



# FSC® FOREST MANAGEMENT PLAN

Garland Forest  
W & S Garland and Tintagel Trust  
Reporting Period: July 2023 – July 2028



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*Front cover: King fern Ptisana salacina (At Risk- Declining) in a Garland forest reserve*

# 1. What is this Plan?

## About this Plan

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This **specific** forest management plan provides details about Garland forest.

It is to be used in conjunction with the **standard** forest management plan, which outlines the typical management applied to the Forest Stewardship Council® (FSC) Group Scheme forests.

Where Garland forest is managed in a different way than described in the standard forest management plan, this is detailed within this plan, which takes precedence.

## Foundation Principle

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W & S Garland and Tintagel Trust is committed to adopting the FSC Principles and meeting the FSC Criteria relevant to forest management.

W & S Garland and Tintagel Trust is committed to the PF Olsen FSC Group Scheme **NC-FM/COC-000190** processes and associated documents.

W & S Garland and Tintagel Trust wishes to maintain FSC certification, to ensure that their forests are managed in an environmentally appropriate, socially beneficial and economically viable manner and to obtain the best access opportunities to the local processing market which is seeking to source FSC certified logs.

## 2. The Forest Land

### Location

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Garland forest is a 22.8 hectare forest in the Waikato region. The location of the forest is shown below.



### Forest Area

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Productive area (ha)	Reserve area (ha)	Total forest area (ha)
6	8.1	22.7

### Legal ownership

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The forest is located on the following legal parcels. The tenure is freehold.

- Lot 1        DPS 59103    Maungatautari SD
- Lot 2        DPS 59103    Maungatautari SD

The forest is planted in a two separate compartments in close proximity. Compartments 1 and 3 are part of a joint venture between W & S Garland and Tintagel Trust.

Compartment 2 is owned by W & S Garland only. It does not form part of Garland Forest and is not part of the FSC Group Scheme.

Compartment	Ownership	Year Established	Area (ha)
1	W & S Garland and Tintagel Trust	2001	2.6
2	W & S Garland	2002	0.6
3	W & S Garland and Tintagel Trust	2003	12.0

## Markets

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The location of the forest in relation to potential markets is listed in the table below.

### Distances from forest to log markets

Potential Market or Export Port	Distance from Forest (km)	Log market
Tauranga	105	Export
Putaruru	57	Domestic
Kinleith	83	Pulp

## Topography

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The topography of the forestland is rolling to steep. The blocks are mainly planted on steeper gully sides. A combination of cable logging and ground-based hauler systems are likely to be used to harvest Garland forest.

Altitude ranges from 200 metres above sea level at the end of Rahiri Road to the north of the block, to 390 metres above sea level where an indigenous vegetation stand meets the private road. The general aspect is north and west facing.

## Soil

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The soils are yellow brown loams of the Pukerata silt loam and clay loam hill soil family. They are formed from ash deposits, from pre-Taupo eruptions, and Greywacke. Erosion hazard potential is rated as negligible to slight soil slip. Production forestry is a suitable

land use on these soils (Source NZ Land Resource Inventory Sheet N66 and N75 and the Waikato Legend).

## **Climate**

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- The average rainfall at nearby Cambridge is about 1181 mm per year.
- The mean annual temperature is around 13.4 ° Celsius. Ground frosts are common with an average of 50.7 ground frost days per year.
- Wind: Gale force wind events are recorded as occurring on an average of 3.4 days per year. This wind has proved a challenge to trees established at Garland forest with some minor windthrow events occurring over the past few years.

## **3. Ecological Information**

### **Ecological District**

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Garland forest is located within the Maungatautari Ecological District (ED), in the Waikato Ecological Region. Refer to following information about the ED:

<https://www.doc.govt.nz/documents/science-and-technical/ecoregions2.pdf>

### **FSC requirement: Ecological District**

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As the area is more than 10% within the forest, there is not a reserve shortfall.

Ecological District	Total Forest Area (ha)	Reserve Area (ha)	Reserve %	Meets FSC?	Reserve Shortfall (ha)
Maungatautari	7	8.1	36%	YES	-

## Threatened Environments Classification

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The reserve areas in Garland forest fall within the following NZ Threatened Environments Classifications.

Threatened Environment Classification	Area (ha)
<10% remaining	2.0
10 – 20% remaining	
20 – 30% remaining	6.1
>30% remaining & <10% protected	
>30% remaining & 10 – 20% protected	
>30% remaining & >20% protected	
Total Area (ha)	8.1

## 4. Cultural and Social Aspects

### Forest history

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Prior to being established in trees, the property was used for pastoral grazing. The steeper areas, now established with trees, were overrun with gorse. Gorse was slashed and burned to clear the land for forest establishment.

### Current social profile

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Garland forest punches well above its weight in the contribution to the social profile of the area. The land is adjacent to the Maungatautari Scenic Reserve which is protected by a pest proof fence. Access to this reserve and fence is permitted across the Garland land. The Garlands have contributed time and financial resources to this project.

The Garlands have established a mixed species forest, described further in section 7. The range of cypress, acacia, and native species selected by W & S Garland and Tintagel Trust will assist in supporting specialty timber processors in the area, in a landscape dominated by radiata pine.



The forest is regularly used by public groups and the Garlands are active members of the New Zealand Farm Forestry Association with local and national field days held on the property.

## Historic and archaeological sites

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Records from the 'Archsite' web resource has revealed there are no known historic sites in or within 1km of Garland forest. Within 1 – 2 km from the forest boundary, there are several recorded ditches and a pa site.

A comprehensive history of the Maungatautari mountain can be found at:  
[http://www.maungatrust.org/About\\_Us.cfm#history](http://www.maungatrust.org/About_Us.cfm#history)

## Tangata Whenua

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Statutory Acknowledgements exist for Ngāti Hauā under the Ngāti Hauā Claims Settlement Act 2014. The Iwi management plan is available at  
<https://ngatihauaiwitrust.co.nz/publications/trust-documents/>

## Tenure & resource rights

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There are no known Iwi interests in Garland forest and, being a small forest, none anticipated.

## Neighbours

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Appendix 2 lists the forest neighbours. Some or all of these parties should be consulted when operations are proposed in forest areas adjacent to their boundaries.

## 5. Regulations

### National Environmental Standards for Plantation Forestry (NES-PF) Erosion Susceptibility Classification

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The NES-PF regulations are generally based on the Erosion Susceptibility Classification (ESC) of the underlying land.

The forests are located on generally low erosion risk land. The majority of the forest activities will be permitted subject to meeting the NES-PF regulations. None of the forests are zones as ESC orange or red.

The table below shows the proportion of each forest by the respective National Environmental Standards for Plantation Forestry (NES-PF) Erosion Susceptibility Classification (ESC).

**Productive plantation area (ha) within each ESC Class**

Low	Moderate	High	Very High	Very High (8e)	Total
14.6	0	0	0	0	14.6

### Council RMA Plans

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Garland forest is within the Waipa District and the Waikato Region. Both the Waipa District Council and the Waikato Regional Council have their own planning documents and associated rules, developed through public process.

The Waipa District Plan pre-dates the NES-PF (2017). Section 4.4. advice note re rules states: ‘...notwithstanding any other rules in this plan, all plantation forestry activities, as from 1 May 2018, are regulated under the NES-PF Regulations 2017.’

harvesting	4.4.2.59 condition s met is P otherwise C	<p><b>Rule – Harvesting of commercial and/or woodlot forestry</b></p> <p>4.4.2.59 Harvesting of forestry, by way of:</p> <ul style="list-style-type: none"> <li>(a) Clear felling of less than 4ha per calendar year per holding; or</li> <li>(b) Continuous cover forestry generating up to 80 loaded truck and trailers loads per calendar year per holding.</li> </ul> <p>Provided that:</p> <ul style="list-style-type: none"> <li>(i) The forestry to be harvested is not located within a water supply catchment; and</li> <li>(ii) Access onto the road network is via a Council approved heavy vehicle entrance; and</li> <li>(iii) No harvesting related activity occurs on the road reserve; and</li> <li>(iv) The harvesting operation shall occur between 1 November and 31 May.</li> </ul>
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Activities that fail to comply with this rule will require a resource consent for a controlled activity in accordance with Rule 4.4.1.2(a).

The following rules related to afforestation are not relevant to Garland forest as it exists today. The existing landuse consent was required under the rules related to viewshafts around Maungatautari (see following section).

afforestation mainly	4.4.2.61 range of activity status	<p><b>Rule – Plantation Forestry Activities</b></p> <p>4.4.2.61 The NES-PF regs and standards shall apply to Plantation Forestry Activities from 1 May 2018, except within:</p> <ul style="list-style-type: none"> <li>(a) An Outstanding Natural Feature and Landscape; or (b) Natural Landscapes other than outstanding; or</li> <li>(e) Natural landscapes and Viewshafts; <b><i>Mt Maungatautari: rule 25.4.1.1(j) to (q)</i></b>, or</li> <li>(c) Heritage sites; [very unlikely to trigger] or</li> <li>(d) Cultural landscapes; or</li> <li>(f) Significant natural areas; [see rule 24.4.1.1(n) and appendix N5 ] <a href="https://www.waipadc.govt.nz/repository/libraries/id:26zgz4o7slcxbyk7hfo7/hierarchy/our-council/waipadistrictplan/documents/wdp-volume-2/Natural%20and%20Cultural%20Heritage/Appendix%20N5%20-%20Significant%20Natural%20Areas">https://www.waipadc.govt.nz/repository/libraries/id:26zgz4o7slcxbyk7hfo7/hierarchy/our-council/waipadistrictplan/documents/wdp-volume-2/Natural%20and%20Cultural%20Heritage/Appendix%20N5%20-%20Significant%20Natural%20Areas</a></li> </ul> <p>where the provisions of the Waipa District Plan apply.</p>
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	<p>in event of breaches of NES-PF: range of activity status</p>	<p>Provisions in the Waipa District Plan also apply in circumstances where regulated activities (as determined by the NESPF) are carried out not in accordance with the standards set out in the NESPF. Failure to comply with the rules that relate to the areas listed in (a) to (f) above, will require a resource consent the status of which is determined by the applicable rule(s).</p>
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If consents are required at any stage, consideration should be given to the Ngāti Hauā Iwi management plan<sup>1</sup>.

### **Consents & authorities held**

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A land use consent for forestry planting from the Waipa District Council is held for the planting and harvesting of vegetation within the Outstanding Landscape zone. Consent conditions include stock proof fencing, earthworks disturbance re-grassed within twelve months and a harvest plan must be submitted to Waipa District Council 12 months before harvesting commences. The resource consent does not supersede any legislation requirements prior to any harvesting.

A full copy of the consent and conditions is held by PF Olsen.

### **Emissions Trading Scheme**

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Garland forest qualifies as post-1989 forest land. The forest has not been registered to participate in the NZ Emissions Trading Scheme and is not subject to the accrual of emissions credits and liabilities under that scheme.

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<sup>1</sup> <https://ngatihauaiwitrust.co.nz/publications/trust-documents/>



## 6. Managing environmental risk

### Assessment of environmental risks

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Refer to the Standard FSC Forest Management Plan.

### Infrastructure damage or service disruption

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Rahiri Road, a formed public road, runs adjacent to the forest. There are power pylons 300 m to the southwest of the forest boundary. The land is adjacent to the Maungatautari Scenic Reserve which is protected by a pest proof fence. Access to this reserve and fence is permitted across the Garland land.

### Pests and diseases

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Currently, the Garlands carry out possum and rat control personally, using a network of baits stations. The Garlands intend to control wild cats themselves. They also intend to engage a contractor themselves to control rats during the bird nesting season.

The Waikato Regional Pest Management Plan<sup>2</sup> outlines pests relevant to Garland forest.

### Fire

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Garland Forest is small and its location removed from uncontrolled public access and risky boundaries. As such the fire risk is considered relatively low.

The Fire and Emergency NZ fire plan<sup>3</sup> for Waikato is relevant to Garland forest .

### Insurance

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PF Olsen recommends forest owners hold crop and public liability insurance.

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<sup>2</sup> [Regional Pest Management Plan Operational Plan 2022-2032 | Waikato Regional Council](#)

<sup>3</sup> [Fire plans | Fire and Emergency New Zealand](#)

## 7. Commercial Plantation Estate

### Current crop

There are a range of species grown in Garland Forest.

Stand	Species	Planted Year	Net Area (ha)	Stocked
GARL-001-01	<i>Cupressus lusitanica</i>	2001	0.7	
GARL-001-02	<i>Eucalyptus fastigata</i>	2001	0.9	
GARL-001-03	<i>Acacia melanoxylon</i> (Blackwood)	2001	0.7	
GARL-001-04	<i>Juglans nigra</i> (Eastern Black Walnut)	2001	0.1	
GARL-001-05	<i>Taxodium distichum</i> (Swamp cypress)	2001	0.1	
GARL-001-06	Mixed indigenous species	2001	0.1	
GARL-003-01	<i>Cupressus lusitanica</i>	2003	4.8	
GARL-003-02	<i>Acacia melanoxylon</i>	2003	3.7	
GARL-003-03	<i>Dacrydium cupressum</i> (Rimu)	2003	0.5	
GARL-003-04	<i>Agathis australis</i> (Kauri)	2003	0.5	
GARL-003-05	<i>Juglans nigra</i> (Eastern Black Walnut)	2003	0.4	
GARL-003-06	<i>Cupressocyparis ovensii</i> (Ovens Cypress)	2003	0.5	
GARL-003-07	<i>Podocarpus totara</i> (Totara)	2003	0.9	
GARL-003-08	Mixed indigenous species	2003	0.6	
GARL-003-09	<i>Dacrycarpus dacrydoides</i> (Kahikatea)	2003	0.2	
GARL-SECF-01	Reserve	-	6.9	
GARL-SECF-02	Reserve	-	1.2	
Productive Area (ha)			14.6	
Reserve Area (ha)			8.1	
Total area (ha)			22.7	

*A. melanoxylon* when intensively managed will produce high value, quality pruned butt logs. These logs have a number of end uses and will most likely be used as decorative veneer or as the basis of high quality, high value furniture or knot free decorative timber.

*C. lusitanica* and *C. ovensii* when intensively managed produce a number of different log types suitable for various processing options. High value pruned butt logs can be used for knot free decorative timber. Unpruned logs can be used for structural timber. *C. lusitanica*

has the added advantage that it can be used in ground contact situations without needing to be treated.

*J. nigra* is one of the world’s premier wood species. It has high value end use applications for appearance grade timber, rifle stocks, furniture and wood turning.

*A. australis* and *D. cupressinum* are iconic native timbers that have high value end use applications for appearance grade timber, furniture and wood turning.

The other alternative species at Garland forest will likely be used as high value decorative timber for veneer, furniture or flooring.

These species were chosen to achieve W & S Garland and Tintagel Trust’s objectives of a mixed productive use forest.

## Tending

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The tending regime consists of frequent short pruning lifts to ensure a small diameter over stubs is achieved, and therefore a small defect core.

*A. melanoxylon* stands require regular form pruning of branches greater than 30 mm to ensure a single dominant leader. *C. lusitanica* stands have received sail pruning to minimise windthrow risk in these stands.

There are several further tending operations required for most stands – further pruning and thinning to waste when pruning has been completed. The table below lists target pruned heights and stocking for each of the main species grown at Garland forest. The regimes may be amended as new knowledge and research becomes available.

**Species silviculture**

Species	Target Pruned Height (m)	Target Final Crop Stocking (sph)
<i>A. melanoxylon</i>	4.5	200 - 300
<i>C. lusitanica</i>	5.5	350 - 450
<i>E. fastigata</i>	6.5	250 - 300
<i>C. ovensii</i>	5.5	350 - 450

Indigenous species stands will be tended. Both thinning and pruning operations will take place during the period of this management plan.

## Tree nutrition

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The soils are generally not deficient in nutrients for healthy tree growth.

## 8. Harvesting Strategy

### Harvesting strategy

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The table below indicates approximate optimum harvest ages for the species at Garland forest. There is no harvesting planned for the period of this management plan.

Approximate harvesting ages

Species	Clearfell Age (yrs)
<i>A. melanoxylon</i>	35-40
<i>C. lusitanica</i>	30-35
<i>E. fastigata</i>	30-40
<i>C. ovensii</i>	30-35
<i>J. nigra</i>	50-60
Kauri, Totara	80-120
Rimu, Kahikatea	120+



## Indigenous Biodiversity

### Protected ecosystems

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Garland Forest contains 8.1 ha of remnant indigenous forest reserves. The largest of 6.9 ha (SECF-01) is protected by a QEII covenant and the smaller area of 1.2 ha is protected under the NZ Forest Accord. Both areas are also identified as Significant Natural Areas (SNAs) by the Waipa District Council (SNA 866).

The QEII covenant area has been recently elevated to ‘regionally significant’ status due to the quality of natural forest regeneration, and utilisation by kākā (At Risk- Recovering).

While the forest types are in a national sense neither rare nor threatened, they do represent a local presence beyond a nationally important reserve of tall forest cover that has been almost totally removed from the local landscape. The larger area also provides riparian protection to a local headwaters stream – something of a rarity in the region.

#### Protected ecosystem & reserve areas by protection category

Stand	Area (ha)	Reserve Type	Protective Status	Forest Type Description	Protection Category
GARL-SECF-01	6.9	Secondary Forest	QE II/SNA	Tawa / Podocarp /	Full
GARL-SECF-02	1.2		SNA	Hardwood	Limited

### High Conservation Value (HCV) Forests

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None of the reserve areas meet the criteria for HCVF.

### Threatened species

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The proximity of the protected Garland forest to the nationally important Maungatautari Ecological Island reserve means that it can provide transitory habitat services to important fauna such as kereru and long-tailed bats that reside there.

**Threatened flora and fauna**

	Species	Threat Status
Flora	Swamp maire <i>Syzygium maire</i>	Threatened - Nationally Critical
	King fern <i>Ptisana salicina</i> (refer photo on front cover)	At risk - Declining
Fauna	Long-tailed bat <i>Chalinolobus tuberculatus</i>	Threatened - Nationally Critical
	Karearea <i>Falco novaeseelandiae</i>	Threatened - Nationally Increasing
	Koura <i>Paranephrops planifrons</i>	At risk- Declining
	North Island kākā <i>Nestor meridionalis</i>	At risk- recovering

**Other notable fauna**

	Species	Threat Status
Fauna	Korimako/bellbird <i>Anthornis melanura</i>	Not threatened
	Miromiro/tomtit <i>Petroica macrocephala</i>	Not threatened
	Glow worms <i>Arachnocampa luminosa</i>	Not threatened
	Toutouwai/North Island robin <i>Petroica longipes</i>	Not threatened



iNaturalist<sup>4</sup> (Biodiversity in Plantations) is used to record sightings of important indigenous fauna or flora discovered in the forest.

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<sup>4</sup> <https://www.inaturalist.org/projects/biodiversity-in-plantations>

## Fish

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Fish species likely to be within the forests have been identified from the:  
 NES-PF Fish Spawning Indicator tool<sup>5</sup>   
 Freshwater Environments New Zealand. 

Further information from the Wildlands ecological survey added to the list of fish species and aquatic invertebrates that may be present in the streams.

Species	Probability	Group	Spawning
Longfin eel	high	'A' diadromous	NA

Key ecological management activities are outlined in Appendix 4.

## 9. Other Special Values: Everything but the timber

### Recreation

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Garland Forest receives some recreational demand from the wider public. In the past horse trekking, hunting, possum trapping and infrastructure access were all activities authorised and recorded. Most usage is possum trapping and trekking.

Any approved access is managed through the PF Olsen forest access permit system.

### Public access roads

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There are no formed or unformed public roads, easements or esplanade reserves (marginal strips) within the property boundary. The land is adjacent to the Maungatautari Scenic Reserve which is protected by a pest proof fence. Access to this reserve and fence is permitted across the Garland land. Refer to the Herenga ā Nuku – Outdoor Access Commission website<sup>6</sup>.

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<sup>5</sup> <https://www.mpi.govt.nz/forestry/national-environmental-standards-plantation-forestry/fish-spawning-indicator/>

<sup>6</sup> <https://maps.walkingaccess.govt.nz/Viewer/?map=b1d1e76a6c754d11b3f3fd9dfce1eb12>

## Other special values

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

- Research
  - AgResearch have an ongoing research project based at Garland Forest relating to water quality.
  - Manaaki Whenua/Landcare Research is leading a project investigating carbon stocks and edge effects provided by small clusters of trees. Garland forest is one of the 32 field measurement sites.
- Aesthetic value - the fence lines of the forest have been specially contoured so the forest blends in with the special landscape character of the region, as required by the district plan.

## Non-Timber Forest Products

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There are no FSC certified non-timber forest products<sup>7</sup> from Garland forest.

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<sup>7</sup> In FSC standards, the reference to non-timber forest products is a reference to such products that are able to carry the FSC label. It is not a reference to the presence or absence of other co-products from the forest areas that do not seek to carry the FSC label.



## 10. Future Planning

### Plan changes & reviews

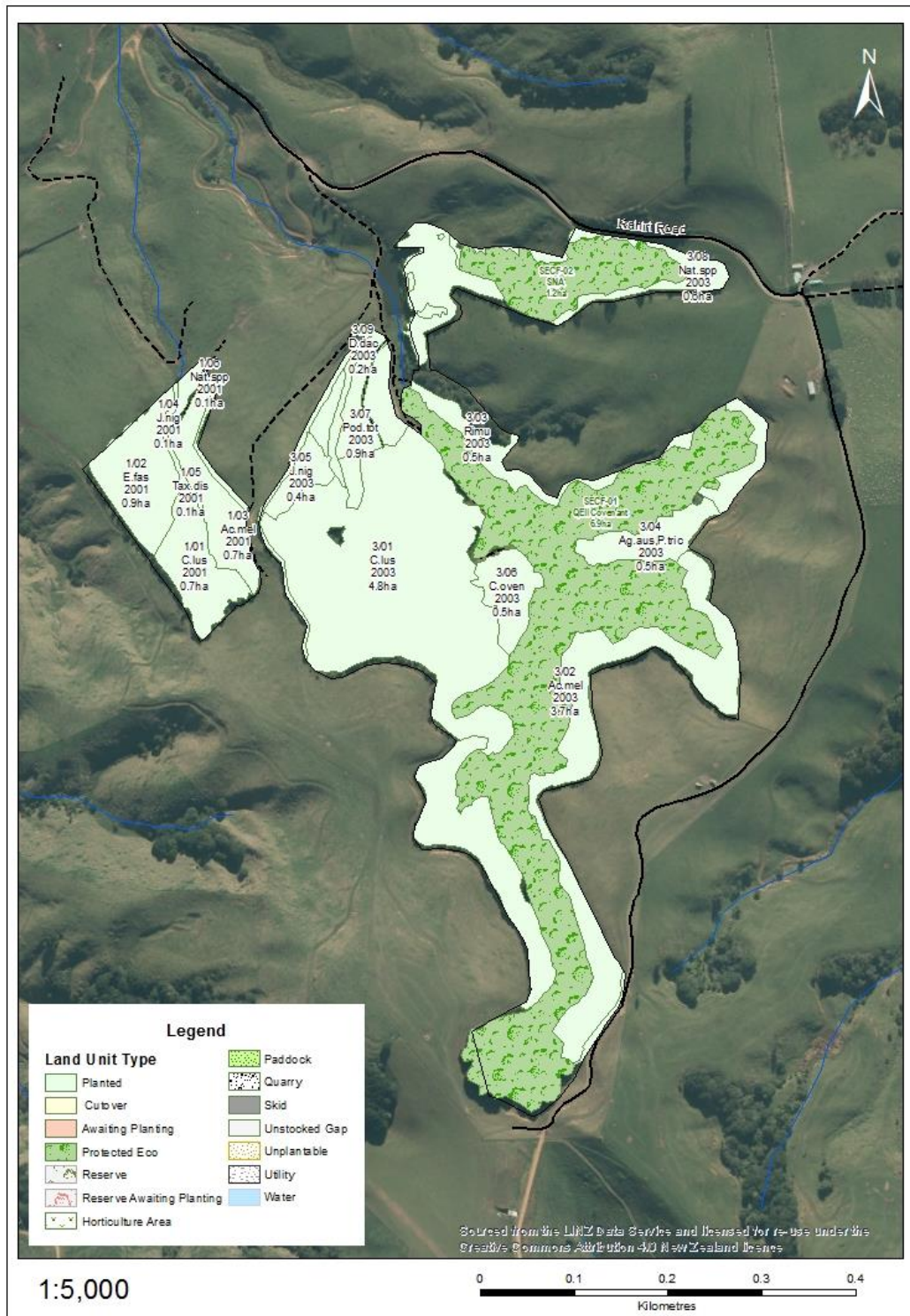
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The next major review date for this plan is July 2028.

Minor revisions may be made at any time. Any material changes made will be documented below.

Change	Date	Section/Page

## Appendix 1: Forest Map



## **Appendix 2: Forest Neighbours**

Not publicly available.

## Appendix 3: Schedule of Ecological Management

Review Date: June 2023

Activity Type	Required actions	Area/s	Due date
Annual walk-through check	Forest manager to do annual onsite check of sites. Note any issues including weeds, wilding pines, animal browse.	SECF-01 & SECF-02	
Rare species	Species and status frequencies (especially new finds) reported in iNaturalist.	Garland forest	
Rare species	Apply relevant forest management protocols (e.g. NZ Falcon Management Guide – Plantation Forestry).	Garland forest	Pre and during operations