

# TUTAMOE FOREST

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Owned by  
**LANDCORP FARMING LTD**

**Forest Management Plan**

**For the period 2017 / 2022**



Prepared by Ryan Drummond  
PO Box 1127  
ROTORUA  
Tel: 07 921 1010  
Fax: 07 921 1020  
info@pfolsen.com  
[www.pfolsen.com](http://www.pfolsen.com)

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## Table of Contents

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1.	Introduction.....	2
2.	Forest Investment Objectives.....	3
3.	Forest Landscape Description .....	5
	Map 1: Forest Location Map .....	7
	Map 2: Forest by Threatened Environments Classification .....	10
4.	Socio-economic profile and adjacent land .....	11
5.	The Regulatory Environment.....	13
6.	Forest Estate Description .....	18
7.	Reserve areas and significant species .....	21
	Map 3: Forest Stands Map .....	24
8.	Non-Timber Forest Products and Other Special Values .....	25
9.	Environmental Risk Management .....	27
10.	Commercial Crop Establishment and Silvicultural Operations.....	30
11.	Forest Inventory, Mapping and Forest Records .....	32
12.	Harvesting Strategy and Operations .....	33
13.	Property Management and Protection .....	34
14.	Monitoring.....	39
15.	Future Planning .....	42

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## 1. Introduction

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### Principles and Criteria

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

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

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### About this Plan

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

- Management objectives;
  - A description of the land and forest resources;
  - Environmental safeguards;
  - Identification and protection of rare, threatened and endangered species;
  - Rationale for species selection, management regime and harvest plan and techniques to be used;
  - Appropriate management of unstocked reserve areas;
  - Maps showing plantation area, legal boundaries and protected areas; and
  - Provisions for monitoring and protection.
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## 2. Forest Investment Objectives

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**Provision of services**

Landcorp Farming Ltd’s objective is to obtain an economic return on investment while providing environmental benefits, including:

- Enhanced water quality;
  - Soil, stabilisation and conservation;
  - Providing a buffer against flooding during storms;
  - Shading waterways for aquatic life;
  - Enhance wildlife and plant habitat leading to increased biodiversity;
  - A reduction in greenhouse gases; and
  - Economic and social benefits to the community and Landcorp Farming Ltd.
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**Forest management goals**

The forest is managed to:

- Grow trees and produce logs for the manufacturing of different wood products in New Zealand and overseas with a focus on describe primary products;
- Ensure that the productivity of the land does not decline;
- Ensure that environmental values are identified and maintained;
- Ensure that historic sites are identified and protected;
- Ensure that other forest values and products are identified, protected and where possible enhanced;
- Harvest the trees as close to their economic optimum age;
- Replant following harvesting; and
- Enter any other objectives specific to the forest area.

These objectives are delivered via the Quality Management System implemented by PF Olsen that includes ISO 9001 and ISO 14001 certification, and FSC environmental certification.

All activities within Tutamoe Forest are subject to management within a framework set by PF Olsen’s environmental policies and Environmental Management System (EMS).

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**Environmental policy**

**PF Olsen Limited Environmental Policy:**

*PF Olsen Ltd is committed to:*

- Sustainable forest and land management;
- Promoting high environmental performance standards that recognise the input from the community in which we operate;
- Where appropriate applying the Principles and Criteria of the Forest Stewardship Council across forest management.

Substantial additional detailed policies are contained within PF Olsen's Environmental Management System (EMS).

**EMS framework**

The EMS is a core document defining the policies, processes and procedures 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.

An Environmental Management Group (EMG) assists the Environmental Manager, who is responsible for ensuring that the EMS is maintained and implemented. Internal audits to ensure compliance with the EMS and to improve the procedures of the EMS are undertaken at least once every two years.

### 3. Forest Landscape Description

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**Overview**

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

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

Tutamoe Forest is located 37km inland from Tolaga Bay and 91km north of Gisborne. Tutamoe Station is located off Tutamoe Road, which in turn is located off Tauwhareparae Road. Internal farm tracks provide access to all parts of the forest. Currently access is by 4x4 motorbike.

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

**Table 1:** Distances from forest to log markets

Potential Market or Export Port	Distance from Forest (km)	Log market
Port of Gisborne		
Gisborne Mills		

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**Topography**

The topography of the forestland is steep to very steep hill country. Because of this topography cable based log extraction methods will be predominantly utilised at harvesting.

The altitude for Tutamoe Forest is 260-760 metres above sea level.

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**Soils**

Tutamoe Station is predominantly yellow-brown pumice soils of the Taupo-Whakatane complex - 10cm brown very friable sandy silt over 12cm reddish brown loose silty sand over 22cm yellowish brown firm pumice sand on yellow to pale yellow firm gravelly pumice sand (Source: Landcorp Tutamoe Business Plan).

The soils have low - medium natural fertility. The soils are recommended for erosion control forestry as the steep hill country soils are prone to deep seated slumps.

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**Climate**

Rainfall: The average rainfall from the weather station at Tauwhareparae is about 2,228 mm per year and is relatively evenly distributed during the year. The driest month is January and the wettest months are July/ August.

Temperature: The mean annual temperature is 12°C.

The property is situated at high altitude and therefore experiences some snowfall in winter.

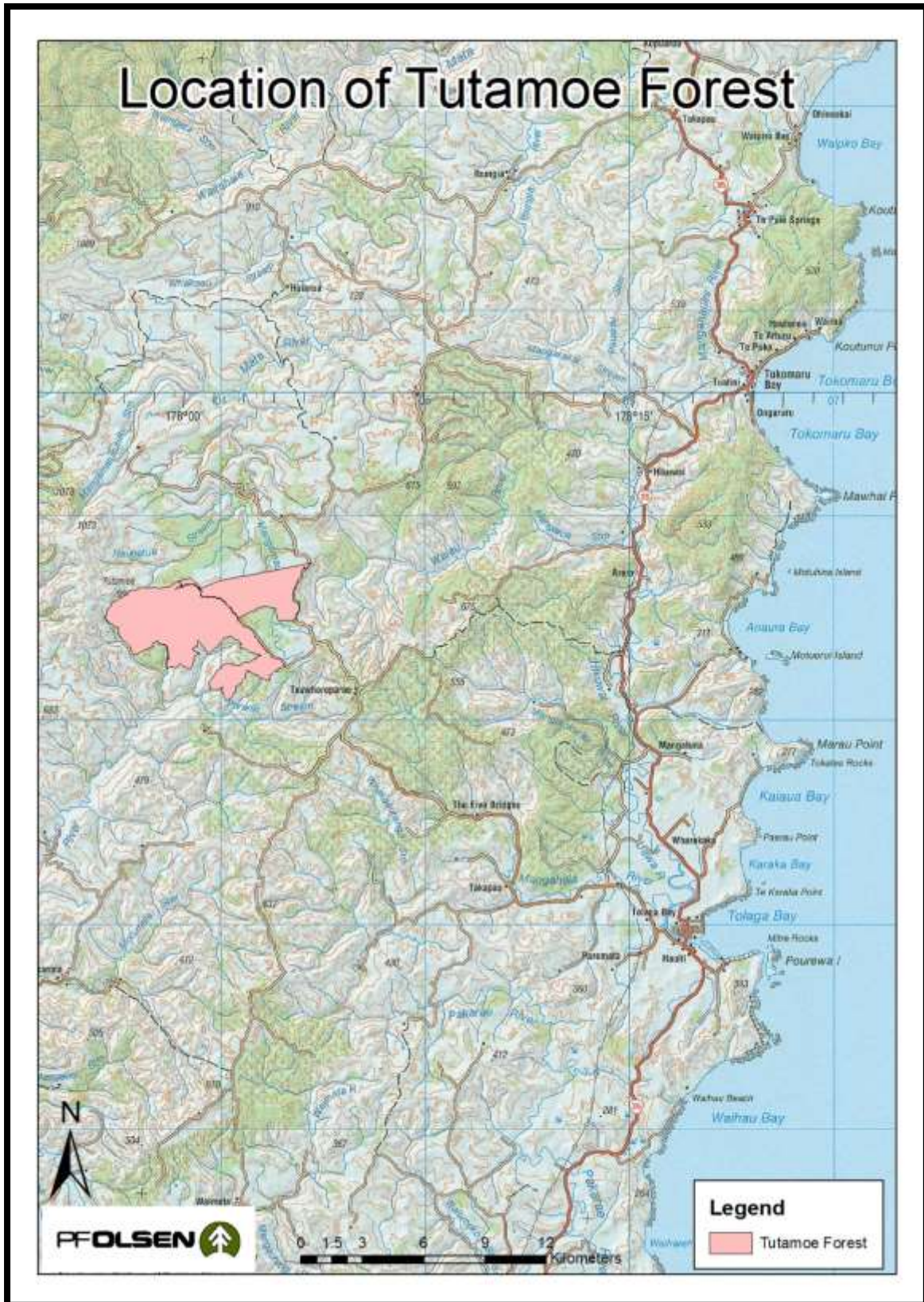
**Legal ownership**

Table 2 lists the legal description of the land on which the forest is situated. The tenure is freehold.

**Table 2: Legal Description**

<b>Forest</b>	<b>CT</b>	<b>Legal description</b>
Tutamoe (292)	5C/125	Section 1 Survey Office Plan 8475
Tutamoe (292)	5C/146	Lot 1 Deposited Plan 6999
Tutamoe (292)	5C/147	Lot 3 Deposited Plan 6998
Tutamoe (292)	5C/357	Lot 3 Deposited Plan 2317
Tutamoe (292)	5C/144	Lot 2 Deposited Plan 6998

Map 1: Forest Location Map





**The ecological landscape**

Tutamoe Forest is located in the East Cape ecological region and the Waipuu ecological district.

The area is characterised by lowlands and steep hill country, and some alluvial plains. The area was originally forested in entirety. The steep hill country would have been mainly podocarp hardwood forest with some red beech and silver beech on highest land and local black beech on lower slopes. There is evidence of former extensive kahikatea dominated podocarp forest on alluvial flats.

The district is now mostly pastoral farming with incidence of exotic forests on severely eroded formerly farmed slopes. The main indigenous forests today are areas of regenerating *Leptospermum* scrub, nursing an understorey development of broadleaved shrub hardwoods. Areas of original indigenous forest cover are rare.

**Protective status**

Table 3 shows vegetation types as required by the Draft National Standard for Plantation Forest Management in New Zealand:

**Table 3: Protective Status of the Ecological Landscape**

Ecological District or LENZ Type	Ecological District Based Assessment	LENZ Level 111 Assessment		
	Waipuu ED	LENZ F6.1	LENZ D3.1	LENZ D3.2
Original (pre-Maori) percentage of ecosystem type in Ecological District within land title	331,529 ha 100 %	778,785 ha	242,524 ha	177,715 ha
Natural ecosystem area remaining	44,620 ha 13.4 %	201,705 ha 25.9 %	40,016 ha 16.5 %	38,208 ha 21.5 %
Proportion of remaining natural ecosystem under protection	3,461 ha 7.7 %	109,525 ha 54.3 %	3,521 ha 8.8 %	2,484 ha 6.5 %
Protection by certificate holder*	436.3 ha 0.9 %	167.7 ha 0.2 %	112.5 ha 3.2 %	110.1 ha 4.4 %
Tutamoe protected areas as a % of total Station forested (reserve + plantation) areas	77 %	29 %	20 %	19.5 %

\* LENZ areas protected by certificate holder do not add to the full 436ha of reserves as some are unclassified.

**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.

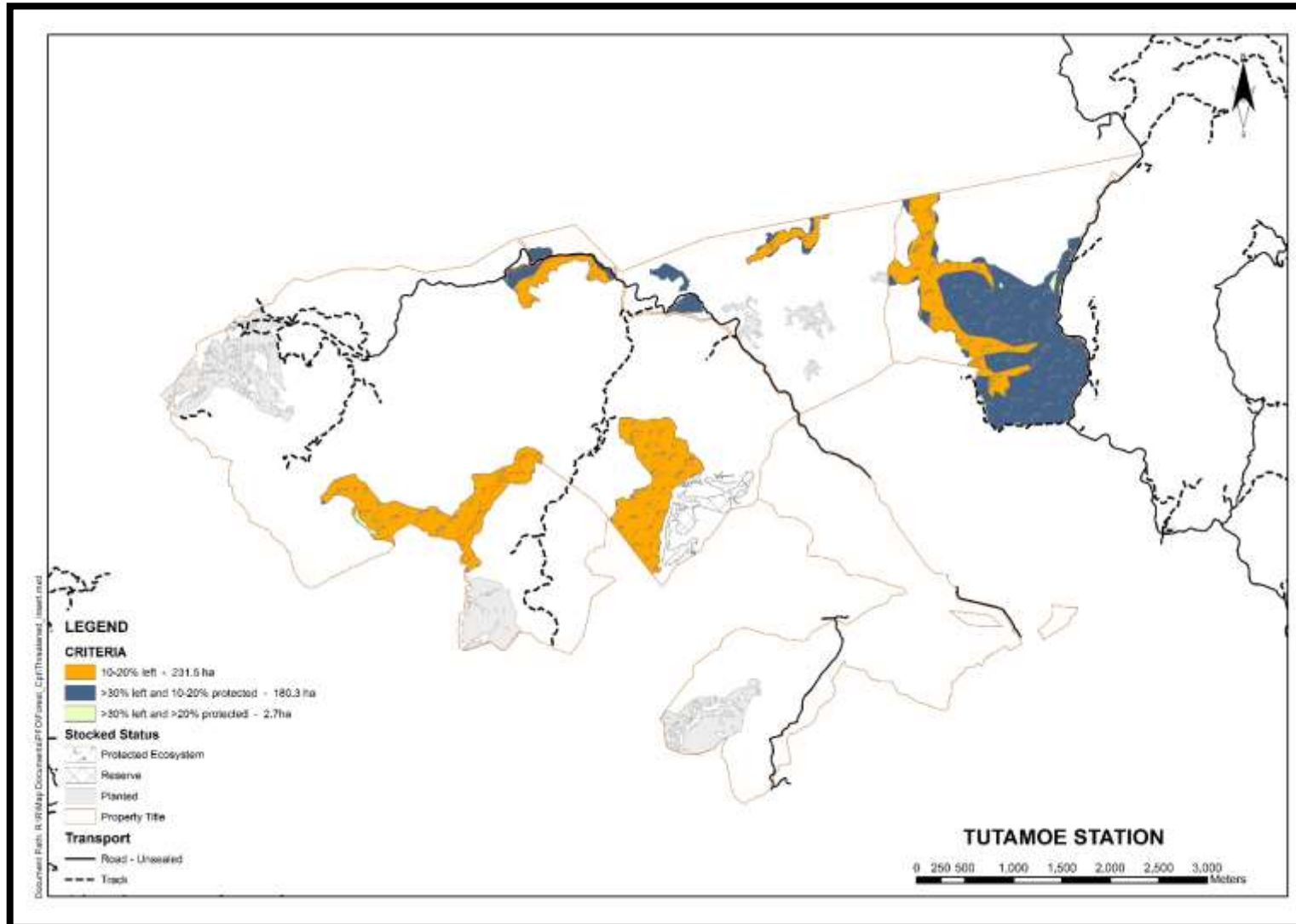
Map 2 illustrates that the single largest protected ecosystem in Tutamoe forest is largely within the land environment where the >30% of the forest types occupying that region remain and 10%-20% of that remaining area is protected.

The remaining areas however all fall within environments where only between 10% and 20% of the original vegetation cover types still remain.

**Table 4: Reserve areas by Threatened Environments Classification**

Threatened Environments Classification	Tutumoi Area (ha and %)
<b>&lt;10% indigenous cover left</b>	
<b>10-20% indigenous cover left</b>	231.5 ha 55.9%
<b>20-30% indigenous cover left</b>	
<b>&gt;30% left and &lt;10% protected</b>	
<b>&gt;30% left and 10-20% protected</b>	180.3 ha 43.5%
<b>&gt;30% left and &gt;20% protected</b>	2.7 ha 0.6%
<b>TOTAL</b>	<b>414.5 ha 100.0%</b>

Map 2: Forest by Threatened Environments Classification



## **4. Socio-economic profile and adjacent land**

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### **Forest history**

Tutamoe Station is a predominantly sheep and beef breeding unit.

Significant areas of plantation forestry were established in the 1980's to stabilise eroding hill country.

A significant environmental programme had recently been completed at Tutamoe Station which consisted of fencing off all erosion prone areas and significant perennial stream areas. Some areas were retired for regeneration under a QEII covenant and other areas were planted in radiata or poplars utilising funding from the then Ministry of Agriculture (MAF) East Coast Forestry Project.

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### **Current social profile**

Contract labour for Tutamoe Station forest is sourced out of Gisborne.

Gisborne city is home to approximately 45,000 people. The forest industry is a very important industry for the East Coast and Gisborne area currently employing 1,700 people directly. This will rise to 4,000 people over the next ten years as a result of the expansion of harvesting and replanting.

Tutamoe Station forest is a small, currently passive, incremental contributor to the social profile of the area. The land and forests are privately owned. Contribution to the local economy by way of added incremental employment and infrastructure is relatively low when compared to the large forestry companies neighbouring Tutamoe and in the Gisborne region.

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### **Associations with Tangata Whenua**

The local iwi is Te Aitanga-A-Hauiti. They will be contacted as required as part of wider stakeholder consultation.

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### **Tenure & resource rights**

There are no known tenure or resource rights associated with this parcel of land.

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### **Neighbours**

Neighbours to the forest estate boundaries have a special interest in the management of the forest. Activities within the forest may positively or negatively impact upon their quality of life or businesses in a number of ways, while inappropriately managed operations could create risks of adverse health, safety and environmental hazards.

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

**Table 5:** Tutamoe Station Neighbours

<b>Owner/Occupier</b>	<b>Contact no.</b>	<b>Location</b>	<b>Activities</b>	<b>Other notes</b>
Waipaoa Station Ltd				
Hikurangi Forest Farms Ltd				
Tauwhareparae Farms Ltd				
Perpetual Trust Ltd				

## 5. The Regulatory Environment

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### Regulatory considerations

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

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

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### Resource Management Act

Tutamoe 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.

Under the RMA, Tutamoe Forest falls under the Gisborne District Council. Gisborne District Council is a unitary authority that undertakes the combined regulatory functions of both a district and regional council encompassing land management, biodiversity and soil conservation and water quality.

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### Unitary Plan

Under the Gisborne District Council Combined Regional Land and District Plan (operative 31 January 2006) this block is zoned rural general.

The Gisborne District Council uses further land zonation to define the scope of many of its rules controlling the effects of land based activities. The zones are mapped on the basis of "land use capability" classes. In the case of Tutamoe Forest, the area under plantation is classified as Land Overlays 1, 2, 3 and 3A.

Land classes 3 and 3A are areas that require specific management with land class 3 describing steep highly erosion prone land with significant limitations to productive and particularly pastoral use, and land class 3A is the worst eroding land of the district.

For areas of land class 3A a Sustainable Hill Country Project Works Plan must be implemented. The works plan and subsequent exclusion fencing and tree crop establishment utilising funding from the East Coast Forestry Project and QEII Trust, has been completed for Tutamoe Station. Activities are permitted provided effective tree cover (permanent) has been established on all treatable land.

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The regulatory rules for land class 3 are displayed in Table 6 below. Pragmatically resource consents will be applied for a whole stand - areas of differing overlay zonation are unlikely to be separated and the regulations applicable to the highest overlay will apply.

**Table 6:** Gisborne District Council Land Overlay 3 Rules as they Affect Forestry

Rule Ref	Status	Requirement
<b>Harvesting &amp; Earthworks</b>		
6.9.1	Not Permitted	Land disturbance and vegetation removal <u>ARE NOT PERMITTED ACTIVITIES.</u>
6.9.3	Restricted Discretionary	Plantation forest clearance: Where an area of plantation to be cleared is greater than 500 m <sup>2</sup> on slopes over 35° or less than 50mm of topsoil over 25 % of the cleared area. The consent application will not be publicly notified except in specific situations.
6.9.3	Restricted Discretionary	Land disturbance including roading involving side cutting >0.5m over any contiguous 20m length in any 3 month period or involving the disturbance of more than 10m <sup>3</sup> of soil over the same period. The consent application will not be publicly notified except in specific situations.
<b>Work in beds of rivers</b>		
7.7.2	Permitted	Maintenance and repair of existing legally established structures except dams.
7.7.3	Permitted	Installation of fords & culverts in catchments, <100ha with a design 5 yr return flood flow capacity installed outside winter fish spawning periods of 1 <sup>st</sup> May to 1 <sup>st</sup> October, and subject to fish passage being maintained and sediment discharge levels returned to normal after construction as well as other design features <u>ALL OF WHICH MUST BE OBSERVED.</u>
7.7.4	Permitted	Disturbance, removal, damage or destruction to vegetation in the bed of a lake or river (e.g. riparian vegetation during cable harvesting), provided that, no material is deposited in or where it can enter a permanently flowing river
7.8.1	Controlled	Suspension of hauler cables over stream beds for the purposes of harvesting wood where the logs cannot be fully suspended over the stream.
<b>Forestry General</b>		
9.A7	Permitted	Agrichemical use and storage carried out in accordance with the Agrichemical code of Practice NZS8409: 2004. Note: Agrichemical usage is restricted in areas near closed canopy scrub. This does not affect first rotation forests.
21.9.1.1	Permitted	Forestry – planting & growing of plantation forests is permitted. No vegetation will shade any sealed carriageway between 10am & 2pm on the shortest day (unless already shaded by topography), no planting within 20m of the centreline of any formed public road & no planting closer than 10m to an adjoining property or 30m to an existing dwelling on an adjoining property.
21.13.1.2	Permitted	
21.8.6	Permitted	New vehicle access ways provided the sight lines specified in table 1 of the rule can be met.
11.12.4.2	Permitted	Farming /forestry related noise in the rural general zone is excluded from the threshold limits subject to using the “best practicable option” to limit noise.

**Proposed National Environmental Standard for Plantation Forestry**

Likely to come into effect during the period which this plan covers is the Proposed National Environmental Standard for Plantation Forestry (NES-PF). If implemented, the NES-PF would replace councils' existing district and regional plan rules for managing plantation forestry. The benefit of this national standard is that it would provide a consistent approach across the country that is responsive to local environments. This should result in improved environmental outcomes and more efficient forest management.

**Historic and archaeological sites**

The *Heritage New Zealand Pouhere Taonga Act 2014* replaced the *Historic Places Act 1993* on 20 May 2014. Under the *Heritage New Zealand Pouhere Taonga Act* it is the landowner's responsibility to identify any historic sites on their land prior to undertaking any work which, may disturb or destroy such sites.

Where such circumstances exist, an "Authority to Modify or Destroy" will be sought from Heritage New Zealand Pouhere Taonga (HNZ). Such authorities are similar in function to a resource consent and if granted, normally come with conditions that must be met. The process to apply for authorities is documented in PF Olsen's EMS. Note also that Consents to modify an archaeological site may sometimes be required from the local District Council

Records of archaeological and historical places are maintained in the NZ Archaeological Association Site Recording Scheme run by the HNZ (<http://www.archsite.org.nz/>). These sites are often included in schedules of places and sites of significance in District plans along with sites of cultural significance.

Checks of the NZAA website show no known records within considerable distance of this block. Similarly a check of the Archaeological Site Probability model published by the Department of Conservation<sup>1</sup> suggests that this very inland location is unlikely to have sites present.

If a site is found or suspected on any block, the protocols specified in PF Olsen's EMS, and any others specifically developed in conjunction with HNZ and Iwi or other stakeholders must be observed.

**Consents & authorities held**

There are no current resource consents or HNZ authorities that apply to Tutamoe forest.

Resource consents will be obtained prior to scheduled harvesting and will be included in FIPS for monitoring once processed.

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



**The Emissions  
Trading Scheme**

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

Tutamoe Forest contains 61.3 hectares of forest that was existing forest as at 31<sup>st</sup> December 1989. At the time of harvest, these stands will be subject to a deforestation tax equivalent to the tonnes of CO<sub>2</sub> projected to be released from decomposition of the forest at a unit financial value determined by the internationally traded emission units. This tax is payable if the forest is not replanted or, if left to regenerate naturally, does not achieve the regulated heights and stocking densities.

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

**Environmental  
Code of Practice**

All operations carried out on the property should be undertaken to the standards specified in the New Zealand Environmental Code of Practice for Plantation Forestry. This document sets out guidelines which ensure safe and efficient forest operations that meet the requirements of sound and practical environmental management.

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

**Forest Road  
Engineering  
Manual**

Roading and engineering techniques employed within the forest should conform to the industry best practice as outlined in the New Zealand Forest Owners Association publication, “NZ Forest Road Engineering Manual”, published 2012.

**Other relevant legislation**

Other relevant legislation in relation to the growing and harvesting of the tree crop are:

- Animal Welfare Act 1999
- Accident Compensation Act 2001 #49
- Animal Welfare Act 1999
- Biosecurity Act 1993
- Climate Change Response Act 2002
- Commercially relevant statutes
- Conservation Act 1997
- Crown Forest Assets Act 1989
- Fencing Act 1978
- Forests Act 1949
- Forests Amendment Act 1993 (Forests Act 1949)
- Forest and Rural Fires Act 1989
- Forestry Rights Registrations Act 1983
- 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
- Injury Prevention, Rehabilitation and Compensation Act 2001
- New Zealand Coastal Policy Statement
- New Zealand Forest Accord
- Noxious Plants Act 1978
- Pesticides Act 1979
- Protected Objects Act 1975
- Reserves Act 1977
- Resource Management Act 1991
- Soil Conservation and River Control Act 1971
- The Treaty of Waitangi Act 1975
- Trespass Act 1980
- Wildlife Act 1953

For a comprehensive list of relevant legislation refer to PF Olsen's EMS. Forest owners can be held liable for breaches of these Acts and may be held responsible for damage to third party property. Appropriate protection should be taken to minimise these risks.

## 6. Forest Estate Description

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### Forest area

The net stocked areas have been measured from a map produced by PF Olsen. The estimated net stocked areas of each stand are set out in Table 7.

**Table 7:** Forest area (ha)

Gross area	Net stocked area	Area awaiting restocking	Reserves
2,986.3	140.3	0.0	436.3

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### Current species

The species grown at Tutamoe 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 8.

**Table 8:** Treestock Seedlot and GF Rating

Stand	Treestock
TUTA-0007-01	GF 21, bareroot, seedlot 01/9
TUTA-0007-01	GF17, bareroot, seedlot, 02/305

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**Species mix**

The species mix of Tutamoe Forest is entirely *Pinus radiata*. No other species have been established as a commercial crop on the property.

**Productivity indices**

The two most common estimators of the productivity of a site are the Site index and 300 index.

Site index is a measure of productivity of a site in terms of height growth of radiata pine at age 20. The 300 index is a measure of productivity of a site based on stem volume growth (mean annual increment) of 300 stems per hectare.

The site index for Tutamoe Forest is on average 33.5m<sup>3</sup>/ha/year, but ranges from 30.0 to 37.5m<sup>3</sup>/ha/year. The 300 index for Tutamoe Forest is on average 32.5m<sup>3</sup>/ha/year, but ranges from 30.0 to 35.0m<sup>3</sup>/ha/year.

Tutamoe Forest is at the higher end of site productivity in the general area for forestry sites.

**Current crop status**

Table 9 summarises measurement data from the most recent inventory (2014) to give the current status of the crop.

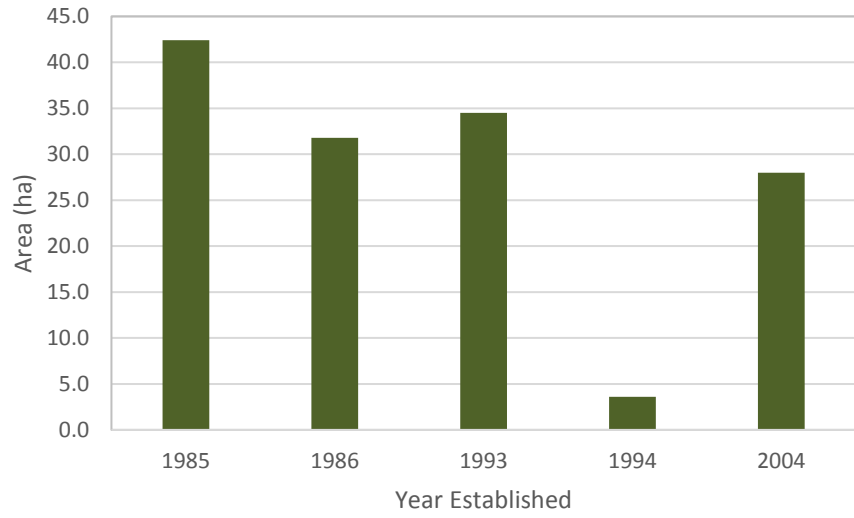
**Table 9:** Current crop status

Cpt/Std	Year planted	NSA (ha)	Planted stocking (sph)	BA (m <sup>2</sup> /ha)	MTH (m)	Mean DBH (cm)	Pruned stocking (sph)	Pruned height (m)
1/1	1985	14.7	790					
2/1	1985	14.8	740					
3/1	1986	31.8	938					
7/1	2004	27.1	-					
7/2	2004	1.2	-					

**Age class  
distribution**

Figure 1 illustrates the age class distribution of Tutamoe Forest.

**Figure 1:** Age class distribution of Tutamoe forest



## 7. Reserve areas and significant species

### Introduction

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

### Reserve areas

Tutamoe Forest contains 436.3 hectares of protected ecosystems and reserves (Table 10). Ecologically none of the stands are significant in terms of rarity of species. However, while in all cases the areas are significantly modified and fragmented, a number are representative of mixed lowland podocarp hardwood ecological associations that have as a result of past pastoral development become almost removed from the landscape in this region. Importantly, three of the large areas have the capacity in the absence of stock or fire to revert to tall forest, of types fully representative of those deficient in the region while the 225 ha block is well developed forest capable of sustaining self-supporting natural ecosystems in a generally deficient landscape.

An extensive environmental program of stock exclusion fencing in conjunction with the East Coast Forestry Project and QEII Trust has been recently completed. There are still some unfenced areas of regenerating scrub, primarily along riparian margins. There are no immediate plans to continue environmental fencing for these areas due to cost and associated broken topography. However these vegetation types are relatively hardy and will continue to develop provided stock pressure is light.

**Table 10: Reserve Areas in Tutamoe Forest**

GeoUnit	Area (ha)	Protection	Description	Protection category
TUTA-SECF-03	4.4	QEII Covenant	Manuka/kanuka/Broadleaved Hardwoods	Passive
TUTA-SECF-04	73.9	QEII Covenant	Manuka/kanuka/Broadleaved Hardwoods	Limited
TUTA-SECF-05	71.4	QEII Covenant	Manuka/Kanuka/Broadleaved Hardwoods	Limited
TUTA-SECF-06	20.6	QEII Covenant	Tawa/ Broadleaved Hardwoods	Limited
TUTA-SECF-07	4.5	QEII Covenant	Tawa/ Broadleaved Hardwoods	Passive
TUTA-SECF-08	2.4	NZ Forest Accord/QEII Covenant	Tawa/ Broadleaved Hardwoods	Passive
TUTA-SECF-09	12.3	QEII Covenant	Manuka/kanuka/ Broadleaved Hardwoods	Limited
TUTA-SECF-10	225	SNA/QEII Covenant	Tawa/ Broadleaved Hardwoods	Full

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The reserve areas registered with QEII Trust are all secondary regrowth with the main species present being Manuka, Kanuka, Ribbonwood, Tutu, Dicksonia, Cabbage Tree, Horopito and more. There are emergent stems of Rewarewa. With stock now excluded Rewarewa will quickly become the taller predominant tree and over time a dominant canopy of Rimu, Tawa, Kahikatea, Mahoe and Pukatea will eventuate as the forest reverts to type. In some reserve areas these species are already present. The protected ecosystems are shown on the Forest Stands (Map 3).

Finally, Landcorp Farming Ltd plan to covenant (QEII) a further eight areas (totalling around 67 ha) within Tutamoe, over a three year period, commencing 2016/2017. These areas would be fenced where possible to exclude stock and deer. Some exotic tree removal would also be carried out to enhance these natural areas.

**Riparian reserves**

A standardised GIS-based stream classification system has been developed specifically for PF Olsen, based on NIWA’s River Environment Classification (REC) and Freshwater Environments of New Zealand (FWENZ) models. 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. Each stream category corresponds with a set of rules in the EMS that apply to operations occurring near the riparian reserve. Table 11 summarised the stream categories within Tutamoe Forest.

**Table 11:** Riparian Reserve Categories

Category code	Category name	Total length (km)
LLWH	Large Low Wet Hard	2.34
LMWH	Large Moderate Wet Hard	1.78
MLWH	Medium Low Wet Hard	10.23
MLWS	Medium Low Wet Soft	6.01
MMWH	Medium Moderate Wet Hard	5.41
MMWS	Medium Moderate Wet Soft	0.03
MSWH	Medium Steep Wet Hard	0.24
SLWH	Small Low Wet Hard	8.07
SLWS	Small Low Wet Soft	1.20
SMWH	Small Moderate Wet Hard	1.86
SMWS	Small Moderate Wet Soft	0.01
VMWH	Very Small Moderate Wet Hard	0.22
<b>Grand Total (km)</b>		<b>37.40</b>

The category description can be interpreted as waterway size (large/medium/small/very small), slope of surrounding terrain (low/moderate/steep), average yearly flow (dry/wet), and stream bottom substrate condition (hard/soft).

**Rare and threatened species**

To date, there have been no sightings recorded of rare and threatened species.

Sightings of rare and threatened species are expected to occur and will be recorded and maintained in the FIPS rare species database.

**CITES species**

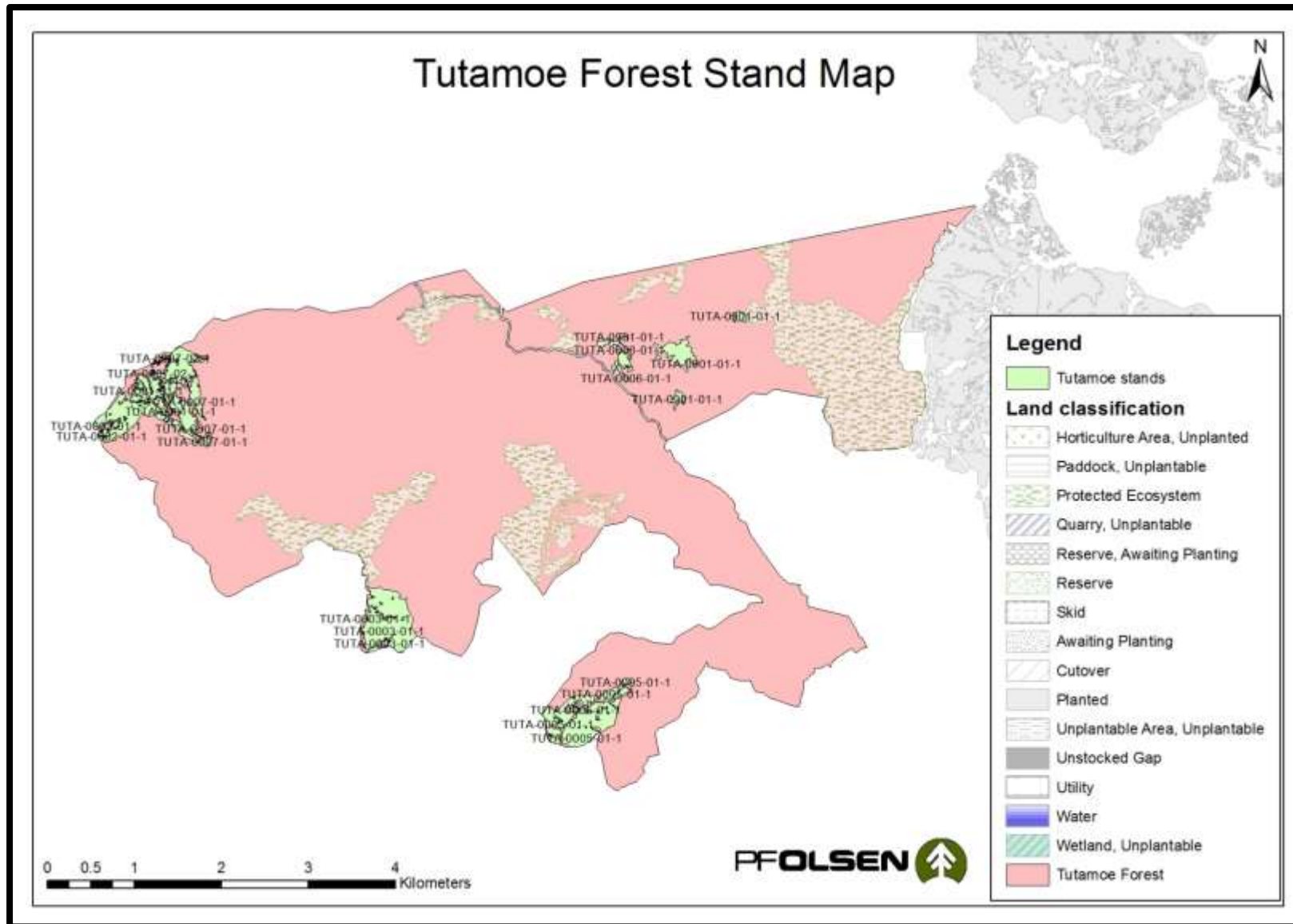
CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments.

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

The full list of New Zealand CITES listed species are available in the EMS, or online at <http://www.doc.govt.nz/about-doc/role/international/endangered-species/cites-species/nz-cites-listed-species/> .



Map 3: Forest Stands Map



## 8. Non-Timber Forest Products and Other Special Values

### Introduction

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

### 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 12 below rates the relative positivity and negativity of the more common social and environmental products produced by Tutamoe Forest relative to the most likely alternative primary production system, pastoral drystock farming.

Table 12: **Environmental and Social Cost-benefit Analysis**

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											✓
Native wildlife habitat										✓	
Threatened fauna										✓	
Native fish										✓	
Air quality					HP		MR				
Native reserve protection										✓	
Landscape/visual			HP					MR			
Recreation										✓	
Commercial forest use										✓	
Firewood											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*

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**Non-timber forest products**

There are currently no FSC certified non-timber forest products being sold from the forest.

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**Other special values**

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

- Firewood (staff only)
  - Possum trapping for fur (generally staff only)
  - Beehives (predominantly Manuka honey production).
- 

**Recreational usage**

Tutamoe Forest receives some recreational demand from the wider public.

- The Poverty Bay Hunt Club utilise the forest and farm areas once a year for a 2 day event.
- The Pig Hunting Club holds an event twice yearly, one event being held prior to lambing to control wild pig numbers.
- Members of the public are regularly permitted onsite to hunt, subject to permission from the farm manager.

The forest will continue to be open for legitimate use subject to entry by permit and provision of kill returns from these permitted hunting activities.

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## 9. Environmental Risk Management

### Assessment of environmental risks

Several areas of typical forest management have been identified as posing a possible environmental risk within Tutamoe Forest. The Environmental Assessment Matrix below (Table 13) summarises the identified risks for Tutamoe Forest. The level of risk has been evaluated in the matrix as high 'H' or low 'L', or not applicable 'NA'.

Prior to operations such as clearfelling, land preparation and production thinning, an assessment is undertaken to quantify the risk involved in carrying out the particular operation, and steps are implemented to manage the risks.

**Table 13:** Environmental Assessment Matrix for Tutamoe Forest

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

Note                      Impacts upon water quality and aquatic life are estimated to have lower potential impact than would often be the case because the severe erosion rates typical to the region mean that these values are already severely affected. Overtime with more native and plantation afforestation water quality in forest tributaries will improve.

**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 Tutamoe Forest are:

- Pesticides;
- Fuels and oils;
- Fire retardants;
- Surfactants.

Transportation, storage and labelling of these hazardous materials must all comply with the provisions of the Health and Safety Manual, which is maintained under ISO 9001 certification and incorporate legislative controls under EPA and NZS 8409:2004 Management of Agrichemicals code of practice.

Furthermore, the forest manager is committed to reducing the use of hazardous substances as much as possible. This involves use of alternative methods for the control of weeds, pests and diseases where these are effective and efficient. The use of fuels and oils is minimised where possible. Fire retardants are only used when required and surfactants are only used to make more efficient use of specific herbicides.

**FSC 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 certified forests. All these five have only 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 in conjunction with the wider NZ certified industry. These chemical pesticides are listed in Table 14 below.

The ‘derogation’ process is run according to specific policies put in place by FSC, including extensive canvassing of stakeholder views. This part of the process has been completed as at September 2015 and formal derogation applications will be lodged with certifying bodies by December 2015.

Two other highly hazardous vertebrate pesticides, sodium cyanide and 1080 are occasionally used in parts of the FSC Group estate. Such use is undertaken under the statutory controls exercised by the Animal Health Board who apply directly to FSC for temporary derogations if and when needed. Historically, these have not been used at Tutamoe.

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There are five agrichemicals that have been classified ‘highly hazardous’ by FSC that are used in forestry and conservation operations within PF Olsen certified forests (Table 14). Special derogations to continue usage subject to conditions are maintained by PF Olsen.

At the same time as the five new chemicals were added to the HH list two commonly used forest establishment herbicides, terbuthylazine and hexazinone were removed from the list. Derogations are no longer required for them.

**Table 14:** Highly hazardous chemicals used by PF Olsen

Active ingredient	Purpose	Common usage
Copper based products	Fungicide	Needle cast control
Picloram	Herbicide	Establishment weed control
Carbaryl	Insecticide	Localised wasp control
Colecalciferol	Vertebrate pesticide	Localised possum control
Pindone	Vertebrate pesticide	Rabbit and Hare control
Use subject to AHB emergency provisions only		
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

All chemical use is tracked in PF Olsen’s FIP’s chemical active ingredient tracking system.

## **10. Commercial Crop Establishment and Silvicultural Operations**

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### **Introduction**

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

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### **Crop species**

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.

Stands at Tutamoe established in 1985 and 1986 have not been thinned and these stands are not suitable for the full range of products described above. Stands more recently established are being managed on a clearwood regime.

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### **Other species**

Alternative species may be considered at the time of re-establishment.

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### **Establishment**

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

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### **Pre-establishment forest flora and fauna**

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. This may include the extension of an existing wildlife corridor or riparian area by increasing setbacks at the time of crop replanting.

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

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**Tending regime**

There are currently no tending operations planned for Tutamoe Forest on account of operations having already taken place.

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**Tree nutrition**

The soils in Tutamoe 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:

- **Nitrogen** – Generally west coast sands in the North Island and the Canterbury Plains, West Coast and Nelson regions in the South Island.
- **Phosphate** – Upper North Island, Marlborough and West Coast have marginal available phosphate concentrations. This is often associated with clay soils.
- **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.

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## 11. Forest Inventory, Mapping and Forest Records

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### 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. PF Olsen have procedures for each of the following four types of inventory to be applied on Tutamoe Forest:

- 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 rotation: to collect measurement inputs for growth modelling;
  - Pre-harvest: to obtain estimates of recovery by log grade.
- 

### Mapping

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

The digital data is retained, processed and managed on PF Olsen’s GIS (Geographic Information System) to an accuracy fit for purpose.

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

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### Forest records

Forest records are essential in monitoring the forest operations by providing a historic perspective to the physical condition of each stand.

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

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

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## 12. Harvesting Strategy and Operations

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### Harvesting strategy

As a plantation with a non-normalised age-class structure, the harvesting strategy employed at Tutamoe Forest is to harvest the forest or constituent stands as close as possible to the optimum economic age as practical. This is the age at which the growth in volume and improvement in quality is offset by the cost to maintain the forest for another year. 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 and for the near future. These factors, together with logistics such as the availability of suitable harvest contractors and the requirements of resource consents, will determine the actual harvest time.

It is anticipated that harvesting of parts of Tutamoe’s forest estate will, if not actually started, be operationally planned over the course of this plan.

### Getting harvest ready

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.

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### 13. Property Management and Protection

**Statutory pest obligations**

Pest management within Tutamoe Forest is subject to statutory obligations under the Regional Pest Management Strategy administered by the Gisborne Unitary Authority.

The Strategy applies to both pest plants and animals and categorises them in terms of management objectives. The categories and landowner obligations are summarised in Table 15 below.

**Table 15:** Statutory Pest Regulations

<b>Pest Category</b>	<b>Plant pest objectives</b>	<b>Animal Pest Objectives</b>
Eradication	Long term = eradication; Short term = contain distribution & reduce density	Eradication
Containment (plants) or total control (animals)	Prevention of infestation of un-infested neighbouring areas & reduce density	Reduction in density & range in targeted areas
Limited control	Reduce adverse effects through better management & education	Reduction in density – targeted areas
Surveillance	Prevent establishment in region	Prevent establishment in region
<b>Forest Landowner Obligations</b>		
Eradication	Plants to be destroyed before seed produced	NA -
Containment (plants) or total control (animals)	Destroy before seeding – Old man’s beard Destroy pampas within 1km of forest boundaries. Maintain 10m clear of clean neighbour boundaries – Broom, gorse, blackberry hawthorn.	No knowing release or cause to be released – Goat, possum, stoat, weasel, ferret, rabbit
Limited control		As above – Feral cats, pigs, wasps.
Full details of classifications and obligations are listed in Sections 3.2 & 3.3 of the Pest Management Strategy.		

**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 pests in Tutamoe Forest are the brushtail possum and goats. 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.

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Tutamoe Station is in a TB Surveillance Area that covers the majority of the East Coast region. A Surveillance Area is an area where it is known there are no TB-infected vectors (wildlife). Here the Animal Health Board maintains a TB surveillance programme of sufficient intensity to detect infection in cattle herds that are clear or are at a low risk of becoming infected with TB. TB testing of cattle in Surveillance Areas is every three years and usually involves all animals over 24 months of age.

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. Wild goats are a major problem on Tutamoe Station and there is a specialist goat shooter employed to control numbers.

Wild pigs are also a major problem and it is difficult for farm management to maintain control over numbers due to encroachment from the adjacent large forestry estates. Farm staff and the pig hunting club use recreational hunting as a method to keep numbers down.

All animal pests in Tutamoe 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 District Council and the Department of Conservation to achieve effective and efficient control within the forest area and on neighbouring land, where required.

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**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 through silviculture by timely thinning and pruning operations, which increases air movement and lowers humidity levels.

There is no *Dothistroma* control carried out at present in Tutamoe Forest.

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**Protected ecosystems, reserves and species**

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.

At present the indigenous vegetation remnants in the estate are fragmented and heavily modified from past farming. As such this aspect down rates the ecological significance of the smaller blocks.

Fifty seven percent of protected ecosystems on Tutamoe Station are LENZ class F6.1. These represent ecological environments that while down to 26 % of their original extent nationally are moderately well protected now. Most of this class is however represented by one large block in Tutamoe, TUTA-SECF-10, which gives it a significance that has also been reflected in its recognition within the Protected Natural Areas programme and Gisborne District Plan as a Significant Natural Area “SNA”. Protection of this area has included an ongoing program of poisoning the wilding pines, and ensuring goats and pigs are excluded.

The balance of the protected ecosystems including two 70ha blocks represents LENZ classes D3.1 and D3.2. These classes, representative of lowland mixed podocarp/hardwood forest types are not only significantly depleted in national extent but also severely underrepresented in formally protected reserves. On Tutamoe, these have been covenanted and fenced.

In all cases, stock fencing, covenanting, pest control and a degree of simple forest monitoring are the main focus of management. Covenanting and stock exclusion fencing has already been completed.

Over the next planning period in addition to fence maintenance it is proposed that:

- Goat control be maintained especially in stand Tuta-Secf-10.
- Possum control be maintained in stand Tuta-Secf-10.
- Photopoint monitoring be established in Tuta-Secf-10.
- Wilding control be maintained in impacted native stands.
- Complete fencing and retirement of a further gully system.

**Ecological equivalence**

The area of reserves in Tutamoe Forest exceed the productive area by 300% and as such the percentage of reserve set-asides massively exceeds the required FSC threshold of 10% reserves area by Ecological District.

**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 prevails, access to adequate water sources, constructing and maintaining firebreaks, and selective forest grazing to reduce fuel within stands;
3. Effective detection systems which includes 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, and
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 Tutamoe Forest the Rural Fire Authority (RFA) is the Gisborne District Council.

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.

**Fire insurance**

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.

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**Public liability insurance**

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

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## 14. Monitoring

### Introduction

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

### Values monitored

Management inspections are completed regularly during operations and periodically between times to monitor all aspects of the forest growth, health and conditions. The findings of the inspections are detailed and, where appropriate, summarised on the PF Olsen FSC website. The full monitoring framework implemented and applicable to Tutamoe Forest is tabulated below (Table 16).

**Table 16:** Environmental Process Monitoring Framework

Monitored Element	Include √	Components	Data Source	Data medium	Reporting / Website frequency
Chemical usage	√	A.I usage Area overuse	Operations Supervisors	FIPS Form	On demand / annual
Consultation activity	√	Complaints	Operations Planners Supervisors	Form	Annual / annual
Environmental incidents	√	Incident number Categories	Operations Supervisors	FIPS Form	On demand / annual
Flora & fauna	√	Species & Status frequencies/ new finds	Operations Supervisors farm staff	FIPS Form	Annual / 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	√	periodic inventory. ISO 9001	Contractors	Pre-harvest	
Forest health	√	Disease & health	National Forest Surveillance Program <sup>2</sup>	document	Periodic-annual – not on web

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<sup>2</sup> Forest health inspections are undertaken annually, by an independent specialist forest health assessor, through the NZ Forest Owners Association forest health scheme.



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FSC membership	√	Block / location / name	FIPS register	FIPS client database	On demand / annual
Health and safety statistics	√	LTI / accidents & incidents.	Operations Supervisors	FIPS	Monthly/ annual
Internal Audit CAR activity	√	Frequency * category	Auditors/ees	FIPS Form	Annual / annual
Log production	On harvest	Total logs FSC markets	Log dockets	Woodtrack	On demand / annual
Operational monitoring	√	Audit trends Cause analysis	Operations Supervisors	FIPS Form	Monthly / annual
Pests	√	RTC, kill returns or other	Farm staff Supervisors	Kills	Annual where relevant
Protected ecosystem condition	√	Condition trends Photopoint monitoring	Supervisors or Farm staff	2016	Bi-annual
High Conservation Value forests	NA	Condition trends Photopoint monitoring	Contractors Supervisors	To be established	Bi-annual if restoration initiated
Recreational & non-timber	√	Permits issued	Branch offices Forest security	FIPS Form	Annual / annual
Resource consents	NA	Number Compliance	Operations Planners	FIPS	6 monthly / annual
Stream monitoring	NA	Clarity +/- other specific	Contractors Supervisors	Spreadsheet	Monthly / annual where relevant
Environmental training	√	Courses, numbers, names	Staff	FIPS Form	Annual/as relevant
Client satisfaction	√	Post-operation client survey	Clients	Survey form	Post-operational /annual
Social survey	√	Demographics, values, work conditions	Contractors	Survey form	5 yearly/annual

**Financial**

Budget versus expenditure is monitored through the PF Olsen FIPS system and presented to Landcorp Farming Ltd when requested. This information is not made public.

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**Social**

Consultation with stakeholders has been undertaken and feedback from these stakeholders (and others as they become apparent) is monitored and would include actions undertaken to resolve disputes and issues should they arise.

In addition there is a full social survey of the contractor work force every three years, due to be repeated in 2018.

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## 15. Future Planning

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### Introduction

This plan pertains to the management of Tutamoe 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 require a full review of this plan.

The next review date for this plan is June 2022.

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

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### Operation plans

For the short term we use operation plans. These plans are prepared annually in accordance with this management plan. This operation plan and associated budget are subject to approval by Landcorp Farming Ltd at the beginning of each financial year.

Landcorp Farming Ltd financial year is 1<sup>st</sup> July – 30<sup>th</sup> June.

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