5C 1018.

The ROW links to an internal metal road (Highway) which provides all weather access to the centre of the forest.

There is also an extensive unmetalled tracking system suitable for silvicultural and management requirements. Because tracking is not metalled some damage is incurred during use, particularly in wet weather and therefore annual maintenance is budgeted.

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

Table 1. Distances from forest to log markets

Potential Market or Export Port	Minimum Distance from Forest (km)	Log Market Type
Gisborne	30 km	Export
Gisborne Mills	25 km	Domestic
Gisborne Port	35km	Pulp

Topography

Approximately 70% of Heritage Forest is described as moderately steep with the balance being easier rolling country. The ridge systems generally run north to south with many areas suitable for logging skid and hauler sites.

Harvesting of the property will be undertaken using variety of systems from medium sized cable logging machinery through to ground-based skidder and tractor logging.

Approximately 90% of the forest drains into the Totangi Stream catchment which flows north, finally reaching the Waikohu river system near Te Karaka township. A small area on the south east of the property flows east into the Parikanapa catchment, finally reaching the Waipaoa River catchment near the Ormond township. Altitude ranges from 150-230 meters above sea level.

Soils

The general geological structure of the area consists of moderately steep hills with a mantle of recent rhyolitic ash. Overlying this parent material is a cover of Taupo ash on mudstones and sandstones.

Soils are described as yellow-grey earths and steepland soils related to yellow-brown pumice soils Otamauri sandy loam hill soil and Moumahaki steepland soils.

These soils, prone to moderate soil slips, are suitable for high producing pasture and commercial afforestation.

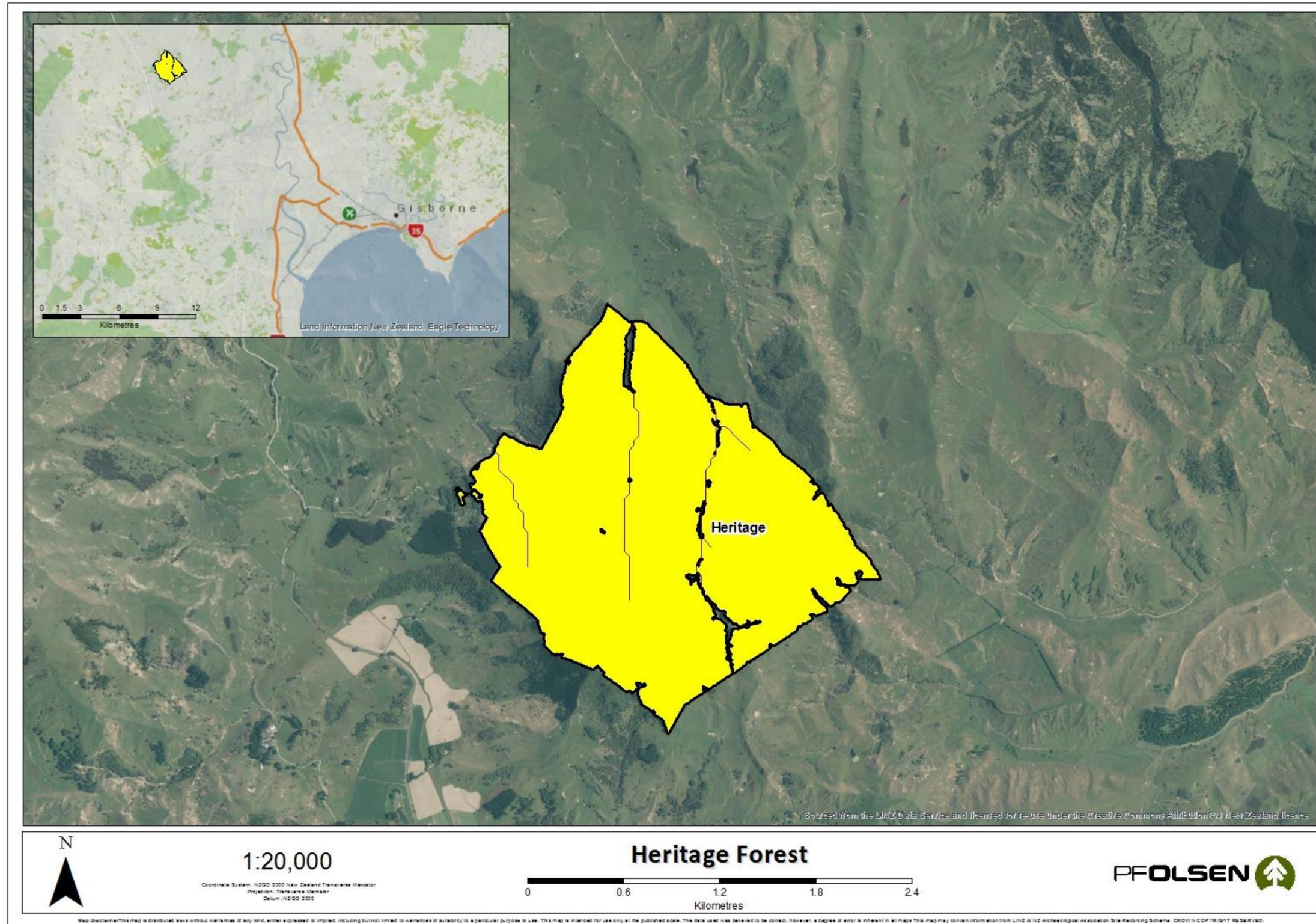
Climate

Rainfall: The average rainfall at nearby Rangimoe is about 925 mm per annum and is relatively evenly distributed during the year, with peak rainfall in July. (Source: GDC Rangimoe Weather Station).

Temperature: The mean annual temperature is around 11 degrees Celsius. The maximum daily temperature ranges from 7.9°C (July) to 18.9°C (February). (Source: GDC Matawhero Weather Station).

The predominant wind direction is North West.

Map 1 - Forest Location Map



3. The Broader Landscape

Ecological landscape

Heritage Forest falls within the Turanga Ecological District (Figure 1). This District is described as comprising of alluvial plains, low hills and a narrow strip of sand on coast with partially tidal wetland behind; The climate is very warm, sunny; and the soils are mostly alluvial soils on flats, with some volcanic ash soils, steepland and hill soils, and sandy soils on dunes. The whole District was originally coastal and lowland forests and wetlands and is now mostly modified for intensive non-forest agricultural and horticultural use.¹

Historically the Gisborne region was heavily developed with extensive tracts of its forest cover cleared to make way, initially for extensive grazing and cropping on the alluvial flats. Few areas remained uncleared and many hill and steepland areas became subject to serious accelerated erosion.

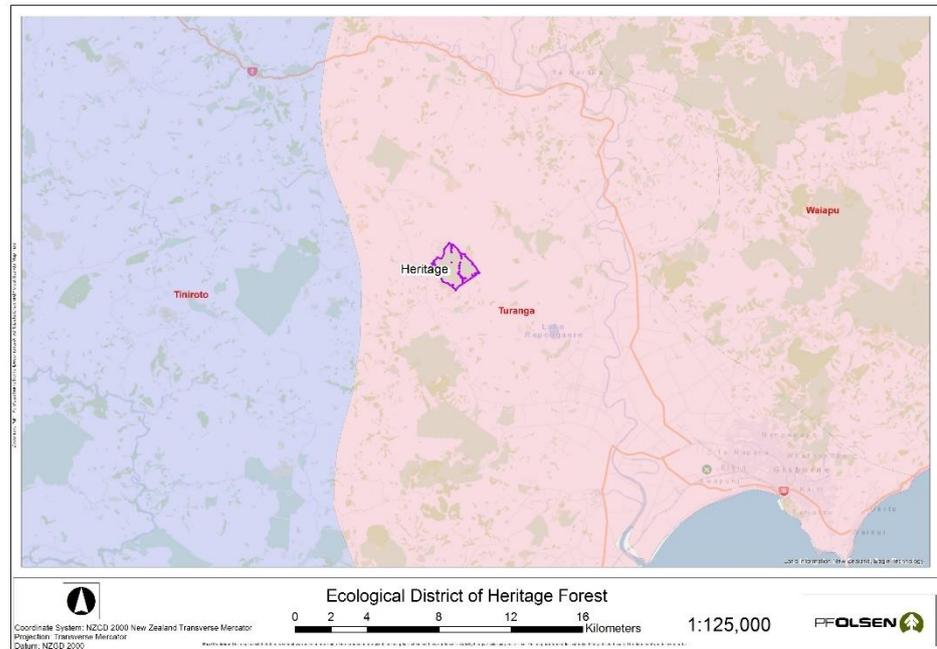


Figure 1. Heritage Forest Ecological District

Erosion prompted major afforestation programmes and some areas of farm retirement that have steadily reverted back to Manuka and Kanuka nurse crop forests. However, the past impacts have resulted in significant depletion of native flora and fauna in the region surrounding the Heritage forest.

In a wider context, this environment remains poorly represented in vegetated cover relative to its original extent and that remaining proportion is very poorly represented within the formally protected areas of NZ.

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¹ http://www.bush.org.nz/ecologicaldistrict/20_03.html

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Under the FSC National Standard for Plantation Forest Management in New Zealand revised in 2013, an area of reserves equivalent to 10% of the productive area should be reserved within each ED, inclusive of reservation of 5% of the productive area within large forests (> 1,000 ha).

Table 2 illustrates the percentage of area protected within Heritage Forest, compared to the total area protected within the Turanga Ecological District. Where this cannot be achieved a series of options to affect an equivalent level of ‘ecological effort’ are permissible under the standard.

Table 2. Protective status of the ecological landscape

LENZ type	LENZ D3.1
Original (pre-Māori) percentage of ecosystem type in Ecological District within land title:	242,525 ha 100%
Natural ecosystem area remaining	40.015 ha 16.5%
Proportion of remaining natural ecosystem under protection:	3,521 ha 8.8%
Protection by certificate holder	1.3 ha 0.003%
Protected areas as a % of management estate	2.3 ha 0.7%
Protected areas as a % of total forest management estate by Ecological District	7 ha 1.7%

Historic and archaeological sites

Records of known archaeological and historical places are maintained in the NZ Archaeological Association (NZAA) Site Recording Scheme. The Archaeological Site Probability model published by the Department of Conservation² provides further guidance on the probability of pre-European archaeological evidence existing based on the geographical location of the forest and historical occupation of the local area. The site recording scheme has revealed no known sites within Heritage Forest. However, a check of the Archaeological Site Probability model published by the Department of Conservation³ suggests that the coastal nature of the general Gisborne area increases the likelihood of archaeological sites being present. Advice from an archaeologist would likely be recommended prior to undertaking works in Heritage Forest.

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² Arnold, G.; Newsome, P.; Heke, H. 2004: Predicting archaeological sites in New Zealand. *DOC Science Internal Series 180*. Department of Conservation, Wellington. 24 p.

³ Arnold, G.; Newsome, P.; Heke, H. 2004: Predicting archaeological sites in New Zealand. *DOC Science Internal Series 180*. Department of Conservation, Wellington. 24 p.

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If a site is found or suspected on any block, the protocols specified in PF Olsen’s EMS, and any others specifically developed in conjunction with Heritage New Zealand (HNZ) and Iwi or other stakeholders must be observed. Where such circumstances require, an ‘Authority to Modify or Destroy’ will be sought from HNZ. Such authorities are similar in function to a resource consent and, if granted, normally come with conditions that must be met. The process to apply for authorities is documented in PF Olsen’s EMS.

Note also that Authorities to modify an archaeological site may sometimes be required from the local District Council and sites of cultural significance are often included in schedules of places and sites of significance in District Plans. Update checks for any sites will be required before any harvesting or related earthworks commences.

**Threatened
Environments
Classification**

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

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

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

Heritage Forest falls within two most threatened categories, 10-20% and less than 10% indigenous cover left.

4. Socio-economic profile and adjacent land

Forest history

Prior to being established in trees, the Heritage Forest property was run as a sheep and beef hill country farm.

Current social profile

Heritage forest was established as a business venture amongst private investors. As a resource it forms a small incremental part of a large permanently managed regional series of plantation estates owned by a number of corporate and private entities. In total these combine to produce a harvest of several hundred thousand cubic metres per annum.

The forest provides intermittent low levels of employment in its mid rotation stage and at harvest will contribute minor additional contract labour opportunities to the wider regional pool although a significant work content for those actually directly employed over the harvesting period.

The local economy is diverse comprising viticulture, pastoral farming, forestry, tourism and aquaculture/fishing with much of the labour pool focussed in the nearby city of Gisborne and its immediate surrounds. As such the nature and scale of activities within the Heritage forest will have only minor influence upon the regional socio-economic profile of its surrounds

Table 3. Key statistics as summarised from Census⁴ data

Census Category	Gisborne	NZ
Ethnicity: European	60.8%	74%
Ethnicity: Māori	48.9%	14.9%
Formal qualifications	71.6%	79.1%
Unemployment	9.3%	7.1%
Dominant occupation	Labourers	Professional
Median income	\$24,000	\$28,500
Family with children	37.2%	41.3%
Internet access	63.2%	76.8%
Home ownership	59.2%	64.8%
Employed in agriculture, fishing & forestry	22.4%	5.7%

Associations with Tangata Whenua

The iwi group associated with the land of Heritage forest is Te Whanau-a-Kai Hapu Trust. Maori comprise nearly 50% of the local city population.

⁴ http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-about-a-place.aspx?request_value=13853&tabname=Business#

Tenure & resource rights

There are no current resource consents or HNZ authorities that apply to Heritage Forest.

Neighbours

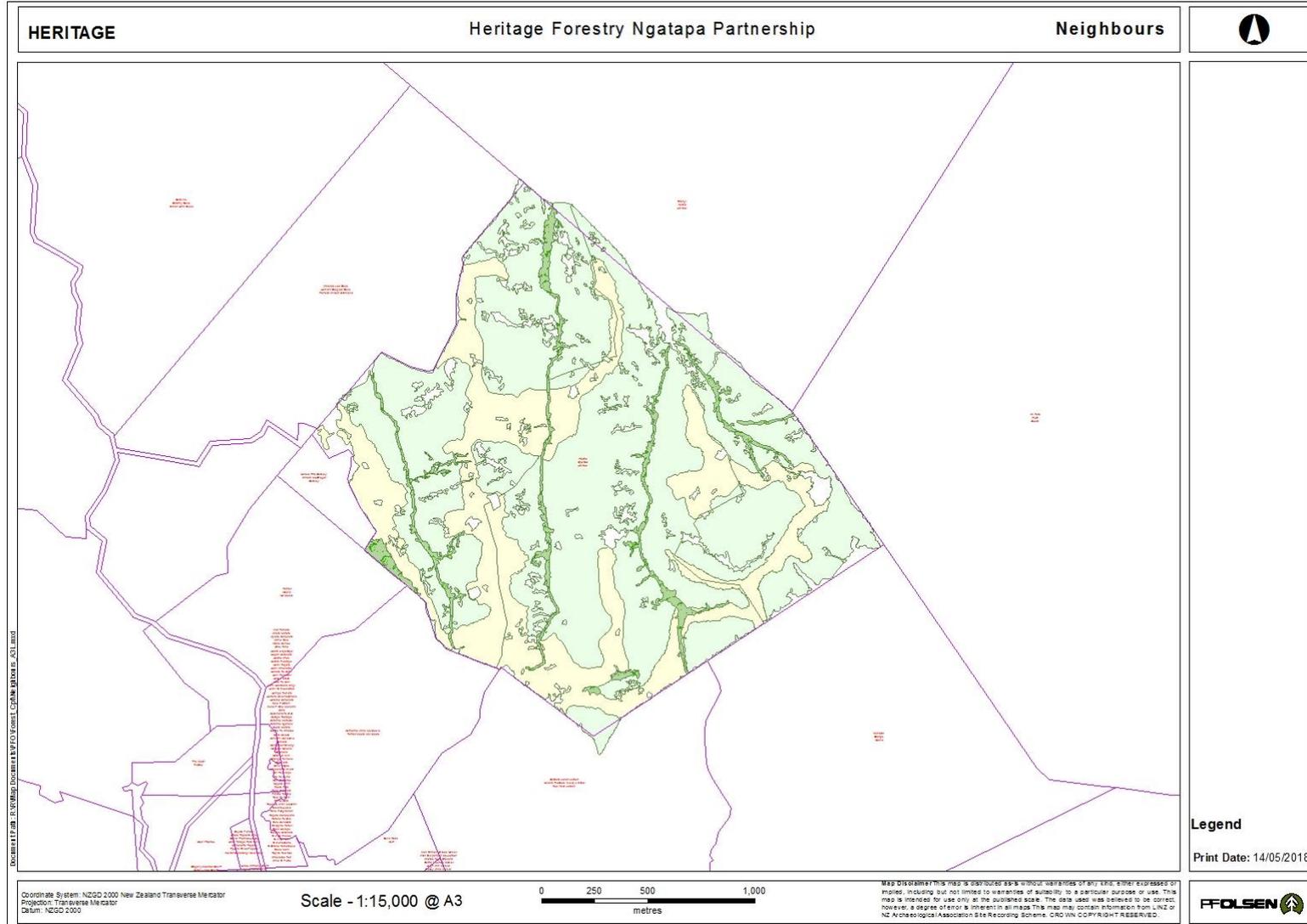
Neighbours to the forest estate boundaries have a special interest in the management of the forest. Activities within the forest may positively or negatively impact upon their quality of life or businesses in several ways, while inappropriately managed operations could create risks of adverse health,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

Table 4 lists the forest neighbours and their primary activities. Some or all these parties should be consulted when operations are proposed in forest areas adjacent to their boundaries.

Table 4. Forest Neighbours

Owner/Occupier	Location (See Map 3)	Activities
Simon and Caroline Cave	North West	Farming
Hamish and Amanda Cave and Richard Stanard		Farming
Totangi Farms Ltd	North East	Farming
Wi Pere Trust		Farming
Micheal Vette	South East	Farming
Paul and Barbara Larsen	South	Farming
Patrick McIldowie	South West	Farming

Map 3 –Heritage Forest Neighbours



REGULATORY ENVIRONMENT & RISK MANAGEMENT

5. 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 forest.

Health and Safety at Work Act 2015

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

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

Resource Management Act (RMA) 1991

Heritage Forest is subject to the provisions of the Resource Management Act (RMA) 1991. The RMA sets up a resource management system that promotes the sustainable management of natural and physical resources and is now the principal statute for the management of land, water, soil and other resources in New Zealand. The organisations relevant to Heritage Forest are listed below:

Table 5. Councils under Heritage Forest

District Council (Unitary Authority)
Gisborne District Council

Under the RMA, each Council has its own planning documents and associated rules that have been developed through public process. Any forestry operations must comply with the rules relevant to the Council area in which the operations are to take place.

At the time of formulation of this Management Plan, many individual Council rules will be superseded by the new instrument under the RMA, the ‘National Environmental Standard for Plantation Forestry’ (NES-PF), designed explicitly to assist streamlining, efficiency and consistency in the application of environmental law to the forest industry (see next section). The contact details for the relevant councils can be seen in [Appendix 1](#).

National Environmental Standard for Plantation Forestry (NES-PF)

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

The underpinning the structure of the NES-PF is a rule hierarchy linked to the erosion susceptibility of the lands upon which forestry operations are to be conducted. Work commissioned by the Ministry of Primary Industries led to the creation of a national spatial map, the ‘Erosion Susceptibility Layer’ (ESC) that classifies all of New Zealand into a series of four classes of erosion susceptibility from low (green) to very high (red).

The stringency of the rules hierarchy, i.e. whether consents are needed and the degree to which Councils can apply discretion to the conditions attached to a consent, is then tied closely to the recognised erosion susceptibility of the lands involved and the risks created by the operations.

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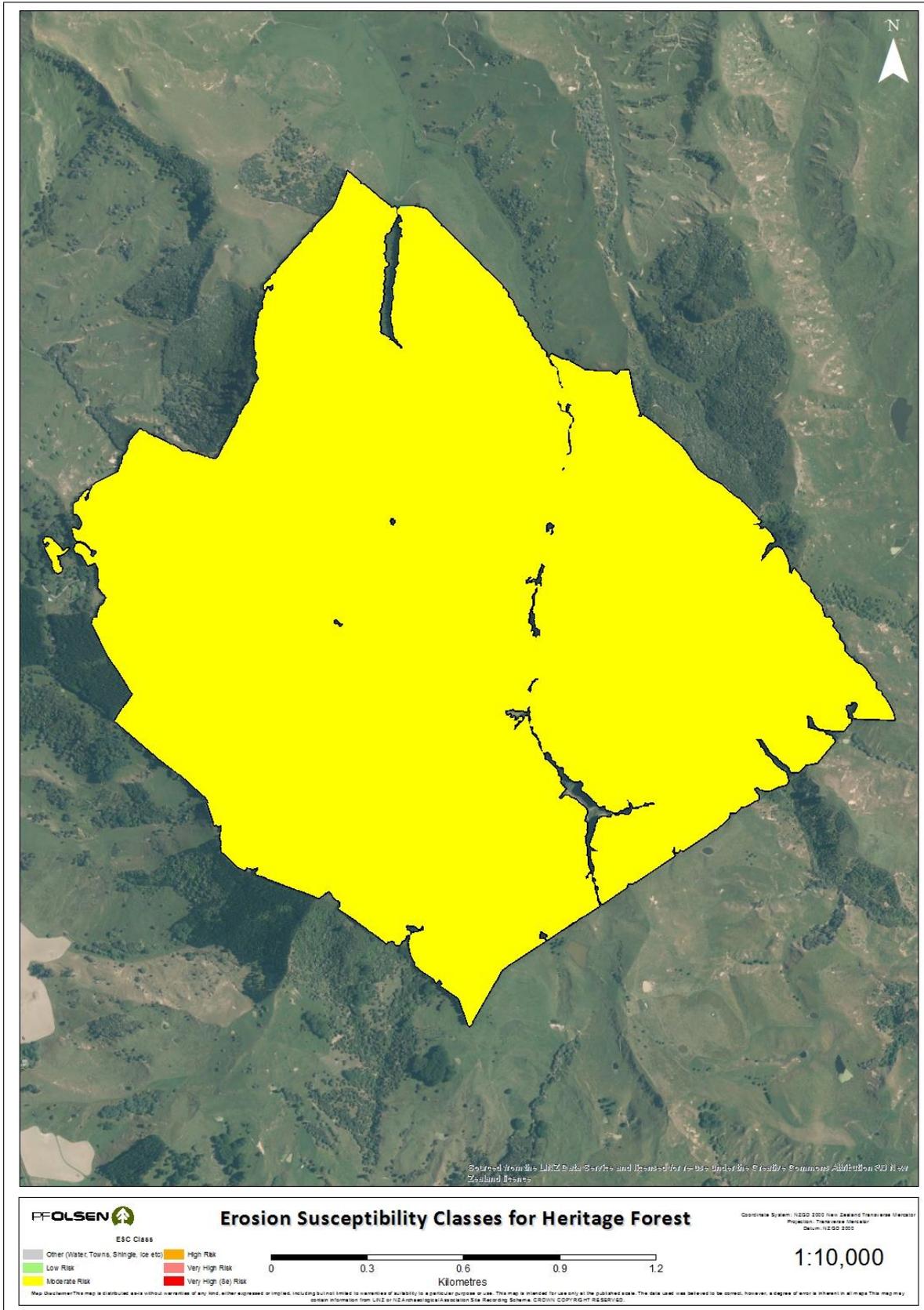
In broad terms, harvesting, roading (earthworks) and new afforestation operations will need consents in the red zone. Earthworks will need consents in orange, and in the green and yellow zones most operations will be permitted subject to conditions. The coverage of the erosion classes within the estate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

In the case of Heritage Forest, Table 6 indicates the proportion of the forest by the respective ESC classes.

Table 6. ESC Classes (Erosion Risk) for Heritage Forest

	Low	Moderate	High	Very High	Very high (8e)	Undefined
Area (ha)	0.02	356.03				
Area (%)	0.01	99.9				

Map 4 – National Environmental Standard Erosion Susceptibility Classes in Heritage Forest



Heritage New Zealand Pouhere Taonga Act 2014

Under the Heritage New Zealand Pouhere Taonga Act 2014 it is the landowner’s responsibility to identify any historic sites on their land prior to undertaking any work which may disturb or destroy such sites. Records of archaeological and historical places are maintained in the NZ Archaeological Association (NZAA) Site Recording Scheme <http://www.archsite.org.nz/>.

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

These responses may include, but are not limited to:

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

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

Consents & authorities held

There are no current HNZ authorities that apply to Heritage Forest, although there is one resource consent: LV-2016-107251.

Emissions Trading Scheme

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

Heritage Forest was planted on ‘Kyoto compliant’ land that was vacant as at 31st December 1989. These forest areas have not been registered to participate in the NZ Emissions Trading Scheme and are not subject to the accrual of emissions credits and liabilities under that scheme.

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 2](#).

6. 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 Heritage Forestry Ngatapa Partnership retains credible access to its markets.

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

Log customer credit risk

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

Infrastructure damage or service disruption

Heritage Forest has no infrastructure within the forest boundaries. Risks around these are managed by:

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

Pests and diseases

Pests and diseases are managed according to any statutory obligations and best practices as identified by scientific research and past experience, with the type and intensity of treatment (if any) subject to what is at risk and the age of trees (see [Section 13](#)).

7. 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 Heritage Forestry Ngatapa Partnership business objectives are considered to be well in alignment.

Environmental policy

PF Olsen Limited is committed to:

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

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

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

Objectives, targets and monitoring

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

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

A systematic management approach ensures these objectives and targets remain the cornerstone of PF Olsen’s business, backstopped by monitoring processes that form a regular review of practices. These are summarised in [Appendix 3](#).

EMS framework

The Environmental Management System (EMS) is an integrated set of cloud based, defined and documented policies, processes and activities that govern the physical implementation of forest management activities. The EMS applies a systematic approach certified to ISO:14001 standards to ensure that prevention of adverse and harmful impacts is effective.

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

Environmental Code of Practice

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

Forest Road Engineering Manual

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

Assessment of environmental risks

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

At a high level, ‘risks’ are presented as consuming services summarised for a typical plantation life cycle in [Appendix 4](#). As a broad assessment over the

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total Heritage Forest, the **potential** for adverse impacts across the range of operations and forest sites is indicated in the Environmental Assessment matrix below (Table 7), which summarises the identified risks across 'key management aspects'. The level of potential risk has been evaluated in the matrix as high 'H', medium 'M' or low 'L', or not applicable 'NA' and is thus indicative of the level of care that might need to be applied to ensure the potential for adverse effects is minimised.

Table 7. Risk assessment for key aspects involved in forest management activities

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

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 Heritage Forest are:

- Pesticides :
 - Herbicides : for commercial and ecological weeds ;
 - Fungicides : for forest fungal disease control ; and
 - Vertebrate or invertebrate toxins: used for control of pest mammals e.g hares and possum or wasps.
- Fuels and oils.
- Fire retardants – (only ever used if there is a fire).
- Surfactants – to increase herbicide efficacy.

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

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

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

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

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

Highly hazardous chemicals

There are five agrichemicals that have been classified ‘highly hazardous’ (HH) by FSC that are used in forestry and conservation operations within PF Olsen group certified forests (Table 8). All these five have recently been added to FSC’s HH list. Special derogations to continue usage of these chemicals, subject to conditions, are being applied for by PF Olsen as FSC Group Manager in conjunction with the wider NZ certified industry. The derogation process is run according to specific policies put in place by FSC, including extensive canvassing of stakeholder views.

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

Table 8. FSC Highly Hazardous chemicals used or potentially used in Heritage Forest

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

THE MANAGED PLANTATION ESTATE

8. Commercial Plantation Estate

Productive Capacity strategy

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

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

Forest area

The net stocked areas have been measured from a map produced by PF Olsen (Map 5). The estimated net stocked areas of each stand are set out in Table 9 and Figure 2.

Table 9. Heritage Forest Area (Ha)

Gross area	Net stocked area	Cutover	Reserves
338.5	229.9	93.6	15.0

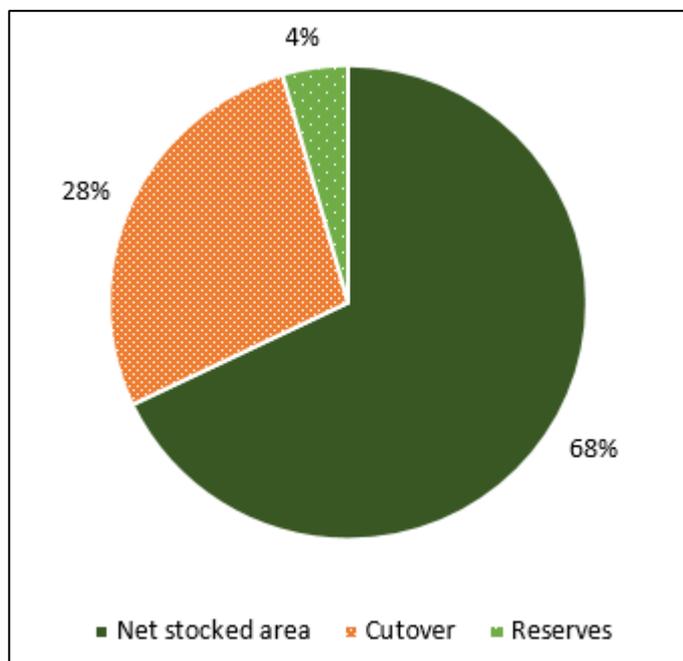


Figure 2. Heritage Forest Area (ha)

Current Species

The species grown at Heritage Forest is *Pinus radiata* (radiata pine). This species has been chosen to best meet the management objectives set out above and in section 2 given the characteristics of the forest land as described in section 3.

Treestocks established in the forest are summarised in Table 10.

Table 10. Treestock Seedlot and GF Rating

Stand	Treestock
1/01	GF 0, Seedling, Seedlot “unknown”
2/01	GF 17, 28, Seedling, Seedlot “unknown”1 and “unknown” 4
3/01	GF 17, Seedling, Seedlot UNKNOWN1
3/02	GF 17, 16, 16, Seedling, Seedlot 94/4, 94/3 and 93/46/A

Productivity Indices

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

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

The site index for Heritage Forest is 35 – 37.5 m.

The 300 index for Heritage Forest is 27.5 – 32.5 m..

Current Crop Status

Measurement data from the most recent inventory (2000 - 2003) is stored in PF Olsen databases and summarised in reports to provide the current status of the stands. This is shown in Table 11 below:

Table 11. Current crop status of Heritage Forest

Stand	Year Planted	NSA (ha)	Total Stocking (stems/ha)	Basal Area (m ² /ha)	Mean Top Height (m)	Mean DBH (cm)
1/01	1993	128.5	362	13.2	16.2	23.2
2/01	1992	112.7	331	14.1	15.8	24.6
3/01	1992	41.1	347	15.2	15.4	22.2
3/02	1995	52.5	372	13.4	14.6	22.4

Age class distribution

The age class distribution of Heritage Forest is illustrated in Figure 3 below. Plantings have decreased in area by each consecutive year.

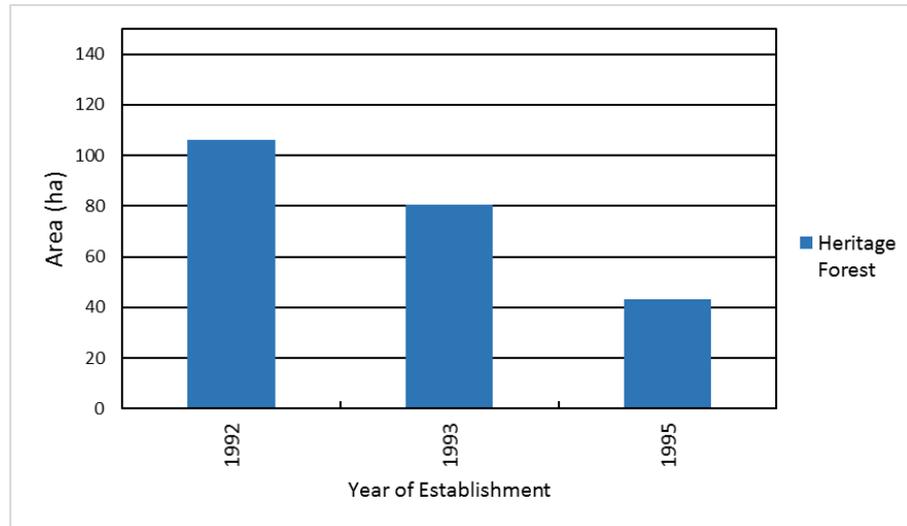
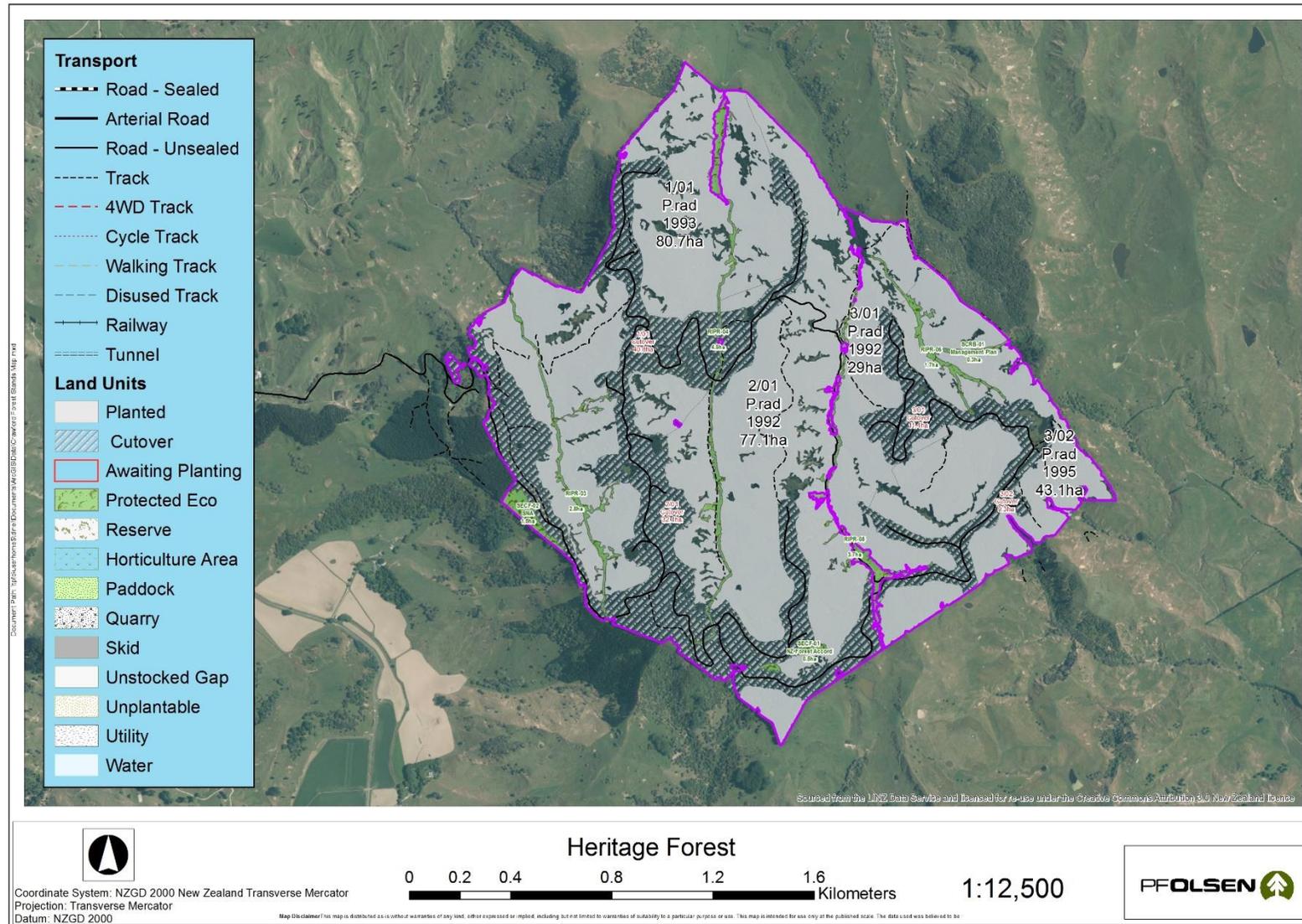


Figure 3. Area age class distribution of plantations within Heritage Forest

Map 5 – Forest Stands Map



9. Commercial Crop Establishment and Silviculture

Introduction

The choice of species is the most important issue in plantation forestry. The species must be suitable for the site and meet the objectives of Heritage Forestry Ngatapa Partnership. Also important is to ensure that the planting material is of good quality.

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

Forest management goals

The Heritage Forest owners are committed to ensure that the forest will be managed to:

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

These goals are further detailed in 'PF Olsen Key Aspects - Objectives, Targets and Monitoring' in [Appendix 3](#).

Crop Species

In Heritage Forest, the single crop species grown is Radiata pine. Alternative species have been considered but did not meet the Heritage Forestry Ngatapa Partnership objectives.

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

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

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

Pre-establishment considerations

Prior to re-establishment of the tree crop, a review will be conducted to identify whether there are any rare, threatened or endangered species of flora or fauna within the area to be planted and what, if any, adjustments in planning may be required. A plantation crop is likely to confer beneficial habitat buffering rather than cause adverse effects. These considerations are covered by the afforestation checklist and riparian rules contained within the EMS.

Unwanted pine spread

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

Re-establishment

Re-establishment will aim to use high quality treestocks suitable for the site and market. These will be investigated at establishment. Re-establishment will occur approximately the following year of harvesting.

Tending

The radiata pine stands at Heritage forest are managed on a pruned regime. The target pruned height is 6.5 metres, and typically one waste thinning operation will be completed to a final crop stocking of around 350 stems per hectare.

Tending at Heritage forest is complete. A sampling programme nearer to harvest time is recommended to determine actual pruned log quality.

Tree nutrition

The soils in Heritage Forest are not likely to be deficient in nutrients for healthy tree growth. However, there are soils within New Zealand that are deficient in one or more nutrients. The most common nutrient deficiencies are likely to be:

- **Magnesium** – Magnesium deficiency is a particular problem of the Central North Island and is associated with the phenomenon known as mid crown yellowing where the middle of the tree crown turns a yellow colour. Heavily pruned trees and some seedlots are more predisposed to the deficiency than others.
- **Boron** – Boron deficient trees can suffer dieback from the terminal buds and this symptom is closely associated with moisture stress and drought. Trees growing on the drier East Coast of both Islands and on the pumice soils of the Central North Island are prone to boron deficiency.

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

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

10. Harvesting Strategy and Operations

Harvesting strategy

The harvesting strategy employed at Heritage Forest is to harvest the forest as close as possible to their optimum economic age as practical. This is the age at which the growth in volume and improvement in quality is offset by the cost to maintain the forest for another year. The optimum rotation length for radiata pine is expected to be within 25 to 30 years (this may be less for framing or unpruned stands).

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

Harvesting will occur for all four stands over the duration of this management plan.

Planning and preparing for harvest

Forward planning is essential when considering harvesting activities. Harvest planning should ideally commence 2 years before harvesting to enable roading infrastructure to be developed and any resource consents, archaeological surveys, etc. to be undertaken. This reduces the chance of hold-ups to the commencement of harvesting, which can be costly when log prices are fluctuating.

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

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

Infrastructure

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

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

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

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

Contractor management

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

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

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

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

11. Forest Inventory, Mapping and Forest Records

Inventory

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

- Pre-assessment: for silviculture rate setting and validating operational timing vs silvicultural targets;
 - Quality control: to check contractor's performance and update stand records;
 - Mid-crop: to collect measurement inputs for growth modelling;
 - Pre-harvest inventory is scheduled for stands around age 24, to collect measurement data on the crop. This is used for harvest planning, marketing and revenue estimation.
-

Pre-assessment

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

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

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

Pre-assessment was completed at Heritage Forest prior to tending operations commencing.

Quality control

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

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

PF Olsen's 'Tending Manual' details the procedures to follow for pre-assessment and quality control plotting. Quality control was completed at Heritage Forest at the completion of each tending operation.

Mid-crop inventory

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

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

Pre-harvest inventory

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

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

Mapping

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

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

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

Forest Records

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

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

NON-COMMERCIAL ESTATE MANAGEMENT & PROTECTION

12. Protected Forests, Habitats, Ecosystems and Species

Introduction

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

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

Protected ecosystems

PF Olsen's Conservation and Ecology Manual provides detailed guidance and specification on the application and execution of ecological management targets and actions, as are broadly laid out in the Environmental Management System (EMS). Programs for ecological management are specified and monitored in FIPS Ecological Management module.

While protection from operational damage and other influences is afforded all areas, in accordance with the EMS and the ecological rankings pertaining to each area, only those with a 'full' and 'special' ranking will be prioritised for more active interventions.

Under these criteria, management aims to protect the 'passive' ranked stands where practical and avoid any loss of area during reestablishment. 'Limited' status stands are to be protected from damage during harvest and reestablishment and are to have pest control undertaken where ancillary to adjacent plantation stands or able to be practically coordinated with adjacent landholders. All areas are to be protected from fire.

The Significant Natural area designated under the district plan will be fully protected from any harvest damage and fire. Cooperation in any pest control operations will also be given if the parties responsible for the bulk of the area seek assistance.

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For the other two stands, SECF-01 & SCRUB-01, protection from fire and harvest damage will be the primary objective along with any co-benefits that accrue from pest management in the surrounding plantation. The ongoing monitoring, and if necessary control of barberry, especially after harvesting will be maintained.

Actions are prioritised according to the ‘Protection Category’ status allocated to the areas from the assessments and classifications undertaken. The management implications pertinent to each status are summarised in Table 12. Prioritisation of work effort will also be based on the principle of ensuring successful and maintainable outcomes at limited scales as a priority over wide scale but marginally beneficial outcomes.

Table 12. Protected Ecosystems Management Categories

Protection Category	Primary Management Objective	Activity Level	Monitoring
Passive	Minimise non-essential damage, maintain area.	Fire protection.	Area- with adjacent stand assessments.
	Observe RPMS obligations.	3rd party arrangements re: pests, apply RPMS.	Pests- to meet RPMS.
			General forest health survey.
Limited	Protect from non-essential damage, maintain area, maintain function (where practical).	Fire protection.	Sample forest condition monitoring.
	Observe RPMS obligations.	3rd party arrangements re: pests, apply RPMS. Associated maintenance pest control.	Low level pest monitoring where relevant. Sample related fauna if relevant.
Full	Protect from all controllable damage, maintain area and function.	Fire protection.	Area monitoring.
	Improve quality.	Specific management.	Forest condition monitoring.
	Observe RPMS obligations.	Targeted pest control, 3rd party arrangements re: pests.	Pest monitoring where relevant, related fauna monitoring if relevant.
Special	Restoration if practical.	As above, plus fencing, covenanting, co-management agreements and funding where practical.	As above, plus as defined in any restoration agreement.

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Table 13 details the areas in each protection category within Heritage Forest, categorised by protective function.

Table 13. Protected ecosystems management categories by function and area

Protective Function	Protective Category		Total Area
	Full	Passive	
Erosion Control			
Landscape / Amenity			
Non-specific			
Rare Species			
Riparian Ecosystem		0.3	0.3
Terrestrial Ecosystem	1.5	0.5	2
Wetland Ecosystem			
Total Area (ha)	1.5	0.8	2.3

Management and riparian setbacks

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

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

Table 14 summarises the stream categories within the Heritage Forest. The total length of waterways within the forest is 3.7 km.

Table 14. Length of stream by REC class

REC Class	Length (m)	Length (km)
VSmall_Low_Dry_Hard	1,219.74	1.22
VSmall_Med_Dry_Hard	2,488.78	2.49
Total	3,708.52	3.7

Rare and threatened species

Where a range distribution suggests the possibility of rare fauna existing, surveys are undertaken for those species. Any appropriate management responses are devised in conjunction with conservation authorities. Protection requirements are also reassessed at the time of re-establishment or land handback where additions to riparian or buffering setbacks are often recommended.

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There are no known rare or threatened species in this forest which is to be expected given the past clearance history and lack of connectivity with other large tracts of indigenous forest.

The only native bird of significance sighted so far is the tui which while not threatened is a species dependent upon nectar bearing trees and shrubs and its presence is probably due to the flax resource in the protected SCRUB_01 stand.

There is a possibility that the threatened NZ falcon could make use of the area once harvesting commences as the cutover habitat is now known to favour the species through the provision of good prey habitat.

Records of sightings and locations are collected and reported in FIPS. Over time this has enabled the build-up of a spatial distribution picture of species within different geographical locations. Recorded sightings within the plantations and indigenous reserves are summarised in Table 15. These records are made available to conservation authorities.

A listing of key species of interest is held by all contractors and staff along with species sighting forms and a request to report such information.

Table 15. Rare and threatened species reported in Heritage Forest

NZ Threat Classification System Category	Species
Nationally Vulnerable	New Zealand Falcon
Not Threatened	Kereru
	Tui

Fish

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

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

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

Avifauna

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

Primary management actions in relation to avifauna are:

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

⁵ <http://naturewatch.org.nz/projects/biodiversity-in-plantations>

Bats

River systems, running within or adjacent to Heritage Forest, that also have large well developed natural forest surrounds may 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 plantation forests. Once published, these will underpin management actions. In the interim, if bats are located in or near an operational area, expert advice will be obtained on how to avoid/mitigate any negative effects on the bats.

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 NatureWatch database.

Herpetofauna

Most NZ lizard species are now threatened, principally due to predation but also habitat loss. The eastern forests in the North Island have been known to be home to certain frog species, which suggests some preliminary work should be undertaken to assess the likelihood of their presence within at least some parts of Heritage Forest, as there have been no sightings yet.

As a starting point, an initial desktop review of the likelihood of presence and distribution of native lizards and frogs within Heritage Forest should be commissioned early in this plan duration to inform future strategies for management if any.

Anticipated activities

In line with the prioritisation approach described previously, key areas of work related to protected ecosystems within Heritage Forest over the next 5 years expected to be:

- Maintenance of threatened species records database and integration into industry NatureWatch 'Biodiversity in Plantations' project.
-

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](#) on the Department of Conservation website .

13. Property Management and Protection

Statutory pest obligations

Pest management within Heritage Forest is subject to statutory obligations under the Regional Pest Management Strategy administered by the Gisborne District Council unitary authority. The current RPMS is for the period 2017 to 2027.

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 the Regional Pest Management Strategy Plan in [Appendix 5](#). These plans are maintained online by the relevant Council.

Plant Pests

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

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

The major plant species potentially threatening production values within the forest can be seen in [Appendix 5](#).

Pest control

The PF Olsen Integrated Pest Management provides guidance on application and execution of the PF Olsen Ltd Environmental Management System (EMS) for pest control and chemical use.

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

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

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

The forest manager will coordinate operations with organisations such as the Regional Council and the Department of Conservation to achieve effective and efficient control with in the forest area and on neighbouring land, where required. Weed pests will be monitored and controlled as required under the Regional Pest Management Strategy, including regular surveillance for new species.

Disease control

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

Dothistroma infection can also be controlled though silviculture by timely thinning and pruning operations, which increases air movement and lowers humidity levels.

Dothistroma control is unlikely to be required in Heritage Forest during the period of this plan.

Fire prevention and control

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

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

Fire authority responsibilities

The legal responsibility for fighting forest fires lies with the respective territorial land authorities where the forest is situated. In the case of Heritage Forest, the Rural Fire Authority (RFA) is the Eastland Rural Fire District.

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

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

Public liability insurance

It is recommended that Heritage Forestry Ngatapa Partnership maintain public liability insurance cover, with a fire fighting extension, to indemnify against unforeseen adverse activity both within the forest area and adjoining land tenure. In the case of fire spreading from Heritage Forest onto adjoining land, Heritage Forestry Ngatapa Partnership would be liable for the fire fighting costs and any damage to property.

Fire insurance

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

Insurance for Heritage Forest is held by Heritage Forestry Ngatapa Partnership. The current extent of cover is:

- Fire fighting cover (the costs of fire suppression)
- Wind cover
- Cover for the crop value and re-establishment costs are retained based on a recognised crop valuation, but reviewed on an annual basis.

Heritage Forestry Ngatapa Partnership should liaise closely with the forest manager at the time of fire insurance renewals and if necessary instruct the forest manager to keep premiums paid up.

OTHER BENEFITS FROM THE FOREST

14. Recreation, Forest Products and Other Special Values

Introduction

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

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

Environmental and Social cost-benefit analysis

Forests can deliver numerous social and environmental products, both positive and negative to varying degrees. These non-timber products can be difficult to quantify, unlike financial costs and benefits.

Table 16 rates the relative positivity and negativity of the more common social and environmental products produced by Heritage Forest relative to the most likely alternative primary production system, pastoral drystock farming.

Table 16. Environmental and social cost-benefit analysis of key non-timber products & services

Environmental or social product	Increasingly negative				Neutral			Increasingly positive			
	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Soil stabilisation										✓	
Erosion/soil loss			HP								MR
Water quality				HP							MR
Riparian shading				HP						MR	
Water quantity					MR	HP					
Carbon sequestration			HP								MR
Native wildlife habitat										✓	
Threatened fauna								✓			
Native fish									✓		
Air quality					HP		MR				
Native reserve protection										✓	
Landscape/visual			HP					MR			
Recreation										✓	
Commercial forest use										✓	
Firewood							MR				HP
Local employment							MR		HP		

NB: where the ratings differ throughout a rotation, 'MR' is used to indicate the mid rotation (growing) stage of the forest, and 'HP' refers to during or post-harvest

Recreational usage

Heritage Forest receives some low recreational demand from the wider public:

- Hunting for ducks, deer and other animals.

Currently, 51 permits are issued regarding the recreational hunting (Figure 4).

Permit Category	Permit Type	Total Permits	% of Total
		1	1.96
Commercial	COMSURVEY	1	1.96
Commercial	LULPOSSUM	1	1.96
Recreational	HORSESEC	1	1.96
Recreational	HUNTDEER	1	1.96
Recreational	HUNTDUCK	4	7.84
Recreational	HUNTOTHER	39	76.47
Recreational	HUNTPOSSUM	3	5.88
		51	

Figure 4. Current permits issued for Heritage Forest

Primary requirements in management of such forest usage are:

- Access subject to non-conflict with current operations and any other safety requirements;
- Acceptable fire danger status;
- Access provided to defined areas other than those freely open to the public; and
- Appropriate liability and fire insurance to be carried by permittees.

Non-timber forest products

There are no non-timber forest products currently being produced or developed in Heritage Forest.

Other special values

In the regional landscape context, Heritage Forests plantations and indigenous ecosystems in combination provide well-defined 'environmental services'. These include:

- Enhanced water quality, and buffering of regionally significant water bodies from agricultural and urban generated nitrification;
- Soil stabilisation and conservation;
- Providing a buffer against flooding during storms;
- Temperature moderation in waterways for maintenance of aquatic life including threatened native species and world-renowned sports fisheries;
- Enhance wildlife and plant habitat leading to increased biodiversity;
- Expanded habitat opportunities for some declining and or threatened fauna;

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- Carbon sequestration and buffering of the effects from a nationally adverse carbon generation footprint.

Some additional special values include:

- Beekeeping
- Possum fur recovery

Over the term of this plan, the regulatory environment will continue to be actively monitored and where possible efforts made to secure the introduction of properly structured market mechanisms to ensure forestry is not dis-incentivised, relative to other land uses.

Other environmental services will continue to be supplied or enhanced based on good corporate citizenship and responsible environmental management.

Public access roads

There is no public tracks or roads within or along Heritage Forest boundaries. If tracks and roads become present, all signage of roads and tracks must be followed and those using the routes will still require a permit if there is any intention to access the forest from the road routes.

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

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

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

LOOKING AHEAD

15. Monitoring

Introduction

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

Values monitored

Management inspections are undertaken regularly. The direct forest monitoring framework implemented and applicable to Heritage Forest is tabulated below.

Table 17. Environmental process monitoring framework

Monitored Element	Components	Data Source	Data medium	Reporting / Website Frequency
Chemical Usage	- A.I Usage - Area Overuse	- Operational Supervisors	- FIPS - <u>Form</u>	- On Demand - Annual
Client Satisfaction	- Post-operation client survey	- Clients	- Survey Form	- Post-operational - Annual
Consultation Activity	- Complaints - Other Interactions	- Operational Supervisors - Planners	- FIPS - <u>Form</u> - <u>Meeting Minutes</u>	- Annual - Annual
Environmental Incidents	- Incident Number - Categories	- Operational Supervisors	- FIPS - <u>Form</u>	- On Demand - Annual
Environmental Goals	- All	- Environmental Management Group	- Meeting Minutes	- Annual
Environmental Training	- Courses - Numbers - Names	- Staff	- FIPS - NZQA	- Annual - Individual
Flora & Fauna	- Species & Status - Frequencies - New Finds	- Operational Supervisors - Public - Crews	- FIPS - <u>Form</u> - <u>Naturewatch</u>	- On Demand - Annual
Forest Estate Structure	- Area: Plantation & Protected Ecosystem - Age-class - Species - Forest Type - Protection Status	- Management Plans - Stand Records	- FIPS Stand Records	- On Demand - Annual
Forest Growth	- PSP Protocols - Periodic Inventory - ISO 9001	- Contractors	- Volume Reconciliations - Estate model	- Periodic-annual - Not on web

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

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

Other monitoring Budget versus expenditure is monitored through the PF Olsen FIPS system and presented to Heritage Forestry Ngatapa Partnership when requested. This information is not made public.

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

However, the framework around this monitoring is tabulated in [Appendix 3](#).

16. Industry Participation and Research

NZFOA and FGLT Heritage Forestry Ngatapa Partnership's primary means of participating as part of the forest owner community, and to gain industry intelligence and access to research findings is via:

- Membership of New Zealand Forest Owners' Association Inc. (NZFOA) <http://www.nzfoa.org.nz/> and representation through its Property Manager on the Executive Board and working committees of NZFOA.

Payment of a commodity levy (currently 27 cents/tonne or JAS) to the Forest Growers' Levy Trust (FGLT). <http://fglt.org.nz/>. The FGLT uses these funds to finance pan-industry good programmes and contracts NZFOA to carry out this work.

Research A little over 50% of the funds raised by FGLT are allocated to forestry research projects. These funds are supplemented by NZ Government research for industry funds that are bid for on a contestable basis every few years.

Application of research is via knowledge gained in workshops, uptake by contractors, commercial providers and better genetics. PF Olsen's direct involvement with other research bodies such as FFR contributes to and benefits Heritage Forestry Ngatapa Partnership through early application of good ideas and research findings.

FISC

The Forest Industry Safety Council (FISC) was set up in early 2016 following an independent review of safety in the forest industry. FISC is a forum for exchange of safety improvement initiatives, and to develop resources for forest managers and contractors. These resources are primarily delivered via the Safetree website <http://safetree.nz/>. FISC is financed jointly from FGLT and government, primarily Accident Compensation Corporation (ACC).

PF Olsen's continued support of FISC in the form of senior staff involvement in the OAG and TAG committees ensure Heritage Forestry Ngatapa Partnership interests are considered and that outcomes are understood and applied in practice.

17. Future Planning

Introduction

This plan pertains to the management of Heritage Forest and will be adhered to for the next 5 years. Any deviation from this plan will be justified only on the basis that the changes do not adversely affect the environment. Any changes, which are contrary to the policies contained in this management plan, will require a full review of this plan. The next review date for this plan is June 2023.

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

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

Operation plans

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

This operation plan and associated budget are subject to approval by Heritage Forestry Ngatapa Partnership at the beginning of each financial year.

Associated management plans

Associated with this plan are forest agreement specific plans covering the descriptive and management detail pertinent to each forest. These plans contain primary descriptive data for the specific forest and details of planned silvicultural objectives. These plans are maintained by the investment manager for Heritage Forestry Ngatapa Partnership.

Stakeholder consultation

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

18. Register of Plan Change and Review

Introduction

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

Change	Date	Section/Page

Appendix 1 - Contact details for Regional and District Councils with jurisdiction over Heritage Forest

Council (Unitary Authority)	Phone	Email	Website
Gisborne District Council	0800 653 800	Service@gdc.govt.nz	http://www.gdc.govt.nz/

Appendix 2 - Other Relevant Legislation

Commercially relevant statutes & regulations

Accident Compensation Act 2001 #49
 Animal Welfare Act 1999
 Biosecurity Act 1993
 Climate Change Response Act 2002
 Conservation Act 1987
 Crown Forest Assets Act 1989
 Fencing Act 1978
 Fire and Emergency New Zealand Act 2017
 Forestry Rights Registrations Act 1983
 Forests Act 1949
 Freshwater Fisheries Regulations 1983
 Hazardous Substances and New Organisms Act 1996
 Health and Safety at Work Act 2015
 Heritage New Zealand Pouhere Taonga Act 2014
 Protected Objects Act 1975
 Reserves Act 1977
 Resource Management Act 1991 regulations
 Soil Conservation and Rivers Control Act 1941
 The Treaty of Waitangi Act 1975
 Trespass Act 1980
 Wildlife Act 1953

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

Industry Accords & Codes

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

Appendix 4 - Significant Aspects of a Plantation Forest Life Cycle



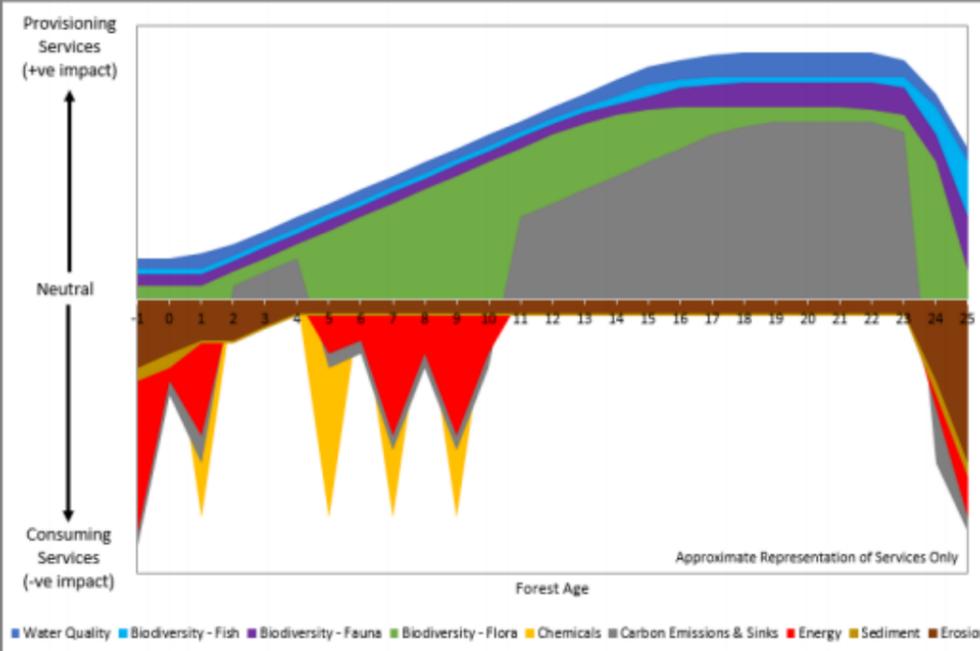
SIGNIFICANT ASPECTS OF A PLANTATION FOREST LIFE CYCLE

Provisioning and Consuming Services

Provisioning Services (+ves)

1. **Biodiversity — Fauna:** plantation forests are home to a wide range of native and endemic species, including kiwi, New Zealand falcon, fernbird, weka, kokako, geckos, skinks, frogs, and short- and long-tailed bats.
2. **Biodiversity — Fish:** streams provide habitat for a range of native fish species, including Giant and Banded Kokopu, Long-finned Eel, Koura and whitebait species.
3. **Biodiversity — Flora:** plantation forests host a variety of native plants. Pioneering plants (ferns, coprosmas, manuka etc.) eventually form the sub-canopy layer under the production species. In addition riparian zones, wetlands, native reserves and other natural areas add a native flora component to the overall forest matrix. These are often protected under Regional/District Council plans, the NZ Forest Accord, management agreements, or as part of forest certification schemes.
4. **Carbon sinks:** trees absorb carbon dioxide from the atmosphere and convert it into oxygen. Trees store the absorbed carbon, even after they are harvested.
5. **Water quality:** once canopy closure is achieved the in-stream temperature stabilises. Riparian zones and the plantation trees stabilise the land, reducing and removing excess nutrient loads. This in turn provides a better quality of habitat for fish and freshwater insects.
6. **Clean air**
7. **Employment,** especially at the time of harvest, both within the forest and ancillary services such as transport and processing
8. **Recreation opportunities** such as hunting, walking, mountain biking, hunting, orienteering, horse riding, motor sport events,





Approximate Representation of Services Only

Aspect	Provisioning / Consuming Services	Frequency	Impact Level	Control Level	Time of Impact	Control Methods
Biodiversity	Fauna	Low	Variable	Medium	Land prep, roadworks & harvesting	Protection, BEP's, buffer zones, timing of operations, monitoring, species management plans
	Fish	Low	Variable	Partial	Land prep, roadworks & harvesting	Protection, BEP's, buffer zones, timing of operations, monitoring, species management plans, fish passage
	Flora	Low	Variable	Partial	Harvesting	Protection, BEP's, buffer zones, timing of operations, monitoring, species management plans, weed control, remedial/enhancement planting
Ecosystem Health	Pests & Weeds	High	Variable	Medium	Ongoing	Control based on identification of weed/pest and associated threat. Chemical (aerial or ground-based), mechanical, biocontrol, trapping, species/management selection. Research into non-chemical alternatives
	Carbon Emissions & Sinks	Oscillating	Medium	Low	Land prep, silviculture, spraying, roading & harvesting	Use of bio oils and lubricants, try to minimise machine movements, replanting new crop after harvest
	Chemicals	Infrequent	High	High	Land prep & ages 5-10 years	Research into amounts used and chemical types, limit spray drift
	Energy	Medium	Low	Low	Any operation involving machinery	Invest in / research energy efficient machinery and technology
Soil & Water	Erosion	Intermittent	High	High	Until canopy closure (-1 to 5 years), extreme weather events, harvesting	Hydroseeding, mulching, BEP's, appropriate earthwork engineering, check sites after weather events, replanting new crop after harvest
	Sediment	Continuous but Low	Medium	High	Until canopy closure (-1 to 5 years), extreme weather events, harvesting	Use of sediment control traps, appropriate earthwork engineering, check sites after weather events, replanting of new crop after harvest
	Water Quality	Low	Variable	High	Extreme weather events, harvesting	Use of sediment control traps, appropriate earthwork engineering, buffer/riparian zones, protection of wetlands, remedial planting, replanting new crop after harvest
Social	Recreation	Medium	Variable	Medium	Variable, dependent on forest and location	Access provided through forest permit system to ensure user and operational safety. Permits allow monitoring of forest usage and hunting kill returns
	Employment	High	Variable	High	Ongoing, peak at harvest/replant	Seek to provide continuity of employment for high performing contractors, provide training opportunities to engage and retain a professional and capable workforce

Consuming Services (-ves)

1. **Carbon Emissions:** heavy machinery and chainsaws during land prep, thinning and harvesting operations (fuel/oil use)
2. **Chemicals:** *Dothistroma* control and weed control
3. **Energy:** energy is released during any forestry operation involving machinery
4. **Erosion:** caused by harvesting, roading and land prep operations, plus extreme adverse weather events
5. **Sediment:** caused by harvesting, roading and land prep operations, plus extreme adverse weather events



Appendix 5 - Regional Pest Management Plan for Gisborne Region 2017 – 2027

Pest Animal Species managed in the Regional Pest Management Plan

Table 2: Pest Animals

COMMON NAME	SCIENTIFIC NAME	PROGRAMME	LEAD AGENCY	GOOD NEIGHBOUR RULE
Argentine Ant	<i>Linepithema humile</i>	Sustained control	Occupier	Yes
Catfish	<i>Ameiurus nebulosus</i>	Exclusion	GDC	
Chinchilla	<i>Lanigera sp.</i>	Exclusion	GDC	
Darwin's Ant	<i>Doleromyrma darwiniana Forei</i>	Sustained control	Occupier/ GDC	Yes
Feral Cat	<i>Felis catus</i>	Site Led	GDC/ Occupier	Yes
Feral cattle	<i>Bos tuarus</i>	Site Led	Occupier	Yes
Feral deer	<i>Cervus spp., Dama dama</i>	Site Led	GDC/ Occupier	Yes
Feral geese	<i>Anser anser</i>	Site Led	Occupier	Yes
Feral goat ⁷	<i>Capra hircus</i>	Sustained Control	GDC/ Occupier	Yes
Feral pig	<i>Sus scrofa</i>	Site Led	Occupier	Yes
Feral pigeon	<i>Columba livia</i>	Site Led	Occupier	Yes
Ferret	<i>Mustela furo</i>	Site Led	GDC/ Occupier	Yes
Hare	<i>Lepus europaeus occidentalis</i>	Sustained Control	Occupier	Yes
Hedgehog	<i>Erinaceinae</i>	Site Led	Occupier	Yes
Koi Carp	<i>Cyprinus carpio</i>	Exclusion	GDC	
Magpie	<i>Gymnorhina hypoleuca</i>	Site Led	Occupier	Yes
Mediterranean Fanworm	<i>Sabella spallanzanii</i>	Eradication	GDC/MPI	
Mosquito fish	<i>Gambusia affinis</i>	Progressive containment	GDC/DOC	
Peacock	<i>Pavo cristatus</i>	Site Led	Occupier	Yes
Perch	<i>Perca fluviatilis</i>	Exclusion	GDC	
Possum	<i>Trichosurus vulpecula</i>	Sustained Control	GDC	
Rabbit (feral)	<i>Oryctolagus cuniculus</i>	Sustained Control	Occupier	Yes
Plague (Rainbow) Skink	<i>Lampropholis delicata</i>	Exclusion	GDC	
Rat	<i>Rattus norvegicus, Rattus rattus</i>	Site Led	GDC/ Occupier	Yes
Rook	<i>Corvus frugilegus</i>	Eradication	GDC	
Rudd	<i>Scardinius erythrophthalmus</i>	Exclusion	GDC	
Stoat	<i>Mustela ermine</i>	Site Led	GDC/ Occupier	Yes
Clubbed tunicate	<i>Styela clavica</i>	Exclusion	GDC/MPI	
Tench	<i>Tinca tinca</i>	Exclusion	GDC	
Wallaby species	<i>Macropus species</i>	Exclusion	GDC	
Wasp	<i>Vespula germanica, V. vulgaris</i>	Site Led	Occupier	Yes
Weasel	<i>Mustela nivalis vulgaris</i>	Site Led	GDC/ Occupier	Yes

Pest Plant Species managed in the Regional Pest Management Plan

Table 3: Pest Plants

COMMON NAME	SCIENTIFIC NAME	PROGRAMME	LEAD AGENCY	GOOD NEIGHBOUR RULE
African feather grass	<i>Cenchrus macrourus/Pennisetum macrourum</i>	Eradication	GDC	
Agapanthus	<i>Agapanthus praecox</i>	Site Led	Occupier	Yes
Alligator weed	<i>Alternanthera philoxeroides</i>	Exclusion	GDC	
Apple of Sodom	<i>Solanum linnaeanum</i>	Eradication	GDC	
Australian sedge	<i>Carex longebrachiata</i>	Progressive Containment	Occupier	Yes
Banana passionfruit	<i>Passiflora mollissima, P. mixta</i>	Progressive Containment	Occupier	Yes
Barberry	<i>Berberis glaucocarpa,</i>	Sustained control	Occupier	Yes
Bathurst Bur	<i>Xanthium spinosum</i>	Sustained control	Occupier	Yes
Blackberry	<i>Rubus fruticosus agg.</i>	Sustained control	Occupier	Yes
Bladderwort	<i>Utricularia gibba</i>	Exclusion	GDC	
Blue morning glory	<i>Ipomoea indica</i>	Site Led	Occupier	Yes
Boneseed	<i>Chrysanthemoides monilifera</i>	Progressive Containment	Occupier	Yes
Boxthorn	<i>Lycium ferocissimum</i>	Progressive Containment	Occupier	Yes
Broom (exotic)	<i>Cytisus scoparius, Genista monspessulana,</i>			
	Site Led	Occupier	Yes	
Buddleia	<i>Buddleja davidii</i>	Site Led	Occupier	Yes
Burdock	<i>Arctium minus</i>	Progressive Containment	Occupier	Yes
Californian Stink Weed	<i>Navarretia squarrosa</i>	Eradication	GDC	
Cape Tulip	<i>Moraea flaccida</i>	Eradication	MPI	
Chilean Needle Grass	<i>Nasella neesiana</i>	Exclusion	GDC	
Chilean rhubarb	<i>Gunnera tinctoria, G. manicata and all varieties and hybrids of these species</i>	Site Led	Occupier	Yes
Chinese Mugwort	<i>Artemisia veriotiorum</i>	Exclusion	GDC	
Climbing Spindleberry	<i>Celastrus orbiculatus</i>	Eradication	GDC	
Common ivy	<i>Hedera helix</i>	Site Led	Occupier	Yes
Egeria	<i>Egeria densa</i>	Exclusion	GDC	
Giant reed	<i>Arundo donax</i>	Site Led	Occupier	Yes
Goats Rue	<i>Galega officinalis</i>	Exclusion	GDC	
Gorse ⁸	<i>Ulex europaeus</i>	Progressive Containment	Occupier	Yes

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Hawthorn	<i>Cretaeus monogyna</i>	Sustained control	Occupier	Yes
Holly leaved senecio	<i>Senecio glastifolius</i>	Progressive Containment	Occupier	Yes
Hornwort	<i>Ceratophyllum demersum</i>	Progressive Containment	GDC	
Horse nettle	<i>Solanum carolinense</i>	Eradication	GDC	
Japanese honeysuckle	<i>Lonicera japonica</i>	Site Led	Occupier	Yes
Lagarosiphon	<i>Lagarosiphon major</i>	Eradication	GDC	
Madeira/mignonette vine	<i>Anredera cordifolia</i>	Progressive Containment	Occupier	Yes
Marshwort	<i>Nymphoides geminate</i>	Exclusion	GDC	
Mexican daisy	<i>Erigeron karvinskianus</i>	Site Led	Occupier	Yes
Mexican Waterlily	<i>Nymphaea Mexicana</i>	Exclusion	GDC	
Monkey Comb Vine	<i>Pithecoctenium crucigerum</i>	Eradication	GDC	
Moth plant	<i>Araujia sericifera</i>	Progressive Containment	Occupier	Yes
Nasella tussock	<i>Nasella trichotoma and Nasella tenuissima</i>	Exclusion	GDC	
Nodding thistle	<i>Carduus nutans</i>	Progressive Containment	Occupier	Yes
Noogura Bur	<i>Xanthium strumarium</i>	Exclusion	GDC	
Old Man's Beard	<i>Clematis vitabla</i>	Progressive Containment	Occupier	Yes
Pampas (common and purple)	<i>Cortaderia selloana and C. jubata</i>	Sustained control	Occupier	Yes
Parrots feather	<i>Myriophyllum aquaticum</i>	Progressive Containment	GDC/ Occupier	
Pennisetum/ White Foxtail/Feathertop	<i>Cenchrus longisetus/ Pennisetum villosum and all hybrids</i>	Eradication	GDC	
Periwinkle	<i>Vinca major</i>	Site Led	Occupier	Yes
Phoenix palm	<i>Phoenix canariensis</i>	Site Led	Occupier	Yes
Privet (tree and Chinese)	<i>Ligustrum sinense, L. lucidum.</i>	Site Led	Occupier	Yes
Purple loosestrife	<i>Lythrum salicaria</i>	Exclusion	GDC	
Ragwort	<i>Jacobaea vulgaris/ Senecio jacobaea</i>	Sustained control	Occupier	Yes
Red cestrum	<i>Cestrum elegans and C. fasciculatum</i>	Eradication	GDC	
Reed sweetgrass	<i>Glyceria maxima</i>	Progressive containment	GDC/ Occupier	Yes
Saffron thistle	<i>Carthamus lanatus</i>	Exclusion	GDC	
Salvinia	<i>Salvinia molesta</i>	Exclusion	GDC	
Senegal Tea	<i>Gymnocaronis spilanthoides</i>	Exclusion	GDC	
Smilax	<i>Asparagus asparagoides</i>	Site Led	Occupier	Yes
Spartina	<i>Spartina anglica and S. alterniflora</i>	Progressive containment	GDC/ Occupier	Yes
Spiny Emex	<i>Emex australis</i>	Eradication	GDC	
Sweet briar	<i>Rosa rubignosa</i>	Site Led	Occupier	Yes
Star thistle	<i>Centaurea calcitrapa</i>	Progressive containment	Occupier	Yes
Thorn Apple	<i>Datura stramonium</i>	Sustained control	Occupier	Yes
Undaria	<i>Undaria pinnatifida</i>	Progressive containment	GDC	Yes
Variagated thistle ⁹	<i>Silybum marianum</i>	Progressive Containment	Occupier	Yes
Velvetleaf	<i>Abutilon theophrasti</i>	Eradication	GDC/MPI	
Water hyacinth	<i>Eichhornia crassipes</i>	Eradication	GDC/MPI	
White edged nightshade	<i>Solanum marginatum</i>	Eradication	GDC	
Wild ginger (kahili and yellow)	<i>Hedychium gardnerianum and H. flavescens</i>	Sustained control	Occupier	Yes