



**Archaeological Assessment and
Heritage Management Specifications for
Mauao Historic Reserve, Tauranga**

30 August 2022

Prepared for: Tauranga City Council
P O Box
TAURANGA

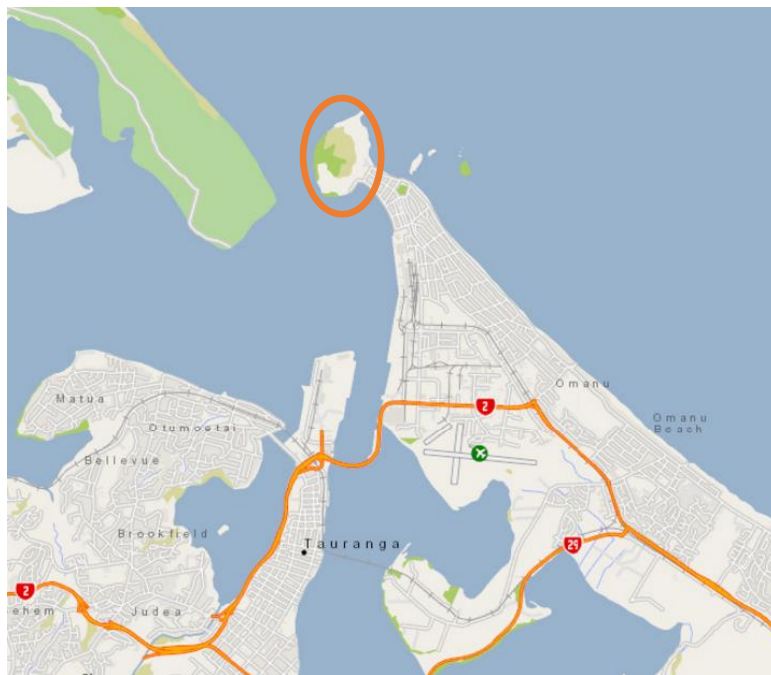
Prepared by: InSitu Heritage Ltd.
P O Box 710
WHAKATĀNE 3158



Contents

1. Purpose	3
2. Statutory requirements	6
3. Project Proposal	6
4. Work Planning	7
5. Current Management Issues	8
5.1 Maintenance of the Summit repairs.....	8
5.2 Land slips and slope stability	10
5.3 Protection or stabilisation of archaeological features	11
5.4 Water control, walking and vehicle track maintenance	12
5.5 Farm operations.....	12
5.6 Rabbit control.....	13
5.7 Conservation of the Iron Jetty landing platform	13
5.8 Condition monitoring.....	14
6. Archaeological values and assessment of effects	14
7. Specifications for work actions	15
7.1 Large tree removal	15
7.2 Land-slip assessment and response.....	16
7.3 Track maintenance	17
7.4 Livestock management.....	18
7.5 Fencing.....	18
7.6 Monitoring.....	20
8. Conclusion and recommendations	20
9. References	21

1. Purpose



Mauao Historic Reserve is an extensive cultural heritage landscape that covers approximately 40 hectares. It is located on the eastern side of the entrance to Tauranga Harbour (Figure 1). There are three known pā complexes within the reserve represented by approximately 800-1,000 visible surface archaeological features including pits, terraces,

Figure 1: Location of Mauao Historic Reserve, Tauranga.

platforms, house floors, shell middens and shell mounds. The archaeological sites are recorded in ArchSite (Figure 2)¹. The shell mounds in the reserve are the only known surviving examples of this type of archaeological feature within the Bay of Plenty. Mauao is a historic reserve gazetted under the Reserves Act 1977 and is also identified as a wāhi tapu on the Heritage New Zealand List (item no. 9423), under the Heritage New Zealand Pouhere Taonga Act 2014.

Mauao is protected under the provisions set out in the Mauao Vesting Act 2008. The Trustees of the Mauao Trust administer the Reserve on behalf of Ngāi Te Rangī, Ngāti Ranginui and Ngāti Pukenga. The Reserve must be managed in a manner consistent with the requirements of the Reserves Act 1977.

¹ The New Zealand Archaeological Association Site Recording Scheme (ArchSite) is the national inventory of archaeological sites in New Zealand, which currently contains over 72,000 records. It was established in 1958 to encourage the recording of information about archaeological sites and is endorsed by Heritage New Zealand Pouhere Taonga and the Department of Conservation as the official national inventory for archaeological sites.

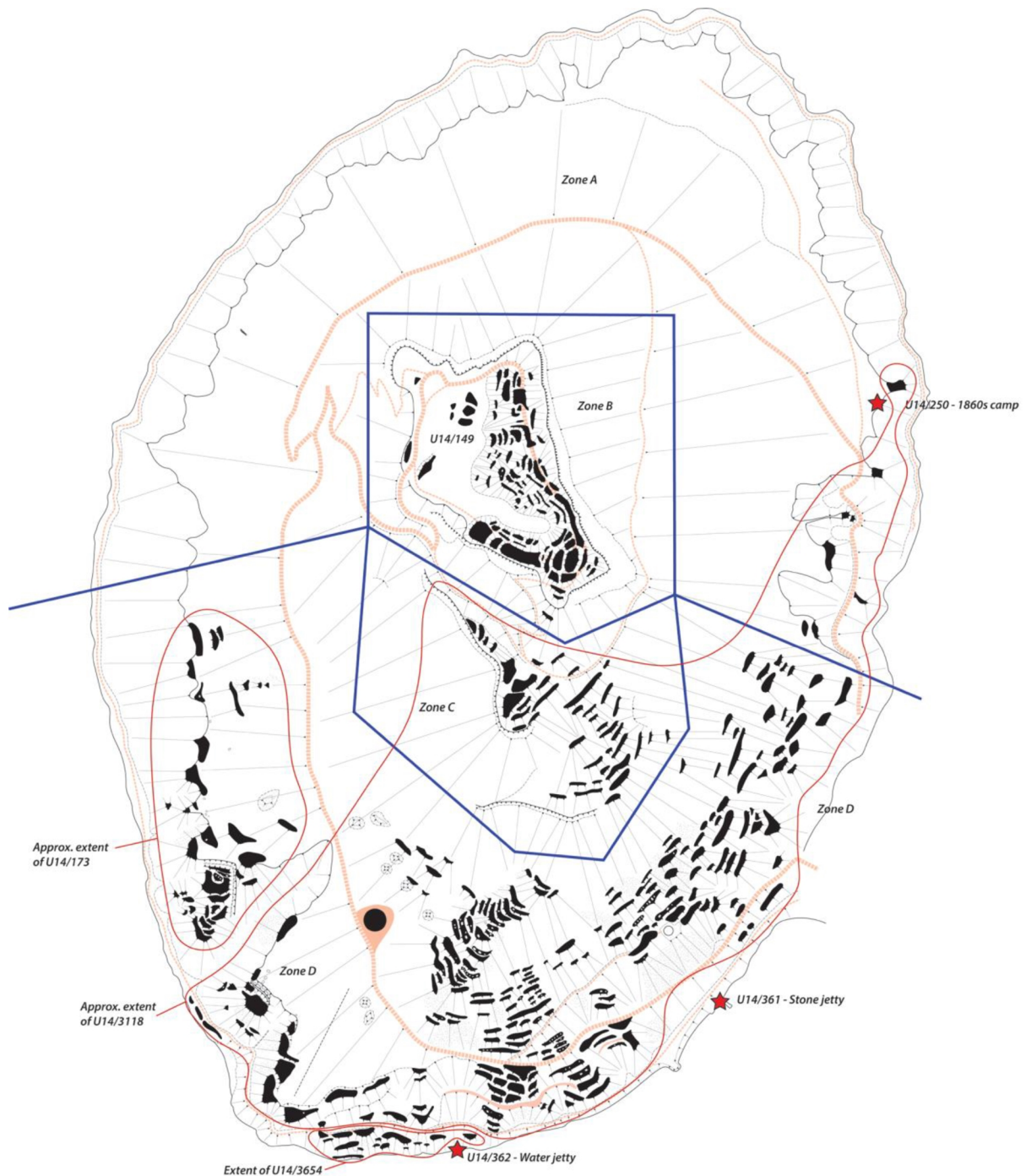


Figure 2: Mauao Historic Reserve and recorded archaeological sites (InSitu Heritage Ltd 2019).

A key principle of historic heritage management is that the values of heritage places are clearly understood before decisions are taken that may result in change. When the heritage values are identified and understood, the aspects of the places that possess heritage value can be conserved and protected accordingly. The visible archaeological features of the reserve were mapped in 2003 and an archaeological report was prepared by s 7(2)(a) - Privacy at that time. In 2004 a Conservation Plan was

prepared for the reserve by Wildland Consultants Ltd, which incorporated specialist archaeological advice to guide management and conservation of the archaeological sites within the Reserve. s 7(2)(a) - Privacy updated the archaeological report in 2014, and the conservation plan was updated in 2015.

Heritage Management Specifications were prepared for the archaeological features of the reserve in 2016 and this current document contains a revision and update of the previous specifications. In 2019 an accurate map of all visible archaeological features was prepared using the earlier 2003 map as well as additional LiDAR and ground surface mapping.

TCC intends to apply for an archaeological authority from Heritage New Zealand Pouhere Taonga (HNZPT) to carry out on-going reserve maintenance and vegetation clearance work at Mauao. That authority would replace authority no. 2017/944 which expired in August 2022. This report includes an archaeological assessment to provide information for the new authority application.

2. Statutory requirements

Heritage New Zealand administers the *Heritage New Zealand Pouhere Taonga Act 2014*. The Act makes it unlawful for any person to modify or destroy, or cause to be modified or destroyed, the whole or any part of an archaeological site without the prior authority of Heritage New Zealand. Any work that may affect an archaeological site requires an authority from Heritage New Zealand before commencement.

This process applies regardless of whether the land on which the site is located is designated, or the activity is permitted under the District or Regional Plan or a resource or building consent has been granted. The Act provides for substantial penalties for unauthorised destruction or modification.

An archaeological site is defined in the *Heritage New Zealand Pouhere Taonga Act 2014* as any place in New Zealand (including buildings, structures, or shipwrecks) that was associated with pre-1900 human activity, where there is evidence relating to the history of New Zealand that can be investigated using archaeological methods.

The archaeological authority process applies to all sites that fit the legal definition, regardless of whether:

- The site is recorded in the NZ Archaeological Association Site Recording Scheme or recorded on the New Zealand Heritage List
- The site is not recorded and only becomes obvious because of ground disturbance
- The activity is permitted under a district or regional plan, or a resource or building consent has been granted.

3. Project Proposal

The proposed work to be covered by the archaeological authority encompasses the routine on-going reserve management activities that include elements of ground disturbance. This encompasses:

- Maintenance of existing walking tracks throughout and artificial surfaces at the summit.
- Maintenance of existing vehicle tracks within the reserve.

- Maintenance of water control features on walking and vehicle tracks including the removal of accumulated road metal from archaeological features adjacent to the 4WD track.
- On-going indigenous vegetation planting in the reserve (as guided by Te Korowai o Mauao Archaeological Site Management and the Ecological Restoration of Mauao Historic Reserve, 2022).
- On-going repair, replacement, and upgrade of fencing,
- Removal of large trees in the reserve that may threaten archaeological site stability or pose a visitor safety risk.
- Replacement of existing interpretive or information signage and structures.

4. Work Planning

When planning any work in the reserve that includes any element of ground disturbance, the following process will be followed:

- Check the archaeological features map (Figure 2, and also available on Council GIS) to determine if visible features are present in the area of proposed work.
- Where there are known or suspected places with heritage values, establish the location and significance of any places using appropriately qualified people where necessary. Archaeological field surveys or inspections should be undertaken by qualified, appropriately experienced archaeologists.
- Ensure that an annual meeting is held with an archaeologist, or Heritage New Zealand staff, to review the proposed work plan for the year, and to obtain appropriate archaeological advice.
- All/any archaeological sites within areas where work is planned must be recorded and accurately shown on maps, and their extent delineated on the ground if appropriate/practical. This work should be carried out with archaeological advice.
- Contact Mauao Trust representatives to identify specific concerns and protection/restoration requirements for any known or suspected heritage places.
- If heritage places will be affected, attempt to redesign, or modify the work program to avoid disturbance, this should be done with archaeological advice.

- If disturbance is unavoidable, check the work is covered by a current Heritage New Zealand Archaeological authority. Ensure compliance with any authority that may be in place.
- Ensure contractors have been briefed about heritage places and archaeological authority requirements.
- Provision should be made during planning for archaeological monitoring of work if required.

5. Current Management Issues

A range of management work has been carried out in the reserve to facilitate the stabilisation of archaeological features including repair of eroded surfaces on the summit, adjustments to the water control management on the 4WD track, on-going rabbit control, redesign of the fencing plan, retirement of vulnerable areas from grazing, adjustment of the grazing regime to reduce stock numbers, planting of areas retired from grazing and removal of large exotic trees from archaeological features.

The main issues that affect the condition of the archaeological sites relate to the activities of visitors, management of large trees, erosion, failure of slopes predominantly on the southern side of the Reserve, and pest control. Erosion and slumping at Mauao is a complex issue, relating to slope stability, vegetation cover, water control and the land management regime, each of which is discussed below although these factors are often interrelated. In addition, one of the two historic jetties on the shoreline at the southern end of the Reserve requires on-going conservation work.

Conservation of heritage places also requires ongoing monitoring of their condition, and appropriate actions to be taken in response to any identified threats. Regular, systematic condition monitoring has been carried out in the reserve since 2018 and this programme is proposed to continue.

5.1 Maintenance of the Summit repairs

The summit pa of Mauao was one of the most strategically important locations in the Tauranga district with commanding views along much of the Bay of Plenty coast and inland to the volcanic plateau. The summit is relatively flat and comprises of two low ridges branching north and northwest from a central high point. The two ridges are separated by a sheltered basin. The summit ridges are terraced while the

basin contains a series of long low back scarps creating large open terrace and platform areas. The summit is naturally defended on three sides by rocky bluffs and steep talus slopes while a 10-20 metre scarp on the southern approach was probably strengthened by palisades.

Prior to 2009 damage to archaeological features on the summit was being caused by the high number of visitors walking over the summit area. The grass sward on tracks could not be maintained due to the density of the foot traffic. As a result, archaeological material was being exposed and subjected to erosion. In many cases the erosion surface had advanced through the archaeological deposit to the underlying natural soil substrate.

Coupled with this erosion was the damage that walkers were causing by using direct routes to destination points which traversed archaeological features. For example, many walkers were taking a direct line through terraces rather than following the track which skirted the edge of these features. The 'desire lines' were often up steeper, and hence more erosion prone, slopes. The severely eroded areas on the terraces and tracks were slippery and as the centre cut deepened the edges collapsed inwards. The steepness of the track and the slipperiness increased the erosive effect of foot traffic. As the erosion area became more unstable walkers moved to a new area which resulted in gradual expansion of the problem.

Repair work commenced in May 2009 (Archaeological Authority No. 2009/224) to cap and armor the archaeological deposits exposed on the summit, and to form a loop track through the site based on widening and formalising the existing walking track. Most of the capping work was completed in 2009. In 2010 a breach in the bank on the summit was repaired with fill and a set of steps was installed over the fill material. In 2011 work on the walking track surface and planting to close old desire line tracks on the cliff edges was completed.

The capping and armoring of the areas of the summit subject to heavy foot traffic and the formalisation of walking routes through the site will continue to protect the archaeological features in the long term. However, to ensure that the capping continues to protect archaeological features, surface wear needs to be regularly monitored and new fill material added periodically. In addition, monitoring of track routes on the summit should be carried out regularly to ensure that new areas of 'desire lines', which have the potential to impact on buried archaeological features, are not developing.

Work actions:

- Condition monitoring of capping and the formation of informal desire lines.
- Remedial action, as required, through the addition of new fill and prevention of desire line formation.

5.2 Land slips and slope stability

Land stability is a significant issue on Mauao, and there has been severe localised loss of archaeological features as a result of slip events since the early 2000s. Some action was taken to stabilise a large slip in the vicinity of the water reservoir by diversion of overflow from the reservoir, fencing of the area to exclude stock and planting in indigenous species. Three other large slips have occurred since that time and have been similarly treated, although the planting regime has differed, and the slips have not all been excluded from grazing.

In addition, the base track cut, coupled with over-grazing, resulted in the destabilisation of middens on the lower slopes, and these have been subject to on-going loss through erosion. This was partially addressed by retiring the areas from grazing in 2005, and intensive rabbit control to establish robust ground cover in areas retired from grazing. In some areas, however, midden continues to erode out onto the base track, and this requires on-going attention to stabilise through the introduction of fill material and planting.

Most of the very large trees in the reserve that required removal were successfully extracted in 2022. However, there are a few remaining trees that need removal and a specification for this work is set out in section 7.1. In addition, there are numerous other smaller trees in the southern portion of the reserve growing on archaeological features. The majority of these are exotic species, and these should also be removed before they become any larger and pose significant removal issues.

Work actions:

- Continue large tree removal where trees are identified as threatening slope stability or pose a threat to public safety.
- Remove smaller trees by felling at ground level, followed by herbicide application to stumps if necessary.
- Land-slip assessment and response.

5.3 Protection or stabilisation of archaeological features

It is appropriate to establish vegetation other than grazed pasture on archaeological features in parts of the reserve where continued livestock grazing is not desirable for archaeological site protection or other reserve management purposes. In these areas, continued grazing is having a detrimental effect on slope stability and is contributing to the loss of archaeological sites. While establishing a vegetation cover other than grazed pasture may lead to some loss of archaeological information, overall that loss will be less than that caused by on-going erosion.

In June 2022 the Mauao Trust and Tauranga City Council accepted and endorsed the archaeological site management advice contained in Te Korowai o Mauao – Archaeological Site Management and the Ecological Restoration of Mauao Historic Reserve, prepared by InSitu Heritage Ltd. That report provides specifications relating to vegetation management within a series of identified units of the reserve. This current report should be considered in conjunction with the Te Korowai report.

Work actions:

- Follow the management specifications for planting set out in Te Korowai o Mauao – Archaeological Site Management and the Ecological Restoration of Mauao Historic Reserve.
- Ensure archaeological authority is in place prior to any planting work.

The establishment or at least encouragement, by protection from grazing by rabbits, of pōhuehue on the large shell mounds within the grazed portion of the reserve should continue. In a few areas this is well established and is protecting the archaeological features. Temporary fencing, or covering with netting, of these areas is required to protect newly established seedlings from grazing by sheep; however, care should be taken to ensure that sheep do not cause further erosion damage by tracking along any fence margins, as has occurred in the past. Archaeological advice is required for this work. Maintaining very low rabbit numbers within the reserve is also crucial to the success of this management approach.

Work action

- Establishment of pōhuehue on shell mounds, this will require excluding livestock by temporary fencing or protective netting.

5.4 Water control, walking and vehicle track maintenance

Regular maintenance of water run-off systems and track formations will minimise the risk of accidental damage to heritage places resulting from land slips. The primary function of regular maintenance is to ensure early identification and remedying of problems. Machinery used for the maintenance of access tracks, water control work, and land slip clearance, however, also has the potential to damage heritage places.

Water runoff through culverts, particularly from the 4WD track on the southern side of Mauao, is resulting in the accumulation of road metal and other debris on the archaeological features below the track. This material is progressively building up on the terraces and resulting in site burial and loss of feature definition. The accumulated material needs to be removed and runoff management needs to be better designed to avoid the deposition of material near culvert outlets on archaeological features.

Work action:

- A specification for track maintenance is provided in Section 7.3.

5.5 Farm operations

Grazing of sheep, to maintain a protective grass cover on archaeological features, has the potential to seriously damage the features through trampling and tracking. Nevertheless, in some areas of the reserve grazing is the most appropriate regime to maintain a vegetation cover that offers the best protection to archaeological features while also providing for public viewing and appreciation of the surface features. The risk to archaeological features posed by grazing must be carefully balanced against the potential damage caused by a change in the vegetation cover.

Management of grazing and associated fencing is a key requirement to stabilise archaeological features and reduce the rate of deterioration of features. A degree of ground damage due to stock trampling and tracking is always going to occur as a consequence of using grazing animals to maintain a pasture sward. This risk should be managed to restrict damage to areas where archaeological features are not affected.

Work action:

- The specification for livestock grazing and fencing is set out in Sections 7.4 and 7.5.

5.6 Rabbit control

At various time rabbits have been present in the reserve in very high numbers. Rabbits cause significant detrimental impact on archaeological features both due to their burrowing activity which disrupts features and browsing of vegetation which exposes the ground surface and exacerbates erosion issues. High rabbit numbers also limit the opportunity to use vegetation as a method to protect and conserve archaeological features. Rabbits need to be controlled to very low numbers, and maintained at those levels, or (ideally) eradicated from the reserve entirely.

Previous rabbit control methods have not been effective in reducing numbers long term. A comprehensive and on-going programme of rabbit control is required.

Care is required in undertaking control methods within the reserve to ensure that ground disturbance is avoided. Some common control practices, such as collapsing burrow entrances during fumigation, are not appropriate within the reserve due to the potential to cause further disturbance of archaeological features. The identification of areas where turf can be obtained to block burrow entrances needs to be done with archaeological advice.

Work action:

- Maintain the rabbit control programme, with archaeological input as required to ensure no adverse effects on archaeological features.

5.7 Conservation of the Iron Jetty landing platform

The Iron Jetty (U14/362) was the first jetty built on the southwestern shore of Mauao near the coastal outlet of the Waipatukakahu spring. The Iron Jetty is thought to have been constructed in 1886 and was used by steam ships up until the mid-1920s. It comprised a stone-faced landing stage and a platform extending out into the deep channel waters supported by iron posts. The stone-faced landing survives in excellent condition, while several lengths of iron can still be seen on the beach below.

Periodic trimming and/or removal of saplings adjacent to the stone-faced landing platform is required to conserve this historic feature by preventing damage from root action. This work should be undertaken with archaeological advice, and sapling growth should be monitored annually and removed as required.

Work action:

- Monitoring and vegetation management of Iron Jetty platform.

5.8 Condition monitoring

Comprehensive recording, condition assessment and ongoing monitoring of heritage places is required as part of effective reserve management in order to:

- Assess the effectiveness of the management regime.
- Detect changes that may lead to detrimental impacts.
- Determine if site management or visitor behaviour is having a detrimental impact
- Initiate appropriate actions where adverse effects are detected.

Annual archaeological site condition monitoring has been carried out at Mauao since 2018, and the programme should be continued. Section 7.6 provides further detail about monitoring. Depending on the outcomes of monitoring, appropriate specialist advice should be sought, and action taken to address any issues.

6. Archaeological values and assessment of effects

Mauao is a historic reserve gazetted under the Reserves Act 1977. It is also identified as a wāhi tapu on the Heritage New Zealand List (item no. 9423), under the Heritage New Zealand Pouhere Taonga Act 2014. The archaeological features within the reserve have high archaeological significance.

Much of the past loss of archaeological features at Mauao has resulted from reserve management actions. All reserve management actions have now been specifically designed to avoid or minimise impact on identified archaeological features.

However, there is still some limited potential for archaeological effects on buried archaeological deposits. Recommendations to avoid or minimise potential impacts are contained in the work specifications in section 7 of this report.

7. Specifications for work actions

7.1 Large tree removal

The majority of large exotic trees in the reserve have been successfully removed without impact on intact archaeological features. However, the southern portion of the reserve does still contain several large exotic trees, including radiata pines, which are nearing the end of their life and becoming unstable. In some cases, these trees overhang walking tracks and pose a significant hazard to visitors due to their instability. In all cases these trees are either growing on archaeological features, or access to them is via archaeological features.

The removal of such trees requires specialist equipment and machinery assistance. Leaving the trees in place is not a viable option due to the public safety risk and if they topple the root plate uplift, as well as the damage caused by the main stem and branches impacting the ground surface, is likely to cause significant loss of archaeological features.

The following principles must be applied during tree removal to minimise the impact on archaeological features:

- All contractors engaged to work on tree removal within the reserve must be made aware of the significance of the archaeological features, the requirement to minimise ground disturbance, and the constraints on the activity.
- A designated route for any machinery access to the felling site must be defined with archaeological advice. This route should be used for all machinery access and no deviation from the specified route should occur.
- The route should be designed to minimise impact on intact archaeological features by utilising areas that have already been subject to disturbance, or where it is possible to introduce additional fill material to cap and protect archaeological features.
- Tree removal should only be carried out when weather conditions are dry and the ground surface is as robust as possible, applying additional material such as metal to protect the track surface may be required.
- All tree removal activity where there is potential for ground disturbance must be subject to an archaeological authority from Heritage New Zealand and include appropriate archaeological monitoring.

- Felled stems and branches must be lifted clear of the ground surface for removal either for transport off the site or for mulching. No dragging of felled material across the ground surface should be permitted.
- Removal of large trees utilising a heavy lift helicopter is the ideal methodology and this has been previously utilised in the reserve. This provides the exemplar method for large tree removal, and it should be used whenever possible.

7.2 Land-slip assessment and response

Loss or damage to archaeological features caused by land slips is a significant threat at Mauao. There have been three slips that have resulted in loss of features that were recorded in 2003.

The following specification should be used in response to all land slip events that occur within areas of the reserve that contain visible archaeological features:

- Immediately following land slip events check the archaeological features map (Figure 2) to determine if visible features are present in the affected areas and complete a field visit to confirm.
- Advise Heritage New Zealand and the Mauao Trust of the event; and as soon as practical arrange an archaeological inspection by a qualified, appropriately experienced archaeologist. Additional specialist advice on slope stability may also be required.
- In consultation with Heritage New Zealand, the Mauao Trust and the archaeologist develop a remediation plan for the slip area. This may involve fencing and planting of the affected area.
- Check that any proposed work is covered by a current Heritage New Zealand archaeological authority. Ensure compliance with any authority that may be in place.
- Ensure any contractors involved in remediation work have been briefed about archaeological authority requirements.
- Provision should be made during planning for archaeological monitoring of work if required.

7.3 Track maintenance

The following specification should be used for all walking and vehicle track maintenance.

- Permitted routine works for the maintenance of walking and vehicle track surfaces should be restricted to levelling of existing tracks and adding new material. The clearance of slips from tracks should also be permitted routine work.
- If any ground disturbance is likely to occur in any area that is not already clearly part of the established track and water control network – for example, the establishment of additional culverts – and will take place in an area containing archaeological sites or heritage features the proposed work should be planned with archaeological advice.
- Culverts and water tables should be regularly checked and cleared. In areas containing archaeological sites, machinery should be restricted to established tracks and work should be monitored by reserve staff. Material removed from culverts should not be spread on known archaeological features.
- Water needs to be diverted off tracks at regular intervals to reduce volume and velocity which in turn reduces the potential of erosion. The velocity of the water when it exits the culverts should be monitored to ensure that run-off does not cause localised channelling and erosion of archaeological features. Reducing the velocity of the run-off ensures that water is dissipated over the ground surface, thus preventing channelling. This could be achieved by placing rocks or geotextile near the culvert exits. The results of such intervention would need to be monitored closely, to ensure that scouring does not occur around any new velocity ‘barrier’.
- Material that has accumulated around culvert exits on archaeological features should be removed with direct archaeological supervision and culvert entrances should be modified to capture and retain gravel/road metal to prevent it being discharged onto archaeological features.

7.4 Livestock management

The objective of the livestock grazing regime within the reserve is to maintain continuous ground cover with a robust pasture sward. This is a key requirement to stabilise archaeological features and reduce deterioration. This is particularly important for the large shell mounds within the reserve, which are vulnerable to loss as a result of land slippage.

The following principles should apply:

- A degree of ground damage due to stock trampling and tracking is going to occur as a consequence of using grazing animals to maintain a pasture sward. This risk should be managed to restrict potential damage to areas where archaeological features will not be affected.
- Ground damage can be minimised by using species and classes of livestock that are appropriate to the site features and conditions. Sheep are the best fit for Mauao and should continue to be used.
- Animals should be provided with access to shade and shelter in areas where archaeological features are not affected. The stock should be rotationally grazed, and moved regularly, so that the pasture sward is maintained by even grazing appropriate to the seasonal conditions. Stock numbers should be monitored and adjusted to suit seasonal variations in grass growth.
- Gateways and water troughs should not be placed in areas where archaeological features are present. Artificial ground hardening, using shingle or cement, could be considered in areas where congregation of stock occurs – for example, gateways and around water troughs.
- Uniform length of pasture sward is not required or necessarily desirable for archaeological site protection i.e., a longer sward on terrace scarps will assist slope stability.

7.5 Fencing

Fences should be designed and placed to have minimal effects on archaeological features. This can be achieved by ensuring that fence alignments avoid visible

features or areas likely to contain buried archaeological deposits wherever possible. However, on Mauao the slope and the widespread archaeological features mean that some impact on archaeological features is unavoidable. The following specifications should be followed to minimise adverse effects:

- Some existing fence alignments cross archaeological features. In some cases, this is the only available, practical fencing alignment. However, fences should be progressively assessed as they are due for renewal, and where possible adjustments should be made to alignments with archaeological advice.
- Any new fence alignments should be established in consultation with an archaeologist familiar with the management of archaeological sites within a pastoral context.
- Ground disturbance associated with the establishment of fences should be minimised by the use of driven posts where-ever possible. Alternative fencing methods, such as the use of standards and netting should be considered where appropriate to reduce ground disturbance.
- Persons undertaking fencing work should be informed of the probability of encountering archaeological deposits and should be briefed by the supervising archaeologist prior to commencing any work. It is recommended that a fencing contractor with some familiarity and experience of working in and around archaeological features is used.
- Where archaeological sites will be affected, all ground disturbance associated with fencing work should be subject to direct archaeological supervision, monitoring and recording.

The archaeologist will advise if the holes resulting from the removal of existing fence posts should be marked in the ground with a layer of fine gravel placed in the base of the holes prior to backfilling. This will ensure that these fence post holes are not confused with earlier archaeological features if the area is archaeologically investigated in the future.

7.6 Monitoring

An accurate and sufficiently detailed level of baseline survey and recording (baseline inspection) is essential to determine change over time. The level of detail required will depend on the specific circumstances of the heritage place, including its complexity and the nature of any threats. Objective measures of condition should be used in order to provide a baseline for future monitoring. It is important that any detrimental effects arising from natural processes or visitor use are identified and addressed.

Monitoring should be carried out at regular intervals. Annual monitoring of archaeological site condition has been completed since 2018, and this should be continued.

A walk-through survey can be used to monitor natural processes as well as visitor and management impacts. Aspects that should be regularly monitored include (as appropriate) weed growth, graffiti/vandalism damage, damage caused by informal tracking, vehicles or bikes, deterioration or damage to structures and safety issues related to features or structures.

In addition to regular annual inspection, informal monitoring should be undertaken during any site visit, after specific management actions, or after extreme weather events.

The monitoring results should be collated and discussed with an archaeologist at an annual meeting to determine if adjustment to the monitoring programme, intervention or remedial action is required.

8. Conclusion and recommendations

Reserve maintenance works at Mauao have been designed to minimise the potential for adverse impacts on archaeological values. However, an element of limited ground disturbance, including planting activity and fencing is required. It is likely that there will be some very limited impact on archaeological deposits that have no surface features.

The following recommendations are made to mitigate the potential impacts on archaeological values:

- An application should be made under the provisions of the *Heritage New Zealand Pouhere Taonga Act 2014* for a general authority to modify or damage

archaeological sites for the purposes of carrying out on-going reserve maintenance works. This authority application should relate to the potential to encounter buried archaeological deposits.

- All effort should be made to minimise the possibility of alteration, modification, or damage to intact archaeological features.
- Archaeological monitoring, as required and considered appropriate by the section 45 archaeologist of ground disturbance is recommended to ensure that any buried deposits that are encountered can be assessed and appropriately recorded.

9. References

Cunningham, B. & K. Musgrave. 1989. *A History of Mount Maunganui*. Printcorp Services Ltd, Tauranga.

InSitu Heritage Ltd. June 2022. Te Korowai o Mauao Archaeological Site Management and the Ecological Restoration of Mauao Historic Reserve. Unpublished report prepared for Tauranga City Council.

s 7(2)(a) - Privacy 2003. Preliminary Archaeological Survey and Identification of threats to archaeological resources, Mauao Historic Reserve. Unpublished report to Tauranga District Council

s 7(2)(a) - Privacy 2014. Archaeological Inspection and Conditions Assessment Mauao Historic Reserve. Unpublished report prepared for Tauranga City Council.

Wildland Consultants Ltd. 2004. Conservation Plan for Mauao Historic Reserve. Unpublished report prepared for Tauranga District Council.