Hancock Forest Management®
A Manulife Investment Management Company

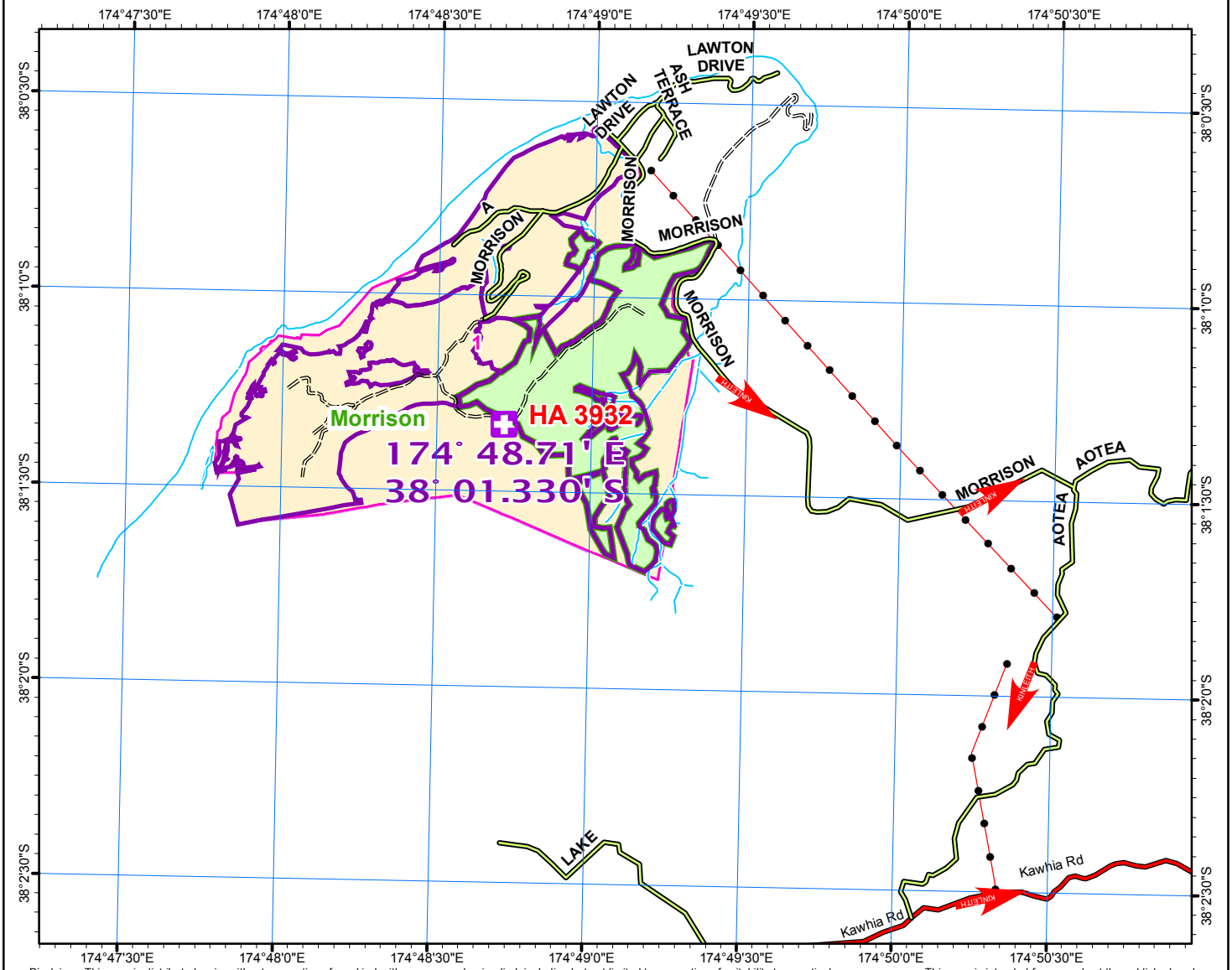
Scale 1:30,000
Print Date: 14/04/2021
Created By: Mitchell Durie

Operational Plan
HA 3932
Morrison Road

Harvesting:	NES PF Rules	**Forest:**	MORR
Engineering:	Otorohanga DC Council land use consent	**Cmpt:**	1
		Tenure:	Forestry Right - Sulby Forestry Partnership
HNZ Authority No:	TBC		
Environmental risk:	High:	**Species:**	P. radiata
Catchment Risk:	Low:	**Area:**	65.52 Ha
Erosion Susceptibility (ESC):	Moderate:	**Volume:**	48301 tonnes
WGS84 Long:	174*48.71 ' E	**Planner:**	Mitchell Durie
Lat:	38* 01.330' S		

Plan Sign Off

		Signed	Date
Harvesting:	Darrell Tahere	.....	.....16/04/2021.....



Operational Plan

HA 3932

Forest: **Morrison**

Road: **Morrison Road**

Cpt: **1**

Summary

Crop & Tenure

- Pinus radiata, 1990 estb. 37.9 Ha.
- Pinus radiata, 1994 estb. 27.62 Ha.
- Total – 65.52 Ha.
- Forestry Right.

Access

Route 1 – Old Taupo Road > Arapuni Road > State Highway 3 > Te Kawa Road > State Highway 39 > State Highway 31 > Aotea Road > Morrison Road > Morrison Road (forestry section).

Area Description

General:

This harvest area is predominantly steep, approximate 2/3^{rds} hauler and 1/3rd ground based. Most of the ground base will require extracting to the hauler ropes. This is due to inaccessibility for the required processing and roading infrastructure to accommodate it. Soil types are predominantly sand based. The most significant archaeological sites in this forest are found on the eastern side of this harvest area, in an area known as Hawaiki iti (Little Hawaiki).

- This harvest area has multiple in harvest area and boundary features/issues.
  - Public Road.
  - Farm Neighbour.
  - Wetlands.
  - Multiple waterways.
- Significant archaeological/historical sites/areas including:
  - Three significant pa sites.
  - A Rua (Cave).
  - Multiple pits and terraces.
  - Multiple midden sites.
  - Historical Taro crops.

RT Service:

The regular used RT channels are compromised in this area. Alternative options will have to be used for channels that do not have reception.

Required notifications: (see safety notes for more details)

- **Traffic Management Plan (TMP) for Morrison Road (public road, Otorohanga D.C.):** The appropriate HFM Forester is to contact the approved TMP providers 6 weeks prior to falling, to have a TMP and road control arranged.

Pre-Salvage R&M:

- Due to the fact that this is a first rotation forest much of the initial engineering will need to be done in conjunction with roadline salvage.

Safety

- At the time of planning cellphone coverage was poor to non-existent at lower levels. Reasonably reliable coverage could be gained from the ridge tops, and from the Morrison and Maukutea Drive Road junction above the main Aotea village. It is recommended that operational suppliers check the area for the closest reliable cellphone location prior to starting work.
- Public Road within two treelengths.
- Farm Neighbour within two treelengths of the harvest area.
- Steep slopes within the harvest area and on the boundary.

Environmental Risk = High

- **This area has been rated high due to the abundance of archaeological sites. This area is highly visible to the public.**
  - Archaeological sites.
  - Visibility to the public, and susceptibility to public scrutiny.
  - Farm neighbour and associated infrastructure.
  - 4M streams.
  - Category 3 Wetland and the Te Puna o Te Korotangi category 4 wetland.
  - Category 4 wetland/shrubland.

  Other considerations are:
  - Non-Slash Zones.
  - Tracking.
  - The water catchment rating for this harvest area is low.
  - The Soil Erosion Susceptibility rating for this harvest area is low and moderate.

Social Impact = High

- This harvest area is in close proximity to the Aotea Harbour and village. Operations will impact on the local community and visitors for a short period of time.
- There are multiple Iwi interests regarding the cultural significance and archaeological sites within this harvest area.
- The HFM Environmental Planner will complete a full social impact report prior to operations commencing.

Forestry

This is a forestry right harvest area.

- The harvest area must meet the agreed hand back status.
- Forestry has no further input.

Distribution

- Distribution from this harvest area is on highway back to Kinleith Mill.
- Engine breaking should be prohibited in and around the Aotea Village.
- To minimise disturbance to residents of Aotea village, logging traffic speed is to be restricted to 30kmph for the section of Morrison Road from the forest entrance until the Maukutea Drive intersection.

Roadline Salvage

General

There are two landings and one stub road to salvage.

Note salvage specification sizes are given in maximum lengths and are not uniform. Refer to the Operational Plan Map for actual shape.

The salvage crew will need to create and designate truck turnarounds and car parks at the time of salvage. Liaise with the HFM Forester for any engineering needs.

Archaeological sites:

Morrison's Forest has a high number of archaeological sites. All known sites have been identified on the Operational Plan and Archaeological Sites Maps. These will be marked prior to operations commencing. There is a very high probability that other, yet undiscovered sites will be found during the operational phases.

- **There is one known pa site within the salvage sections of this harvest area; and one midden in close proximity to the salvage boundary (refer to the Operational Plan and Archaeological Sites Maps for their locations). Specific felling and extraction strategies must be agreed, in consultation with the approved archaeologist or HFM representative prior to working on or around these sites. *See environmental section for details.***

Pre-Salvage R&M

Due to the fact that this is a first rotation forest much of the engineering will need to be done in conjunction with roadline salvage.

Safety

- **Steep slopes:**
  - There are steep slopes on most of the salvage area boundaries in this harvest area (refer to the Slope Map for the locations). Highlight this to operational staff and manage through the Daily Hazard ID and hazard management processes.

Environmental

Archaeological sites:

Morrison's Forest has a high number of archaeological sites. All known sites have been identified on the Operational Plan and Archaeological Sites Maps. These will be marked prior to operations commencing. There is a very high probability that other, yet undiscovered sites will be found during the operational phases.

There is one known pa site and one midden site within the salvage sections of this harvest area; and one midden site in close proximity to the salvage boundary (refer to the Operational Plan and Archaeological Sites Maps for their locations). Specific felling and extraction strategies must be agreed, in consultation with the approved archaeologist or HFM representative prior to working on or around these sites.

Known sites/archaeological survey records (Refer to the Archaeological Sites Map for locations):

- **R15/172 -** R15/172 is a rectangular pa site located on a high spot of one of the major ridges running north from the Pukeatua trig. The site consists of a rectangular shaped main platform, with subtle indications of further divisions. A bank and terrace run around the north and west of the site, while the naturally steep topography is utilised to the south and east. To the south east of the main platform a flight of terraces runs down the ridgeline; no clear evidence of pits is present on the site. The site is in excellent condition, it is clearly marked; but has been fully planted. A specific felling strategy will be required to minimise ground disturbance in this area. **This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **Trees on visible archaeological features should be felled leaving high stumps around the boundaries where practicable. Dragging of felled stems across archaeological features must be avoided. If stems cannot be removed without causing damage to archaeological features they should be felled to waste.**

- **Track screwing and dragging of stems should be avoided in the vicinity of archaeological sites to minimise ground disturbance.**

- **If operations discover any new archaeological sites work must stop immediately in that area. The Environmental Planner must be contacted immediately. No further work can commence on such a site until approved by HFM.**

Non slash Zones:

- Non-slash zones have been allocated around Hauler Pads (HP) 71B, 72A and 72B. **Ensure no slash or spoil is loaded along these margins. Slash and spoil are to be stored on stable ground.**

Tracking:

- Morrison's Forest has a high number of archaeological sites. **Tracking could unearth undiscovered sites and should be avoided unless necessary. All tracking and modifications are to be planned and carried out in consultation with the HFM Harvesting Forester. Ensure all tracks not required for further use are deactivated as soon as possible and consideration is given to any forecast periods of wet weather.**

Operations

General

There are two landings, and one stub road to salvage.

Salvage configuration

This harvest area has been planned for a forwarder configured crew.

Landing 71: - (180m x 190m). This is a relatively flat site on sand and includes the area for two hauler pads. Stems will have to be felled and shoveled out of the way to allow engineering to form the road and loadout strip. This volume can be processed/loaded out on site.

Landing 72: - (220m x 100m). This is a relatively flat site on sand and includes the area for two hauler pads. This volume is to be extracted to Landing 71 for processing/loadout.

Stub Road B: - (610m x 125m). This is the section of road from the end of Salvage Setting 71 through to the start of Salvage Setting 72. This area also includes the salvaging of a pa site, refer to the environmental notes regarding this site. This volume is to be extracted to Landing 71 for processing/loadout.

Engineering

General

There are two landings, 1225 metres of road, four hauler pads, three hauler pad tracks, two truck turnarounds (TT), and two carparks (CP) to form.

Archaeological sites:
Morrison's Forest has a high number of archaeological sites. All known sites have been identified on the Operational Plan and Archaeological Sites Maps. These will be marked prior to operations commencing. There is a very high probability that other, yet undiscovered sites will be found during the operational phases.

- **There is one known pa site and two middens in close proximity to the engineering operational area (refer to the Operational Plan and Archaeological Sites Maps for their locations). Agreed work methods, in consultation with the approved archaeologist or HFM representative prior to working on or around these sites is required. *See environmental section for details.***

Safety

- **Steep slopes:**
  - There are steep slopes on the margins of the roadline and hauler pads to be built in this harvest area (refer to the Slope Map for the locations). Highlight this to operational staff and manage through the Daily Hazard ID and hazard management processes.

Environmental

Archaeological sites:
Morrison's Forest has a high number of archaeological sites. All known sites have been identified on the Operational Plan and Archaeological Sites Maps. These will be marked prior to operations commencing. There is a very high probability that other, yet undiscovered sites will be found during the operational phases.

- **There is one known pa site and two middens in close proximity to the engineering operational area (refer to the Operational Plan and Archaeological Sites Maps for their locations). Agreed work methods, in consultation with the approved archaeologist or HFM representative prior to working on or around these sites is required.**

Known sites/archaeological survey records (Refer to the Archaeological Sites Map for locations):

- **R15/172 -** R15/172 is a rectangular pa site located on a high spot of one of the major ridges running north from the Pukeatua trig. The site consists of a rectangular shaped main platform, with subtle indications of further divisions. A bank and terrace run around the north and west of the site, while the naturally steep topography is utilised to the south and east. To the south east of the main platform a flight of terraces runs down the ridgeline; no clear evidence of pits is present on the site. The site is in excellent condition, it is clearly marked; but has been fully planted. **The roadline is clear of the main site however artifacts could be unearthed, and all operational staff need to be made aware of this site. This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented plan.**

Operations

Capital:

Landing 71: - (70m long x 75m wide inclusive of loadout strip). This is a relatively flat sand site. The majority could be knifed, some contouring will be required.

- Stub Road B will serve as the loadout strip.

Landing 72: - (70m x 40m exclusive of loadout strip). This is a relatively flat sand site that can be knifed.

- Stub Road B will serve as the loadout strip. This can be done at the time of landing formation.

Stub Road B: - 1225 metres of capital construction from the boundary of harvest area 3931, across the sand dunes to harvest area 3932, and through to the end of landing 72. The final location of the roadline across the sand dunes may differ slightly to plan.

Hauler Pads: - (HP) 71A, 71B, 72A, 72B **-** (20m X 20m.) **Do not install without consultation with harvesting contractor.**

HP 71B Track: - 80 metres form and metal. **Do not install without consultation with harvesting contractor.**

HP 72A Track: - 30 meters form and metal. **Do not install without consultation with harvesting contractor.**

HP 72B Track: - 60 metres form and metal. **Do not install without consultation with harvesting contractor.**

Truck Turnarounds (TT) 71, 72: - (10m X 12m.) Construct and metal.

Carpark (CP) 71, 72: - (10m X 15m.) Construct and metal.

Harvesting

General

This harvest area is predominantly hauler, or areas that have to be ground-based extracted to the hauler ropes. There are multiple features that require protecting, consisting of wetlands, farm paddocks/infrastructure, and a public road. Multiple known archaeological sites exist within the harvest area, with a high probability of discovery of others.

Archaeological sites: The most significant archaeological sites in this forest are found on the eastern side of this harvest area, in an area known as Hawaiki iti (Little Hawaiki). These include two pa sites and multiple terraces and middens. Specific felling and extraction strategies must be agreed, in consultation with the approved archaeologist or HFM representative prior to working on or around these sites. *See environmental section for details.*

Configuration: This harvest area has been planned for a large skyline capable tower, with the ability to run a motorised carriage where required. This will give the best deflection and vertical lift required to protect the natural and archaeological features within the harvest area. A skidder or tractor will also be required for the ground-base/two-stage areas.

Two-staging: Due to constraints, roading access along the eastern flats of this harvest area was not feasible. This has meant that two staging to hauler ropes is required from parts of this area. There is approximately 13 hectares of ground base area at the southern end of Setting 71, and two hectares of ground-based area on the eastern boundary of Setting 72 (refer to the Operational Plan Map for the locations), that will require extracting to the hauler ropes. The maximum ground-based extraction distance to the ropes in Setting 71 is approximately 600 metres; long and short ground-based extraction distances can be mixed in this setting. The maximum two stage hauler line is approximately 480 metres.
The maximum ground base extraction distance to the ropes in Setting 72 is approximately 340 metres; the two-stage hauler line is approximately 190 metres.
Note: there are several requirements to go with this two staging, refer to the following three comments below.

1. **Tail spar:** A tail spar is to be utilised in setting 71 to minimise scarring and improve lift over an intermediate ridge that runs north to south from an adjacent pa site. Utilisation of a tail spar will also have the added benefit of being able to stockpile large volumes of stems under the ropes (refer to the Operational Plan Map for the tail spar location).

2. **Armouring:** The archaeologists have requested that the intermediate ridge running north to south from an adjacent pa site (referred to above) is armoured with stems to minimise scarring. This option can be discussed with the Environmental Planner prior to extraction over this ridge (refer to the Operational Plan Map for the location).

3. **Channel/stream protection:** The two-staging hauler line in Setting 71 crosses a 4M stream. The crossing point will require protecting. A culvert and stems can be used to protect the stream at the extraction crossing point.

- **Setting 72B:** A portion of this setting is planned to be extracted across Te Puna o Te Korotangi, Category 4 wetland, consisting mainly of Raupo swamp. Minimise the number of extraction corridors though/over this area. **Any rope shifts over the Raupo should be straw line shift, i.e., no lateral dragging of ropes. Some minor temporary damage can be expected to the Raupo from log extraction.**

Causeway: There is a causeway running south-west from Morrison Road through Te Kowiwi Creek Wetland. This causeway has been built up with sand from the surrounding swamp, it could be used for light machine and vehicle access. This would have to be reassessed at the time of harvest.

Required notifications: (see safety notes for more details)

- **Traffic Management Plan (TMP) for Morrison Road (public road, Otorohanga D.C.):** The appropriate HFM Forester is to contact the approved TMP providers 6 weeks prior to falling, to have a TMP and road control arranged.

Safety

- **Felling within two treelengths of Morrison Road (public road):**
  - The northern and north-eastern boundary of this harvest area is within two treelengths of the public section of Morrison Road. A Traffic Management Plan (TMP) and road control will need to be in place prior to any falling within two tree-lengths of this road. The appropriate HFM Forester is to contact the approved TMP providers 6 weeks prior to falling, to have a TMP and road control arranged.

- **Farm Neighbour within two treelengths:**
  - The Okapu Trust Farms are on the western and southern boundaries of this harvest area. This area will require a full hazard assessment around the time of clearfell. The farm neighbour is to be contacted, hazards will have to be identified and discussed with all affected parties.

    Okapu Trust Farm Contact; Farm Manager - Lance Limmer – PH# 07-871-0876.

- **Steep slopes:**
  - There are steep slopes throughout and on the boundaries of this harvest area (refer to the Slope Map for the locations). Highlight this to operational staff and manage through the Daily Hazard ID and hazard management processes.

Environmental

Archaeological sites:

Morrison's Forest has a high number of archaeological sites. All known sites have been identified on the Operational Plan and Archaeological Sites Maps. These will be marked prior to operations commencing. There is a very high probability that other, yet undiscovered sites will be found during the operational phases.

There are multiple known sites within or on the boundary of this harvest area which include three pa sites, and multiple terraces and middens. (refer to the Operational Plan and Archaeological Sites Maps for their locations). Specific felling and extraction strategies must be agreed, in consultation with the approved archaeologist or HFM representative prior to working on or around these sites.

Known/sites archaeological survey records (Refer to the Archaeological Sites Map for locations):

- **R15/112: -** R15/112 is a cave rua cut into a rock face on the northern aspect of a large ridgeline. The rua is in excellent condition. It has two 'bays', possible petroglyphs, and clear toki marks on its walls. The site is clearly marked, and directional felling will ensure no damage to the site during removal of nearby trees. It is recommended that further marking is carried out uphill from the site to ensure no trees are dropped into the area of the site. **This site is to be protected. Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from the site to protect it. Stems to be carefully shovelled away from site.**

- **R15/805: -** R15/805 is a small terrace site overlooking Morrison's Road. The site is in good condition and is largely outside the forest boundary in a stand of indigenous bush. Adjacent trees can be easily felled away from features. Harvesting will have no impact on the site. **Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from the site to protect it.**

- **R15/807: -** R15/807 consists of a possibly natural terrace that has been utilised by Maori. On the downhill (eastern) slope of the terrace a large scatter of midden is present, which appears to have been cast down the hill. Pine trees are present on the terrace and down the steep slope. Planned harvesting activity will have no impact on the terrace feature but may disturb intact midden deposits. **Carry out a pre site assessment with the Environmental Planner. Mechanical directional felling on areas approved by the Environmental Planner. Manual directional falling to protect site, trees to be carefully shovelled off.**

- **R15/806: -** R15/806 consists of two terraces located on a natural knoll overlooking the wetland to the east of the forest. The site is marked and planted; however, the terrain in this area and the relatively small size of the features means directional felling and lifting stems off the site will be sufficient to cause no damage. **This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/172: -** R15/172 is a rectangular pa site located on a high spot of one of the major ridges running north from the Pukeatua trig. The site consists of a rectangular shaped main platform, with subtle indications of further divisions. A bank and terrace run around the north and west of the site, while the naturally steep topography is utilised to the south and east. To the south east of the main platform a flight of terraces runs down the ridgeline; no clear evidence of pits is present on the site. The site is in excellent condition, it is clearly marked; but has been fully planted. A specific felling strategy will be required to minimise ground disturbance in this area. **This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/430: -** R15/430 is a pit/terrace site located on a low spur immediately to the west of the Te Kowiwi stream. The site is in good condition, is well marked and is planted. The current harvest plan calls for trees to be moved uphill from the site via hauler. Dragging of stems across the site is likely to impact the archaeological features. Rigging a tail tree in this area may provide sufficient lift to minimise disturbance. **Carry out a pre site assessment with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan.**

- **R15/796: -** R15/796 is a small pit/terrace site located on a ridgeline below R15/172. The pit is approximately 100mm deep and ephemeral. The terrace is in good condition and is not planted, although a wilding pine is present, which should be felled to waste. Harvest will have no impact on the site. **Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from the site to protect it.**

- **R15/171 -** R15/171 is a pa site located on the end of a narrow spur overlooking the Te Kowiwi Stream. The site is unplanted (although some wilding pines are present), and largely in grass. The main platform is separated from the spur with a large ditch and bank, inside these defences a large number of rectangular storage pits are present and in good condition. The southern slope of the pa contains no features and is planted; but will be difficult to harvest due to the presence of the pa (above) and taro (below). Trees in this area may have to be felled to waste. **This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/428: -** R15/428 is a small terraced area downhill from a forestry track that sidles around the hill bordering Hawaiki iti. The terrace contains a probable pit approximately 4m x 4m next to a dead wilding tree. The site is not planted; harvest will have no impact on the site. **This site is to be protected. Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from this site to protect it.**

- **R15/798: -** R15/798 is several stands of taro, regarded as remnants of early Polynesian cultivation in the area. Plants are located in a number of patches to the west of the wetland area but are in particularly good condition south of R15/171 where they are found adjacent to running water. Much of the taro is located outside the forest; however, some stands may be impacted by hauler operations in this area. **These sites are to be protected. Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from these sites to protect them.**

- **R15/797: -** R15/797 is a site that consists of a single pit and terrace on a low-lying small spur northwest of R11/171. The site is in fair condition, with some surface erosion causing features to become indistinct. The site is clearly marked and is small enough that trees can easily be removed with no ground disturbance. **These sites are to be protected. Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from these sites to protect them.**

- **R15/425: -** R15/425 is a midden/terrace site on a spur directly below (east) of R11/216. The site was originally recorded as a midden, but in his update Coster included a singular terrace. Like Coster's survey, the 2020 survey did not find the midden, but the terrace was present, although it was not clear. The terrace is marked, trees are largely excluded, but are present on the southern margin. Harvest operations around this site should cause no ground disturbance. **This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/216: -** R15/216 consists of at least four terraces on a small spur overlooking pa site R15/171 to the east. It is also immediately to the west of R11/425. The site is clearly marked and is planted. One terrace is clear, but further terracing is ill-defined. The discrete nature of the site mean that harvest operations should have minimal impact. **Carry out a pre site assessment with the Environmental Planner, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/799: -** R15/799 is a collection of four open rectangular pits located on a thin ridge near the boundary of the forest. The pits are generally clear and in good condition, although one pit is filled and ill-defined. The site is in good condition, it is clearly marked, but has been planted. The discrete nature of the features and local topography mean that harvest operations should have minimal impact. **Carry out a pre site assessment with the Environmental Planner, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/426 -** R15/426 is located on a wide, flat piece of high ground in the south of the forest. The margins of the hill have large amount of in-situ and redistributed midden with associated charcoal. No features are clear on the top of the hill, although the large amount of midden on the slope below the flat natural platform is highly suggestive of occupation. Felling and dragging stems across the slope of the site is likely to impact several small in-situ midden deposits. Moreover, while no surface features are present it is possible that ground disturbance on the top of the landform will uncover further archaeological deposits. **Carry out a pre site assessment with the Environmental Planner, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/810: -** R15/810 is an eroding midden, probably related to R15/426, which lies just outside the boundary fence adjacent to a small area of native. Harvesting will not impact the site. **Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from the site to protect it.**

- **R15/809 –** R15/809 is a single terrace on the western side of a flat spur that projects into the surrounding swamp. No features were observed on the flat area behind the terrace, although the nature and location of the landform are consistent with occupation, which may have resulted in subterranean features. The slope below the terrace has a large amount of eroding midden. The site is in good condition, the visible terrace is not directly planted on and nor is the slope on which the midden is located. The current harvest plan indicates that felled stems will be shovelled north past/over the site. Although there is a relatively small amount of wood in this stand a route should be identified that avoids the site and minimises ground disturbance on the top of the landform. **Carry out a pre site assessment with the Environmental Planner, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/429: -** R15/429 is a midden in the sand dunes outside the forest plantation. This site would only be affected if trees were felled in that direction. **Carry out a pre site assessment with the Environmental Planner. Mechanically and manually fall trees away from the site to protect it.**

- **R15/111 -** R15/111 is a well-preserved pa on a headland overlooking a swamp immediately south of Aotea township. The site consists of a main elevated platform with two large terraces extending around its north and west, large pits are clearly present on the upper terrace. Smaller terraces run down the northern spur toward the wetland below. The site remains in excellent condition and has been marked, the upper platform has been excluded from planting but much of the rest of the site has been planted. Peripheral trees can be removed with minimal impact on features using high-stumps and directional felling. Trees on the western portion of the terraces may be able to be reached and removed by machine with minimal surface damage; however, slewing is likely to occur in order to reach trees in the northern section of the large terraces. Trees that cannot be removed without damage to archaeological features must be felled to waste. A specific harvest strategy should be developed for this site**. This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan. Some trees may have to be felled to waste.**

- **R15/800 -** R15/800 consists of two dense midden deposits immediately uphill from R15/111. One deposit appears to be in-situ and the other is a diffuse scatter of shell on the surface. The periphery of the deposits is marked with yellow tape, some trees are within the taped zone. The site is small meaning trees can easily be accessed without entering the site boundary. Lifting and shovelling felled stems away from the site will cause no disturbance to the site. **This site is to be protected. Assess the area with the Environmental Planner or authorised archaeologist, work to a documented tree removal plan.**

- **Trees on visible archaeological features should be felled leaving high stumps around the boundaries where practicable. Dragging of felled stems across archaeological features must be avoided. If stems cannot be removed without causing damage to archaeological features they should be felled to waste.**

- **Track screwing and dragging of stems should be avoided in the vicinity of archaeological sites to minimise ground disturbance.**

- **If operations discover any new archaeological sites work must stop immediately in that area. The Environmental Planner must be contacted immediately. No further work can commence on such a site until approved by HFM.**

- **Visibility to the public, and subject to public scrutiny:**
  - Operations will be highly visible to the public. Operational suppliers should be mindful that public perceptions may be very different to those within the industry.
    - Highlight this point to all operational staff.
    - Apply best practice at all times.
    - Be vigilant to issues that may be viewed differently by the general public.

- **4M Streams:** There are multiple 4M streams, and one 5L steam within the harvest area (refer to the Operational Plan Map for the locations). Ensure slash is left clear of the channels and cannot be carried offsite. Minimise disturbance to riparian vegetation. Refer to Appendix II, Rule 6 of the HFM EMS manual.

- **Temp Crossings:** Three Temp crossings have been planned for in Setting 71. (refer to the Operational Plan Map for the locations). These are indicative sites. The harvesting contractor can shift these sites after consultation with the HFM Harvesting Forester.

- **Te Puna o Te Korotangi, Category 4 wetland:** This harvest area only impacts on the lower section of this wetland. The wetland is culturally significant to Ngati Te Wehi and was the find site for the ancient Korotangi (sacred bird artefact).
  - The "lower" section (Hauler Setting 72). comprised predominantly of Raupo wetland. **Fall trees away from this area as much as is practicable and maximise lift. Any rope shifts over the Raupo should be straw line shift, i.e., no lateral dragging of ropes. Some minor temporary damage can be expected to the Raupo from log extraction.**

- **Te Kowiwi Creek Wetland, Category 3:** The Te Kowiwi Creek Wetland is on the eastern boundary of this harvest area. **Fall trees away from this area. Do not Damage.**
  Note: There is a causeway running south-west from Morrison Road through this wetland. This causeway has been built up with sand from the surrounding swamp, it could be used for light machine and vehicle access. This would have to be reassessed at the time of harvest.
- **Category 4 wetland/shrubland:** There is a Category 4 wetland/shrubland at the southern end of the harvest area (Refer to the Operational Plan Map for the location). **Do not disturb this area.**

- **Public Road:** The northern and north-eastern boundary of this harvest area is adjacent to Morrison Road. **Fall trees away from this area. Do not Damage.**

- **Farm Neighbour:** The Okapu Trust Farms are on the western and southern boundaries of this harvest area. **Fall trees away from this area. Do not Damage.**

- **Non slash Zones:**
  - Non-slash zones have been allocated around the drop-offs of Hauler Pads 71 B, 72A, and 72B. Ensure no slash or spoil is loaded along these margins. Slash and spoil are to be stored on stable ground.

- **Tracking:**
  - Morrison's Forest has a high number of archaeological sites. Tracking could unearth undiscovered sites and should be avoided unless necessary. All tracking and modifications are to be planned and carried out in consultation with the HFM Harvesting Forester. Ensure all tracks not required for further use are deactivated as soon as possible and consideration is given to any forecast periods of wet weather.