

Environmental Standards



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Introduction

What is this Environmental Standards Manual about?

This manual is about best environmental practices in forest management. By complying with its standards and rules you help Pan Pac Forests achieve its goals of:

- Ensuring our forestry practices are environmentally sustainable,
- Meeting or exceeding legal and regulatory requirements, and
- Continued Forest Stewardship Council® (FSC-C017103) certification.

Who should read, understand and comply with this Environmental Standards Manual?

This Environmental Standards Manual is organised into four parts as per the below table. While all staff, contractors and their employees should be familiar with the entire contents of this manual, the scope of each part is specific to either Pan Pac Forests staff, contractors or both.

These people	Shall adhere to	What it contains
Staff	Part 1	Describes how Pan Pac Forests staff shall manage forestry activities and how Pan Pac Forests implements its Environmental Policy and vision.
Contractors	Part 2	Prescribes how contractors shall carry out their operations.
Contractors and staff	Part 3	Sets out the minimum standards and best practices, which help protect Pan Pac Forests significant environmental harm.
Contractors and staff	Part 4	Appendices - supplementary information.

Note

These standards and rules do not apply to workers at the Pan Pac Mill site.

Definitions

Certain terms in this Environmental Standards Manual are given precise meanings as below.

Bank Full Channel Width	Means the distance across a river channel formed by the dominant channel-forming flow with a recurrence interval seldom outside a 1 to 2-year range (measure at the right angle to the channel flow).
Outstanding Natural Feature or Landscape	Means natural landscapes and features that: (a) Are identified in a regional policy statement, regional plan, or district plan as outstanding, and (b) Are identified in the policy statement or plan by their location, including a map, a schedule, or a description of the area.
Outstanding Fresh Water Body	Means a fresh water body that: (a) Is identified in a regional policy statement or regional plan as having outstanding values, including any ecological, landscape, recreational, or spiritual values; and (b) Is identified in the policy statement or plan by its location, including by a map, a schedule, or a description of the area.

Papakāinga	Means a traditional layout of residential accommodation where dwellings are erected to exclusively house members of a whanau, hapu, or iwi, on land that is owned by the whanau, hapu, or iwi, and is Māori land within the meaning section 4 of Te Ture Whenua Māori Act 1993 (including Māori customary land and Māori freehold land)
Riparian Zone	The margin and bank of a water body, including the area where direct interaction occurs between land and water systems, that is important for the management of water quality and ecological values.
Rules	Prescribe exactly how a given activity shall be carried out.
Sediment	Means solid material that: (a) Is mineral or is mineral and organic; and (b) Is in suspension, is being transported, or has been moved from the site of origin by air, water, gravity, or ice and has come to rest on the earth's surface, either above or below water.
Spoil	Means the by-product of excavations and earthworks.
Significant Natural Area	Means an area of significant indigenous vegetation or significant habitat of indigenous fauna that: (a) Is identified in a regional policy statement or a regional or district plan as significant, and (b) Is identified in the policy statement or plan, including a map, a schedule, or a description of the area or by using significant criteria.
Visual Amenity Landscape	Means a landscape or landscape feature that: (a) Is identified in a district plan as having visual amenity values, and (b) Is identified in the policy statement or plan by its location, including by a map, a schedule or a description of the area.
Water Body	Means fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer, or any part thereof, that is not located within the coastal marine area.
Water Conservation Order	Means an order made under section 214 of the RMA for any of the purposes set out in section 199 of the RMA and that imposes restrictions or prohibitions on the exercise of regional councils' powers under paragraphs (e) and (f) of section 30(1) of the RMA (as they relate to water) including, in particular, restrictions or prohibitions relating to: (a) The quantity, quality, rate of flow, or level of the water body; and (b) The maximum and minimum levels or flow or range of levels or flows, or the rate of change of levels or flows to be sought or permitted for the water body; and (c) The maximum allocation for abstraction or maximum contaminant loading consistent with the purposes of the order; and (d) The ranges of temperature and pressure in a water body.
Wetland	Includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions
Wilding Tree Risk Calculator	Located: http://www.mpi.govt.nz/growing-and-producing/forestry/overview/national-environmental-standards-for-plantation-forestry/wilding-tree-risk-calculator/

Abbreviations

The following abbreviations are used in this Environmental Standards Manual:

CHBDC	Central Hawke's Bay District Council
DOC	Department of Conservation
ESC	Erosion Susceptibility Classification
FSC®	Forest Stewardship Council® (FSC-C017103)
HBRC	Hawke's Bay Regional Council
HDC	Hastings District Council
NESCF	National Environmental Standard for Commercial Forestry
NPSFM	National Policy Statement for Freshwater Management 2020
NZTA	New Zealand Transport Association
MPI	Ministry of Primary Industries
PRFO	Principal Rural Fire Officer
POAC	Post Operation Assessment Checklist
WDC	Wairoa District Council
WTRC	Wilding Tree Risk Calculator

Background

Pan Pac Forests manages:

- Esk Forest,
- Gwavas Forest,
- Kaweka Forest,
- Mohaka Forest,
- Tangoio Forest, and
- The harvest and management of the re-establishment and tending of other landowners' forests.

1. PART 1: PLANNING AND MANAGING FORESTS OPERATIONS

1.1. Pan Pac Forest's Environmental Vision and Commitment

Our Vision	"Working together to protect the environment from harm"
Our Commitment	<p>To achieve our goal of long-term sustainable management of resources in the forests we manage, Pan Pac Forest's is committed to:</p> <ul style="list-style-type: none">• The Pan Pac Forest Products company Environmental Policy,• The principles and criteria of the Forest Stewardship Council®,• Complying with the requirements of the National Environmental Standards for Commercial Forestry,• Meeting or exceeding statutory and regulatory legislative requirements and any other relevant codes of practice or best practice guideline,• Consideration of the environmental and social effects of our activities,• Consideration of the effects of our activities on threatened species,• Promoting open communication with our stakeholders such as local authorities, the community, Tangata Whenua and interest groups,• Being proactive towards environmental management, research and training,• Maintaining consistency in environmental management over all our forests and woodlots,• Monitoring our activities, quantifying their effect, and seeking continuous improvement in our environmental performance.

1.2. Responsibilities

General responsibilities	<p>All staff, contractors and their employees are responsible for ensuring they carry out their duties and adhere to the requirements detailed in this Pan Pac Forests Environmental Standards Manual.</p> <p>Particular environmental responsibilities include the following:</p> <ul style="list-style-type: none">• Ensuring compliance with all applicable permits, regulations and legislation.• Understanding and adhering to all applicable prescriptions, harvest plans, earthworks management and sediment control plans, and quarry erosion and sediment control plans prior to commencing forest operations.• Ensuring induction and training programmes inform new workers about the importance of good environmental practices and the contents of this manual.• Monitoring operational practices and assessing completed operations to ensure that there are no adverse effects on the environment and the requirements detailed in these Environmental Standards and resource consent conditions are or have been adhered to.• Defining roles, responsibilities and authority for aspects of environmental performance, and delegating them to specific personnel.• Seeking continuous improvement in environmental performance, and allocating personnel to be responsible for particular aspects of it.• Ensuring contingency plans are in place for any significant environmental risks arising from operations.
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1.3. Consultation

Background

Pan Pac Forests addresses community concerns through culturally appropriate consultation with all relevant parties which may include:

- Regulatory authorities i.e. regional and district councils,
- Neighbours,
- DOC, Forest and Bird, Fish and Game,
- Māori/Iwi, and
- Other stakeholders and interest groups.

When to consult

Consultation is required prior to, during or after operations that:

- Alter water quality,
- Discharge a chemical contaminant e.g. herbicide spraying,
- Impact with noise,
- Alter adjacent landscapes,
- Affect access or cause traffic hazards,
- Cause air pollution e.g. fires, dust
- Impact on conservation values,
- Impact on Māori cultural values,
- Damage or destroy archaeological, cultural or archaeological sites, or
- Inhibit access to forest resources by local people and recreational users.

Māori

Both the Treaty of Waitangi and Resource Management Act 1991 recognise the special status of those with ancestral links to a locality.

Managers shall consider the need to consult with

Māori:

- In preparation for (or as a condition of) a resource consent, or
- Whenever operations may impact on Māori cultural values.

Note:

Ensure the appropriate Māori groups are consulted - generally anyone claiming mana whenua status shall be consulted. For resource consents, the council can advise whom to consult and what form the consultation should take.

Records

It is important to maintain written records of all consultations held. Minutes shall be kept and circulated to those at meetings.

Forms of consultation Pan Pac Forest's shall ensure that consultation is culturally appropriate to the target groups . **Examples of this include**

- An 'at place' hui with mana whenua to discuss gravel extraction,,
- Meeting a farmer in his woolshed (outside of lambing season) to discuss fencing,
- Meeting council staff in a meeting room at council offices,
- Going to a community group AGM in the evening.

1.4. Forest Access

Pan Pac encourages access to its forests for recreational use within operational and ownership constraints. A permit (issued by any member of the Forestry Team) is required but may be revoked if unplanned hazardous conditions occur.

Lighting of fires by visitors is prohibited.

1.5. Assessing Social and Environmental Impacts

General operations	<p>All Pan Pac's forestry activities are assessed for their environmental and social impacts in order that the company can act responsibly while carrying out its operations. Assessment is an integral part of:</p> <ul style="list-style-type: none">• 5-year planning,• Annual budgets,• Pre-operation planning and consent application• Monitoring of operations,• Post operation inspections,• Environmental audits, and• Yearly reviews.
New business ventures/ land acquisitions	<p>All new business ventures and property acquisitions/disposals are assessed for their environmental and social impacts. The relevant manager is responsible for:</p> <ul style="list-style-type: none">• Carrying out site assessments (before negotiations begin),• Documenting the environmental and social impacts,• Allocating responsibility for any issues that arise, and• Preparing the Sale and Purchase Agreement.

1.6. Environmental Risks

Background	<p>Pan Pac is required by law to avoid, remedy or mitigate the environmental risks of its operations.</p> <p>Operational workers shall manage environmental risks by engaging with the Environmental Advisor to assist with:</p> <ul style="list-style-type: none">• Understanding environmental values,• Managing the effects of forestry activities on environmental values,• Pre-operation assessment of values and risks,• Operational prescription and sign off,• Understanding and complying with harvest plans, earthworks management plans and sediment control plans,• Onsite monitoring of environmental practices, and• Post-operational assessment of environmental risks (POAC).
Existing Environmental Risk Assessments	<p>The tables located in <i>Appendix A</i> summarise the potential environmental risks of each Pan Pac Forests activity.</p>
Risk Matrix	<p>Risks assessments on environmental effects and hazards shall be undertaken using the environmental risk matrix located in <i>Appendix B</i>.</p>
Environmental Risk Register	<p>An Environmental Risk Register summarising the potential environmental risks, effects and required mitigation measures from Pan Pac Forests operations shall be developed and maintained.</p> <p>The Environmental Risk Register shall be developed and reviewed by Pan Pac management and worker representatives with experience and knowledge of the applicable operation(s) and required mitigation measures to manage the environmental effects or risks.</p> <p>The residual risk ratings from the Environmental Risk Register shall be reviewed and approved by the applicable Pan Pac Forest Manager as per the risk evaluation table located in <i>Appendix B</i>.</p>

1.7. General Planning Operational Requirements

National Environmental Standards for Commercial Forestry

Background

From 6 November 2023, all forestry activities in New Zealand shall comply with a nationally consistent set of regulations, Resource Management (National Environmental Standards for Commercial Forestry) Regulations 2023, known as NES in this manual.

The following core forestry activities can be permitted activities provided there are no significant environmental effects, the risks to the land are not too high and all permitted activity conditions can be achieved:

- Afforestation,
- Pruning and thinning to waste,
- Replanting,
- Mechanical land preparation,
- River crossings,
- Forest quarrying,
- Earthworks,
- Harvesting, and
- Other general activities such as slash traps, indigenous and non-indigenous vegetation clearance and fuel storage.

The NES applies to all forests greater than 1 hectare that have been planted for commercial purposes and harvest.

Potential Adverse Environmental Effects

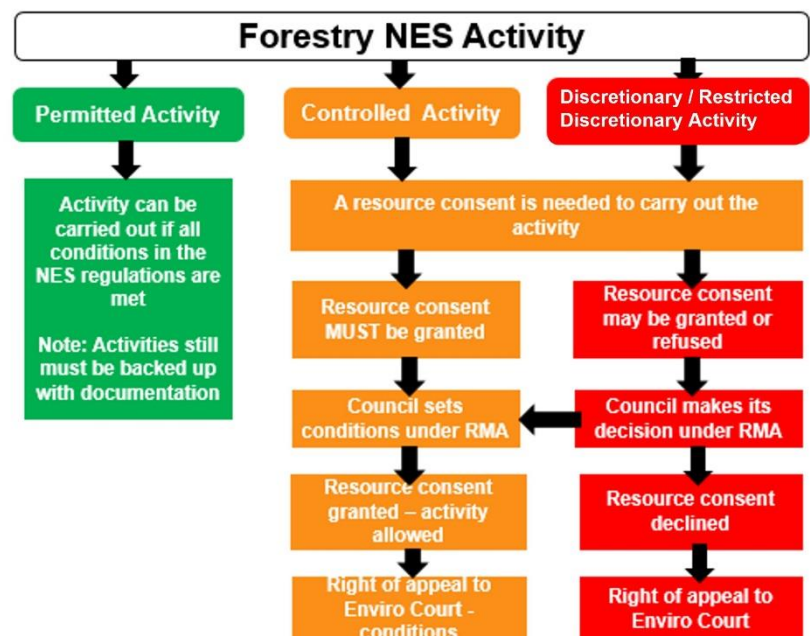
The NES recognises and requires Pan Pac Forests to manage the following potential adverse environmental effects from the various operational activities.

Activity	Potential Adverse Environmental Effects
Harvesting	<ul style="list-style-type: none">• Slash reaching water bodies.• Soil disturbance resulting in sedimentation in water bodies.• Soil erosion post-harvest.• Impact on rare, threatened or endangered (RTE) species• Damage to indigenous vegetation
Earthworks	<ul style="list-style-type: none">• Accelerated erosion due to slope instability and bare soil exposure.• Excessive sediment discharges into water bodies.• Damage to archaeological sites• Damage to indigenous vegetation
River Crossings	<ul style="list-style-type: none">• Sedimentation of a water body.• Restricting or preventing passage of fish, or disturbance to fish spawning.• Activating or accelerating bed erosion.• Accumulating debris around culvert openings.• Erosion, sedimentation or damming of structures.

Activity	Potential Adverse Environmental Effects
Replanting	<ul style="list-style-type: none"> • Landscape and amenity effects. • Wilding pine spread in vulnerable areas. • • Soil disturbance associated with mechanical land preparation (slash raking etc)
Afforestation	<ul style="list-style-type: none"> • Soil slip erosion caused by weight of trees on steep sites with shallow soils. • Landscape and amenity effects. • Wilding pine spread in vulnerable areas.

Types of NES Activities

The below diagram illustrates the types of NES activities that Pan Pac Forests shall manage and adhere to.



All Forestry NES activities will be subject to onsite compliance monitoring by the applicable councils.

Erosion Susceptibility Classification (ESC Zones)

New Zealand landscape is divided into the following categories under the NES regulations:

- Green (low risk),
- Yellow (moderate risk),
- Orange (high risk),
- Red (very high risk), and
- 8e (extreme risk).

Pan Pac Forests shall establish the ESC landscape classification for forestry activities as part of the planning processes.

Where landscapes are in the high (orange), very high (red) or 8e (red) Pan Pac Forests shall identify and manage the additional requirements which may include the activity only be able to be carried out under a resource consent.

NES Notification and Documentation Requirements

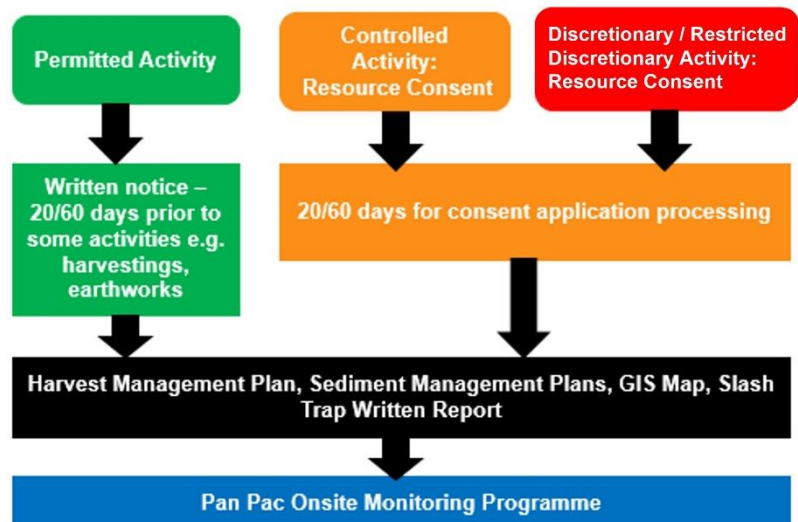
For harvesting (including production thinning), earthworks, forestry quarrying, slash traps, and permanent river crossings activities that can be carried out as a permitted activity, the Hawkes Bay Regional Council shall be provided with written notification within 20-60 working days of commencing the activity. For afforestation and replanting operations, notice must be given between 20 working days and 8 months prior to commencement.

For harvesting (including production thinning), and quarry activities that can be carried out as a permitted activity the applicable District Council shall be provided with written notification within 20-60 working days of commencing the activity. As for the Regional Council, for afforestation and replanting operations, notice must be given to the applicable District Council between 20 working days and 8 months prior to commencement.

Where a resource consent is required for any activity, the consent application shall be submitted to the applicable council at a minimum of 20 working days before the activity is planned to begin.

The below diagram summarises the notification and documentation requirements by type of NES activity.

Notification/Documentation Requirements



Notes:

For salvage harvesting or earthworks activities, written notice to the Hawkes Bay Regional Council and for harvesting activities the applicable district council is required within 2 days prior to commencement.

NES Planning Requirements

As part of the Pan Pac Forests planning and scheduling processes for the above core forestry plantation activities, the NES requirements shall be determined by referring to and working through the below applicable Pan Pac Forests NES Process Flow Chart with applicable Pan Pac Forests operational staff and / or the Environmental Advisor:

- FOR-PRO-HS26 River Crossings NES Process Flow Chart,
- FOR-PRO-HS02 Earthworks NES Process Flow Chart,
- FOR-PRO-HS03 Replanting NES Process Flow Chart,
- FOR-PRO-HS04 Pruning and Thinning to Waste NES Process Flow Chart,
- FOR-PRO-HS05 Afforestation NES Process Flow Chart,
- FOR-PRO-HS06 Mechanical Land Preparation NES Process Flow Chart,
- FOR-PRO-HS07 Slash Traps NES Process Flow Chart,
- FOR-PRO-HS08 Harvesting NES Process Flow Chart, and/or
- FOR-PRO-HS09 Forestry Quarrying NES Process Flow Chart.

Notes:

- A competent person who holds a tertiary qualification in silviculture and forest ecology and has at least 2 years' experience in the field of silviculture or a competent person who has at least 5 years' experience in silviculture that includes forest establishment may only use the Wilding Tree Risk Calculator where this is required to measure the spread of wilding trees.
- A wilding tree risk calculator score shall be calculated in accordance with the Wilding Tree Risk Guidelines, and provided to the relevant regional council and territorial authority at the same time as notice is given under regulation 10 of the NES, as well as
- an assessment of each element of wilding tree risk for each relevant area of forest and an explanation of how the assessments were made.
- Under the NES requirements, replanting shall occur within 5 years of harvesting.

1.8 Criteria for Replanting and Harvesting in ESC Red (Very High Risk of Erosion) Zone

Background

Establishing and maintaining "Production Protection Forests" on ESC red zone land types can provide a sustainable economic use of sensitive land for the land owner. Species for production protection forests are chosen for their ability to quickly, successfully and economically re-establish a protective canopy over the land and develop a substantial root biomass within a few years of planting.

The quickly establishing forests provide protection to the soil in four ways:

- Foliage intercepts rain and litter reduces splash erosion,
- Roots reinforce the tensile strength of the soil,
- Forest crop maintains a drier soil, allowing greater water storage in rainfall events, and
- Forest soils are lower compaction than pastoral, allowing greater infiltration.

When combined with low impact hauler based harvesting, carefully planned roading networks, strategic use of riparian strips and setbacks from waterways; Production Protection Forests are a sustainable use of this land class.

The Forest Manager is responsible for approving all replanting activities in the ESC red zone and the Forest Engineering Manager and Forests Operations Manager are responsible for approving all harvesting activities in an ESC red zone.

Due consideration shall be given to the actual environmental, health and safety, and economics risks. Where some or all of these criteria are not satisfied, the replanting area would be retired and protection forests promoted. In most cases, harvesting will be considered in an ESC red zone, due to the environmental risks associated with leaving standing trees exposed to the external environment.

Supporting this decision making for replanting and harvesting operations in the ESC red zones is the NES-CF standards and consenting requirements as per section 1.7.1 above.

1.9 Forestry Planning

Background

Forestry planning is gathering, analysing and reporting information in order to determine the best way to carry out forestry operations.

Key factors to consider include:

- Environments including impacts on landscape, ecological, community, recreational, cultural, archaeological and aesthetic values.
- Regulatory requirements such as National Environmental Standards for Plantation Forestry, and all points listed in schedule 3 of the NES
- Health and safety, and
- Productivity.

Note: A forestry plan comprises minimum operational requirements, environmental risks and required mitigation measures, a map, monitoring requirements, checklist and relevant notes.

Environmental Standards

Follow these standards when:

- Planning forestry operations so that they sustain or improve site productivity,
- Planning forestry operations to eliminate, isolate or minimise adverse environmental effects, and
- Obtaining consents or permits well before work commences.

Rules

Forest planners shall comply with the following rules.

Rule	
1	Ensure you use the forestry standard operating procedure, applicable NES process flow chart and new land checklist during planning.
2	<p>Follow forestry standard operating procedure including;</p> <ul style="list-style-type: none">• Check current resource consent/statutory requirements• Consider consultation with neighbours, DOC, Forest and Bird, Fish and Game, Iwi and other groups• Complete pre operational, operational, and post operational assessment checklists. <p>Note: Consents/permits shall be obtained before work commences.</p>
3	<p>Follow the applicable NES process flow chart to determine whether:</p> <ul style="list-style-type: none">• The activity can be carried out as a NES permitted activity and the monitoring programme requirements to ensure permitted activity conditions are adhered to,• The Wilding Risk Tree Calculator shall be applied, or• A consent is required, the notification period and monitoring programme requirements.
4	<p>Do not plan planting within:</p> <ul style="list-style-type: none">• 5 metres of a perennial river with a bank fill channel width of less than 3 metres or a wetland greater than 0.25 hectares,• 10 metres of a perennial river with a bank full channel width greater than 3 metres, lake greater than 0.25 hectares, outstanding fresh water body, water body subject to conservation order, or• 30 metres of a coastal marine area.

1.10 Earthworks and Harvest Planning

Background

Earthworks and harvest planning aims to maintain site productivity and identify (and minimise) likely environmental effects of operations. Key factors to consider include:

- Safety,
- The environment,
- Regulatory requirements such as National Environmental Standards for Commercial Forestry and sediment control measures,
- Value maximisation,
- Road access, and
- The impact of earthworks and harvest operations on the landscape, ecology, community, recreational, cultural, archaeological and aesthetic values.

Environmental Standards

Plan earthworks and harvesting processes to:

- Allocate the correct harvesting system to the terrain,
- Avoid poor deflection zones for cable harvesting, where possible,
- Avoid pulling across waterbodies unless this will lessen soil and/or vegetation disturbance,
- Minimise damage to native vegetation and riparian margins
- Consider clear fell size especially in sensitive catchments,
- Avoid unstable areas with earthworks,
- Minimise soil disturbance including sediment discharges into water bodies and loss of productive area,
- Incorporate restricted areas and hazards,
- Provide for the storage or removal of slash resulting from harvesting operations,

- Locate temporary crossings to minimise disturbance during installation and removal. Consideration shall be given to potential impact on aquatic life, risk of failure, or downstream damage during heavy rain events, and
- Obtain consents or permits well before work commences.

Rules Earthworks and harvest planners shall comply with the following rules.

Rule	
1	Use the forest road engineering and harvest planning guidelines and manuals as planning guides.
2	Follow the applicable NES process flow chart to determine whether: <ul style="list-style-type: none"> • The activity can be carried out as a NES permitted activity, the council notification requirements and the monitoring programme requirements to ensure permitted activity conditions are adhered to, • A earthworks management and sediment control plan and/or harvest plan is required, or • A consent is required, the notification period and monitoring programme requirements.
3	Develop harvest & earthworks management plans using the GEO Master templates. Notes: <ul style="list-style-type: none"> • For NES permitted activities, the council may request a copy of these 20-60 days prior to the activity starting, or • Where a consent is required, these shall be provided with the consent application.
4	Identify utilities and other restricted areas on the harvest plan map.
5	Do not plan construction or machine activity within: <ul style="list-style-type: none"> • 5 metres if a perennial river with a bank fill channel width of less than 3 metres or a wetland greater than 0.25 hectares, • 10 metres of a perennial river with a bank full channel width greater than 3 metres, lake greater than 0.25 hectares, outstanding fresh water body, water body subject to conservation order, or • 30 metres of a coastal marine area. Permitted Exceptions: Exceptions are stream crossings, stream cleaning, water supply points, – with Forest Engineering Manager’s approval
6	Check current resource consent and other statutory requirements.
7	Consider other resources requirements such as: <ul style="list-style-type: none"> • Operations Handbook, • Roding Handbook, • Forest Practice Guidelines, • Pan Pac Environmental Standards, • Threatened Species Management Plans, • Existing agreements with neighbours, and • Consultation with affected parties e.g. DOC, Iwi, neighbours.
8	Use a culvert sizing formula for all culverts in perennial streams

1.11 Environmental Auditing and Inspections

Background Pan Pac Forests operational teams shall routinely audit and inspect operations within its forests to check compliance with its Environmental Policy, Environmental Standards, NES permitted activity conditions, consent conditions and FSC® practices. Additionally, some streams may be monitored to assess possible effects on the environment.

Rules All NES plantation forestry activities shall be inspected and audited and all other forest operations should be inspected and audited to ensure compliance. The following rules represent minimum levels of monitoring.

Rule	
1	Contractors shall submit a POAC to the relevant Co-ordinator within five working days of completing an operation, and also with other monthly reports during extended operations.
2	At least 10% of all POAC's shall be audited by a Forestry/Roading Co-ordinator as appropriate.
3	Internal inspections and audits shall be carried out by Pan Pac operational staff to ensure operations meet NES and FSC® requirements. Note: External audits by FSC® approved auditors are carried out annually.

Note

POAC's, audits, inspections and details of remedial work are filed at Pan Pac Forests office.

1.12 Environmental Training

Background

Environmental training is important so staff, contractors and their employees can become familiar with statutory requirements, Pan Pac Forest requirements and operational best management practices.

Rules

Environmental requirements shall be part of Pan Pac Forests induction programme, and shall also be part of every contractor's induction programme.

Environmental training workshops will be held and facilitated by Pan Pac Forests where required.

Rule	
1	All staff, contractors and their employees that make environmental decisions shall: <ul style="list-style-type: none"> • Be familiar with the contents of this manual, • Understand the environmental requirements relevant to their work, • Attend a NES/ FSC® internal training workshop, and • Achieve that relevant NZQA unit standard as below within 12 months of commencing work for Pan Pac Forests.
2	Machine operators shall achieve the relevant NZQA unit standard as listed below within 3 months of starting work for Pan Pac Forests.

Minimum

The following are required.

Qualifications

Who	NZQA Unit Standard			
Pan Pac Operational Planning Staff	6963			17772
Harvesting Co-ordinators		6964		17772
Forestry Co-ordinators	6963			17772
Roading/ Roading contractor's Co-ordinators			6965	17772
Harvesting Contractors/Foremen		6964		17772
Forestry Contractors/Foremen				17772
Machine Operators				17772

Notes:

6963 is "Plan forestry operations to meet environmental requirements".

6964 is "Applying environmental management to harvesting trees".

6965 is "Applying environmental management to roading and earthworks".

17772 is "Demonstrate knowledge of environmental requirements in forest operations".

2. PART 2: CARRYING OUT FORESTRY OPERATIONS

2.1 Land Preparation for Planting

Background

Land preparing for planting includes slash raking, ripping, crushing, cultivation, drainage, creating firebreaks, burning, scrub cutting, over sowing and aerial spraying.

Standards for slash raking

Follow these guidelines.

- Use excavators as the preferred machine for land preparation.
- If mechanical land preparation cannot be carried out parallel to the contour of the land, sediment control measures shall be implemented to minimise sediment discharges into water bodies.
- Avoid mechanical land preparation on steep slopes and unstable soils, and using heavy machinery where it may damage streambeds and banks.
- Minimise displacing or compacting soil, duff and light slash on steep slopes or fragile soils.
- Take extra care and plan ahead before large-scale mechanical soil cultivation on slopes > 25 degrees.
- Arrange for over sowing, where appropriate, as soon as practicable after harvesting.
- Locate slash piles and minimise erosion and protect watercourses.

General rules

Ensure compliance with the below general rules for land preparation.

Rule	
1	Check permitted activity and resource consents condition requirements.
2	Ensure operations comply with consents, the specification, prescription and operational map.

Rules for spraying

Ensure compliance with the below rules for land preparation using spraying.

Rule	
1	<p>Do not spray:</p> <ul style="list-style-type: none"> • Within 20 horizontal metres of a stream with a width > 3m or specified in a district plan, • Within 15m horizontal distance of rivers specified in the regional and district plans, • Within 5 horizontal metres of permanent streams with a width < 3m, unless unavoidable, • Any other water e.g. water tables, unless unavoidable, • Riparian margins, • Within 20 horizontal metres of wetlands or lakes > 0.5ha, • Neighbour's properties (or allow spray drift or spray in waterways), or • Over buildings, people or property. <p>Notes:</p> <ul style="list-style-type: none"> • It is acceptable to spray up to wetland's margins (for wetland area 0.1-0.5ha), up to standing production forest and across dry watercourses. • Refer to the agrichemicals, biological agents and fertiliser section for further information on spraying.

Rules for slash raking

Ensure compliance with the below rules for land preparation using slash raking:

Rule	
1	Keep roads, tracks, water tables, fences, firebreaks, streams and dams free of slash (to avoid ponding or damage to streams, water tables and culverts).
2	Do not modify any wetland > 0.01ha without approval from the Forestry Manager.
3	Do not operate heavy machinery within: <ul style="list-style-type: none">• 5 metres of a perennial river with a bank fill channel width of less than 3 metres or a wetland greater than 0.25 hectares, or• 10 metres of a perennial river with a bank full channel width greater than 3 metres, lake greater than 0.25 hectares, outstanding fresh water body, water body subject to conservation order without approval from the Forestry/Roading Co-ordinator and obtaining a resource consent.

Rules for burning

Ensure compliance with the below rules for land preparation using burning:

Rule	
1	Do not carry out a controlled burn without a burn plan approved by Bay Forest Rural Fire District PRFO. The plan shall minimise environmental effects and comply with: <ul style="list-style-type: none">• Bay Forests Rural Fire District Fire Plan,• Resource Management Act 1991,• Forest and Rural Fires Act 1977,• Fire and Emergency New Zealand Act 2017, and• HBRC Regional Plan.

2.2 Establishment

Background

Establishment includes all operations during the first few years that promote successful crop establishment, e.g. planting, manual releasing, blanking and regeneration treatments.

Environmental Standards

The following should not be planted:

- Unproductive sites.
- Sites that cannot be managed safely.
- Sites that have the potential for significant environmental effects on the environment.
- Sites not permitted under the NES requirements.
- Sites where planting is restricted by a Council plan rule or by another regulation or law.

Rules

Ensure compliance with the below rules for establishment.

Rule	
1	Ensure compliance with the specification, prescription management plan and operational map.
2	Ensure setback distances meet Pan Pac specifications regarding boundaries, roads, tracks, power lines and permanently flowing streams.
3	<p>Do not plant within:</p> <ul style="list-style-type: none"> • 10 horizontal metres of a stream or perennial river with a width > 3m or as specified in a district plan, • 5 metres of a wetland > 0.25ha, • Within 15 metres horizontal distance of rivers specified in the regional and district plans, • Within 5 horizontal metres of permanent streams or perennial rivers with a width < 3m, • Within 10 metres of a lake > 0.25 hectare, outstanding fresh water body or water body subject to conservation order, • Within 30 metres of a coastal marine area, • Within 10 metres if a significant natural area, • Within 30 metres of the boundary of land zoned in a district plan as a pakakainga or an urban area, • Riparian margins, outstanding natural feature or landscape, • Within 30 horizontal metres of power lines on prevailing upwind side and 15 horizontal metres downwind, • Within 2 horizontal metres of in-forest water tables and road edge, or • Within the specified distances of neighbours (differ between council plans). <p>Note Set back distances from stands that will be harvested shortly are on a case-by-case basis.</p>
4	<p>For afforestation activities only, do not plant:</p> <ul style="list-style-type: none"> • Within 10 metres of the boundary of an adjoining property not owned or managed by Pan Pac or the land it is located on, • Within 40 metres of a dwelling located on the property where establishment will occur or a distance where the forest species when fully grown will not shade a dwelling between 10am to 2pm on the shortest day of the year (except where topography already causes shading) • Within a visual amenity landscape if rules in the relevant plan restrict plantation forestry activities within that landscape, and • Within the specified distances of public roads (as per NES requirements and council plans).
5	<p>Plant up to:</p> <ul style="list-style-type: none"> • Adjoining plantation forest not at clear fell age, • Riparian and native forest margins, and • Dry water courses or those flowing for part of the year.
6	Remove temporary stream crossings as soon as operations are complete.
7	Do not plant any genetically engineered tree stock.

POAC's

A POAC shall be submitted to the Forestry Co-ordinator on completing operations (and also with other monthly reports during extended operations)..

2.3 Silvicultural Operations

Background	Silviculture includes activities such as thinning to waste, and pruning.
Environmental Standards	Where practicable keep roads, tracks, water tables, fences, firebreaks, permanent flowing streams and dams free of slash (to avoid ponding or damage to streams, water tables and culverts).
Rules	Ensure compliance with the below rules during silvicultural operations.

Rule	
1	Ensure compliance with the specification, prescription and operational map.
2	Thinning and pruning slash should be placed behind the first row of trees on road and track edges. Note: Slash shall not be deposited into a water body, onto land that would be covered in a 1 in 20-year flood event or into coastal water.

2.4 Agrichemicals, Biological Agents and Fertiliser

Background	<p>Agrichemicals include herbicides to control weeds, fungicides to control Dothistroma, and pesticides for possums, rabbits and hares.</p> <p>Control can also be achieved with biological control agents (e.g. gorse spider mite).</p> <p>Fertiliser may be applied to areas deficient in essential mineral nutrients.</p>
Environmental Standards	<p>Follow these requirements:</p> <ul style="list-style-type: none">• Minimise agrichemical use, and where possible select control methods with an acceptable impact on non-target species.• Exercise care when handling, storing and transporting agrichemicals and use, handle, store and transport in accordance with the agrichemical safety data sheet.• Locate agrichemical mixing sites to minimise adverse effects on streams, reserves, neighbours, restricted sites, non-target vegetation and any site-specific hazards (e.g. spring fed water tables and cut-outs leading to sensitive areas).
Qualifications	Only personnel qualified as follows may apply agrichemicals.

For	Required qualification
Manual application	<p>A current Growsafe Introductory Course or FIRS module 2.3 including unit standards 1236, 1237 and 1239.</p> <p>Notes:</p> <ul style="list-style-type: none">• A qualified person shall supervise personnel undergoing training.• Supervisors / mixers shall hold an Applied Growsafe Certificate.
Aerial application	Hold a National Certificate in Agrichemical Application (aerial), and hold or be under training for a Pilots Chemical Rating issued by Civil Aviation.
Roadside spraying	Current Growsafe Registered Chemical Applicators Certificate.
Restricted pesticides	Relevant license or registration certificate.

Rules before operations

Ensure compliance with the below rules before operations commence.

Rule	
1	Check that operations will comply with: <ul style="list-style-type: none">• Resource consents and other relevant legislation,• Pan Pac's specifications and prescriptions,• Health and Safety at Work (Hazardous Substances) Regulations 2017,• NZS 8409:2021 Code of Practice for the Management of Agrichemicals,• Forest Operations Handbook, and• The agrichemicals manufacturer's specifications and safety data sheet.
2	Ensure there is a spill kit, and that all workers know how to use it. Note: Safety Data Sheets shall be available at storage and work sites.
3	Give notice of aerial applications by using road signage.

Rules during operations

Ensure compliance with the below rules during operations.

Rule	
1	Ensure compliance with the specification, prescription and operational map.
2	Wear protective clothing as prescribed in the safety data sheet and ensure equipment is fit for purpose and well maintained.
3	Mix only enough herbicide for immediate use.
4	Carry spill kits (min 50 litres) when transporting and using herbicides.
5	Do not spray: <ul style="list-style-type: none">• Within 20 horizontal metres of a stream with a width > 3m or specified in a district plan,• Within 15m horizontal distance of rivers specified in the regional and district plans,• Within 5 horizontal metres of permanent streams with a width < 3m, unless unavoidable,• Any other water e.g. water tables, unless unavoidable,• Riparian margins,• Within 20 horizontal metres of wetlands or lakes > 0.5ha,• Neighbour's properties (or allow spray drift or spray in waterways), or• Over buildings, people or property. Note: It is acceptable to spray up to a wetland's margins (for wetland area 0.1-0.5ha), up to standing production forest and across dry watercourses
6	Take all reasonable care when aerial spraying to prevent discharge within 20m of a permanently flowing stream, or a waterbody > 100m ² .
7	Contain and clean up any spills immediately, and notify a Co-ordinator.
8	Do not wash equipment where run-off can enter a waterbody, and ensure wash water remains within the treated area.
9	Provide Pan Pac with a daily record of herbicide usage and areas treated.

Rules on completion

Ensure compliance with the below rules when completing operations.

Rule	
1	Provide the Forestry Co-ordinator with maps showing treated areas and quantities of herbicide used. Note: Records of agrichemical use shall be kept in the stand records at Pan Pac's Office.
2	Return empty herbicide containers to the Forestry Co-ordinator (ensure no contamination from other herbicides or dye so that they can be recycled).
3	Triple rinse all herbicide containers that can be returned to the manufacturer.

2.5 Earthworks

Background

Earthworks include the construction/maintenance of roads, landings, installing deadmen, firebreaks tracks and stream crossings.

Earthworks are potentially a major source of sediment in waterways.

Environmental Standards

Follow the following requirements for earthworks:

- Plan earthworks to avoid unstable areas, and to minimise environmental impact.
- Install runoff control structures during construction.
- Avoid large side casts, and bench or end haul if side cast may have significant environmental effect.
- Compact unstable soil.
- Use cut/fill batters appropriate for the soil type - from vertical cut batters in solid rock to gently sloping ones where necessary.
- Apply metal to new roading as soon as practicable to reduce erosion.
- Place topsoil where it can be re-used if rehabilitation is planned.
- Avoid unnecessary soil disturbance, and only work in suitable soil and weather conditions.
- Avoid excessive sediment discharges into waterways.
- Oversow sensitive new earthworks with grass seed to reduce erosion.

Note:

The Pan Pac Roading Handbook and Forest Practice Guide requirements shall be used for road and landing construction.

Standards for water control

Minimise erosion by effective water control, e.g.

- Ensure adequate culvert sizing, spacing and location.
- Cut-off water over stable ground and flume off fill slopes.
- Filter runoff through vegetation or slash.
- Avoid ponding, flood scour and soil in watercourses.
- Use sediment traps in sensitive areas.
- Divert water away from restricted areas.

Rules - Operations

Rule	
1	Check permitted activity and resource consents condition requirements.
2	Ensure operations comply with provisions on the prescription, earthworks management and sediment control plan, operational maps, the Roading Handbook and Forest Practice Guides.
3	No earthworks within: <ul style="list-style-type: none">• 5 metres if a perennial river with a bank fill channel width of less than 3 metres or a wetland greater than 0.25 hectares,• 10 metres of a perennial river with a bank full channel width greater than 3 metres, lake greater than 0.25 hectares, outstanding fresh water body, water body subject to conservation order, or• 30 metres of a coastal marine area.

	Permitted Exceptions: Exceptions are stream crossings, water supply sites or where constraints such as rock bluffs leave no alternative. Forest Engineering shall approve any permitted exceptions.
4	Ensure permanent stream crossings have culverts, fords or bridges, and that where fish are present crossings are constructed to allow fish passage. Note: Bridges and major retaining structures shall be designed (and their construction certified) by a registered civil engineer.
5	Keep landings at least 50m from a waterbody, unless approved by Forest Engineering.
6	Temporary crossings shall not be constructed without approval from the Engineering/Harvesting Co-ordinator.
7	Do not place soil and debris in an area where it could enter a waterbody without approval from the Engineering/Harvesting Co-ordinator.
8	Fill shall contain no more than 5% (by volume) of vegetation and wood.
9	Spoil shall not be deposited: <ul style="list-style-type: none"> • Where it may cause failure of the deposited material or the underlying land, • Over slash or woody vegetation, • Into a water body, coastal water, or significant natural area, or • Onto land in circumstances that may result in the spoil or sediment entering water.
10	Carry out rehabilitation as soon as practicable after operations have been completed. All disturbed soil shall be stabilised and contained.
11	Storm water, water run-off and sediment control measures shall be installed and maintained.

**Rules -
Ongoing inspections**

Rule	
1	The principal Roading Contractor's staff shall inspect new roads and assess maintenance requirements within a month of completing operations.
2	A Forestry Co-ordinator shall inspect existing roads and drainage control structures at least annually or after a storm event.
3	Bridges shall be inspected annually by the Roading Co-ordinator, and maintained as necessary.
4	After a storm, the Forestry/Roading Co-ordinator shall: Inspect "problem" culverts/water tables and arrange general infrastructure maintenance.

**Rules - on
Completion**

Rule	
1	Remove temporary stream crossings immediately on completion of operations (unless needed for re-establishment).
2	Check the earthworks management plan and/or harvest plan and prescription to see if machinery needs washing down before being shifted between forests or from infested to non-infested areas.

POAC's	A POAC shall be submitted to the Roding Co-ordinator on completing operations (and also with other monthly reports during extended operations).
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2.6 Quarries, Metal Stockpiles and River Extraction

Background	Roding aggregate includes material from quarries, metal stockpiles, borrow pits and river extraction sites.
Environmental Standards	<p>Follow these requirements:</p> <ul style="list-style-type: none"> • Use effective water control to drain and protect quarries, e.g. direct water over stable ground and flume away from fill slopes. • Inspect metal sources regularly for weeds (inform Forestry Co-ordinator if weed control is needed to minimise spread).
Rules	Ensure compliance with the below rules before operations commence.

Rule	
1	Check permitted activity and resource consents condition requirements.
2	<p>Ensure operations comply with the provisions of:</p> <ul style="list-style-type: none"> • Consents/permits, • Quarry erosion and sediment control management plan, • Mining regulations, and • NZ Forest Road Engineering Manual.
3	<p>No quarrying within:</p> <ul style="list-style-type: none"> • 5 metres if a perennial river with a bank fill channel width of less than 3 metres or a wetland greater than 0.25 hectares, • 10 metres of a perennial river with a bank full channel width greater than 3 metres, lake greater than 0.25 hectares, outstanding fresh water body, water body subject to conservation order, or • 30 metres of a coastal marine area. <p>Permitted Exceptions: The Manager Forest Engineering shall approve any permitted exceptions.</p>
4	<p>Excavated overburden shall not be deposited:</p> <ul style="list-style-type: none"> • Where it may cause failure of the deposited material or the underlying land, • Over slash or woody vegetation, • Into a water body, coastal water, or significant natural area, • Onto land which may result in sediment entering water, or • Within 20 metres of an adjoining property not owned or managed by Pan Pac on land where the forestry quarry is located on
5	Overburden and exposed spoil generated from quarrying activities shall be stabilised to prevent soil erosion and sediment export.
6	All disturbed soil shall be stabilised or contained.
7	Storm water, water run-off and sediment control measures shall be installed and maintained.

2.7. Harvesting Operations

Background	Harvesting involves felling, extracting, processing and stockpiling, and also includes roadline salvage and production thinning operations. Harvesting is potentially a major source of sediment in waterways.
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Environmental Standards

For harvesting operations:

- Minimise tracking to reduce earthworks, soil compaction and potential erosion.
- Place topsoil where it can be re-used if rehabilitation of tracks is planned.
- Minimise slash and sediment reaching water bodies.

Requirements for waterbodies

Follow these requirements concerning waterbodies.

- Minimise the impact of hauler operations on waterbodies (and other sensitive sites) by using maximum practical suspension of logs.
- Fell trees away from waterbodies where practicable. If not:
 - Fell tree across the waterway so as to avoid breakage.
 - Leave untrimmed, and do not crosscut head if it could enter a waterway.
 - Extract so as to minimise disturbance of soil, stream margins and streamside vegetation.
 - Leave debris (including wind throw) occurring naturally in a waterbody unless it could lead to unacceptable environmental impact.

Rules during operations

Ensure compliance with the below rules during operations:

Rule	
1	Check permitted activity and resource consents condition requirements.
2	Ensure operations comply with provisions of consents/permits, prescription, harvesting management plan, and operational maps.
3	Get approval to make changes to harvesting plans before starting work. These shall be approved by the Harvesting Co-ordinator.
4	Do not track in designated non-tracking areas including those planned for cable harvesting, without approval.
5	Ensure harvesting debris/earthwork material is placed in a stable position, and do not locate permanent slash heaps where they may cause slumping or landing collapse.
6	Harvesting contractors are responsible for maintaining water control structures affected by their operations e.g. water tables, culverts and cut-outs.
7	Do not operate heavy machinery within: <ul style="list-style-type: none">• 5 metres if a perennial river with a bank fill channel width of less than 3 metres or a wetland greater than 0.25 hectares,• 10 metres of a perennial river with a bank full channel width greater than 3 metres, lake greater than 0.25 hectares, outstanding fresh water body, water body subject to conservation order, or• 30 metres of a coastal marine area without approval from a Harvesting Coordinator.
8	Do not fell trees into restricted sites or indigenous forest.

Rules on completion Ensure compliance with the below rules when completing operations:

Rule	
1	Install temporary water control if leaving a site for more than 5 working days e.g. for landings and tracks.
2	Any slash/debris retrieval from waterbodies should be completed as soon as practicable during, or immediately after, harvesting operations.
3	Remove temporary stream crossings immediately after operations (unless needed for re-establishment).
4	If required in the prescription, ensure machinery is washed down (to reduce spreading weeds/diseases) before being shifted between forests or from infested to non-infested areas.
5	Remove all rubbish from the forest as soon as practicable, and dispose of waste in a legal and environmentally acceptable way.
6	The Principal Roding contractor is require to carry out rehabilitation of landings, roads and tracks plans as instructed by the Roding Co-ordinator.

POAC's

A POAC shall be submitted to the Harvesting Co-ordinator on completing operations (and also with other monthly reports during extended operations).

2.8 Environmental Incidents and Response

Background

All environmental incidents shall be:

- Reported to the applicable Forests Coordinators immediately.
- Reported and investigated on an Incident Report and forwarded to the Pan Pac Forests.
- Recorded in the Pan Pac Forests incident database
- Investigated in accordance with the incident matrix located in the Pan Pac Operations Manual.
- Have recommendations, corrective and preventative actions signed-off by Pan Pac management.

Spills

In the event of a spill of hazardous materials, take the following immediate action.

Action	
1	Stop the operation, and ensure the health and safety of workers.
2	Call on the <i>Ops Mill Pan Pac Dispatch Channel</i> or the appropriate Pan Pac Channel, if a person has sustained any injuries.
3	Do not smoke, and avoid sparks from ignition/exhaust systems.
4	Stop/contain spill using a spill kit or soil (refer to hazardous material Safety Data Sheets).
5	Notify a Pan Pac Forests Operational Manager immediately after steps 1-4.

Protected sites

In the event of damage to a protected site, take the following immediate action.

Action	
1	Stop the operation and mark the area at risk.
2	Inform co-workers and a Pan Pac Operational Manager.
3	Do not work in the risk area (stay 20m from an archaeological site).

Non-compliance In the event of any form of non-compliance, take the following immediate action e.g. spray drift.

Action	
1	Take remedial action (unless it will worsen the situation) if safe to do so.
2	Notify a Pan Pac Forests Operational Manager immediately after step 1.

Significant effect In the event that any kind of significant environmental effect has occurred, take the following immediate action.

Action	
1	Take remedial action (unless it will worsen the situation) if safe to do so.
2	Notify a Pan Pac Operational Manager immediately after step 1.

3. PART 3: STANDARDS TO PROTECT THE ENVIRONMENT

3.1 Forest Grazing

Background Grazing sheep and cattle in a forest not only provides supplementary feed for neighbouring farms, it also reduces fire risk and controls weeds. However careful management, planning and monitoring is needed to minimise the environmental impacts of grazing.

Environmental Standards Minimise environmental impacts of grazing such as soil compaction, damage to stream banks, roads and water control structures by:

- Timing grazing to suit weather and soil conditions,
- Careful location of water troughs and gates, and
- Frequent monitoring.

Rules Ensure compliance with the below rules for forest grazing.

Rule	
1	Ensure compliance with NPS-FM stock exclusion rules, specification, prescription and operational map.
2	Ensure riparian margins around streams known to contain threatened fish species or trout are fenced prior to grazing.
3	Do not permit grazing in restricted areas without the approval of the Forestry Manager. Notes: <ul style="list-style-type: none"> • The Forestry Manager is responsible for checking restricted area records. • The relevant Forestry Co-ordinator is responsible for documenting restricted area requirements in the prescription, and discussing them with contractors.
4	Ensure temporary fencing put up for grazing is removed.
5	Ensure no fences are nailed to production forest trees.

3.2 Restricted Areas

Background Restricted areas include hazards, streams identified for stock exclusion in the NPS-FM, archaeological/cultural sites, protected native bush, designated covenants and reserves, utilities like power lines or water supply, forest trials, amenity plantings, picnic areas, and water monitoring sites.

Environmental Standards Mark restricted area boundaries to assist identification, where required (e.g. cultural sites by marking trees close by and leaving high stumps).

**Rules for
archaeological /
cultural sites**

Ensure compliance with the below rules for archaeological and cultural sites.

Rule	
1	<p>Pan Pac Forests Coordinators shall ensure:</p> <ul style="list-style-type: none">• Approval has been given by Heritage New Zealand before work to modify or destroy an archaeological site,• Consultation with tangata whenua has occurred for cultural sites, and• Restricted areas are marked on forest operation maps and listed in prescriptions.
2	<p>Contractors shall ensure:</p> <ul style="list-style-type: none">• Operations in a restricted area are carried out according to the prescription and operational map, and• No forest operation (including grazing) takes place on archaeological/cultural sites without approval from the relevant Pan Pac Forests Operational Manager <p>Note: Always bear in mind that there may be sites as yet unidentified.</p>
3	<p>Protect any feature you feel may be a possible archaeological/cultural site (this is a legal requirement) by:</p> <ul style="list-style-type: none">• Stopping the operation.• Marking the area at risk and inform co-workers.• Inform a Pan Pac Forests Operational Manager.• Do not work in the risk area (stay 20m from an archaeological site).

Rules for Other sites Ensure compliance with the below rules for other restricted sites.

Rule	
1	<p>Pan Pac Forests Coordinators shall ensure:</p> <ul style="list-style-type: none">• Approval has been given to work within a restricted area by relevant authority or Pan Pac Forests Operational Manager e.g. Waka Kotahi for felling alongside or adjacent highways or Forestry Manager for harvesting a forest trial, and• Restricted areas are marked on forest operation maps and listed in prescriptions.
2	<p>Contractors shall ensure:</p> <ul style="list-style-type: none">• Operations in a restricted area are carried out according to the prescription, harvest plan or earthworks management plan and operational map, and• Relevant Forestry Coordinators are notified of new sites e.g. significant natural hazards like tomos.

Further information A list of archaeological sites and native bush covenants is provided in *Appendix C*.

3.3 Clearing Native Vegetation

Background

Pan Pac's policy complies with the NZ Forest Accord.

Environmental Standards

Follow these requirements:

- Protect where possible single significant mature native trees such as rimu and totara, and
- Adhere to the NES requirements; refer to the applicable NES process flow charts for the applicable forestry activity.

Rules

Ensure compliance with the below rules for clearing native vegetation.

Rule	
1	Ensure operations are carried out according to the prescription, harvest or earthworks management plan and operational map.
2	Obtain written approval from the relevant Pan Pac Forests Operational Manager before felling any significant mature native tree, whether for roading, harvesting or any other reason. Note: Consultation with DOC may be required.
3	Protect any area > 5 hectares with a predominance of native trees of any size.
4	Protect areas of 1-5 hectares of native vegetation > 6m tall, where practicable. Disturbance needs approval from a Pan Pac Forests Operational Manager.
5	The Pan Pac General Manager Forests shall approve disposal of native logs.

Notes:

- Logs from native trees belong to Pan Pac. Sale of native logs requires a permit from MPI.
- Native trees are those that can grow larger than 30cm diameter. This includes kanuka, rimu, totara, matai, kahikatea but not vegetation such as manuka.

Guidance:

- All useable native logs are to be trucked to Pan Pac or to a safe location where they will not be cut into firewood.
- Logs in the first instance are to be offered to iwi who own the forest land.
- No logs are to be donated to individuals.

3.4 Threatened Species

Background

Threatened species include:

- Birds such as kiwi, kaka, parakeet, blue duck and NZ falcon.
- Plants such as kakabeak (a red flowering kowhai).
- Mammals such as long tailed bats.
- Fish such as kokopu and koaro.

Pan Pac Forests aims to protect threatened species in keeping with the Principles for Commercial Plantation Forest Management in New Zealand 1995 and NES requirements.

Environmental Standards

Follow these requirements:

- Avoid impact to threatened species wherever possible.
- Carry out operations outside the breeding season if possible.
- Protect indigenous bird nesting sites.

Rules

Ensure compliance with the below rules for threatened species.

Rule	
1	Known locations of threatened species should be clearly marked on all maps, prescriptions and other operational documents.
2	Protect threatened species. All indigenous bird nesting sites shall be protected by a 50m radius boundary. Note: A threatened species discovered within the Pan Pac forest estate shall be reported directly to a Pan Pac representative or noted on a POAC.
3	Only dog owners with kiwi aversion trained dogs will be permitted to enter the following forests or forest blocks; all of Kaweka including Te Kowhai, Glenfalls, Hukatara, Ohane, Pohokura and Putere.
4	Dog owners shall show proof of kiwi aversion training before a permit is written. Acceptable proof is the aversion training certificate or their name on an approved pig hunting club's aversion training register.
5	Stop work immediately if a threatened species is found during an operation and may be at risk. Report it to the appropriate Co-ordinator. Note: The appropriate Pan Pac Forests Operational Manager shall determine what action to take in consultation with DOC and other relevant organisations.

Note:

Refer to *Appendix C* (individual forest descriptions) to see which particular threatened species may be found in which forests.

3.5 Dams and Water Extraction Sites

Background

Water is stored in the forest so that it may be used for firefighting, spraying operations, vehicle washing, and other domestic purposes.

Environmental Standards

Follow these requirements:

- Plan and construct dams and water extraction sites so as to minimise adverse environmental effects, especially sediment movement.
- Take extreme care when using concentrated fire retardants and foams near waterways.

Rules

Ensure compliance with the below rules for dams and water extraction sites.

Rule	
1	Water supply sites shall be clearly identified on maps and in the forests.
2	Water storage, extraction and construction of dams shall be carried out according to rules in the HBRC Regional Plan, resource consent conditions and the emergency provisions of the Fire and Emergency New Zealand Act 2017 (FENZ).
3	Inspect dams and water extraction sites after construction and before the start of each fire season.
4	Carry out any maintenance required on dams and water extraction sites as soon as practicable.

3.6 Fuel Use, Transport and Storage

Background Petrol, diesel and oils can potentially cause significant harm to the environment.
Note: In some instances a special licence is required to transport and store fuels.

Environmental Requirements Follow these requirements:

- Take care when loading/unloading fuels to protect people, property and the environment.
- Consider both ease of servicing and how to contain a spill when re-fuelling or changing oil (use drip trays if appropriate).
- Recycle oils and fuel containers where practicable.
- Fuel shall never be stored and machinery shall never be refuelled in any location where fuel could enter a water body, or onto or into the bed of a water body.

General rules Ensure compliance with the below general rules for fuel:

Rule	
1	Machinery shall not be refuelled: <ul style="list-style-type: none">• Within 10 metres of a perennial river, wetland, lake, outstanding fresh water body, or water body subject to conservation order,• Within 30 metres of a coastal marine area,• On, over, or in the bed of a water body or coastal marine area, or• Within a water body or coastal marine area.
2	Contractors shall have a fuel spill response action plan in case of a fuel spill.
3	Ensure workers are adequately trained in fuel use, equipment maintenance, safe filling/pouring procedures, and the fuel spill response action plan.
4	Ensure machinery is maintained to use fuel efficiently and minimise the risk of leaks (e.g. from chafing hydraulic hoses).
5	Dispose of fuels and containers when no longer required in a legal and environmentally acceptable way.

Storage Ensure compliance with the below rules for storing fuel:

Rule	
1	Store containers in a safe, secure location, away from food, people, sensitive areas, waterways, and substances that may react with them such as chlorine, bleaches and fertilisers. (This also applies to refuelling).
2	Fuel shall not be stored: <ul style="list-style-type: none">• Within 10 metres of a perennial river, wetland, lake, outstanding fresh water body, or water body subject to conservation order,• Within 30 metres of a coastal marine area,• On, over, or in the bed of a water body or coastal marine area, or• Within a water body or coastal marine area.
3	Store only enough fuel on-site for an appropriate short-term supply. Use bunding and drip trays where necessary.
4	Ensure containers are of an approved standard, labelled correctly, and in good working order in accordance with the Health and Safety at Work (Hazardous Substances) Regulations 2017.
5	Do not smoke or permit open flames/spark sources within 15m of stored fuels or re-fuelling sites.

Transport

Ensure compliance with the below rules for transporting fuel:

Rule	
1	Do not transport fuels in the same vehicle stand as food or people.
2	Before transporting fuels ensure: <ul style="list-style-type: none">• The requirements of the Land Transport – Dangerous Goods Code 2005 are adhered to.• Containers are not damaged and do not leak.• Containers are segregated from substances that may react with fuel (e.g. chlorine, bleaches and fertilisers).• The load is secure.• Portable decanted containers are labelled with as a minimum, the product name, UN number and classification.• You have two 1.5kg dry powder or two 9-litre foam extinguishers.
3	Ensure you have a suitable spill kit if transporting large quantities.

Spills

Ensure compliance with the below rules in the event of a spill:

Rule	
1	Check for the health and safety of all persons.
2	Remove any sources of ignition.
3	Stop the source of leak/spill if safe to do so.
4	Isolate the spill from streams and water bodies, for example: <ul style="list-style-type: none">• Use a spill kit, if available.• Dig a trench to divert or contain it.• Cover the spill with loose dirt/sawdust.• Block entry into a stream.
5	Notify the Forestry Co-ordinator immediately if the spill has reached a water body.
6	Recover the spill from any areas where the water may flow when it rains.
7	Fill in an Incident Report and forward to Pan Pac Forests.

3.7 Rubbish Disposal

Background

All the following are considered to be examples of rubbish - used oil, oil containers, oil filters, grease cartridges, aerosol spray cans, anti-freeze, herbicide containers, plastic bags, cardboard boxes, steel ropes, air filters, machine parts, vehicles, newspapers, books, magazines, plastic, garden rubbish, glass bottles, planting boxes.

Rubbish and human waste is a major environmental concern. Pan Pac Forests encourages recycling wherever practicable.

Environmental Standards

- Always consider whether an item of rubbish can be recycled.
- Pan Pac Forests encourages having toilet facilities at operational worksites.

Rules

Ensure compliance with the below rules for disposing of rubbish.

Rule	
1	Remove all rubbish from the forest as soon as practicable, and dispose of it in a legal and environmentally acceptable way.
2	Only forestry camp rubbish may be disposed of in a Pan Pac rubbish pit. The Forestry Manager shall approve all pits. Note: A list of pits, their location and age is kept at Pan Pac's office.
3	Human waste is to be buried and located away from waterway and tracks.
4	Notify the Forestry Co-ordinator if you notice rubbish dumped in a forest.

3.8 Wilding Trees and Plant Pests

Background

Pan Pac aims to prevent wilding trees spreading from within its plantation boundaries into native forest areas, in keeping with the Principles for Commercial Plantation Forest Management in New Zealand 1995 and NES requirements.

Environmental Standards

Follow these requirements:

- Plant buffers with species such as radiata pine (which are not prone to spread) between natural areas and species prone to spread such as Douglas fir and contorta pine.
- Do not plant hilltops or forest boundaries upwind of sensitive land in tree species prone to spread.
- Control wilding trees with herbicide, hand pulling, or cutting at ground level with a pruner, slasher or chainsaw. If necessary collect cones.
- Inform the Forestry Co-ordinator of the location of any pest plants discovered in the forest.

Rules

Ensure compliance with the below rules for wilding trees and plant pests.

Rule	
1	Comply with the HBRC Pest Management Strategy and NES requirements.
2	Consult with adjacent landowners regarding control of wildings.

3.9 Slash Management

Background

Pan Pac aims to implement slash management practices to prevent the damage of downstream structures and slash entering water bodies.

Environmental Standards

Follow these requirements:

- Slash traps shall be designed to allow water to flow through freely and ensure that the slash trap doesn't dam a water body.
- Slash traps shall be positioned in an area that will allow machine access for clearing and maintenance.
- Slash traps shall be designed, located and maintained to provide the passage of fish.
- Contaminants will not be released into the water other than sediment.

Rules

Ensure compliance with the below rules for slash traps

Rule	
1	Using the FOR-FLO-E07 Slash Traps – NES Process Flow Chart determine whether the slash trap to be installed is a permitted activity which requires written notification to the HBRC or requires a resource consent prior to installation.
2	Establish a clearing and maintenance programme which shall as a minimum include: <ul style="list-style-type: none">• An inspection within 5 working days after a significant rainfall event in the upstream catchment that is likely to mobilise debris,• Debris is cleared at least 20 working days following a 1 in 20-year flood event, and• Ensuring the slash is maintained to avoid erosion of the river bed and maintained in a structurally sound and effective condition.
3	Elevated sediment levels in any river resulting from the construction, installation, maintenance or removal of a slash trap will not occur for more than 8 consecutive days

3.10 Dust, Noise and Vibration Management

Pan Pac requires all staff and contractors to take all reasonable steps to avoid excessive, offensive, noxious or dangerous dust, noise and vibration from generating outside Pan Pac Forests legal boundaries or managed woodlots.

Noise and vibration surveys will be completed where required to ensure that operations are being carried out in accordance with NES noise and vibration requirements.

4. Summary of Amendments

DATE	VERSION NO.	SUMMARY OF AMENDMENTS
16/03/18	4.0	Full review of document to include NES requirements. Amendments made to all sections. List of archaeological sites and plant pests removed from appendices.
10/07/19	5.0	Updated the FSC® trademark and reformatted the document.
23/08/19	5.1	Change sections 2.8 and 3.2 – archaeological site buffer from 30m to 20m; change section 3.5 to FENZ Act 2017; change throughout document reference of ‘historic’ to ‘archaeological’.
16/03/23	6.0	Review of document to update some referenced standards and guides
28/11/23	6.1	Review to update document to incorporate new NES-CF requirements and changes.
Unpublished	6.2	Full review with various process experts and stakeholders planned for February 2024

5. APPENDIX A – Summary of Potential Environmental Effects and Risks by Pan Pac Operation

Harvesting

Activity impacts on ...	Potential effect		
Soil/water			High
Air	Low		
Flora/fauna			High
Visual			High
Neighbours			High
Community			High
Forest recreation			High

Roading Earthworks

Activity impacts on ...	Potential effect		
Soil/water			High
Air	Low		
Flora/fauna			High
Visual			High
Neighbours		Moderate	
Community		Moderate	
Forest recreation		Moderate	

Quarries

Activity impacts on ...	Potential effect		
Soil/water			High
Air	Low		
Flora/fauna			High
Visual			High
Neighbours		Moderate	
Community	Low		
Forest recreation	Low		

Burnoffs/ Wild Fires

Activity impacts on ...	Potential effect		
Soil/water		Moderate	
Air			High
Flora/fauna			High
Visual			High
Neighbours			High
Community		Moderate	
Forest recreation		Moderate	

Aerial Spraying

Activity impacts on ...	Potential effect		
Soil/water		Moderate	
Air		Moderate	
Flora/fauna			High
Visual			High
Neighbours			High
Community		Moderate	
Forest recreation		Moderate	

Aerial Fertiliser

Activity impacts on ...	Potential effect		
Soil/water			High
Air	Low		
Flora/fauna	Low		
Visual	Low		
Neighbours	Low		
Community	Low		
Forest recreation	Low		

**Hand
Spraying**

Activity impacts on ...	Potential effect		
Soil/water	Low		
Air	Low		
Flora/fauna	Low		
Visual	Low		
Neighbours	Low		
Community	Low		
Forest recreation	Low		

Planting

Activity impacts on ...	Potential effect		
Soil/water	Low		
Air	Low		
Flora/fauna	Low		
Visual		Moderate	
Neighbours		Moderate	
Community		Moderate	
Forest recreation	Low		

Wilding pines

Activity impacts on ...	Potential effect		
Soil/water	Low		
Air	Low		
Flora/fauna		Moderate	
Visual		Moderate	
Neighbours			High
Community		Moderate	
Forest recreation	Low		

**Pest
Poisoning**

Activity impacts on ...	Potential effect		
Soil/water		Moderate	
Air	Low		
Flora/fauna			High
Visual	Low		
Neighbours			High
Community			High
Forest recreation			High

Grazing

Activity impacts on ...	Potential effect		
Soil/water		Moderate	
Air	Low		
Flora/fauna		Moderate	
Visual	Low		
Neighbours	Low		
Community	Low		
Forest recreation	Low		

Silviculture

Activity impacts on ...	Potential effect		
Soil/water	Low		
Air	Low		
Flora/fauna	Low		
Visual	Low		
Neighbours	Low		
Community	Low		
Forest recreation	Low		

Oversowing

Activity impacts on ...	Potential effect		
Soil/water	Low		
Air	Low		
Flora/fauna	Low		
Visual	Low		
Neighbours	Low		
Community	Low		
Forest recreation	Low		

**External
Cartage**

Activity impacts on ...	Potential effect		
Soil/water	Low		
Air	Low		
Flora/fauna	Low		
Visual	Low		
Neighbours			High
Community			High
Forest recreation		Moderate	

6. APPENDIX B – Environmental Risk Matrix

ENVIRONMENTAL RISK MATRIX					RISK PROBABILITY (LIKELIHOOD)				
					Highly Unlikely (May happen only in exceptional circumstances)	Unlikely (Could happen at some time)	Possible (Has occurred occasionally)	Likely (Will probably occur in most circumstances)	Almost Certain (Expected to occur in most circumstances)
	Environmental (E)	Reputation (R)	Financial Impact (FI)		E	D	C	B	A
RISK SEVERITY (CONSEQUENCE)	Significant Pollution Localised impact and recovery work. Medium term damage (1-3 months). Specialised third party assistance required for remediation.	Negative National Media Interest for up to 2 days. Major business disruption and impact on company operations & market supply. Significant public impact & concern. Very significant fines & prosecutions.	< \$20,000,000 > \$2,000,000	5	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
	Localised Pollution Localised impact and recovery work. Short term damage (<1 month). Specialised third party assistance required for remediation.	Negative National Media Interest for 1 day. Some disruption to supply. Major breach of regulation and significant prosecution. Community impact.	<\$2,000,000 >\$200,000	4	LOW	MEDIUM	HIGH	HIGH	EXTREME
	Pollution with some offsite impact Recovery/remediation work required, possible third party assistance required.	Some Negative Media. Heightened concern from local community - adverse local public attention. Interrupted supply for several hours. Serious breach of regulation with possible prosecution.	<\$200,000 >\$20,000	3	LOW	MEDIUM	HIGH	HIGH	HIGH
	Pollution with slight impact Recovery work managed on site - event contained on site.	Local Public Concern. Minor interruption to supply. Breach/non-compliance, minor legal involvement. Minimal internal disruption.	<\$20,000 >\$2,000	2	LOW	LOW	MEDIUM	MEDIUM	HIGH
	Minor Environmental Consequence No lasting effects	Local Public Complaints. Prosecution unlikely.	<\$2,000	1	LOW	LOW	LOW	MEDIUM	MEDIUM

RISK RATING (Post Controls)	RISK TREATMENT ACTIONS REQUIRED
EXTREME	Unacceptable level of risk – Do not attempt the task!
HIGH	Significant level of risk! Is it necessary we operate at this level risk? The General Manager Forests shall approve activity or task to commence in consultation with the Managing Directors. Management plan and environmental risk control plan shall be reviewed and approved by the General Manager Forests.
MEDIUM	The risk is tolerable provided the risk has been managed as low as reasonably practicable and the control measures have been reviewed and approved by the applicable Operations Manager responsible for the activity, task or work environment.
LOW	Risk is acceptable, no further treatment required, controls shall be monitored.

7. APPENDIX C ESK FOREST SUMMARY

Esk Forest

Description

Esk Forest is about 40 km north of Napier, and is made up of 6 blocks:

- Ohane,
- Hukatara,
- Pohokura,
- Glenfalls,
- North Block, and
- Te Pohue.

Feature	Description
Altitude	120m - 780m.
Average rainfall	1752mm, distributed throughout the year.
Topography	Mostly rolling to steep hill country.
Soils	Generally non-marine conglomerate.
Underlying rock	Mudstone, sandstone and siltstone.

Archaeological Sites

There are a number of archaeological sites in the Esk Forest. Refer to the GIS system for the latest list and location of known sites.

Covenants

Location	Description
Takere Road conservation covenant	26.6ha of native forest on the banks of Stoney Creek in the Ohane Block.
Paratu Road conservation covenant	8.6ha of native forest in the Ohane Block.

Threatened Birds

Species	Location
North Island brown kiwi (nocturnal, flightless).	<ul style="list-style-type: none">• Inhabits native/exotic forest, scrub and rough farmland.• Ohane block.• Hukatara block.• Glenfalls block.• Pohokura block.
New Zealand falcon	<ul style="list-style-type: none">• Inhabits bush and open country, particularly cutover blocks and bluff outcrops.• Esk Headquarters.• Glenfalls block.• Ohane block.• Hukatara block.• Pohokura block.
North Island kaka	<ul style="list-style-type: none">• Old podocarp and beech forest, mainly in the canopy.• Ohane block.• Hukatara block.

Blue duck	<ul style="list-style-type: none"> • Inhabits mountain streams with adjacent undisturbed forest. • Ohane block. • Hukatara block (Toropapa stream).
Kereru (New Zealand pigeon)	<ul style="list-style-type: none"> • Inhabits native/exotic forest with berries and flowers. • Widespread and common in all Pan Pac Forests.
Yellow-crowned parakeet (kakariki)	<ul style="list-style-type: none"> • Inhabits mature podocarp and beech forests, mainly in upper canopy. • Ohane block. • Hukatara block.

Threatened Mammals

Species	Location
Long tailed bat (nocturnal)	<p>Inhabits native/exotic forest scrub and farmland. Feeds in clearings and near streams/ponds. Roosts in hollow trees, logs, caves and outcrops.</p> <p>Low in numbers, ranging widely in all Pan Pac Forests.</p>

Threatened Plants

Species	Location
Kakabeak (Kowhai ngutukaka)	<p>Shrub 1-4m tall, glossy green leaves with scarlet beak shape flowers from September to December. Grows on disturbed sites (e.g. slips) and places protected from browsing (e.g. cliff faces)</p> <p>Pohokura block - Heidi's track (only know site).</p>

8. APPENDIX C - GWAVAS FOREST SUMMARY

Gwavas Forest

Description

Gwavas Forest is divided into two blocks by the Wakarara Range Duffs and Pharazyn.

The headquarters is on Gwavas Road, off State Highway 50, 73km south west of Napier.

Feature	Description
Altitude	300m - 800m.
Average rainfall	1262mm distributed throughout the year.
Topography	Rolling to steep hill country.
Soils	Sandy silts and sandy loams, very shallow on steep slopes.
Underlying rock	Non-marine gravels east of Headquarters Greywacke on the western foothills.

Archaeological/ Cultural Sites

There are a number of archaeological sites in the Gwavas Forest. Refer to the GIS system for the latest list and location of known sites.

Covenants

Location	Description
Poporangi Stream covenant (stands 54 and 77)	59.5ha of native forest and scrub in the Poporangi gorge.
Wakarara covenant (south of stand 68)	31.3ha of native forest and scrub running westwards from the banks of the Poporangi stream.

RAP's (HDC)

Location	Description
RAP 24 – "Poporangi Stream" (part within the Poporangi Conservation Covenant, Part between Stand 66 and 126.)	Podocarp – broadleaf – beech forest. No modification of vegetation without a resource consent.

**Significant nature
conservation value (CHBD)**

Location	Description
Area 6 – “Poporangi Stream” (Stand 16).	Podocarp – broadleaf – beech forest. No modification of vegetation without a resource consent.
Area 8 – Bush margin – Makaroro River”(DOC land adjacent to stands 301 and 304).	Natural forest. No modification of vegetation without a resource consent.

**Threatened
Birds**

Species	Location
New Zealand falcon	Inhabits bush and open country, particularly cutover blocks and bluff outcrops. Throughout Gwavas.
Blue duck	Inhabits mountain streams with adjacent undisturbed forest. Dutch Creek.
Kereru (New Zealand pigeon)	Inhabits native/exotic forest with berries and flowers Widespread and common in all Pan Pac Forests.

**Threatened
Mammals**

Species	Location
Long tailed bat (nocturnal)	Inhabits native/exotic forest scrub and farmland. Feeds in clearings and near streams/ponds. Roosts in hollow trees, logs, caves and outcrops. Low in numbers, ranging widely in all Pan Pac Forests.

9. APPENDIX C - KAWKEA FOREST SUMMARY

Kaweka Forest

Description

Kaweka Forest is divided into three block

- Kuripapango,
- Waiwhare, and
- The headquarters is on the Napier – Taihape Road, 60km west of Napier.

Feature	Description
Altitude	300m - 900m.
Average rainfall	1412mm, distributed throughout the year.
Topography	Generally rolling.
Soils	Miocene non-marine conglomerate and sands - shallow in many areas due to steep slopes or past wind erosion.
Underlying rock	Greywacke with siltstone, sandstone and limestone.

Archaeological/ Cultural Sites

There are a number of archaeological sites in the Kaweka Forest. Refer to the GIS system for the latest list and location of known sites.

Recommended Area for Protection

Location	Description
RAP 28 (stand 116)	Native bush in a gully alongside stand.
RAP 29 (stand 90)	Native bush in a gully on west, south and east boundaries of stand.

Threatened Birds

Species	Location
North Island brown kiwi (nocturnal, flightless).	Inhabits native/exotic forest, scrub and rough farmland western Kaweka forest.
New Zealand falcon	Inhabits bush and open country, particularly cutover blocks and bluff outcrops. Throughout Kaweka.
Kereru (New Zealand pigeon)	Inhabits native/exotic forest with berries and flowers widespread and common in all Pan Pac Forests.

Threatened Mammals

Species	Location
Long tailed bat (nocturnal)	Inhabits native/exotic forest scrub and farmland. Feeds in clearings and near streams/ponds. Roosts in hollow trees, logs, caves and outcrops. Ranges widely in all Pan Pac Forests, though not yet detected in Kaweka.

**Threatened
Fish**

Species	Location
Banded kokopu	Adults found in pools with large boulders, overhanging banks or logs. Also found as whitebait (juveniles) running up streams near the coast. Makereturetu stream Otakarara stream

10. APPENDIX C - MOHAKA FOREST SUMMARY

Mohaka Forest

Description

Mohaka Forest is divided into three blocks:

- Anaura,
- Putere, and
- Waipapa.

The Headquarters is on State Highway 2, 70km north of Napier.

Feature	Description
Altitude	30m - 809m, but average around 350m.
Average rainfall	1565mm generally spread through the year.
Topography	Mainly rolling to steep hill country.
Soils	Generally yellow-brown pumice.
Underlying rock	Marine sediment of mudstone, siltstone and sandstone, with outcrops of limestone.

Archaeological Sites

There are a number of archaeological sites in the Mohaka Forest. Refer to the GIS system for the latest list and location of known sites.

Covenants

Location	Description
Anaura Stream conservation covenant	75.2ha of native forest/scrub downstream of the Skudders Road bridge.
Tutumara Stream conservation covenant (stand 332)	42.4ha of native forest off the end of Patuwahine Road, in the Putere Block.
Boundary Stream conservation covenant	55.6ha of native forest and scrub above the Waikari River.

Reserves (WDC)

Location	Description
Reserve C10 "Anaura covenant"	Located within the Anaura Stream Conservation Covenant.
Reserve C11 "Waikari covenant"	Located within the Boundary Stream conservation covenant.

**Threatened
Birds**

Species	Location
North Island brown kiwi (nocturnal, flightless).	<ul style="list-style-type: none"> • Inhabits native/exotic forest, scrub and rough farmland • Putere block (currently) • Anaura Stream (previously).
New Zealand falcon	<ul style="list-style-type: none"> • Inhabits bush and open country, particularly cutover blocks and bluff outcrops. • Mohaka Headquarters • Putere block.
Yellow-crowned parakeet (kakariki)	<ul style="list-style-type: none"> • Inhabits mature podocarp and beech forests, mainly in upper canopy. • Te Heru Ecological Reserve (next to Headquarters).
Blue duck	<ul style="list-style-type: none"> • Inhabits mountain streams with adjacent undisturbed forest. • Waikari River.
Kereru (New Zealand pigeon)	<ul style="list-style-type: none"> • Inhabits native/exotic forest with berries and flowers • Widespread and common in all Pan Pac Forests.

**Threatened
Mammals**

Species	Location
Long tailed bat (nocturnal)	<p>Inhabits native/exotic forest scrub and farmland. Feeds in clearings and near streams/ponds. Roosts in hollow trees, logs, caves and outcrops.</p> <p>Low in numbers, ranging widely in all Pan Pac Forests.</p>

11. APPENDIX C - TANGOIO FOREST SUMMARY

Tangoio Forest

Description

Tangoio Forest is located north of Napier and divided into three separate blocks:

- Mill,
- Waipatiki, and
- McKinnons.

Feature	Description
Altitude	10m - 300m.
Average rainfall	1200mm, with drier summer periods.
Topography	Moderate to steep.
Soils	Generally of sandy loams.
Underlying rock	Mainly impermeable marine sediments (mudstone, sandstone and limestone).

Archaeological Sites

There are a number of archaeological sites in the Tangoio Forest. Refer to the GIS system for the latest list and location of known sites.

Threatened Birds

Species	Location
New Zealand falcon	Inhabits bush and open country, particularly cutover blocks and bluff outcrops. Occasionally seen in Tangoio.
North Island kaka	Old podocarp and beech forest, mainly in the canopy Whirinaki (last seen in 1999).
Kereru (New Zealand pigeon)	Inhabits native/exotic forest with berries and flowers Widespread and common in all Pan Pac Forests.

Threatened Mammals

Species	Location
Long tailed bat (nocturnal)	Inhabits native/exotic forest scrub and farmland. Feeds in clearings and near streams/ponds. Roosts in hollow trees, logs, caves and outcrops. Low in numbers, ranging widely in all Pan Pac Forests.

**Threatened
Fish**

Species	Location
Banded kokopu	Adults found in pools with large boulders, overhanging banks or logs. Also found as whitebait (juveniles) running up streams near the coast. Pakuratahi stream. Kowhiro stream. Waipatiki block.
Kōaro	Inhabit fast-flowing streams and run from the sea as whitebait Pakuratahi catchment.