FSC® FOREST MANAGEMENT PLAN

Kawaroa Forest

TGH Natural Resources Ltd

March 2023 – March 2028

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1. What is this Plan?

About this Plan

This **specific** forest management plan provides details about Kawaroa Forest.

It is to be used in conjunction with the **standard** forest management plan[1], which outlines the typical management applied to the Forest Stewardship Council (FSC®) Group Scheme estate forests.

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

Foundation Principle

As a policy the:

- Tainui Group Holdings (TGH) Natural Resources Ltd has a long-term commitment to the FSC Principles and Criteria in the management unit, and to related FSC Policies and Standards, and
- TGH Natural Resources Ltd is committed to the PF Olsen FSC Group Scheme **SCS-FM/COC-400064** processes and associated documents.

TGH Natural Resources Ltd has sought FSC certification, to ensure that their forests are managed in an environmentally appropriate, socially beneficial and economically viable manner and to obtain the best access opportunities to the local processing market which is seeking to source FSC certified logs.

[1] https://nz.pfolsen.com/site/pfolsen/ForestManagemenPlan%20-%20Standard.pdf

2. The Forest Land

Location and access

Kawaroa Forest is a 552.1 hectare forest on the northern side of Kaiwhia Harbour, in the Waikato Region. The location of the forest is shown in Map 1.

Forest Area

Forest	Net Stocked area (ha)	Indigenous area (ha)	Awaiting planting (ha)	Total forest area (ha)
Kawaroa[2]	332.1	154.1	65.9	552.1

Legal ownership

The legal description of the forest land is:
SA 31D/931. 1/1, Lot 2 Deposited Plan South Auckland.

The land tenure is freehold vested in Pootatau Te Wherowhero with a Forestry Right vested in THG Natural Resources Ltd.

Markets

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

Distances from forest to log markets

Potential Market or Export Port	Distance from Forest (km)	Log market
Te Kuiti	66	Domestic
Putaruru	104	Domestic
Tokoroa	121	Domestic
Tauranga	165	Export
Auckland	194	Export

[2] Note: the areas of stocked, cutover awaiting replanting and reserves do not add to the Gross forest (property) area due to the areas of open grassland, roads and skids

Topography

The topography consists of hill country.

- Kawaroa Forest is located on moderate to steeply dissected hill country broadly aligned along a S.SW to N.NE axis rising from near sea level to 225m above sea level.
- The topography dictates harvesting by cable based systems including tethered machine felling where appropriate. Access is from a road network originating from an existing but upgraded Kawaroa Road and track that runs along much of the ridgeline forming a spine through the middle of the forest.
- The geology underlying Kawaroa is Apotu Group siltstones with some sandstone and conglomerate present.

Soil

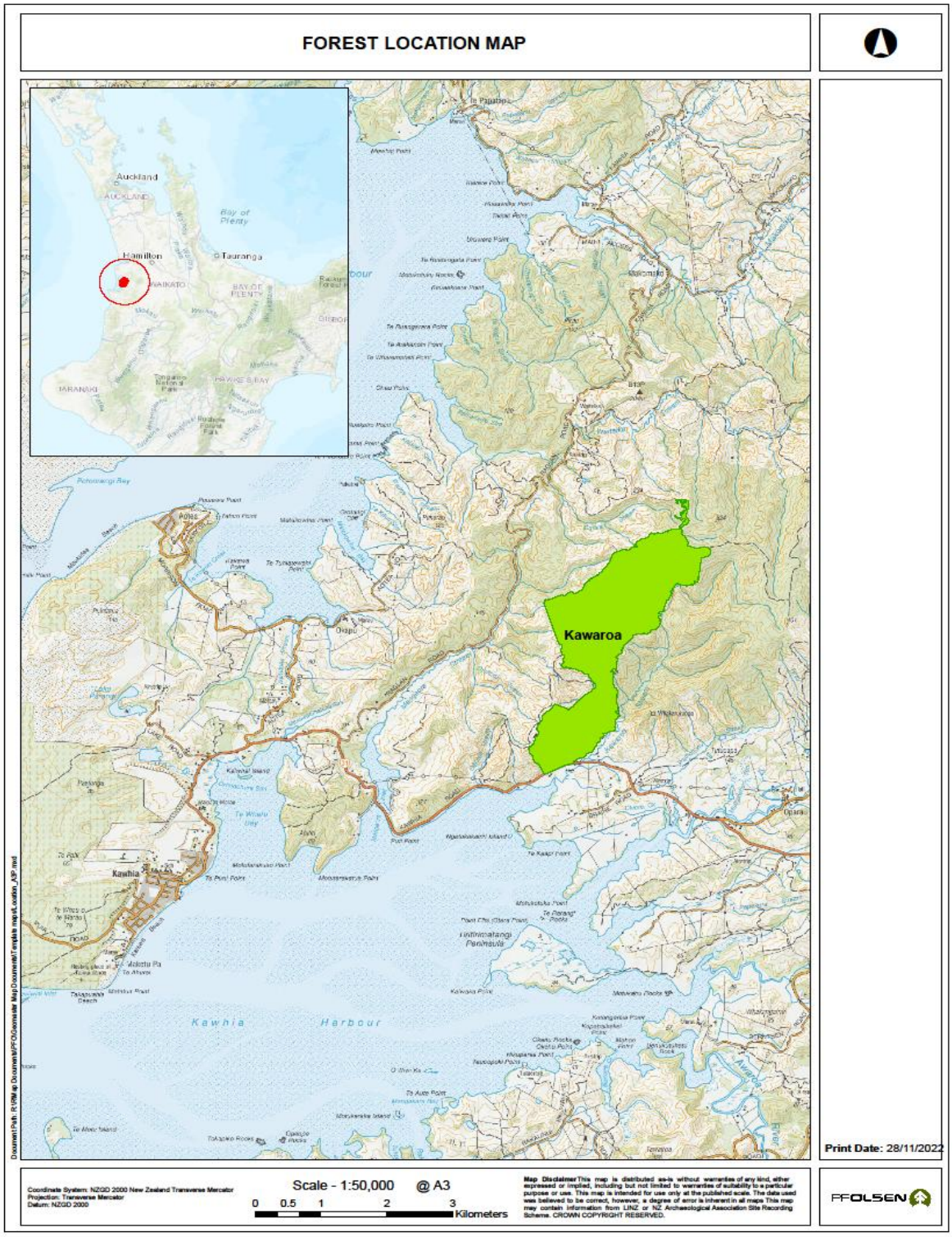
Soils are predominantly Brown / Yellow Brown, originating from the underlying weathered parent material.

- Detailed soils mapping for this area is not currently available from the S-Map database. However, adjacent mapped areas and extensions of similar topography suggest the dominant soils will be 'Brown Soils' or 'Yellow Brown' soils, moderately well drained with moderate to low available moisture in the profile which is also moderately deep at between 45-100 cm to hard base layers.
- These soils are generally not prone to summer drought nor winter waterlogging and combined with depth are good for tree growth and generally compatible with the type of harvesting operations expected, without seasonal constraints.

Climate

- The Kawhia region experiences an 'oceanic' type climate strongly influenced by westerly airstreams.
- The forest area has warm humid summers and mild winters.
- The average rainfall is about 1400-2000 mm in the upper elevations dropping to 334 mm at the coast. Kawaroa being slightly elevated and inland will be above the coastal level.
- The mean annual daytime temperature is around 18 degrees Celsius.

3. Map 1 – Location Map Kawaroa Forest



4. Ecological Information

Ecological District

Kawaroa Forest is located within the Kawhia Ecological District (ED), in the Tainui Ecological Region.

- Kawhia ED represents a complex landscape of eroded basalt and andesite volcanic cones surrounded by rolling and broken hill country draining to drowned river valley harbours.
- The commercial forest is bounded to the east by two large patches of indigenous forest being mixed lowland podocarp hardwood and kanuka dominant respectively. Semi-intensive dry stock pastoral farmland with patches of reverting indigenous vegetation in gully systems and some faces is on land to the west of the forest.
- The predominant landcover in the ED is pastoral grassland with most mixed podocarp hardwoods concentrated on the lower flanks of the volcanic cones and wind shorn montane vegetation on the upper flanks. There is no forest connectivity between Kawaroa Forest and the large protected areas of the Pirongia Forest Park on and around the volcanic cones.
- The ED is recognised as having the most northern limit of semi-continuous NI Brown Kiwi. NZ Falcon are quite likely in the area and within the forest and there is a possibility, given the coastal setting of the southern end of the forest, for partial utilisation of the plantation forest habitat by fernbirds and some shore birds. Surveys have been undertaken to confirm or otherwise the presence of 'threatened' species.
- Galaxid species and longfin/shortfin eel are likely inhabitants of the Kawaroa steam running parallel to the eastern boundary of the forest as well as in some tributaries within the forest.

FSC requirement: Ecological District

As the area of reserves within the forest property boundary is more than 5% by forest, and more than 10% within the Kawhia ED within the PF Olsen Group Scheme, there is not a reserve shortfall.

Reserve areas in Kawaroa Forest by Ecological District

Ecological District	Total Forest Area (ha)	Reserve Area (ha)	Reserve %	Meets FSC?	Reserve Shortfall (ha)
Kawhia	552.1	154.1	28%	Yes	0

Threatened Environments Classification

The reserve areas in Kawaroa Forest are within well represented and protected categories within the NZ Threatened Environments Classification.

Threatened Environment Classification	Area (ha)
<10% remaining	-
10 – 20% remaining	-
20 – 30% remaining	-
>30% remaining and <10% protected	-
>30% remaining and 10 – 20% protected	76.8
>30% remaining and >20% protected	77.3
Total Area (ha)	154.1

5. Cultural and Social Aspects

Forest history

The land and forest form part of the Treaty Settlement for the Waikato Tainui.

Current social profile

Immediately surrounding Kawaroa Forest, the predominant land use is extensive dry stock pastoral farming and a large area of indigenous hill country forest, isolated from the Pirongia Forest Park 11 km away. There are other large plantation forests in coastal locations by the Kawhia and Aotea estuaries.

The community of Kawhia serves both the rural community, fishing and holiday/recreational businesses.

Kawaroa Forest is within the Ōtorohanga District. As a whole, 2019[3] statistics indicate approximately 80% of the population were of working age (68% national), 70% were non-urban dwelling (17% national) and 30% of the population identified as Māori. Median income was $86,000/yr ($92,000 national).

In the district, the annual GDP contribution from forestry, mining and fishing was estimated at $24.4 million, and from agriculture $165 million.

By the very nature of its ownership structure, Kawaroa Forest represents a specific economic investment by Tainui for the wider benefit of its people. The intent being that direct physical operations enable employment opportunities for tribal affiliated members and financial returns provide economic strength and returns to the wider Tainui members.

Historic and archaeological sites

The 'Archsite' web resource does not record any known historic sites within Kawaroa Forest. There are four recorded sites within 1 km of the forest boundary. Very high densities have been identified beyond 1.5 km to the coastline.

[3] https://webrear.mbie.govt.nz/theme/gdp-by-industry/map/barchart/2019/otorohanga/agriculture?accessedvia=waikatoandleft-transform=regionalPercentageandleft-zoom=1andright-transform=absolute

Accidental discovery protocols will apply should any physical evidence be discovered during operations (also see Section 'Consents and authorities held').

Close liaison with Tainui representatives will be needed for guidance in respect of any other matters cultural heritage, places and values that need to be considered and provided for during operations.

Tangata Whenua

PF Olsen manages TGH Natural Resources Ltd's forestry assets. PF Olsen reports to TGH enabling direct oversight of the operational progress and outcomes within the forest by Iwi representatives. TGH sought a forest management partner who would uphold principles of kaitiaki, taiao and support social procurement initiatives enabling contractors to support and train rangitahi to work on their own whenua.

There is also a Land Management Committee whose role involves facilitation of annual planning on the whenua, incorporating the principles of mana whenua consultation, taiao considerations and protection of waahi tapu and waterway protection. PF Olsen will provide a representative on this committee.

Tenure and resource rights

The Kawaroa Forest Cutting Right is owned by TGH Natural Resources Ltd, which is itself a 100% owned subsidiary of Tainui Group Holdings Ltd which is owned by the Waikato Raupatu Lands Trust through its trustee Te Whakakakitenga o Waikato Inc., an investment arm of the Waikato Tainui Iwi. The underlying land is held in an Iwi Trust (see Forest History).

There is a coastal hapu collective seeking mandate over the lands in an area near to but exclusive of the forest area[4]. The collective includes hapu associated with Waikato-Tainui and Maniapoto.

[4] https://waikatomaps.waikatoregion.govt.nz/Viewer/?map=ad99a09be104440ea676cca7cdce3b2a

The forest area itself does not currently include any Wahi Tapu areas as notified by that collective.

Neighbours

Appendix 2 lists the forest neighbours.

Adjacent land parcels are being used for extensive pastoral agriculture or small scale lifestyle/agriculture or to the east, are largely or completely indigenous forest cover.

Parties should be consulted when operations are proposed in areas adjacent to their boundaries including cross boundary liaison with Tainui's adjacent farm operations.

6. Regulations

National Environmental Standards for Commercial Forestry (NES-CF) Erosion Susceptibility Classification

The National Environmental Standards for Commercial Forestry are a Resource Management Act regulation. They have replaced most council rules except where the councils may have more stringent rules in accordance with the regulations. The NES-CF applies to forests of greater than 1 hectare, established for commercial reasons and will be harvested.

The regulations are generally based on the Erosion Susceptibility Classification (ESC) of the underlying land. The following table shows the proportion of each forest ESC.

The forests are located on generally low erosion risk land. The majority of the forest activities will be permitted subject to meeting the NES-CF regulations.

No areas of the forest are within, although near, the 'Coastal Marine Area' on the southern boundary of the forest. As Kawaroa Road discharges to and the Kawaroa Stream flows into Kawhia Harbour, managing sediment will be important.

Productive plantation area (ha) within each ESC Class

Forest	Low	Moderate	High	Very High	Very High (8e)	Total
Kawaroa	114.5	284.3	-	-	-	398.8

Council RMA Plans

Kawaroa Forest is within the Ōtorohanga District and the Waikato Region.

Both the Ōtorohanga District Council and the Waikato Regional Council have their own planning documents and associated rules, developed through public process. The Waikato Regional Council plans do not have rules for forestry that are more stringent than the NES-CF.

Under the 2014 Ōtorohanga District Plan:

- Kawaroa is zoned 'Rural'.
- The adjacent indigenous forest on the eastern boundary (some of which falls within the property parcel of Kawaoa Forest) is zoned as Landscape High Amenity Value (LHAV) (Coastal) Mangaora, Mangahanga and Moerangi Natural Areas.

- District Wide rules, section 1.7 states: *Relationship of Rules to Regulations Gazetted under National Environmental Standards*:

  Any activity expressly provided for by regulations gazetted under any National Environmental Standard shall not, unless the regulation states otherwise, be subject to the standards or rules set out in Sections 3 – 24 of the Land Use Chapter of this plan.

Under the Waikato Regional Plan:

- Agrichemical spraying must comply with rules 6.2.4.8 and 6.2.4.9.
- The Waikato Regional Plan maps contain:
  - Karst landforms identified along the southwestern edge of the Kawhia harbour, however none are adjacent to or under the forest.
  - Two freshwater ecosystems – lakes or wetlands within a tributary stream near, but not within, the southwestern end of the forest[5].
  - A Biodiversity 'Special Area' wetland adjacent to the true left mid catchment of the Kawaroa Stream external to the forest[6].
  - Streams draining from the northern most section of the reserved indigenous forest are classed as 'Natural State', while Kawaroa Stream and a tributary on the southeastern boundary are classed as 'Priority 1 stock exclusion'.
  - Kawaroa Forest falls within the Waikato's West Coast Catchment Management Zone.

  If any resource consents are required for operations, consideration will need to be given to the Waikato Tainui Environmental Management Plan - Tai Tumu Tai Pari Tai Ao[7]. The requirements for consultation are described in Section 5.5.7.1 of the plan. TGH will be able to provide further specific guidance through the Land Management Committee.

[5] https://waikatoregion.maps.arcgis.com/apps/webappviewer/index.html?id=cd512953486b430c8b0a18ee50c5467a
[6] https://waikatomaps.waikatoregion.govt.nz/Viewer/?map=49a72640c5474484b156d453144044a3
[7] https://waikatotainui.com/wp-content/uploads/2022/08/Waikato-Tainui-Environmental-Plan-2013.pdf

Consents and authorities held

There are no resource consents or Archaeological Authorities held relevant to Kawaroa Forest. However, a general Archaeological Authority will be obtained due to the proximity of recorded and the potential for discovering archaeological sites within the forest.

Emissions Trading Scheme

Kawaroa Forest titles include Climate Change Response Act notices for Post-1989 and pre-1990 forest land. The client has assumed responsibility for managing their own ETS obligations, however any harvesting and replanting must be managed in consultation with TGH Natural Resources Limited to ensure compliance with the ETS. Assistance from PF Olsen may be required in preparing forest emissions returns.

7. Managing environmental risk

Assessment of environmental risks

Refer to the Standard FSC Forest Management Plan.

Infrastructure damage or service disruption

There are no identified infrastructure utilities within the forest boundary.

There are private buildings within 45-150 m of the southeastern forest boundary, separated from the forest by Kawhia Road (public). Those buildings are very close to the Kawaroa Stream and another small un-named stream. Consideration of these buildings and the Kawhia Road bridge over the Kawaroa Stream is needed in relation to slash management and any river crossing points in tributaries of the Kawaroa Stream. See Regulation 43 of the NES-CF.

Pests and diseases

The Waikato Regional Pest Management Plan (RPMP) 2022-2023 includes a number of pest species that are or may be present in the forest[8].

RPMP Status - Eradication
Objective: *Over the duration of the Plan, reduce the level of infestation of the weeds and animal pests within the Waikato Region to zero density to prevent adverse effects and impacts as identified.*
Evergreen buckthorn
Mile -a-minute
Variegated thistle
Rook

RPMP Status - Progressive Containment
Objective: *Over the duration of the Plan, contain and where practicable progressively reduce the geographic distribution or extent of the weeds within the Waikato Region to pre-2022 levels to reduce further adverse effects and impacts as identified.*
Chocolate Vine
Climbing Spindlebery

[8] https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/RPMP/RPMP-2022.pdf

Lantana
Old man's beard
All wilding conifers

RPMP Status - Sustained Control
Objective: *Over the duration of the Plan, sustainably control the weeds within the Waikato Region to ensure that land free of or being cleared of weeds does not become infested to prevent adverse effects and impacts.*
Banana passionfruit
Broom
Gorse (*Present-confirmed by survey*)
Pampas (*Present-confirmed by survey*)
Ragwort
Nodding thistle
Tutsan
Wild ginger
Woolly nightshade

Objective:
Brushtailed possum: *to control possum within priority control areas*
Feral rabbit: *control to level 4 or below on the Modified McLean Rabbit infestation scale 2012.*

None of the weed species identified as present in Kawaroa Forest were considered an ecological threat to the indigenous reserve areas[9], but will be subject to periodic control along boundaries, during replanting preparation and roadside maintenance. Another weed species 'Mexican daisy' was also confirmed as present.

Within the indigenous vegetation, the Wildlands ecological survey identified herbivory pressure from goats as being the primary pest animal adversely impacting these forest areas. (See Appendix 4 for management activities)

Fire

Kawaroa Forest is within the Fire and Emergency NZ (FENZ) Waikato Central Zone[10]. The plan references the thresholds for fire restriction levels and the coordination of forestry risk management responses between forest owners/managers and FENZ.

[9] Natural Area Survey and Assessment of High Conservation Value Areas of Kawaroa Forest. Contract Report 6602. Wildlands 2022.
[10] https://fireandemergency.nz/assets/Documents/fire-plan/Waikato-Fire-Plan-2021-2024-approved.pdf

8. Commercial Plantation Estate

Current crop

Kawaroa Forest is predominantly radiata pine, planted in 1996-97. At that time, Radiata pine was selected as it was the most commercially viable species. Just under 12 ha is planted in *Cupressus lusitanica*.

Radiata pine will remain the dominant species to be utilised for restocking after harvest as it remains the most commercially viable species for NZ conditions at present.

Tending

Kawaroa Forest has been tended as a Clearwood, pruned forest, with both the radiata and cypress pruned and thinned mostly between 2004 and 2005.

The intention by the owners is that the future silvicultural regime will be reviewed following replanting to ensure it remains appropriate to maximising commercial returns and other objectives.

Tree nutrition

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

9. Harvesting Strategy

Harvesting strategy

By agreement with the forest owner, the strategy for harvesting Kawaroa Forest is to maintain one full time crew, which has associations with the Tainui iwi, more or less uniformly through to the completion of the harvest.

Clearfell age will be between 25 and 26 years for radiata pine with approximately 31% of the harvested wood volume expected to go to local domestic processors. Very small quantities of *Cupressus lusitanica* will be harvested during roadline salvage. Otherwise, these areas are too young for harvest.

The planned harvest for radiata beyond the end of 2022 is listed below:

Annual harvest (ha)	2023	2024	2025	2026	2027
47 ha by Dec 2022	137	122	42	-	-

Infrastructure

A partial layout of road and access infrastructure in Kawaroa Forest exists and by the end of 2022 a total of 3 km of existing road will have been upgraded with a further 2.5 km and 9 landings and 2 pads anticipated to have been constructed.

The forward work programme for road engineering planned to service the total forest harvest is:

Year	2023	2024	2025	2026	2027
Road upgrade (km)	-	-	-	-	-
New road (km)	2.95	1.65	-	-	-
Landings	9	6	-	-	-
Pads	1	-	-	-	-

10. Indigenous Biodiversity

Protected ecosystems

Within the property boundary two indigenous vegetation areas, totalling 140 ha, were identified plus small areas of exotic herbfield and grassland on the flood paths adjacent to Kawaroa Stream and other tributaries.

	Vegetation group	Description	Threatened Environment Classification	Ecological ranking
1	(Rimu), (Halls totara)/tawa – rewarewa-kohekohe-(pukatea).	Highly diverse lowland tall forest.	Approx. half area classed as "under protected" half as "less reduced and better protected".	Larger area contiguous with large external block of well developed forest. PF Olsen FSC Group Scheme protection class 'Full'.
2	Kanuka forest.	Kanuka dominant canopy with broadleaf shrub hardwoods and tree ferns.	Classed as "less reduced and better protected".	Small, fragmented areas, mainly kanuka and shrublands, modified through past land use and browsing pests. PF Olsen FSC Group Scheme protection class 'Limited'.
3	Other herbfields and grasslands.	Exotic riparian herbfields and grasslands.		NA – Some potential for restoration/enhancement.

Of the reserve areas, 74% is the 'Full' protection class under the Group Scheme. This means that specific efforts are made to avoid damage from plantation forestry operations, and that where practical, the forests ecology is enhanced, e.g. Through pest control (See Appendix 4 for the ecological management activities for the reserve areas).

Protected ecosystem and reserve areas by protection category

Forest	Special	Full	Limited	Passive	Reserve	Total (ha)
Kawaroa	-	114.6	25.2	-	14.3	154.1
	0%	74%	16%	0%	9%	100%

As a large area of 'Full' protection forest is contiguous with and a smaller part of a Council designated 'Landscape High Amenity Value' area, effective pest control will be very dependent upon whether joint cross boundary effort can be arranged. As the 'Full' protection forest area is an external boundary to the plantation forest, protecting it from damage will be achieved by normal good forestry practice.

High Conservation Value (HCV) Forests

The Natural Area survey conducted by Wildlands Consultants Ltd found no reserves met the HCVF criteria.

Threatened species

The ecological survey by Wildlands Ltd[11] identified a number of threatened flora and key fauna that are, or potentially could be, within the boundaries of Kawaroa Forest.

Mānuka and kānuka are also listed as threatened but this is a precautionary response to the threat of myrtle rust, not because of any rarity in the species. Conversely myrtle rust was observed on ramarama and care should be taken to avoid any areas containing this plant.

No rare or threatened birds were located in Kawaroa Forest at the time of the survey, however other records from the area suggest they could be present. The Kawau tūī/Little Black Shag, Kawaupaka/Little Shag and Māpunga/Black Shag could use trees along the southern end of the forest close to the Kawhia estuary and or the lower Kawaroa Stream. It is likely that kārearea/NZ falcon will also inhabit the forest, with the likelihood increasing as harvesting progresses (providing more favourable hunting and breeding habitat).

Ecological management activities for the reserve areas are summarised in Appendix 4. Appendix 3 lists other bird species recorded in the NZ ornithological Society database[12] from the immediate vicinity of the forest at Kawhia inlet. While seabirds are close-by, to the south edge of the forest, they are unlikely to make more than transient use of the forest. Other common birds can be expected within the forest on a regular basis.

[11] Natural Area Survey and Assessment of High Conservation Value Areas of Kawaroa Forest. Contract Report 6602. Wildlands 2022.
[12] https://ebird.org/newzealand/hotspot/L4404916

Overview of threatened flora and fauna

	Species	Status
Flora	Aka	Threatened - Nationally Vulnerable
	White rātā/Metrosiderous diffusa	Threatened - Nationally Vulnerable
	Rātā	Threatened - Nationally Vulnerable
	Ramarama	Threatened - Nationally Critical
Fauna	Mātātā /Fernbird	At risk - Declining
	Pūweto/Spotless crake	At risk - Declining
	Kawau tūī/Little Black Shag	Naturally uncommon
	Kārearea/NZ falcon	Nationally vulnerable

iNaturalist[13] (Biodiversity in Plantations) will be used to record sightings of important indigenous fauna or flora discovered in the forest.

A number of lizard species have been located in forest and scrubland areas in the broad vicinity of Kawaroa Forest and may be present within Kawaroa Forest. As most have 'At risk - declining' status, particular care should be taken to avoid physical damage to plantation forest/ shrubland interface margins.

The species that may be present are listed below. Ecological management activities for these potential species are summarised in Appendix 4.

Herpetofauna potentially within Kawaroa Forest

Species	Threat Status	Habitat
Forest gecko	At risk - Declining	Indigenous forest and shrublands
Elegant gecko	At risk - Declining	Indigenous forest and shrublands
Pacific gecko	Not threatened	Indigenous forest and shrublands
Copper skink	At risk - Declining	Indigenous and plantation
Hochstetter's frog	At risk - Declining	Upper stream reaches and seeps in undisturbed catchments

Bats have been recorded in the vicinity of Kawaroa Forest. Pekapeka/Long-tailed Bats (*Chalinolobus tuberculatus*; Threatened–Nationally Critical). Kawaroa Forest is within 13 km of a cluster of Long-tailed Bat records located on the eastern side of Pirongia Forest Park. Central Lesser Short-tailed Bats (*Mystacina tuberculata rhyacobi*; At Risk-Declining) are also

[13] https://www.inaturalist.org/projects/biodiversity-in-plantations

present within 8.5-12 km of the forest. Based on the available habitat and known records of long-tailed bats, it is likely that long-tailed bats use Kawaroa Forest for foraging and roosting.

Stream Protection and riparian setbacks

Within Kawaroa Forest there are a number of streams some of which drain westward to the Mangaora Stream and some eastward into the Kawaroa Stream. Both of these streams flow into the Kawhia estuary.

The combined length of these streams within the forest is a little over 4 km. They fall into the Rivers Environments Classification (REC) categories as listed below, with the recommended minimum riparian setbacks from each bank and the FSC required setbacks.

Stream class	Width	Length	Minimum setback	FSC setback
Very small	0-0.75 m	0.01 km	5 m	10 m
Small	0.75–1.5 m	3.06 km	5 m	10 m
Medium	1.5– 3.0 m	0.94 km	5 m	10 m

Most of the moderate sized streams are low gradient streams running over relatively hard geology while 60% of the small streams are moderate gradient headwater streams.

Tailored stream setbacks are needed to maintain high water quality and meet wider enhancement and restoration objectives, including establishment of small wetlands. This is based on the:

- streams flowing into Kawhia harbour,
- clay soils that are naturally prone to permanent colloidal suspension of fine sediments
- low gradient passage of the streams through deep wet soils in the valley floors.

In addition to meeting, at a minimum, the required FSC setbacks, specific plans for each catchment including post harvesting replanting planning will need be developed in conjunction with Tainui representatives, (See summary - Appendix 4).

A small stream near Gully Road provides opportunities for redesigned / improved riparian protection.

Fish

Fish species likely to be within the forests have been identified from the:
NES-PF Fish Spawning Indicator tool[14]
Freshwater Environments New Zealand.

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

Key ecological management activities are outlined in Appendix 4.

[14] https://www.mpi.govt.nz/forestry/national-environmental-standards-plantation-forestry/fish-spawning-indicator/

Species	Probability	Group	Spawning
Redfin Bully	62%	'A ' diadromous	01/08 – 31/10
Longfin eel	high	'A ' diadromous	NA
Shortfin eel	high		
Common bully	high		
Banded Kokopu	moderate		
Short-jawed kokopu	moderate		
Koaro	moderate		
Inanga	moderate		
Common smelt	moderate		
Freshwater shrimp	moderate		
Koura	moderate		

11. Other Special Values: Everything but the timber

Recreation

Any access provided for public use is a matter of discretion for TGH and the Land Management Committee. Any approved access is subsequently managed through the PF Olsen Forest access permit system (for areas outside legal public access areas). For information on how to apply for a permit, please contact the PF Olsen Central North Island Office 07 921 1010.

Following the intent of the Outdoor Access Code[15], published by Herenga ā Nuku - Outdoor Access Commission, and any signage / barriers in place within the forest, is expected behaviour. Closures will also apply during times of high fire risk, any *force majeure* state and during forestry operations.

The forest may be used for recreation and hunting by Iwi members subject to safety requirements and conditions specified by TGH and the Land Management Committee. TGH require applicants seeking access for hunting or other matters to submit an application and undergo an induction process[16]. The application will then be referred to the Land Management Committee who will approve/decline the application subject to further approval /liaison protocols with PF Olsen as the site manager.

Public access roads

According to the information available on the Herenga ā Nuku - Outdoor Access Commission website[17], there are no formed or unformed public roads, easements or esplanade reserves (marginal strips) within or adjacent to the property boundary.

Any users are expected to abide by the intent of the Outdoor Access Code[18] published by the Herenga ā Nuku - Outdoor Access Commission, or signage / barriers in place at track or public access points.

[15] https://www.walkingaccess.govt.nz/assets/Publication/Files/Outdoor-Access-Code/0fcf4d2e5b/Outdoor-Access-Code.pdf
[16] Embedded within "Systemsafe 365"
[17] https://maps.walkingaccess.govt.nz/Viewer/?map=b1d1e76a6c754d11b3f3fd9dfce1eb12
[18] https://www.walkingaccess.govt.nz/assets/Publication/Files/Outdoor-Access-Code/0fcf4d2e5b/Outdoor-Access-Code.pdf

Other special values

There are currently no other ancillary commercial or non-commercial use within the forest. Granting of any such requests would be a matter for TGH Ltd and, if agreed through their Land Management Committee, subject to the liaison and permitting process described for recreational usage and any other legal use Agreements as may be required by either TGH Ltd or PF Olsen (within a safety and fire management context).

Non-Timber Forest Products

There are no FSC certified non-timber forest products [19] from Kawaroa Forest.

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

12.Future Planning

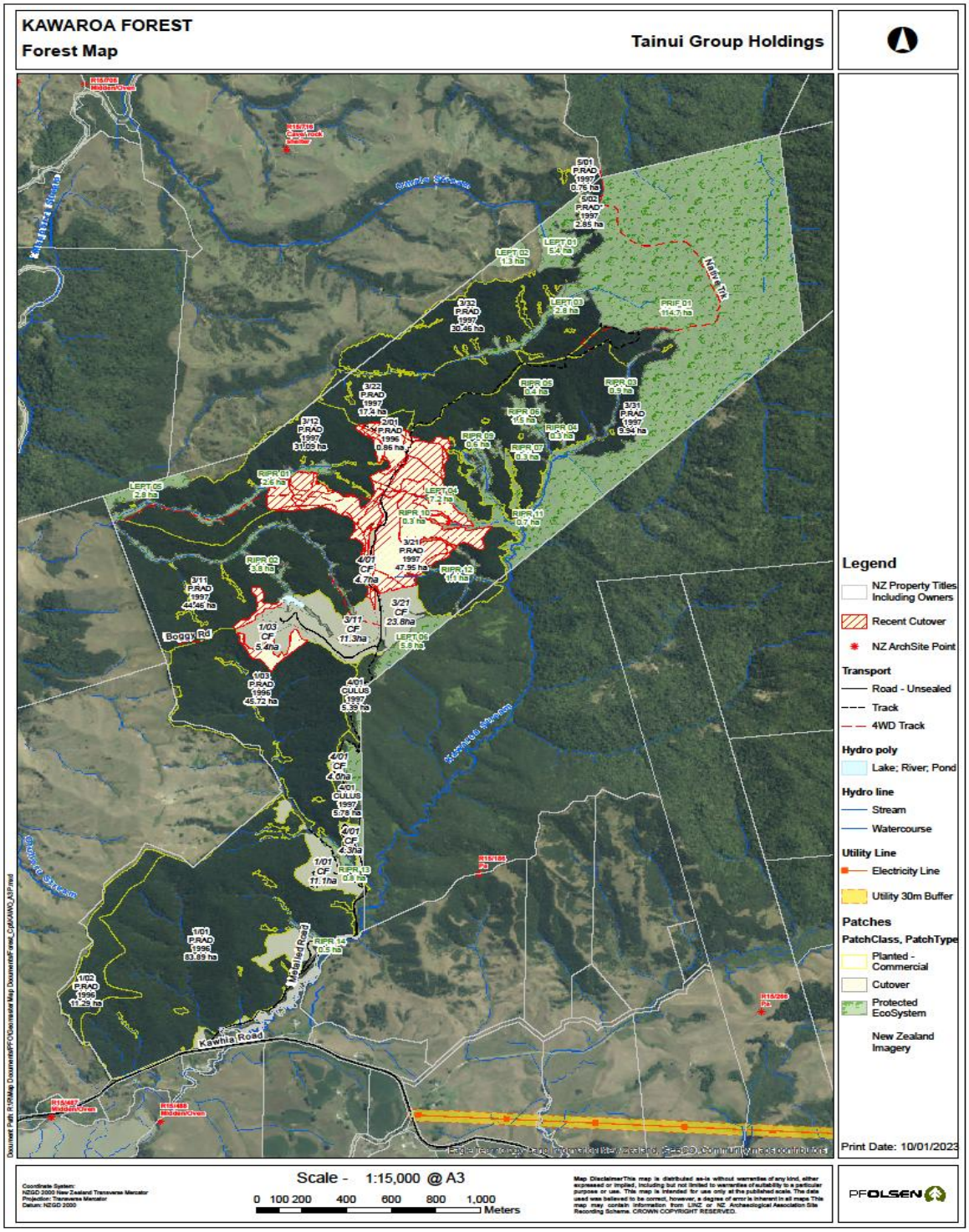
Plan changes and reviews

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

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

Change	Date	Section/Page
Moved whole FMP to new template	Sept-24	Whole plan
Updated NES-PF to NES-CF in Regulations	Sept-24	Page 13
Updated Foundation Principle	Sept-24	Page 4
Update FSC certificate	June-25	Page 4
Update ecological workplan- add dates and eDNA monitoring	July-25	Appendix 4

Appendix 1: Forest Map



Appendix 2: Forest Neighbours

Not Publicly Available.

Appendix 3: Bird Species possible within or around Kawaroa Forest

57 Checklists | 12 Atlasers | **60 Species**

Species observed

SPECIES	LOCATION	DATE
Pied Stilt	Morrison/Aotea Rds	11 Aug 2022
South Island Oystercatcher	Morrison/Aotea Rds	11 Aug 2022
Kelp Gull	Morrison/Aotea Rds	11 Aug 2022
White-faced Heron	Morrison/Aotea Rds	11 Aug 2022
New Zealand Fantail	Morrison/Aotea Rds	11 Aug 2022
Welcome Swallow	Morrison/Aotea Rds	11 Aug 2022
Silvereye	Morrison/Aotea Rds	11 Aug 2022
Common Chaffinch	Morrison/Aotea Rds	11 Aug 2022
Graylag Goose	5416 Kawhia Rd	11 Aug 2022
Canada Goose	5416 Kawhia Rd	11 Aug 2022
Black Swan	5416 Kawhia Rd	11 Aug 2022
Australasian Swamphen	5416 Kawhia Rd	11 Aug 2022
Masked Lapwing	5416 Kawhia Rd	11 Aug 2022
Tui	5416 Kawhia Rd	11 Aug 2022
European Starling	5416 Kawhia Rd	11 Aug 2022
Common Myna	5416 Kawhia Rd	11 Aug 2022
Song Thrush	5416 Kawhia Rd	11 Aug 2022
Eurasian Blackbird	5416 Kawhia Rd	11 Aug 2022
House Sparrow	5416 Kawhia Rd	11 Aug 2022

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SPECIES	LOCATION	DATE
European Goldfinch	5416 Kawhia Rd	11 Aug 2022
Yellowhammer	5416 Kawhia Rd	11 Aug 2022
Sacred Kingfisher	5225 Kawhia Rd	11 Aug 2022
Swamp Harrier	260 Aotea Road, Kawhia, Waikato, NZ (-38.031, 174.841)	1 May 2022
Variable Oystercatcher	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
Double-banded Plover	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
Bar-tailed Godwit	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
Caspian Tern	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
Little Pied Cormorant	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
Pacific Reef-Heron	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
Royal Spoonbill	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	30 Apr 2022
White-fronted Tern	Aotea - Tahuri Point	30 Apr 2022
Gray Gerygone	Aotea Harbour - Okapu	30 Apr 2022
Mallard	Aotea Harbour--Te Kowiwi Creek	30 Apr 2022
Ring-necked Pheasant	Aotea Harbour--Te Kowiwi Creek	30 Apr 2022
Australasian Bittern	Aotea Harbour--Te Kowiwi Creek	30 Apr 2022
Eastern Rosella	Aotea Harbour--Te Kowiwi Creek	30 Apr 2022
California Quail	Aotea Township	30 Apr 2022
Morepork	Aotea Township	30 Apr 2022
New Zealand Grebe	Kawhia - Lake Parangi	29 Apr 2022
Great Cormorant	Kawhia - Lake Parangi	29 Apr 2022
European Greenfinch	Kawhia--Ghost Lake	29 Apr 2022
Indian Peafowl	Auto selected	28 Apr 2022
Wild Turkey	Auto selected	28 Apr 2022
New Zealand Pigeon	Auto selected	28 Apr 2022
Paradise Shelduck	Auto selected	28 Apr 2022
Pied x Black Stilt (hybrid)	Aotea Harbour--Makomako Inlet	28 Apr 2022

11/17/22, 2:09 PM AO68 - New Zealand Bird Atlas

SPECIES	LOCATION	DATE
Pied Cormorant	Aotea Harbour--Makomako Inlet	28 Apr 2022
Silver Gull	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	27 Apr 2022
Australasian Gannet	Aotea village waterfront	27 Apr 2022
Australian Magpie	Aotea village waterfront	27 Apr 2022
Mallard x Pacific Black Duck (hybrid)	Kawhia--Ghost Lake	7 Nov 2021
New Zealand Scaup	Kawhia--Ghost Lake	7 Nov 2021
Shining Bronze-Cuckoo	Morrison Road, Kawhia, Waikato, NZ (-38.024, 174.839)	7 Nov 2021
New Zealand Falcon	Morrison Road, Kawhia, Waikato, NZ (-38.024, 174.839)	7 Nov 2021
New Zealand Fernbird	Morrison Road, Kawhia, Waikato, NZ (-38.024, 174.839)	7 Nov 2021
Australasian Shoveler	Kawhia--Ghost Lake	24 Apr 2021
Eurasian Skylark	Kawhia--Ghost Lake	24 Apr 2021
Spotless Crake	Kawhia Rd. @-38.043893, 174.830205	23 Apr 2021
Gray Teal	Kawhia--Ghost Lake	18 Apr 2021
Eurasian Coot	Lake rd	2 Mar 2021
Pacific Black Duck	NZ-Waikato-Kawhia-Lake Road (-38.042, 174.821)	11 Oct 2020
Little Tern	Aotea Harbour--Waitetuna Bay/Morrisons Shellbank	23 Feb 2020

Appendix 4: Schedule of Ecological Management

Review Date: 15/07/2025

Activity Type	Required actions	Area/s	Due date
Pest control- possum and ungulates	Targeted possum, deer and goat control in and adjacent to large indigenous block PRIF-01 to protect any threatened lizard species present, especially around harvest of adjacent forest. Liaise and, if possible, integrate ground control or aerial control with adjacent 3rd parties.	PRIF-01 and adjacent stands	Ongoing. Increase intensity pre, during and post-harvest of adjacent forest (approx. October 2025 to March 2027).
Drone monitoring- riparian establishment	Drone flyovers to undertake repeat site imagery to monitor riparian establishment. These sites will be replanted with 10m + riparian buffers following harvest of previous crop.	Three sites post-harvest. See map following.	Commence April 2024 – then repeat annually until 2029, then switch to three-yearly (2032, 2035…). Next due April 2026.
Photopoint monitoring- riparian establishment	Photopoint monitoring to monitor riparian establishment. These sites will be replanted with 10m + riparian buffers following harvest of previous crop. Viewshafts may be compromised as crop grows- discontinue affected sites and rely on drone monitoring sites (above) to continue monitoring riparian areas.	Eight photopoints to be setup post-harvest. See map following.	Commence April 2025 – then repeat annually until 2029, then switch to three-yearly (2032, 2035…). Next due April 2026.

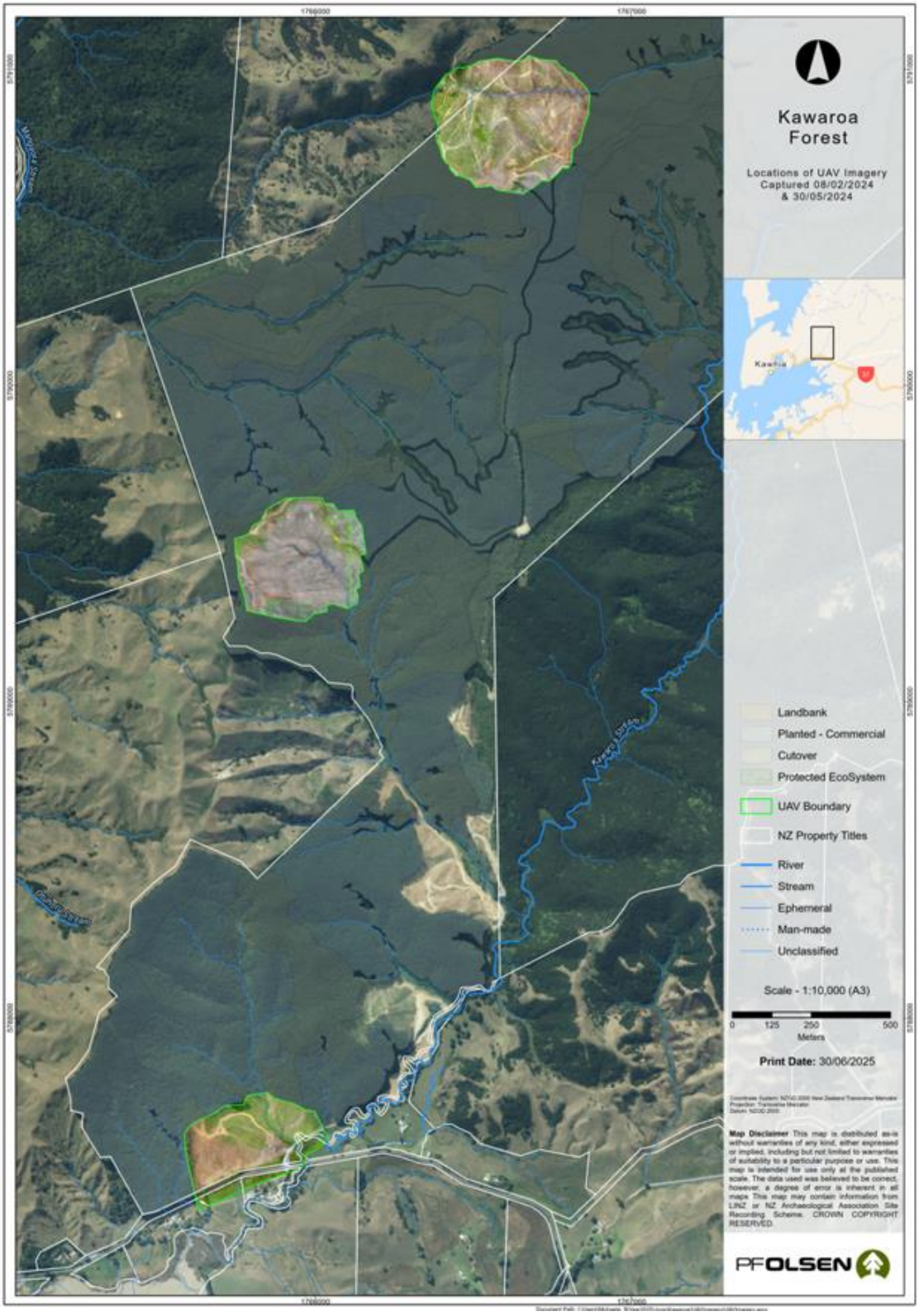
<table>
<tr><th>Activity Type</th><th>Required actions</th><th>Area/s</th><th>Due date</th></tr>
<tr><td>Threatened lizards</td><td>Provide threatened species ID posters and FOA rare species guidelines for lizards and train crews to be alert for presence of threatened species.
Record any sightings in iNaturalist database.</td><td>All forest- particularly when working alongside indigenous forest and scrub areas.</td><td>Ongoing- train new crews as required.</td></tr>
<tr><td>eDNA water monitoring</td><td>Undertake comprehensive eDNA water testing to:
establish aquatic / amphibious / riparian terrestrial rare species presence.
provide water quality indicator (TICI).
If threatened species are identified:
Findings will be reported in iNaturalist
Review forestry and harvesting operations to ensure that any potential impacts are recognised and managed appropriately to not adversely affect the threatened species (in line with the National Policy Statement for Indigenous Biodiversity).
If an unexpected result is produced, a repeat test will be implemented.

Regime: Implement annually for forest catchment age 0 to 5 years to monitor effects of post-harvest canopy closure. Switch to 5-yearly during mid-rotation (age 5, 10, 15, 20, 25 years). Increase frequency to annual just prior and during next harvest. Ensure minimal to no in-stream disturbance during spawning period for redfin bully or others if identified.</td><td colspan="2">Two proposed sites, as shown on the map following.
Exact site location is subject to change based on practical access and stream suitability.
Implement annually or 5- yearly as per regime outlined.

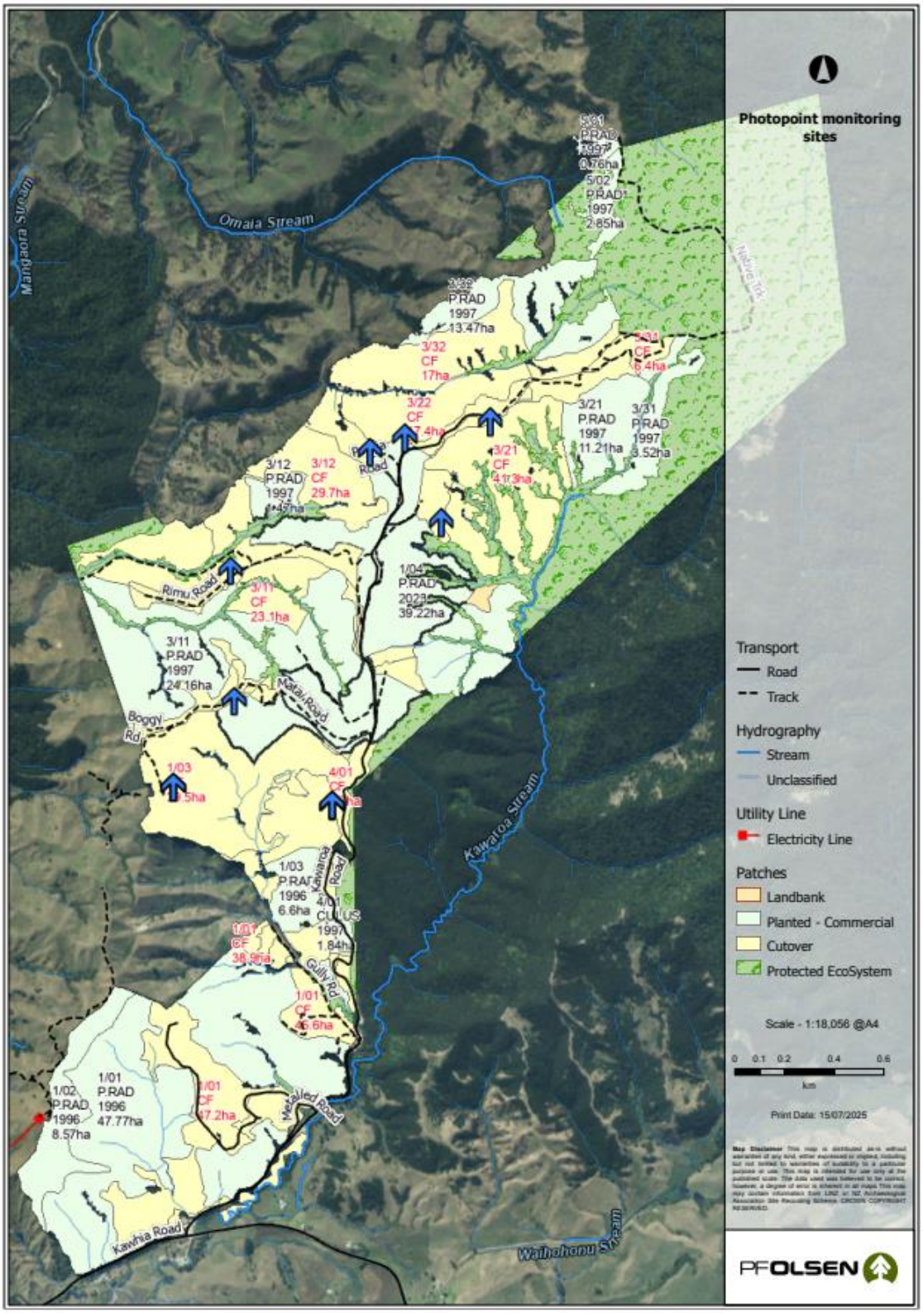
<table><tr><th>Site location (NZTM)</th><th>Description</th></tr><tr><td>E1765507, N5790200</td><td>Site 1
Tributary of Mangaora Stream</td></tr><tr><td>E1767216,
N5789973</td><td>Site 2
Kawaroa Stream</td></tr></table>
Establish baseline February 2026.
Implement annually February 2027 to February 2032.
Then 5-yearly: 2037, 2042…</td></tr>
<tr><td>Bat monitoring</td><td>Deploy bat detection boxes along the two wider stream valleys prior to harvesting to determine presence or otherwise of bats.
Record any sightings in iNaturalist database.
If bats are discovered, apply forestry bat management protocols and review existing harvest sequence in consultation with Tainui representatives and ecological advice if required.</td><td>Site 1: along Kawaroa Stream at southeastern boundary of forest.
Site 2: at water monitoring site 2 (NZTM E1767216, N5789973)</td><td>Summer prior to harvest.</td></tr>
</table>

Activity Type	Required actions	Area/s	Due date
		Site 3: adjacent to PRIF-01 at the northern most end of Kawaroa Road.	
Threatened birds	Little black shag, little shag, black shag, karearea. Report any sightings to Tainui representatives. Apply relevant forest management protocols (e.g. NZ Falcon Management Guide – Plantation Forestry). Avoid damage to clearly utilised roost/perch trees and in consultation with Tainui implement measures to protect.	All of forest	Ongoing
Riparian setback extension	Develop post-harvest site management plans in consultation with Tainui representatives to identify areas that could be enhanced with supplementary planting of indigenous species and widened riparian setbacks.	Selected wet valley floor infills - mainly areas consisting of depleted and long grass vegetation.	Post harvest, ongoing as agreed

Drone monitoring sites- Riparian establishment



Photopoint monitoring sites- Riparian establishment



Water monitoring sites