Te Wera Forest Management Plan

Managed by NZ Forestry, Owner China Forestry Group Corporation NZ

Period 2022-2027

Document review period Biannual -

Te Wera Management Plan – V2 – 07/23

NZForestry
FOREST MANAGEMENT & CONSULTING

Contents

1. Introduction

   This management plan has been produced in accordance with our commitment to the FSC Principles and Criteria. It contains details of NZ Forestry's general procedures and approach to forest management applied to certified forests under our management.

   Our management of Te Wera Forest is covered in this plan.

2. Legal Rights and tenure

   Te Wera Forest is on land under Forest lease; China Forestry Group Corporation currently hold the harvesting rights under this licence and it is Managed by NZ Forestry Ltd. Ngati Maru is the owner of the Whenua as it was transferred back from the crown on 31st July 2022

   The forest was originally began being planted in 1953 by the NZ Forestry Corporation, multiple species were planted as trials for what would grow well in the region. A single mans camp was set up to house the staff, this is present day still used as an adventure camp for school children.

3. Management Objectives

   The primary management objective of China Forestry Group Corporation in Te Wera Forest is to maximise investment returns by increasing the net present value of the estate.

   This will be achieved by progressing the following secondary objectives:

   - Optimising biological growth to maximise value,
   - Minimising tree crop expenses to maximise value,
   - Maximising residual stumpage,
   - Managing legal, commercial, and physical risks,
   - Ensuring that the forest asset is accurately described and modelled,
   - Operating in a sustainable and ethically responsible manner.

4. Related Documents and Systems

   1. NZF Environmental Management System
   2. NZF Health and Safety Manual
   3. Monitoring Plan
   4. NZF Pest and Weed Management Strategy
   5. High Conservation Value Assessment and Management Plan
   6. Complaints and disputes process
   7. Contracts and Prescriptions
   8. Geographic Information System (GIS)
   9. Stand Records System (Geomaster)
   10. Forest stewardship council / NZF policies and procedures.

5. Forest Stewardship Council (FSC)

NZF is committed to forest management in accordance with the FSC Principles and Criteria. FSC certification is an international forest product labelling scheme, which provides independent and credible verification that the product comes from forests that have been managed in accordance with the FSC Principles and Criteria.

Founded in 1993 FSC is an international non-profit organisation that promotes good forest management through an independent forest certification system.

The FSC is divided into three chambers.

- Economic,
- Social and
- Environmental
- in New Zealand a fourth chamber for Māori has been established.

FSC is controlled by an elected board from the three chambers and is administered from Bonn in Germany. FSC is supported and promoted by prominent international environmental and social advocacy groups such as WWF, Greenpeace and Friends of the Earth.

The FSC Mission Statement is: "The Forest Stewardship Council shall promote environmentally appropriate, socially beneficial and economically viable management of the world's forests". FSC has 10 Principles, each of which include Criteria which need to be achieved to obtain and retain FSC certification.

The 10 FSC Principles and Criteria ES202 can be found on the FSC website (www.fsc.org) or FSC NZ website https://nz.fsc.org/en-nz/about-fsc.
The National Standard for Certification of Plantation Forest Management in New Zealand provides local interpretations of the FSC Principles and Criteria and can be found at the FSC NZ website.

6. Forest Description

Taranaki consists of four distinctive landforms, each of which requires a different type of environmental management. Te Wera is in the eastern Taranaki hill country, comprising siltstones, sandstones and mudstones, known locally as parpa. The topography of the hill country is steeply dissected and is prone to soil erosion and slipping but can support both pastoral farming and commercial forestry when managed in accordance with the physical limitations of the land.

The Taranaki region has a temperate climate with generally abundant rainfall. The incised nature of ring plain streams means that flooding is not a major problem. However, occasional intense rainfall events can lead to rapid rises in river levels and flooding in hill country valleys and elsewhere.

7. Forest Statistics

Prior to being established in plantation forestry in the early 1950's the land was a mix of indigenous forest, scrubland and pastoral farming.

Some 99 % of the planted area is established in radiata pine, with Douglas fir and Tasmanian Blackwood making up the balance. After almost a hundred years of trial planting, radiata has proven to be the species that grows most economically in the soil and conditions of New Zealand.

The table below outlines the total area of forest and the land use classification.

Area Type	**Area (ha)**
Stocked	2,298.1
Native (including eco systems)	1,535.2
Non-Productive	407.2

Age Class	**Area (ha)**
0-5	496.7
6-10	292.6
11-15	212.2
16-20	279.6
21-25	83
25+	934
Total	2,298.1

ESC Zone	% of Forest in Each Zone
Green	0.3%
Yellow	48.3%
Orange	51.4%
Red	0%

**as of ESC March 2018*

8. Socio Economic Conditions

Figures from the 2018 census show the total population of Taranaki stands at 117,561, an increase of 7.3% over the 2013 census figure. Taranaki's population accounts for 2.5% of New Zealand's total population.
Population changes have also varied within the region. The most notable feature has been the continued growth in the proportion of the population residing in the New Plymouth district, which contains 68.6% of the region's population – up from 67.7% in 2013. Both Stratford and South Taranaki districts have also experienced population increases since 2013.
The general trend has been for a decrease in the population of smaller rural towns and an increased concentration of population in north Taranaki and the main centres.
The Taranaki population is both older and younger than the national average, with a higher proportion of children under 15 years and adults over 65 years of age. This may be in part due to lifestyle factors, as Taranaki is seen as an attractive and desirable area for family living with good facilities and affordable housing.
The percentage of Māori within the region continues now stands at 17.5%, an increase from 16.6% at the 2013 census. There are eight recognised iwi within Taranaki: Ngāti Tama, Ngāti Mutunga, Ngāti Maru, Te Atiawa, Taranaki, Ngāruahine, Ngāti Ruanui and Ngaa Rauru

Forestry is a developing industry in Taranaki as the region experiences the harvest of the mid '90s planting boom. In 2020 forestry contributed $456million in Export earnings to the local economy.

9. Environmental Management

All NZF forest operations are undertaken in accordance with the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017, relevant Regional Plans and National legislation and other voluntary requirements, including certification obligations for Forest Stewardship Council.

NZF is committed to maintaining a high standard of environmental and social performance throughout its forest plantation activities. The company recognises the importance of the environment and society for the future of its business, for the future of its people and for the future of the communities in which it operates

NZF operate an environmental management system (EMS) primarily designed to comply with the Resource Management Act, NZ Environmental Code of Practice for Plantation Forestry, and

the National Environmental Standards (NES). Environmental management also includes the identification and management of important values such as rare, threatened and endangered species, protection of reserve areas and waterways, carbon management and the control of pests and weeds.

The social perspective includes ensuring that contractors and their workers adhere to health and safety standards, and that engagement and consultation with neighbours and stakeholders in respect of operations on the forest is undertaken.
The cultural perspective includes consultation with the appropriate iwi and ensuring that cultural and historic sites and values are identified and protected.

The economic perspective refers to the selection of a species, management and harvesting regime, which provides an adequate return on investment while minimising the risks of investment.

The Pest Management Strategy allows for the containment and control of unwanted pest species which has a direct effect on the welfare of remaining indigenous resources within the estate. For example, the pro-active control of possums helps to protect indigenous native birds. It outlines the types of operations where chemicals are used and the mechanisms for recording the type and quantity of chemicals used in forest operations with a chemical register and chemical reconciliation system.

The Environmental Management System also provides guidelines and protocols for the proper use of chemicals and environmental incidents. NZF concedes that under current best practice, chemical applications are necessary to procure even and quality tree-crops as well as prevent increment loss through the competitive effects of weeds and the destructive effects of animal pests such as possums.

However, NZF will always actively seek management practices that reduce the amount of chemical entering the environment in its estate. This is of benefit not only to the environment but also NZF as chemicals are expensive to procure and apply so reducing these activities would have a substantial financial as well as environmental benefit to the FMU.

The EMM outlines company procedure and policy on best practice guidelines in road construction, harvesting and maintenance operations that change soil or landscape properties and affect the quality of water flowing in streams and rivers (as well as the downstream effects).

10. Environmental limitations

There are a number of environmental limitations to plantation forestry within the eastern Taranaki hill country but most are related to the steep slopes and shallow soils of the topography. The soils within the region vary with some being more erodible than others. Under the NES most sites within Te Wera include areas designated high under the erosion susceptibility classification. These sites provide a challenge to harvesting operations, requiring tracks to be end-hauled and close supervision of water controls to manage sedimentation. Permanently flowing streams limit stream crossing constructions dependant on fish spawning and so careful harvest planning needs be done to ensure operations are not occurring within certain time constraints.
South and westerly winds are a common feature in Taranaki and can cause significant windthrow within the forest when combined with the shallow soil. The costal environment requires management of sedimentation to ensure the seabed remains unaffected by harvesting operations.

11. The Environment and Forestry Activities

Forestry activities encompassing silvicultural and harvesting operations can have both beneficial and adverse impacts on the environment, depending on the quality of environmental and operational management. Well-managed forests can:

- Enhance water quality
- Stabilise and conserve soil
- Provide a buffer against flood flows during storms,
- Shade waterways for fish life
- Contribute to biodiversity and wildlife habitats
- Manage carbon appropriately
- Provide recreational, economic and social benefits to the community.

On the other hand, poorly managed forestry activities can have harmful impacts NZ Forestry aims to identify the potential adverse impacts that its activities may have, and to institute environmental safeguards to prevent or to minimise the adverse impact from its operations. In general, our approach to environmental management falls into two inter-connected categories:

- Compliance where NZ Forestry work to ensure rules are met and values are protected from our operations.
- Active management of environmental values, specifically:
    - Biodiversity, including of:
    - Rare and threatened species management
    - Management of conservation areas
    - Integrated pest management
    - Waterways and land management
    - Carbon
    - Herbicide management
    - Cultural and historical sites.

12. Compliance

Compliance is focused on meeting Regional Council rules and industry best practices.
Operational compliance is managed by the designated NZF staff member and contractor from planning through to post operation remediation. Compliance is then audited by NZF staff members and territorial authorities.

The Harvest Forester provides an overview of operational environmental management and in particular plans audits for high-risk operations and council resource consent conditions.
NZ Forestry also operate a system to identify any site-specific environmental risks such as streams, adjacent natural vegetation, archaeological sites, etc., which may not be covered by following the generic BEPs.
Depending on the operation this is completed in the harvest planning stage and requires the Harvest Forester & Regional Manager to identify environmental or social risks and then implement measures to minimise potential adverse effects.
For establishment operations this is completed as part of the site assessment. Furthermore, there are safeguards should an environmental risk be discovered during the operation such as archaeological sites.

13. Risk Management

At the beginning of the planning phase of operations staff determine what values may be at risk from an activity.
This is undertaken through our Harvest Plan production or Establishment Plan where the operation planner considers if the following values may be affected, and if so, how management can take these into account:

- If a Resource consent required
- Archaeological sites present
- Adjacent to Native areas - rare species are present.
- Adjacent to (within 10m – i.e., the Riparian Zone) a perennial stream, river, lake or wetland.
- Harvesting undertaken by hauler.
- Adjacent landowners.
- Public utilities such as powerlines, public roads, etc.
- Registered easements
- Māori or cultural issues.
- People are likely to be adversely affected by the proposed operation.
- Landscape sensitivity or other restriction indicated in the GIS.
- Covenants or easements.

The consequent action will depend on the values and risks identified and may include engagement with affected stakeholders, a change of operation or approach, protection measures, monitoring or following one of our Best Management Practices.

A Mangagement plan or prescription is developed prior to the commencement of all operations which details the work requirements and standards to operators. Any conditions for the activity, details about the site terrain, stand data, a description of the job, specific environmental, health and safety requirements, as well as any specific reporting requirements are incorporated into the prescription. Reference is also made, where necessary, to the company's Geographic Information System (GIS) or other key document or procedure.

Environmental hazard identification is completed, and control measures are documented and communicated to the operator along with the Prescription. During operations, operators are required to follow the Prescription. Where there is potential for soil loss or sediment discharge onto sensitive environmental sites, the operator is required to implement correct water control procedures & re-vegetate the site as soon as possible.

14. Environmental Impacts and Safeguards

In order to manage Environmental impacts NZF undertakes environmental assessments on a site or operational specific basis.
It is recognised that environmental components such as soil, water and underlying geomorphology are an essential part of the forest and broader ecosystem and need sensitive management and safeguarding.
Environmental safeguards have been developed into management prescriptions and operational procedures, based on a combination of company assessments, external assessments and operational experience.

Each operation is individually assessed and a plan produced detailing site specific management prescriptions. Compliance with legal and other regulatory frameworks is monitored both internally and externally through Council Compliance Officers.

The FMU has numerous operational constraints that arise from environmental compliance. NZF maintains a Geographic Information System (GIS) which records spatially information relevant to the protection and maintenance of production, environmental and cultural values. The GIS delineates exclusion and reserve areas and contains environmental information such as known localities of threatened species and additional biodiversity values,

Erosion Susceptibility Classification, stream catchments, stream widths and visual landscape features. Areas of productive plantations are also incorporated into the coverage. This information is used during operational planning primarily in the development of site-specific operational management prescriptions.

Sedimentation is a key component that forest operations must manage and limitations around operations are directed by the Erosion Susceptibility Classification, which is legislated under the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017. This legislation also sets out key requirements forest managers must meet when managing operations during fish spawning and nesting periods for protected bids. Working around streams and various setbacks are legislated nationally to ensure stream banks are protected and slash is removed from waterways to prevent damming.

15. Maintenance and Enhancement of Forest Services

Forests provide a number of services that enhance our environment. These services are managed in a way that will maintain or enhance them; the services include biodiversity, waterway management, soil conservation and historical sites.

16. Biodiversity

Wetlands
Wetlands support processes which provide environmental services like water storage and flood control, nutrient removal, erosion control and water table maintenance. As an endangered habitat they are of significant value, so steps have been taken to enhance the wetlands through wilding and weed control, increasing setbacks and planting a buffer of native seedlings.

Wilding Control
As part of NZF's Commitment to the principles of FSC we are committed to managing the spread of wildlings into reserve areas and undertake screening checks. Control measures are dependent on the size of the trees involved, but generally involve a combination of poisoning, thinning or manual plant pulling. Other wilding species and pest plants are dealt when they occur in reserve areas or in accordance with Regional Pest Plans.

Waterways and Land
Our attention to waterways (including hydrological flows) is embedded in our general practices, in particular Best Environmental Practices. These take into account regional and National rules and regulations that cover water quality and yield, erosion, compaction and other mechanisms to protect land and water values.

Some key factors or process NZF use to protect land and water values include:

- Retaining a mosaic of well spread age classes that minimise effects of forest operations. This includes reestablishment.
- Through application of BEPs that, for example, prescribes re-plant setbacks and water controls for earthworks that relate slope.
- Operational planning where high risk situations are identified and considered as operations are planned.

- Operational audits that focus on soil and water values.
- Retaining and enhancing riparian strips that filter sediment before it enters the waterways.
- Engagement with regional authorities to ensure compliance with rules and permitted standards and advise on appropriate activities in high-risk areas.

Te Wera Arboretum

The Te Wera arboretum is accessed via SH43 and has a signposted car park and public access. This arboretum was set up by the New Zealand Forest Service and provides an insight into species trials and their effectiveness in the Taranaki Hill Country. It's also used by Te Wera Lodge with school groups to expose students to arboriculture and forestry in New Zealand

17. Forest Management & Operations

NZF manages Te Wera Forest in the Taranaki Region of New Zealand to provide logs for its customers derived from fast growing, sustainable Pinus radiata forestry plantations. The extent to which the forest will prosper in the future depends greatly on the quality of the natural and physical resources that provide the foundation for our business.

NZF is committed to sustaining the natural resource base, not only for the future of the company, but also for the future of the communities in which NZF operates.

The forest estates are managed consistent with the forest management policy and to meet the five-Year Plan, to ensure that the management of the forest is sustainable, from an environmental, social, cultural and economic perspective. NZF aims to intensively manage the forest estate to supply a range of log products. Intensive management involves best practice land preparation, planting of tree stocks, risk management, forest health and thinning. The evaluation and selection of a silvicultural system for the forest, is based on recognised forest practices and guidelines, taking into account management objectives for the specific site.

The primary objectives in selecting a fit for purpose silvicultural system is to maximise the value of wood products grown and harvested from the land whilst maintaining the long-term productivity of the land and other environmental values. In determining the appropriate silvicultural system, a number of factors need to be considered. These include, but are not limited to:

- Plantation management objectives.
- Species and regime selection.
- Rotation length.
- Site environmental factors.
- Natural and cultural values.
- Fire management requirements.
- Commercial / marketing factors.
- Plantation investment requirements.
- Lease agreement terms and conditions.
- Operational constraints; and
- Community expectations.

Species Selection

Pinus radiata is the forest species selected over decades of trials in New Zealand and is grown primarily as a sawn timber resource and provides logs to local mills. It is frost resistant, tolerant of dry sites and capable of satisfactory rates of growth on less fertile sites.

18. Establishment and Silviculture

The regime in Te Wera forest is a structural one – establishment is at 1000 stems per hectare (sph), followed by two thinnings of the stand to a final stocking of 500 sph. Stands are thinned in order to provide the optimum growing space for selected crop trees enabling us to maximise their economic return. The aim is to thin out the smaller or poorly formed trees, leaving the bigger, better formed trees to grow on. Thinning to waste operations results in the thinned stems being left on the forest floor to decompose. Due to the type of terrain the forests occupy Production thinning is not a viable option.

Year	Operation	Description
-1	Land preparation	Weed control
0	Planting	1,000 stems per hectare *Pinus radiata*
1	1st Release	Undertaken to release from weed competition and to reduce frosting. Usually with a mix of hexazinone and terbuthylazine applied aerially. Where steep terrain makes it unsafe to apply by knapsack, it is applied aerially.
10	Thin to waste	10 m mean crop height
25-27	Clearfell	Dependant on stand characteristics. See harvesting for more detail.

The establishment phase is crucial to obtaining a quality crop. As such we aim for high seedling survival and initial growth rates in order to compete with other on-site vegetation. Key objectives at establishment to ensure a good crop are:

- High quality and healthy tree stock properly handled to the site
- Cultivation of the soil.
- Placing the tree roots in the soil in a position that encourages stability.
- Reducing competition from other vegetation in the first years of growth.

Herbicides are used for weed control and are usually confined to the year of planting and the following year. Successful establishment means that herbicides are only required to be used up to two times every 25 to 30 years. Areas that pose risks to the health and safety of our contractors are release sprayed aerially. Herbicides are selected based on their ability to desiccate and/or kill the target weed species at the same time as being safe to use (i.e. non-toxic to non-target species, such as animals and humans) and break down quickly in soil and water to a safe organic substance. Application plans include strategies to protect watercourses, wildlife habitats and areas of native forest.

19. Tree Health

Tree nutrition Generally the soils in the Taranaki region are not likely to be deficient in nutrients necessary for tree growth. Foliar samples are 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 or where economic analysis demonstrates a benefit.

Dothistroma and Red needle blight are common diseases in the Taranaki area. NZF have commenced independent Annual Forest Health surveys to ensure any disease outbreak is identified and managed.

Pests in the forest estate include wild goats which eat young trees and ring bark older trees while scratching their horns. Possums, which can attack the growing tips of trees causing stem malformation and die-back. Possums will also eat native tree species and predate upon native wildlife in conservation reserves and parks. Rabbits and hares can also be a pest in the first two years after planting, as they can eat the tops of young trees. Goats and possums are the main pest of concern in Te Wera forest, and a large amount of pest control is required annually to achieve an economic crop.

20. Monitoring of Silvicultural Systems

The plantation monitoring program, carried out to ensure acceptable stocking, performance, and quality, involves surveying and assessment of the recently established planted area up until age 3 to ensure successful reforestation has been achieved at these critical early stages of the plantation life cycle.

Monitoring includes:

- Site preparation quality control.
- Planting quality control.
- A survival assessment no more than 12 months post establishment to ensure adequate stocking levels have been achieved; and
- Annual plantation health assessments.

Plantation assessments and monitoring occur throughout the rotation (not simply restricted to the early operational phases). For example, growth plots, are being measured and assessed as required to ensure data is collected to validate that sustainable forest management practices are being implemented.

21. Harvesting

NZF in conjunction with CFGCNZ contract out the estate planning function of the forest & woodflow generation to a third-party consultant as this is done to include CFGNZ forests NZF does not manage. NZF is involved in the consultation and development of the long term & 5-year plan. From this a 5-year harvest plan is developed, and then translated into an annual harvest plan. The rate of Harvest NZF & CFGC endeavours to harvest its forest resource as closely as possible to the optimum tree age for each stand.

A major determinant on the level of harvest is the age class distribution. Our aim is to harvest close to optimum tree age rather than maintain a set yield. An uneven age class distribution,

(with different areas of trees in each age class) is a consequence of the amount of forest established & harvested each year. The table below shows the age class distribution:

The ability to alter the harvest to respond to market demand fluctuations from year to year does exist. Harvesting is usually scheduled at around 25 for radiata pine. Actual timing depends on stand and market conditions.

22. Extraction Techniques

NZF uses three basic criteria to ensure the right harvesting methods are employed:

1. Health and Safety: the method is the most appropriate for the topography and nature of land so that the potential for injury is minimised.
2. Environmental: the method, which creates the least impact on the environment.
3. Economic: the method, which is the most cost-effective for the area, taking safety and environmental considerations into account.

23. Conventional Harvesting

Conventional harvesting is characterised by log making on local skid sites. Various methods are used, including ground based, tethered, swing yarder and hauler tower on steeper areas and selection of these will depend primarily on the terrain.

24. Harvesting and Slope Decisions

NZF is committed to adopting harvesting techniques and technology that minimises the impact on the environment and reduce the risk of accidents and injuries. To meet these objectives, land is divided into five terrain types and use the appropriate machinery configurations on each type. Including Ground-Based skidder/tractor. Swing Yarder, Tower.

25. Monitoring Plan

The purpose of a monitoring program is to assess the condition of the overall forest, yields of forest products, chain of custody, management activities and any social and environmental impacts. Those elements to be monitored and the frequency and intensity of the monitoring is set out in the Monitoring Plan.

26. Monitoring Forest Growth and Dynamics

A critical component of management planning and continuous improvement is understanding the available forest resource. A key component of this is through forest measurement and mapping. In order to accurately determine the area of net stocked area, reserves, infrastructure and riparian's these must first be mapped using aerial photography. Data collected early in the rotation during establishment and silvicultural tending quality control assessments is captured in Geomaster and provides base data for future operations.
Preharvest inventory is undertaken at around 3-5 years prior to harvest to determine, to a very detailed level, the predicted yield and product outturn of stands at harvest.
This data is then used post-harvest to reconcile the actual yields to those predicted.
The forest growth and dynamics is monitored at several stages of forest development, including:

- QC Following planting, pruning and thinning
- Survival surveys
- Foliage sampling

- Forest health surveys
- Pre-harvest inventory
- Post-harvest reconciliation.

27. Social impact assessments

NZF understand that forestry operations we undertake can affect our neighbours in a variety of ways. The social impacts of Harvesting and cartage operations are assessed during the harvest planning operation.

Due to the size of the estates managed & NZFs local presence NZF can communicate directly with those neighbours who have the potential to be affected by operations. This is done either face to face or verbally over the phone.

Harvest Plans, Prestart induction audits or prescriptions are updated with any requirements the neighbours have requested, such as calling them when working close to the boundary or if there are trucking restrictions.

Feedback from neighbours during the harvesting operations is generally by phone, face to face or email. Historically most concerns from neighbours' area regarding cartage times, dust and working along boundaries where there are fences or animals present. Any concerns from the neighbours are acted upon in a timely manner. Mud: Most of the complaints are due to mud being dragged out onto public roads or the level of trucking effecting the road. NZF monitor these impacts on a weekly level with our site inspection notice and tidy them up in a timely manner. Prior to any spray operations NZF contact neighbours on the boundary with the affected forest to notify them of the operation.
The Forester will discuss the operation and address any concerns they may have. Where there are concerns that need to be addressed these will be added to the prescription.
The Forester remains present during the spraying of sensitive boundaries to ensure NZF are present to mitigate any neighbour concerns.

A database of social impacts is kept and details the steps taken to manage the impacts of operations.

28. Spatial Information and Decision Support Systems

NZF currently has an integrated GIS system that contains detailed spatial and stand information data layers for all forests in the resource. The current GIS allows NZF to produce a variety of high-quality maps with a large array of necessary information displayed including legal and stand boundaries, protected areas, land-use capabilities, tenure and related spatial information, such as contours, hydrology and transportation features, these are stored as an ESRI Spatial database using ARCPRO. The GIS is used to plan harvesting operations, storing locations of landings and planned roads. All maps and mapping systems are generated from these GIS systems and will continue to be so into the foreseeable future.
NZF in conjunction with CFGCNZ uses the ATLAS Technology Suite (e.g., ATLAS Geomaster) for our stand record system, forestry and harvesting management systems. Atlas is the leading provider of forestry software within New Zealand and was developed by Scion Research, formerly known as Forest Research Institute. Health, safety and environmental auditing is managed with NZF's own H&S System. All audits and checklists are available electronically and available without data coverage. Corrective actions are monitored in line with NZF's H&S System and procedures

29. Forest Protection

Pest management within Te Wera is subject to statutory obligations under the Taranaki Regional Council Pest Management Plan June 2021. This plan applies to both plant and animal pests and categorises them in terms of management objectives.

The overall objective in managing plant and animal pests is to

- Meet statutory obligations under the Taranaki Regional Council Pest Management Plan June 2021
- Reduce their impacts on plantation and indigenous biodiversity values
- Ensure that any impacts from pest species originating in the forest boundaries are promptly dealt with
- Monitor the abundance and distribution of these species within Te Wera

Pest control in Te Wera will be managed through the processes laid out in detail in the NZ Forestry Integrated Pest Management Plan - Taranaki.

30. Fire Management

There is a high fire risk in Te Wera with the potential for dry summers in the Taranaki region. NZF in conjunction with FENZ communicate and develop plans to reduce the risks. Including, maintaining roads so emergency response can access the forest. Having up to date neighbour contacts so we can communicate with the community,

31. Security Access, Permits and Events

NZF has tight control of access through a thorough permitting system where applications are made on a purpose designed form. All drivers and their vehicles must obtain access permits which are only approved when the following is provided:

- Valid reason for entry.
- Valid full drivers' licence.
- Vehicle insurance (can be from the contractor's company)
- Public liability (minimum $5 million), firefighting (minimum $1 million) and vehicle liability insurance (minimum $5 million).

These processes ensure NZF approves only qualified access and can pass on safety and behavioural information. Permits enable NZF to determine if the person is appropriate to enter the forest (i.e.: checking driver license, firearms license, previous history - trespass, etc) and to pass on behavioural information such as safety messages, road rules, closed areas (i.e.: where harvesting activities are happening), hazards etc.

Recreational access is generally managed through the NZF permit system. The NZFs right to protect the forest and assets through access control. The key features of the policy are: Provides for the public to hunt within specified forests it manages and access fishing rivers by vehicle, during daylight hours on weekends when the fire danger is low (which includes the period from May to September).

32. Forest Communications

There is cellular coverage in certain areas of the forest. Communication within the forests is mainly through Te Wera radio channel which has its own repeater on site and is owned by CFGCNZ. This operates on a powerful repeater across the region and is key in managing safety within a forest. When working alone in the forest staff carry personal locators have a check procedure to ensure safety.

33. High Conservation Value (HCV) Areas

Whilst NZF protect and manage all conservation areas, in particular those that meet the NZ Forest Accord we prioritise active management to those with special or particular values, such as those that meet the FSC high conservation values (HSV) criteria. Each site has specific management aimed at their identified or significant values. NZF will progressively assess new areas adjacent to harvest sites for HCV values with the objective to protect and enhance these areas using detailed in the Reserves Management Plan. The following sections provide definitions of HCV and how they are assessed and managed. High Conservation Values Principle 9 of the Forest Stewardship Council deals with High Conservation Values and places significance on the maintenance and protection of areas identified with these values.

NZF recognises the importance of High Conservation Value areas and are committed to identifying, protecting and where practical enhancing forest that is recognised as having high conservation value. High Conservation Value is identified using the FSC definition (below). Native areas are assessed through reviews of existing relevant assessments, consultation with stakeholders and undertaking assessments in forest areas that may contain high conservation values. High Conservation Value (HCV) are areas that possess one or more of the following attributes:

HCV1. Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia).
HCV2. Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.
HCV3. Forest areas that are in or contain rare, threatened or endangered ecosystems
HCV4. Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).
HCV5. Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health).
HCV6. Forest areas critical to local communities‟ traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

NZF has commissioned an independent ecologist to determine the presence of HCV's being present in Te Wera. There is conflicting information from the previous forest manager and the ecological survey previously done in 2017.
Due to availability for independent qualified ecologists, this survey will occur in October 2022.

34. Indigenous Biodiversity

Within the forest NZF & CFGCNZ actively consulted with DOC, Taranaki Regional Council and a qualified Ecologist for the management, restoration and conservation of Native areas which is detailed in the Te Wera management areas for HCNZ. Identification of high biodiversity values are determined by analysis of the following criteria:

- They contain rare, endangered or threatened ecosystems.
- They contain biodiversity values that are globally, nationally or regionally significant as described by the NZ National Policy Statement on Biodiversity.
- The high biodiversity values are either viable populations or ecosystems.
- Are crucial to the survival of category one endangered species.

35. Significant Natural Resources

Significant natural resources within the forest estate are identified through the relevant regulatory authority plan as either a municipal water supply catchments or as critical for erosion control.

36. Community and Cultural Value

Areas of high community or cultural value are identified as having the either of the following characteristics:

- Having high archaeological significance that is of national or regional significance.
- Having community values or significance that is essential to the identity of the wider community in which it exists.

While HCV are determined through this process the identification and management of FSC HCV also includes engagement.

37. Stakeholder Engagement

Should new areas be identified, or reviews of plans undertaken, NZF engages and where relevant inspects these areas with stakeholders (such as DOC, iwi and local experts) to determine if the identified values meet the FSC definition of HCV.

The following steps shall be taken.

- stakeholders with interests in High Conservation Values will be invited to participate in consultation via email or phone with sufficient notice;
- records of these invitations and subsequent consultation will be maintained in a stakeholder engagement register.
- the consultation process will be open to parties claiming an interest in or affected by the implementation of this plan.
- all identified stakeholders will be provided access to sufficient information; and
- Stakeholders will be provided copies of the final plan.
- NZF will use the discussions with these stakeholders to develop management and monitoring procedures for any areas that are agreed to have HCV.

38. Management objectives

To maintain and where possible enhance the viability of threatened species populations that occur within the FMU.

Threats to the High Conservation Values

- Loss of habitat due to operational activity.
- Introduction of weeds, diseases and pests.

39. Management Strategies

- In order to achieve sustainable forest management goals, forest operations comply with the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017.
- Operations that have the greatest potential to affect the environment, such as Harvesting, earthworks, quarrying and stream crossings, require detailed management plans for managing environmental risks and preventing damage to native forests.
- Undertake training and awareness of staff in the identification and management of threatened species. 30

- Consultation with the Department of Conservation, Ecologist and local council, as to best undertake restoration operations where required.
- Ensure plantation operational activities do not impact on natural forest or other non-productive areas within the FMU.
- Undertake active management works e.g., wilding, weed and pest control, as required and identified through monitoring activities.
- Continue to undertake threatened species management in Underwood Farms, in consultation with relevant authorities and experts.
- Implement measures to ensure protection of HCV areas (Precautionary approach, setbacks, etc.), where plantation harvesting or management activities are undertaken in close proximity.
- Protecting biodiversity values, retention of natural forest across the landscape; retention of streamside reserves; management of risks from weeds and diseases.
- Comply with plantation operational procedures and identified thresholds, within the Environmental Manual.
- Where applicable and appropriate develop site specific Management Plans for HCV sites.

40. Other Conservation Reserve Areas

Managing conservation areas (natural areas or reserves) is a key component of FSC certification which is primarily undertaken through the GIS & EMS. FSC certification requires a minimum of 10% of the management unit to be set aside as conservation areas, currently this is at 36.2%, in the Matemateaonga and North Taranaki Ecological Districts. In general reserve management is relatively simple where pest control and wilding removal produce the best biodiversity results. Pest control is mostly achieved through hunting and trapping. Wilding control will be undertaken within identified reserves following the formal ecological survey in late 2022

41. Monitoring

Monitoring is undertaken by NZ Forestry or at times by engaging an expert. The method of monitoring will depend on the high conservation values and the outcome of consultation with stakeholders. Monitoring is undertaken by visual inspection, for degradation, pest damage, unauthorised activity. 5 yearly full assessments of the HCV or potential HCV will be carried out to determine the likely presence and distribution of rare, threatened and endangered species. Any areas that are covenanted will also be monitored by the QEII trust every two years.

- Complete monitoring activities throughout the FMU in accordance with NZ Forestry's commitments to managing wilding pines and weed species in HCVF
- Monitor operations to ensure compliance with the requirements specified in Harvest Management Plan or Earthworks Management plan. Monitoring results are recorded through the I-auditor App.
- Where species change category through legislation, NZ Forestry will ensure any impacts on the FMU are considered.
- Harvesting and Earthworks are subject to external checks by the Regional Council to demonstrate compliance. Auditing results will be included in Annual Monitoring Report.
- Effective monitoring, management, and research of HCVs is collated and summarised annually within the HCV Monitoring Report.

42. Responsibility
    - Harvest forester
    - Regional Manager

43. Non-production benefits from the forest

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

- Use by apiarists – Taranaki Manuka is prized by apiarists for its late flowering season and high productivity
- Hunting
- Access to public walkways.

At present, such requests for access are quite low and are managed through a permitting system.

Public usage of the Te Wera Forest, as organised groups and clubs, as commercial or non-commercial events or as individuals, is provided for subject to operational and safety constraints, landowner requirements, and Iwi controls in respect of existing customary rights and existing public access rights. Where other public use requests of Te Wera forest arise, the extent and conditions of these rights will be determined through consultation with stakeholders and the public.

44. Culturally and Historically Significant Sites

- Te Wera is located in the eastern Taranaki Hill country and has 16 identified Historical sites and in the event that a new site is found or for known sites in other forests under NZF management our approach to such sites or values is to:
- Protect historic sites and features in accordance with the Heritage New Zealand Pouhere Taonga Act 2014
- Known sites (specific and landscape level) are registered in our GIS system for recognition when planning is undertaken.
- Educate employees and contractors to follow best practices to prevent damage (particularly by earthworks) to archaeological sites.
- Consult with appropriate stakeholders, most critically iwi representatives and where necessary an archaeologist, to develop management options for the protection of significant archaeological sites before commencing operations.
- Delineate known sites in the forest by inserting painted marker posts on the site's perimeter and including in the forest wide GIS system. The system will flag the site to NZ Forestry staff when operations are being planned
- Train employees and contractors to identify and report newly discovered sites of significance.

45. Revisions

Upon the identification of any technological, scientific or any other benefit to the forest, the forest manager will

- Discuss the potential benefits or negative impacts with the wider NZF team
- Contact another FM who has dealt with the new technology to understand a peer review.
- Trial the new benefit on a sample of the forest
- If the benefit is found, revise the management plan and incorporate the new system into the management plan.