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THE HISTORY AND ARCHAEOLOGY OF THE MAKATOTE TRAMWAY, ERUA

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Introduction

Bush tramways played an integral role in New Zealand's early timber extraction industry, and are an important part of our industrial heritage (see Mahoney 1998 for a detailed history of New Zealand's bush tramway industry). Bush tramways were located across New Zealand from Port Craig in Southland to Pupoke in the Far North, and there was a considerable number in operation across the central North Island's Waimarino Plain, to the west of Mount Ruapehu. One such tramway was the Makatote tramway, the remains of which are situated on the western boundary of the Tongariro National Park, approximately five kilometres south of Erua, and ten kilometres south of National Park, on State Highway 4 (Figure 1). The Makatote tramway dates to the late 1920s and contains a range of structures and features associated with timber milling operations, including the tramline itself (both wooden and metal rails), skid sites, a log hauler, water pits, bogie wheels and a range of metal artefacts. It also appears to run past at least three house sites, marked by clearings in the bush running south to the point where State Highway 4 descends into the Makatote gully. The Makatote tramway, including the associated house sites, was recently registered by the New Zealand Historic Places Trust as a Category II historic place (Register No. 7688) on the basis of its archaeological, historical, technological and scientific significance, and it has been gazetted as an archaeological site (S20/32) under Section 9 of the Historic Places Act 1993.

History of the Makatote tramway

The land on which the Makatote tramway is located was formerly part of the Waimarino Block. The Waimarino Block was surveyed in 1882, and

Figure 1. Location map, adapted from map of Makatote tramway, Department of Conservation Tongariro/Taupo Conservancy.

the Crown purchased the land from Ngati Tuwharetoa five years later at 2/6 per acre (Allen 1984: 22). Land in the upper Waimarino district was allocated to the Forests Department in 1900 under the Forests Act 1874, and from the early 1900s the Government started to make small parcels of land available for the removal and milling of indigenous species such as rimu, totara and matai, which all formed part of the natural vegetation of the Waimarino Plain (Williams and Mercer 2006: 4).

The area in which the Makatote tramway is located was part of the Erua State Forest, gazetted in 1922 (George 1990: 78). A number of mills were established in the vicinity of Erua during the late 1910s/early 1920s as further

areas of indigenous forest became available for the purposes of commercial harvesting (Williams and Mercer 2006: 5). There was a marked increased of *New Zealand Gazette* advertisements for the sale of cutting rights on Crown land in the area between Erua and Horopito between 1917–1925, and there was a rise in the number of sawmills in the area between Taumarunui, Raetihi and Ohakune (Williams and Mercer 2006: 5). Allen (1984: 124–125) notes that there were as many as 86 mills in the Waimarino district alone, a significant number of which were operated by workers of Scandinavian descent.

Information that the Makatote tramway was constructed around 1905 has not been substantiated, but historical evidence (including oral history) indicates that the Pedersen family were the first people to mill this piece of bush (George 1990: 82; Allen 1984: 133; Williams and Mercer 2005: Tim Towns interview). The Waimarino Electoral Roll (1914) indicates that fifteen members of the Pedersen family had moved to the Waimarino District, establishing sawmills at Rangataua (east of Ohakune) and Pakihi, near Raetihi (Williams and Mercer 2006: 6). Charlie Pedersen owned the Mangawhero Sawmilling Company at Karioi with two of his sons, Arthur and Alfred (Fred), and their wives Julia Pedersen, Annie Elizabeth Pedersen and Tereita Elizabeth Pedersen were the principals of the Karioi Sawmilling Company Limited, which was incorporated on 19 December 1927 (Archives NZ File, CO-W Acc 3445/ 336). All were from Raetihi, and the men are listed as sawmillers in the Waimarino Electoral Roll (1928). The company did not evidently begin business operations at the Makatote site until 17 January 1929, and the mill later closed down on 18 December 1931. The reason given was that "the price of timber fell to such an extent, that serious loss would have been incurred, had operations continued" (Correspondence: 9 May 1932, Archives NZ File, CO-W Acc 3445/336). The Karioi Sawmilling Company was struck off the Companies Register on 3 July 1934 (Archives NZ File, CO-W Acc 3445/ 336).

The history of the Makatote site between the years 1931 to 1934 is unclear, but the bush was surveyed in 1934 and timber-cruising sheets were prepared (Archives NZ File F1 23/3/42/8). Available timber species included matai, miro, totara, rimu and kahikatea (Timber-cruising sheet, Archives NZ File F1 23/3/42/8). The sale of the cutting area Lot 11 (immediately north of the area cut over by the Karioi Sawmilling Company) was advertised in the New Zealand Gazette on 13 September 1934, and two tenders were received; one from Mr Thomas Dinwoodie, a sawmiller who had mixed success in previous operations in the region, and one from Mr Edhouse of Crighton Brothers Limited in Ohakune (Correspondence: 6 October 1934, Archives NZ File F1 23/3/42/8). References from the Bank of New Zealand described Dinwoodie

as a "reliable man in small way but appears to be doing fairly well at present. Providing he doesn't meet with a reverse consider him safe risk for £128 per month, over 37 months" (Correspondence: 13 October 1934, Archives NZ File F1 23/3/42/8). Dinwoodie's business associates D.G. and K.S. Glendinning were also considered reliable, and his tender was accepted (Archives NZ File F1 23/3/42/8).

Dinwoodie subsequently formed the Dinwoodie Timber Company with the Glendinning brothers, and in November 1934 he was issued with a sawmill license (No. 16/42/72) for Lot 11 of State Forest 42, Block VIII Manganui and Blk V Ruapehu Survey Districts, as shown in Figure 2. The license covered the period 18 October 1934 to 17 April 1939, and had a purchase price of £5100 (Archives NZ File F1 23/3/42/8). The license allowed for the erection of a sawmill and the cutting of rimu, matai, kahikatea, totara and miro, estimated contents totalling 3,347,600 ft board measure and 500,810 ft cubic measure (Archives NZ File F1 23/3/42/8).

Dinwoodie was subsequently issued with a lease of a 2.86 acre site within State Forest 42 for the purposes of erecting a sawmill, backdated to be valid for the same period as the sawmill license (Archives NZ File F1 23/3/42/8). Dinwoodie was also required to obtain a tramway license, but this was delayed due to complications arising from the fact that part of the necessary tramway formation had already been completed as a result of the Karioi Sawmilling Company's activities (Archives NZ File F1 23/3/42/8). The tramway license was finally issued on 24 September 1935, but was backdated to 18 October 1934 and valid for four and half years.

The tramway license allowed the Dinwoodie Timber Company Limited "to occupy the land specified in the Schedule hereto as a tramway route for the purpose of using and maintaining a tram-line and running a tram thereon" (Tramway License PN/38/42/4, Archives NZ File F1 23/3/42/8). An attached plan showed the extent of the existing tramway, which crossed the "Bulls–Taumarunui Road" (State Highway 4) to join the North Island Main Trunk railway (Figure 3). The license did not allow for any other use of the land such as felling of trees for maintenance of the tramline, this was to be assessed and charged for (Williams and Mercer 2006: 7). Dinwoodie was also required to provide free carriage of young trees and materials for replanting for the State Forest Service, at such time as unloaded trolleys were returning to the workings (Williams and Mercer 2006: 7).

It is unclear what type of technology was utilised by Dinwoodie in his initial milling operations, but in 1936 he purchased a new RD6 Caterpillar tractor and used it to retrieve logs, and transport them to the mill (Anderson 2000: 60). The tractor soon created financial and legal problems however,

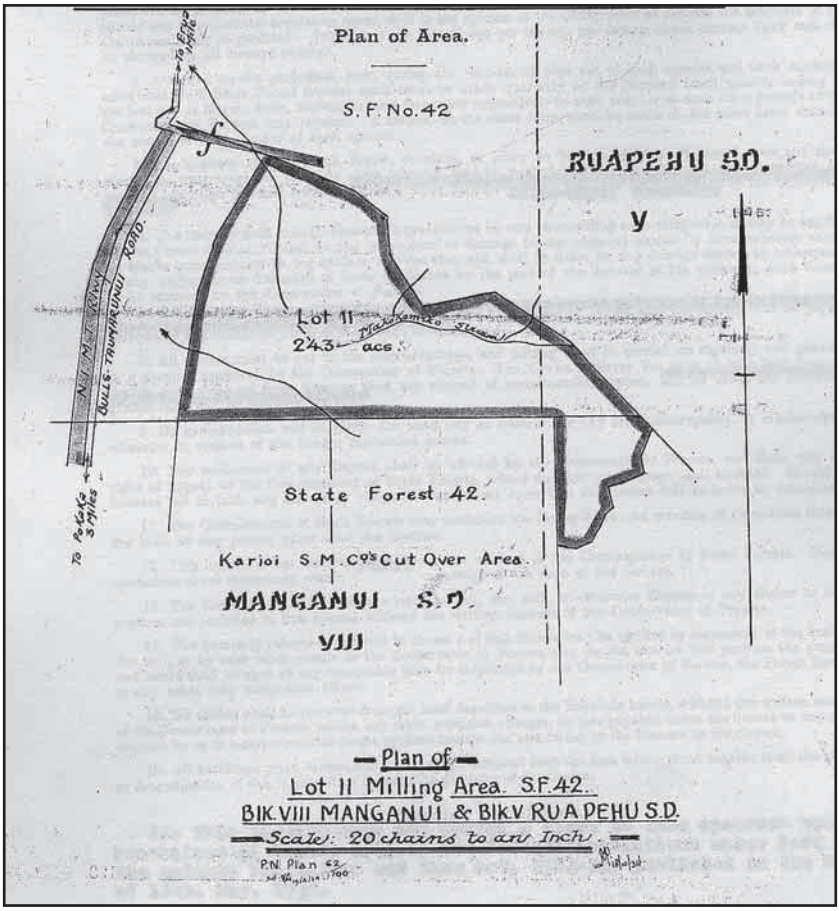

Figure 2. Plan of Lot 11 Milling Area, State Forest 42. Attached to Sawmill License No 328, File F23/3/42/8, Archives NZ, Wellington.

as Dinwoodie was "misled by the agent selling the tractor as to the nature of the track required with the result that his track on his right-of-way is now a channel of mud" (Correspondence: 10 October 1935, Archives NZ File F1 23/3/42/8). Young exotic trees had also been damaged as a result of the tractor leaving the right-of-way, and the local Forest Ranger requested that action be taken against Dinwoodie for trespass (Correspondence: 10 October 1935, Archives NZ File F1 23/3/42/8). The hauling of logs through mud evidently also led to difficulties with mud getting into the mill machinery, which

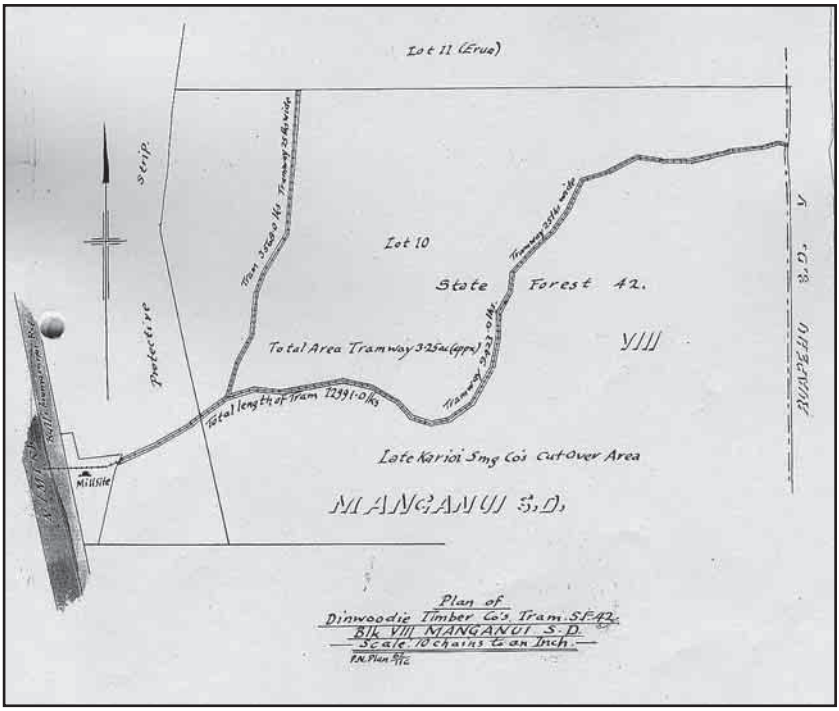

Figure 3. Plan of Dinwoodie Timber Company's Tram in State Forest 42. Attached to Tramway License, 24 September 1935, File F23/3/42/8, Archives NZ, Wellington.

was particularly problematic if stones had become embedded (Williams and Mercer 2005: Crighton interview).

By March 1938 it was reported that Dinwoodie had found tractor logging to be unsuitable, and he had to close his mill for at least a month to lay new tramlines (Correspondence: 20 June 1938, Archives NZ File F1 23/3/42/8). Dinwoodie had ordered a specific rail tractor however and was awaiting its delivery (Correspondence: 20 June 1938, Archives NZ File F1 23/3/42/8). Dinwoodie's situation did not greatly improve however over the ensuing months, and K.S. Glendinning wrote to the Conservator of Forests in October 1938 to request postponement of the promissory notes that had fallen due, pleading extenuating circumstances on Dinwoodie's behalf (Correspondence: 12 October 1938: Archives NZ File F1 23/3/42/8).

In June 1939, Dinwoodie applied to cut over the remaining area of timber in Lot 10, State Forest 42 (the area cut over by the Karioi Sawmilling Company), having completed his harvesting in Lot 11 (Archives NZ File F1 23/3/42/8). Tenders were advertised and Dinwoodie's poor financial record was considered. He was granted the license from 24 July 1939 for a period of one year since his payments had been met, but the company soon experienced further financial difficulties, and went into liquidation in June 1940 with a debt of over £438 owing to the State Forest Service (Correspondence: 3 October 1940, Archives NZ File F1 23/3/42/8). Arrangements were made for Dinwoodie's creditors to work the area, which had been left with cut timber to the value of approximately £630. A creditors' meeting was planned and the Conservator of Forests recommended that a new license be issued for the balance of the uncut timber and to clear the cut timber as a means of debt recovery, but it is unclear if this actually transpired (Correspondence: 21 October 1940, Archives NZ File F1 23/3/42/8). Dinwoodie continued his involvement in the sawmilling industry however, and is listed in the Waimarino Electoral Roll (1943) as a sawmiller at National Park.

The archaeology of the Makatote tramway

The Makatote tramway was surveyed over a total of six and a half days in July and October 2005. Key features such as tramway junctions, artefacts, bridge crossings, draglines and skid sites were photographed and recorded using a GPS (with an aerial attachment) where possible, and measurements were also recorded if considered appropriate. The survey data was then utilised to produce a map of the site as shown in Figure 4.

Mill Site

The first evidence of the Makatote tramway is the mill site, which is accessed via an unmarked track that crosses the road reserve into the Tongariro National Park.[1] The mill site is in a relatively flat, open area and although there is no structural evidence of the mill, there is a metal plate (possible boiler plate) and artefactual remains such as billies, pails, metal drums and a spade. The size and structure of the mill is unclear, but its position is verified by historical maps/ plans (refer to Figure 3).

Tramway

The tramway itself consists of a branching network of tramlines that head in an easterly/ north-easterly direction from the mill site. There are both

[1] While this track is quite visible from the side of the road, the route through the bush to the beginning of the tramway is not clearly marked. Anyone visiting the tramway would need to be guided by a person familiar with the site.

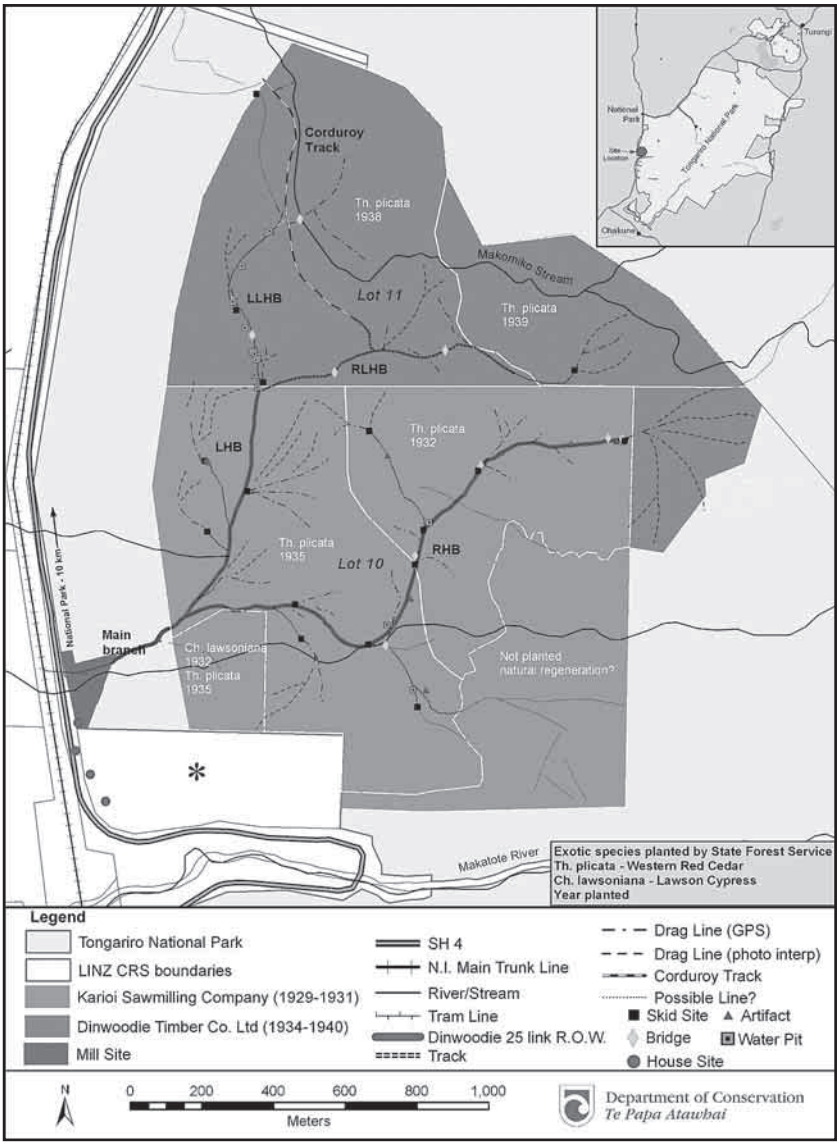

Figure 4. Map of Makatote tramway site, produced by Department of Conservation Tongariro/Taupo Conservancy, February 2006.

wooden and metal rails, as well as a corduroy track in the northwest of the site. While no conclusive comments can be drawn about the tramway's sequence of construction, historical documents indicate that the "the whole of the left hand branch and part of the right hand branch towards the eastern extremity" were constructed by the Dinwoodie Timber Company (Correspondence: 7 June 1935, Archives NZ File F23/3/42/8). The following description of the tramway focuses on the various components of the network, referred to as the main branch, left-hand branch (with a further division into the left left-hand branch and right left-hand branch), right-hand branch and corduroy track.

Main branch

The tramway begins from the mill site and continues in a north-easterly direction. Few sleepers and rails are remaining, but the formation is clearly visible. The wooden tramway was constructed from totara rails (approximately 70 x 150 mm), overlaid on rough sawn logs of various diameters (Williams and Mercer 2006: 9). The rail was attached to the underlying sleeper by a substantial metal spike, several of which can be seen along the tramway. The sleepers are spaced 1.2 m apart and the gauge of the rails is approximately 1.25 m. A bogey wheel was also observed on the main branch, shortly before a junction where it splits into the left-hand and right-hand branches.

Left-hand branch (LHB)

The LHB runs in a northerly direction from the main branch junction and has several side branches to the east and west. The second side branch to the west of the LHB is notable for its *in situ* rails, bearers and sleepers, and it also has a points change. It leads to a skid site and log hauler, which is imprinted with the name "S. Luke and Co Ltd, Wellington", one of the 13 principal log hauler manufacturers in New Zealand (Mahoney 1998: 21). The log hauler has a noticeable crack in the side, and is likely to have been abandoned here as a result (Figure 5).

The LHB then continues past the side branches for a distance before splitting into two at the former boundary between Lots 10 and 11. The left left-hand branch (LLHB) has more *in situ* sleepers, rails and bearers than the LHB, and has two skid sites, a causeway and a bridge crossing. There are also numerous water pits along both sides of the tramway which are of varying shapes and sizes, including one with clearly excavated sides measuring 2 x 1.5 m, with a depth of 2.3 m. The function of these pits is unclear; they could have been constructed to provide water for the steam-powered log hauler, but may also have provided the water needed to meet the fire safety requirements of the tramway license.

Figure 5. Close up of log hauler, Makatote tramway. Photo Department of Conservation Tongariro/Taupo Conservancy, August 2004.

The right left-hand branch (RLHB) of the tramway runs in an easterly direction from the junction, and is a very different formation from the LLHB with its *in situ* lengths of wooden tramway. The RLHB has two bridge crossings and largely consists of intermittent sections of corduroys though there is a small length of wooden tramway at the very end of the branch, which was discovered after cutting through an area of fairly dense bush, and leads to a skid site and associated draglines. There is also a junction partway along the RLHB, continuing either straight ahead or looping back along a corduroy track towards the LLHB.

Corduroy track

A corduroy track begins at the junction on the RLHB and continues in a north-westerly direction as far as the western edge of former Lot 11, as shown in Figure 4. There are two distinct draglines off this track to the north-east, and both run down to the Makomiko Stream. The southernmost dragline has a bridge across the Makomiko Stream and continues on the other side, but there was no clear crossing for the dragline at the north-western end of the corduroy track. The latter dragline was of particular note as parallel logs had been placed on the upward slope to assist with the hauling of logs. A large skid site was located and recorded to the northwest of the corduroy track, almost at the western edge of former Lot 11. The exact age and function of this corduroy

track is unclear, but Dinwoodie possibly used this track for hauling logs with his RD6 Caterpillar.

Right hand branch (RHB)

The RHB heads east up a slight incline from the junction, and there are exotic trees planted on either side of the formation. It then continues in a north-easterly direction towards the edge of former Lot 10 where a skid site and associated draglines were recorded. Historic maps indicate that it continued beyond this point, into the block currently planted in Lawson's Cypress, and although draglines are visible in this area on aerial photographs, these were not able to be located during the archaeological survey. The RHB is overgrown in places, but continuous lengths of wooden rail (including a section of double tramline) are present, and there are metal rails further along the branch (Figure 6). There are also a number of bridge crossings along the RHB and several side branches with skid sites and draglines, including two to the south that cross the stream. Recorded artefacts along the RHB (and its side branches) include numerous bogey wheels (Figure 7).

Skid Sites and Drag Lines

16 skid sites have been recorded within the Makatote tramway site, either adjacent to the main branches, or at the end of side branches. These skid sites are of varying condition and size, but they all have the same basic construction, with a series of notched base lateral logs supported several cross beams which the logs were hauled onto (Figure 8). Wire rope was frequently observed around tree trunks in close proximity to the skid sites, and scaffolding marks were also recorded on two tree trunks. Associated draglines also varied in their length and depth; some were difficult to detect while others were clearly visible with a depth of 1–1.5 m. In some cases the draglines also forked, as seen with the dragline that runs off the corduroy track down to the Makomiko Stream and continues on the other side. This dragline is 2 m wide, 0.6 m metres deep and has a length of 243.5 m before it forks into two branches. The left hand branch continues for another 49 m while the right hand branch continues for a further 229 m.

House Sites

There are no structural remains of any houses, but oral history interviews indicated that there were at least three houses associated with the Makatote tramway and mill, though the information about these houses varied between the interviewees. Erua resident Noel Heath identified the clearings along the eastern side of State Highway 4 (between the road and the

Figure 6. Section of metal rail on right hand branch, Makatote tramway. Photo Department of Conservation Tongariro/Taupo Conservancy, March 2005

Figure 7. Bogey wheel, Makatote tramway. Photo Jo Wylie, NZHPT, July 2005.

Figure 8. Skid site, Makatote tramway. Photo Department of Conservation Tongariro/Taupo Conservancy, August 2004.

National Park) as being the former house sites, as marked on Figure 4 (Williams and Mercer 2005: Noel Heath interview). These clearings were inspected as part of the archaeological survey of the site, and relevant features were recorded. A pit was noted in the northern most clearing and various artefacts were observed**,** including a white china plate with the inscription "Victoria/China/Czechoslovakia." The next clearing to the south contained a number of pit features, and further pits were recorded in the bush to the north of this clearing, as were artefacts such as ceramics, bottle glass and an enamel billy. Two *in situ* wooden posts and a metal pipe were also recorded in this clearing. Two pits and a wooden post were recorded in the third clearing heading south towards the Makatote Gully, and a fourth, much larger clearing contained a pit filled with twentieth century European artefacts, including broken ceramics and glass.

Concluding Remarks

There was a thriving sawmilling industry across the Waimarino Plain during the first half of the twentieth century, but there has been a cumulative loss of this industrial heritage over recent years. Selected sites have been preserved, such as the ex-sawmillers' cottages and mill manager houses at Horopito and the nearby National Park sawmill, and recent historical and archaeological research undertaken on the Makatote tramway suggests that

there is potential for further aspects of this heritage to be protected. While the archaeological survey revealed that the Makatote tramway is only of fair condition overall, it is remarkably complete, with evidence of each of the various components of the operation, and how these changed over time. It has clear potential for archaeological inquiry, such as excavation of the mill site, and possesses high interpretive value. The tramway is easily accessible from State Highway 4, and there is a wealth of historical and archaeological information that could be used for public interpretation purposes, such as the creation of a walking track.

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