Attachment A: Te Tapunui Queenstown Hill Reserve Restoration Management Plan 2025 (track changes)

Queenstown Lakes District Council

Draft Te Tapunui Queenstown Hill Reserve ~~Forestry~~ Restoration Management Plan

March 2025

Contents

Preface:

This report has been prepared to replace the Ben Lomond and Queenstown Hill Forestry Plan adopted March 2006 in so far as it applies to Te Tapunui Queenstown Hill.

Ahika Consulting were engaged by The Whakatipu Wilding Conifer Control Group (WCG) and Queenstown Lakes District Council (QLDC) in 2022 to write the first draft of Te Tapunui Queenstown Hill ~~Forestry~~ Restoration Plan.

The first version investigated viable pathways for removing the wilding risk from QLDC administered Reserve on Queenstown Hill. The draft outlined a vision for managing the site and provided options and issues as a starting point for discussions with key stakeholders and mana whenua.

Introduction

Te Tapunui Queenstown Hill has become progressively dominated by wilding conifers over the past 60+ years and these trees are acting as a seed source facilitating the spread of wilding conifers elsewhere in the Whakatipu ~~b~~Basin.

Background:

Without active management and intervention, wilding conifers will continue to spread, threatening the landscape, and its ecological values, resulting in the loss of biodiversity within and around the Reserve.

The Otago Regional, Pest Management Plan (ORPMP) seeks to progressively contain and reduce the geographic extent of wilding conifers within the Otago Region. A National Wilding Conifer Control Programme has been developed and provides a collaborative funding model for addressing infestations. The Douglas fir on Te Tapunui Queenstown Hill Reserve (the Reserve) provide a significant seed source for the wider Whakatipu Basin.

The ORPMP and National Wilding Conifer Control Programme note that indigenous ecosystems at particular risk from wilding conifer invasions include tussock grasslands and sub-alpine shrublands found on Te Tapunui Queenstown Hill and in the mountains beyond.

The Whakatipu Wilding Conifer Control Group (WCG) was established to control wilding conifers in the Whakatipu Basin, protecting biodiversity and landscapes. The WCG support the removal of this significant wilding seed source on Te Tapunui Queenstown Hill.

The 2006 Forestry Plan is now outdated and no longer fit for purpose. – While forestry remains a component, the primary focus of this updated plan is the ecological restoration of the reserve, as reflected in the ~~its~~ new name. ~~This forestry~~ This restoration plan assesses the current tree cover and site conditions, and outlines options for harvesting and replanting to replace invasive wilding trees. It ~~guide the removal~~provide~~s~~s guidance on the removal of these species and supports ~~guides~~ the ~~restoration~~ establishment of a healthy, diverse forest for the future. The plan details the proposed harvest, wilding clearance, and restoration activities ~~for the Reserve~~, based on findings from vegetation surveys and forest measurement data.

The removal of the established Douglas fir forest will alter the landscape and may significantly impact the experience of current recreational activities at the site. The restoration ~~forestry~~ p~~P~~lan plays a crucial role in communicating the future intentions of the Reserve and informs the community about how tree management will occur and what revegetation will look like.

Key Objective:

QLDC will fell and eradicate all wilding exotic tree species on Te Tapunui Queenstown Hill Reserve (the Reserve) and replant the site with a mixed native/exotic forest and scrub/tussock grassland. The

Reserve will not be replanted as a production forest, with the new cover forming a permanent mixed species forest.

The ~~forestry~~ restoration plan has been developed to achieve the following objectives, identified through current policies, regulations, and the aspirations of the local community:

- ~~Control~~ Eliminate existing wilding conifers and eradicate successive wilding generation.
- Protect, restore and enhance existing biodiversity values.
- Protect and enhance the water quality in all water catchments within the reserves.
- Protect landscape and ecological values by implementing staged management zones.
- Revegetate harvested areas within two to four years following the completion of harvesting operations in each management zone.
- Ensure that QLDC meets its obligations under the New Zealand Emissions Trading Scheme.
- Manage the risk of erosion and land instability.
- Manage the discharge of contaminants such as silt, sediment and debris to surface water bodies.
- To ensure effective and environmentally responsible slash management practices are implemented.

District Plan Requirements

The Reserve is zoned Open Space and Recreation – Informal Recreation in the QLDC Proposed District Plan (PDP).

Importantly, the Reserve has a 'designation' for the purpose of 'Forestry Operations' (Designation #374) under the PDP. The purpose of the designation is to enable QLDC to carry out forestry operations which means the use of the land primarily for the purpose of planting, tending, managing and harvesting of trees for timber or wood production.

A designation is a 'spot zoning' over a site or area that authorises the Requiring Authority's (QLDC in this instance) work and activity without the need to comply with the zone rules or obtain a resource consent.

Designation #374 authorises QLDC to carry out forestry operations in the area known as Te Tapunui Queenstown Hill Recreational Reserve.

There are specific conditions associated with Designation #374 (as detailed in Appendix 1). In summary the conditions require or regulate: DP

- *All forestry operations to be carried out using best practice.*
- *All forestry operations must comply with the polices in the following plans (or any updated version):*
    - *Ben Lomond and Queenstown Hill Reserve Management Plan*
    - *Ben Lomond and Queenstown Hill Forestry Plan*
- *The current Forestry Plan shall address the following matters:*

- *Policies and programmes for the re-establishment of production forestry, together with areas to be retired from production forestry following harvesting operations. The revegetation plans shall include*
  - *proposed future re-vegetation (including plant schedules and botanical names) and maintenance programmes*
  - *Proposed control of any wilding generation following harvesting operations.*
  - *That re-vegetation shall occur as soon as practicable and no later than two years after harvesting operations.*
- *Policies in relation to the impact and requirements of the New Zealand Emissions Trading Scheme (ETS).*
- *All updates of the Forestry Plans shall be subject to consultation with the community using the Special Consultative Procedure set out in section 83 of the **Local Government Act 2002** before adoption by the Council.*
- *An Outline Plan is required for the harvesting of trees prior to any harvesting taking place.*

This restoration plan has been prepared to meet the requirements for a Forestry Plan in accordance with the designation conditions.

This plan specifies that all areas of the Reserve are to be retired from production forestry following harvesting operations.

Reserve Management Plan

The Draft Te-Taumata-o-Hakitekura Ben Lomond & Te Tapunui Queenstown Hill Reserve Management Plan (RMP) has the following objectives and policies[1]~~:~~ that are relevant to this plan.

RMP Objectives:

- To protect, restore and enhance existing biodiversity values by actively managing invasive species.
- To protect landscape and ecological values by implementing staged, considered approaches to wilding conifer and noxious vegetation removal.
- To allow the planting of non-invasive exotics species that assist native regeneration and support sustainable recreation opportunities.
- To preserve the Time Walk as the primary walking (only) trail on Te Tapunui Queenstown Hill Reserve.

RMP Policies:

Natural Values/Hazards - Landscape Protection Forestry Policies

1 These draft objectives and policies were undergoing public consultation at the time of writing of this ~~Forestry~~ Restoration Plan. Should these change in the final RMP this Forestry Plan shall be updated accordingly.

14.4.2 Implement as a priority Te Tapunui Queenstown Hill Forestry Management Plan to remove pest species, particularly Douglas fir *Pseudotsuga menziesii*.

14.4.4 The management plan needs to consider:

- Ensuring minimal impact on amenity values through the use of low impact extraction methods, while recognising the long-term goal of restoring the natural environment and enhancing biodiversity values;
- Allowing for revegetation with a mix of native and non-invasive exotic species;
- Identification of areas of remnant beech forest and other native vegetation for protection and enhancement;
- Pest plant and animal control;
- Acknowledgement of recreation values, ensuring important reserve connections remain accessible where possible; and

14.4.5. Application of a cross-organisational approach in the management of vegetation in the reserves and where possible, work with adjoining landowners to reduce natural hazard risks and pest species.

Infrastructure and Reserve Development -- Reserve Trail Network Policies:

14.6.8 Work with the key stakeholders to develop and implement a Trail Masterplan that formalises the trail network. This will include:

a. Identification of the existing trail network and categorise:

i. Pedestrian/walking only trails

ii. Multi-use trails

iii. Mountain biking trails

b. Identify where new trail connections could be developed and where unauthorised tracks can be closed and remediated.

Te Tapunui Queenstown Hill Time Walk Policies

13.2.2.3 Establish and maintain view shafts through the vegetation at various points along the Time Walk track to provide views over the township and Whakatipu Basin – to be retained through the revegetation of Te Tapunui Queenstown Hill.

13.2.2.4 Consider the realignment of the Time Walk track to start from the Kerry Drive carpark arrival area.

13.2.2.5 Consider a link to Highview Terrace and Tree Tops Rise, to enable additional pedestrian access.

13.2.2.6 Consider a new walking trail from Matakauri Wetlands to Te Tapunui Queenstown Hill.

Emissions Trading Scheme (ETS) Liabilities

The ETS is New Zealand's main tool for reducing emissions. Forestry is New Zealand's largest potential carbon 'sink'. As trees grow, they absorb carbon. The emissions trading scheme has two classes of forests Non-Kyoto Forests (pre-1990 forests) and Kyoto Forests' (post-1989 forests).

Under the ETS pre-1990 forest landowners can harvest and replant their forest without any liability. If the land is deforested, then the landowner must pay for deforestation.

~~Over 30 hectares of the Reserve is registered as pre-1990 forest land. Provided that the site is replanted within 4 years with a forest species that will meet the definition of forest land under the ETS, then the current forest can be harvested without any liability. However, if the site is not replanted within 4 years, then deforestation obligations will apply.~~

Over 30 hectares of the Reserve are registered as pre-1990 forest land. If the site is replanted within four years using forest species that meet the ETS definition of forest land, the existing forest can be harvested without incurring deforestation liabilities. However, if replanting does not occur within that period, deforestation obligations will apply.

Under this restoration plan, more than 30 hectares is to be replanted, ensuring the site meets the definition of a forest. As a result, QLDC has no deforestation liability under the ETS.

Site description - Te Tapunui Queenstown Hill Reserve

The Reserve is 109 hectares (Appendix 2, Legal descriptions) and is located on the southeast and southwest side of Te Tapunui Queenstown Hill ("the Reserve"). Figure 1 below shows the extent of the Reserve that is the subject of this report.

The Reserve lies to the northeast of the Queenstown town centre and comprises of four land parcels classified as recreation and local purpose reserves. Refer to Appendix 1 for legal descriptions. Residential development has occurred in close proximity to the downslope extent of the Reserve.

The popular 'Time Walk' walking trail traverses through the Reserve to a lookout point on private land to the north of the upper reserve boundary. Aside from the Time Walk, the Reserve is largely undeveloped.

Figure 1: Extent of site - Te Tapunui Queenstown Hill Reserve

Forestry Access

There are two public access points into the Reserve in close proximity to one another. One is off Belfast Terrace, which provides the trail entrance to the Time Walk. There is a small car parking area on Belfast Terrace. The second access is off Kerry Drive. This leads to a larger carpark which provides access to the Kerry Drive Pump Track and public toilets. There are no other formed public reserve accessways.

Lot 1 DP 496901, known as the 'Commonage Land', is adjacent to the Reserve, as shown in Figure 2. This land is to be developed as a residential subdivision in the future. QLDC have approved an easement in favour of the developer through the Reserve to provide an alternative road access to the Commonage land. This road could be used to provide vehicle and forestry operational access to the site. The Commonage land can also be accessed via Vancouver Drive.

There is also access to the Reserve via a 10m-wide easement through the Commonage land from Vancouver Drive (Figure 3). This easement is in favour of QLDC and Aurora Energy.

Delta Utility Services utilise this access road to access the power substation. There is an existing single-lane gravel and concrete road following the alignment of this easement that could provide another point of forestry operational and vehicle access to the site.

Figure 2: Easement through Lot 1 DP 496901 in favour of Lot 2 DP 496901

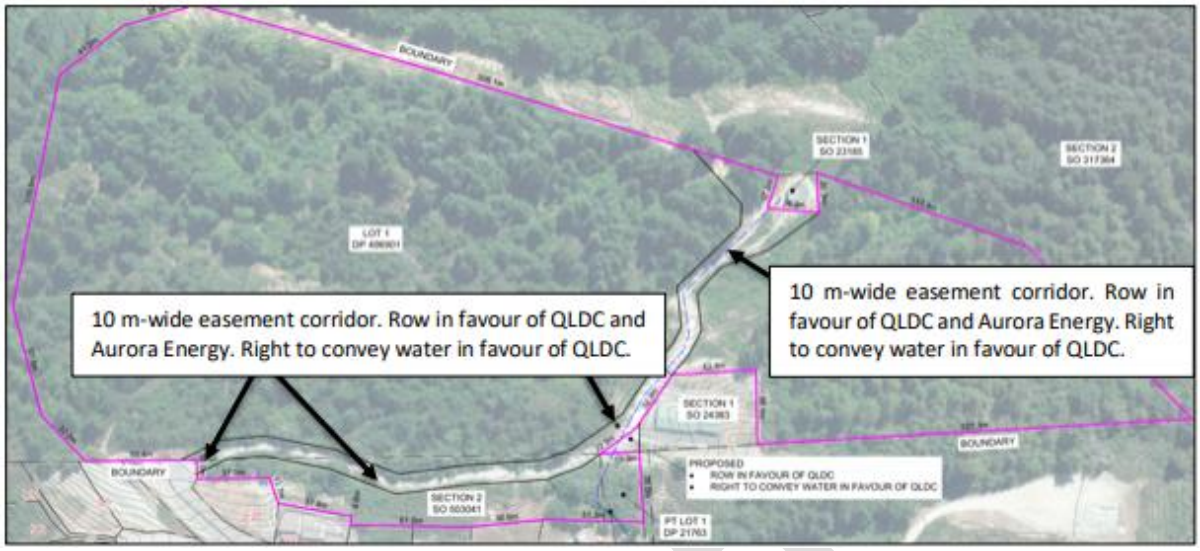

Figure 3: Existing easement through Lot 1 DP 496901

The majority of the Reserve is landlocked by private property boundaries. Further to the east, Tree Tops Rise/Silver ~~c~~Creek residential subdivision is currently under development. To access the Reserve at the eastern end would require permission from private landowners.

There is an existing gravel 4WD track that runs from Queenstown Hill Station down into the Silver Creek development and it is understood there is an access agreement in place in favour of Queenstown Hill Station for farming and tourism purposes. Should Queenstown Hill Station decide to harvest the wilding species on their property then this may be a possible vehicle access option.

Much of the reserve is landlocked because of urban development and there are limited options for ~~F~~forestry access for vehicles such as logging trucks into the Reserve.

Public Utility Infrastructure

The Reserve contains Aurora 33kV power lines. The lines run up the Reserve from Anderson Heights through to the Aurora Commonage Substation and run though the Reserve parallel to Frankton Road (Figure 4).

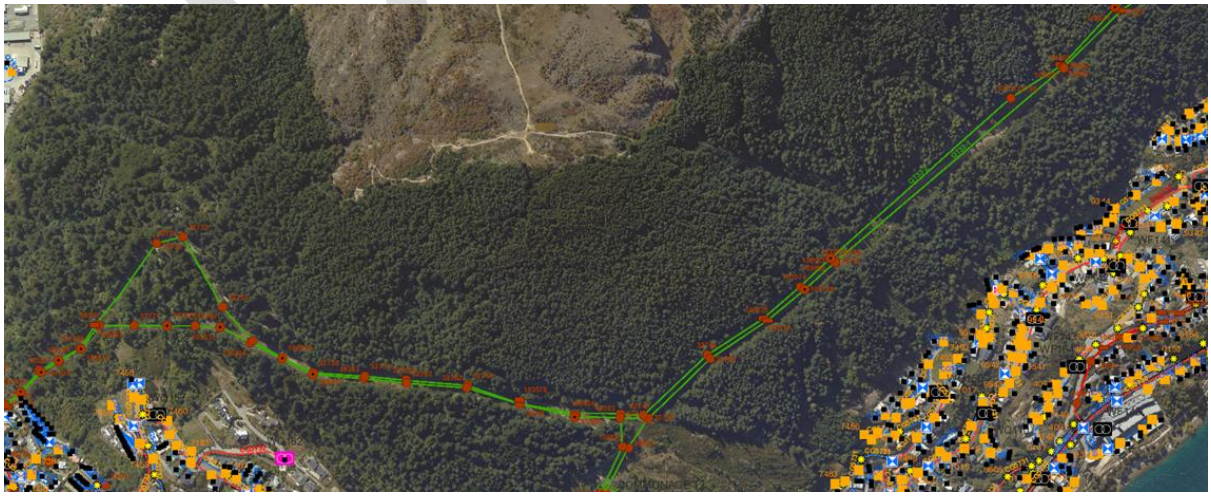

Figure 4: Aurora 33kV power lines within the reserve shown in green.

Recreation

The Reserve supports the following recreational activities:

- Walking
- Trail running
- Mountain biking (Kerry Drive Jump Park)
- Guided walking
- Rock climbing

Te Tapunui Queenstown Hill Time Walk (Figure 5) is a well utilised walking trail that leads up to the Basket of Dreams sculpture and viewpoint. The ~~walkway~~ Time Walk contains interpretative panels the length of the trail providing information about different periods in Queenstown's history. ~~.~~Public access over the parts of the trail within private land is protected by a covenant.

During the harvest, there may be temporary changes or closures to the Time Walk. Where possible, alternative routes to the Basket of Dreams will be provided and QLDC will make every effort to protect the trail and maintain public access~~.~~. Health and Safety requirements may necessitate the closure of all or part of the trail, and some damage may occur. However, QLDC will take all reasonable steps to minimize disruption, protect the trail, and maintain access wherever it is safe to do so.

The B~~b~~asket of D~~d~~reams sculpture, artwork gate and interpretive panels are QLDC assets and are included in a regular maintenance schedule. After the trees surrounding the trail are felled, these assets will have greater exposure~~ed~~ to the elements, increased maintenance may be required until the new forest is fully established to protect these assets.

Figure 5: Map showing Te Tapunui Queenstown Hill Time Walk

Rock climbing is undertaken on the northwestern side of the Reserve accessed from Gorge Road. A commercial recreation climbing activity 'Via Ferrata' using fixed metal handles is accessed via an easement over the reserve.

Unauthorised mountain biking tracks have been developed within the Reserve. In many locations the trails cross private land before entering the Reserve. The removal of the mature forest canopy will affect this unauthorised ~~informal~~ trail network, as the canopy currently ~~it~~ helps protect~~s~~ the trail surfaces ~~by reducing~~ from ~~-~~water damage and user~~s~~ related wear. The unauthorised trails will not be protected from the ~~-~~effects of the harvesting activity including tree felling, operational tracking and the residual slash left on the site, as a result this ~~bike tracks~~ trail network~~s~~ ~~may be removed due~~will effectively be removed from the Reserve.

The development of new logging road infrastructure provides an opportunity to create a new network of ~~walking~~ trails for public use once the site is safe to access again. Policies in the RMP support working with the key stakeholders to develop and implement a Trail Masterplan that formalises the trail network. This desired end use should, therefore, be taken into consideration when designing the layout of logging infrastructure in this zone.

The Queenstown Mountain Bike Club has a licence over an area at the end of Kerry Drive where they have developed a dual pump track. QLDC will work with the club to remove any wilding trees within the site.

Geology

The site is underlain by finely foliated schist rock and onsite observations revealed that the topsoil is shallow in many places. Localised glacial soils will be present in some areas. Figure 6 below shows the mapped soil types across the site. The limited soil profile needs to be considered as it may inhibit restoration efforts in some areas. The majority of the site is classified as having a low erosion susceptibility in the National Environmental Standard for Commercial Forestry.

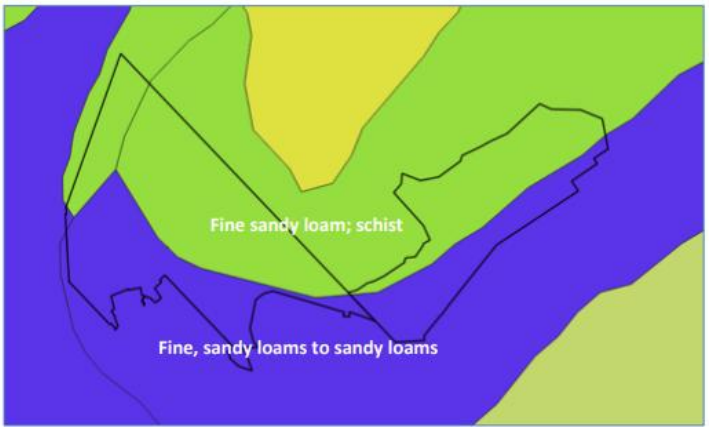

Figure 6: Soil types across the site (source: New Zealand Land Resource Inventory, lris.scinfo.org.nz)

Topography

The Reserve showcases the effects of past glacial activity that shaped the Whakatipu Basin. Te Tapunui Queenstown Hill's summit at 907m is situated outside of the reserve boundaries on Queenstown Hill Station (Figure 7). The highest elevation within the Reserve is 670 m, ~~-~~the site ~~is and~~ features many scoured ~~many~~ bluffs, cliffs, gullies, and rocky outcrops.

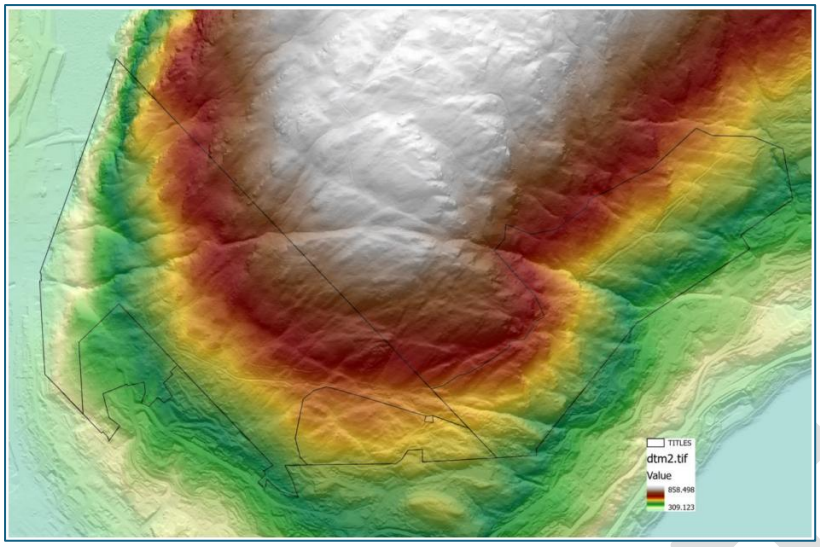

Figure 7: Digital elevation model (DEM) derived for the area (Interpine 2021)

A rockfall assessment was undertaken to assess the rock fall hazards on Queenstown Hill. The report detailed risks and appropriate measures that can be taken during harvesting operations to minimise likelihood of rock fall. The high-risk outcrop areas are mainly located above Gorge Road, with a few on the Frankton Road side of the Reserve. This ~~forestry~~ restoration plan includes low-impact techniques, such as drill-and-fill herbicide methods, which leave standing dead trees to reduce ground disturbance in these areas.

Hydrology

The reserve does not contain any named waterways, but the land area forms part of the eastern side of the Horne Creek catchment, which flows into Matakauri Wetland entering Lake Whakatipu at Te Karere Queenstown Gardens. The catchment on the southern side of the reserve discharges into waterways that flow towards and under Frankton Road into Lake Whakatipu.

The catchments area and drainage points within the Reserve are mapped and are shown in Figure 8.

A stormwater runoff assessment of the Queenstown Hill deforestation has been completed. The assessment detailed the effects of the planned deforestation on downstream overland flow and stormwater pipe network. Any operational planning will consider and mitigate any future effects.

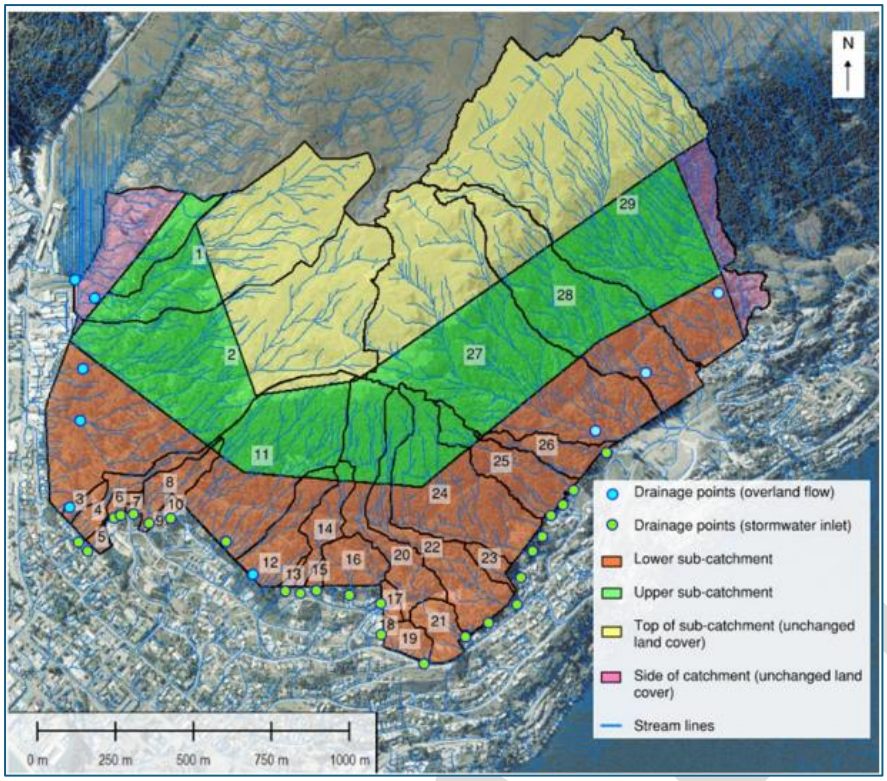

*Figure 8: Te Tapunui Queenstown hill catchment delineation and drainage points (Beca 2024 Queenstown Hill Deforestation Stormwater Runoff Assessment) **Black lines show the catchment delineation areas (1-29)***

Existing Vegetation

The Reserve is largely covered with wilding conifer tree species. It is predominantly forested with D. fir (Pseudotsuga menziesii) but includes other exotic species such as Pinus radiata (Pinus radiata), larch (Larix spp), cypress species, silver birch (Betula pendula). Damp gullies contain patches of sycamore species, rowan (Sorbus subg. sorbus) ~~and~~ , hawthorn (Crataegus monogyna), buddleia (*Buddleja davidii*), and cotoneaster (*Cotoneaster glaucophyllus*)~~.~~ Numerous other weed species are present on the lower slopes

The Reserve supports very small areas of remnant beech forest, but most native species have been suppressed and outcompeted by D. fir.

The conifer forest provides a significant seed source for wilding conifer spread in the Whakatipu basin despite regular control of the upper margins with aerial application of herbicide.

The fast-growing D. fir is also encroaching on the 'Basket of Dreams', which is the destination for many of the reserve users who are undertaking the Time Walk through the reserve. Iconic panoramic views are being lost to the D. fir.

Proposed Future Vegetation Cover

The future vegetation cover proposed across the site (Figure 9) has been informed by:

- landform (location of gullies, bluffs and spurs),
- existing pockets of native vegetation that may be retained,
- feasibility of establishing different vegetation types in each area,

- site constraints including risk of invasive species from neighbouring areas,
- current policy
- community drivers

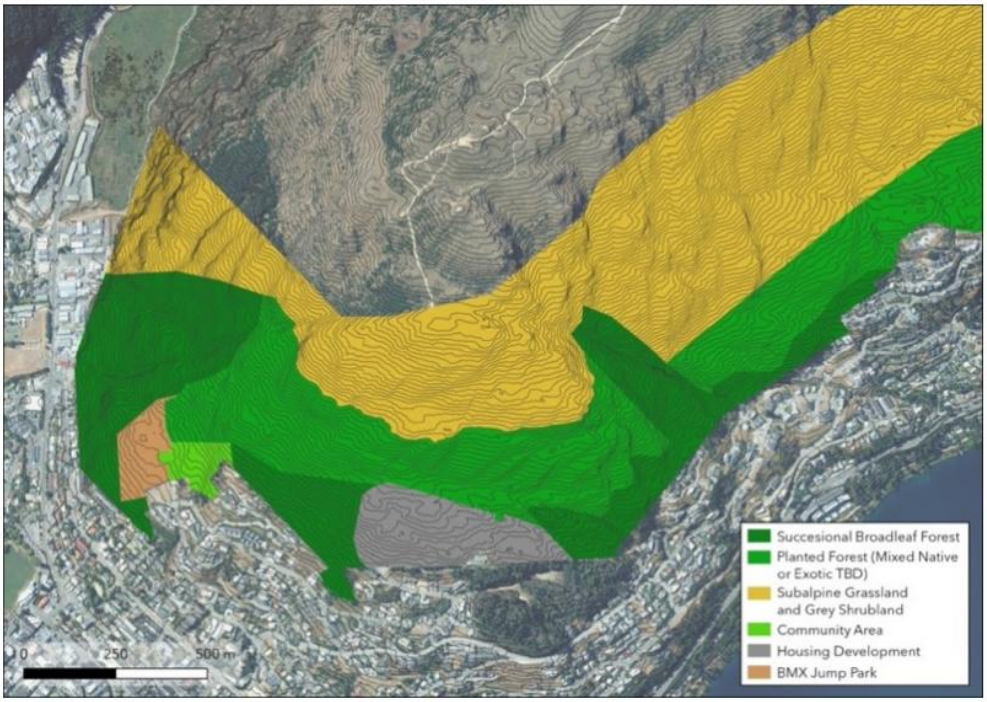

Figure 9: Proposed vegetation cover across the site

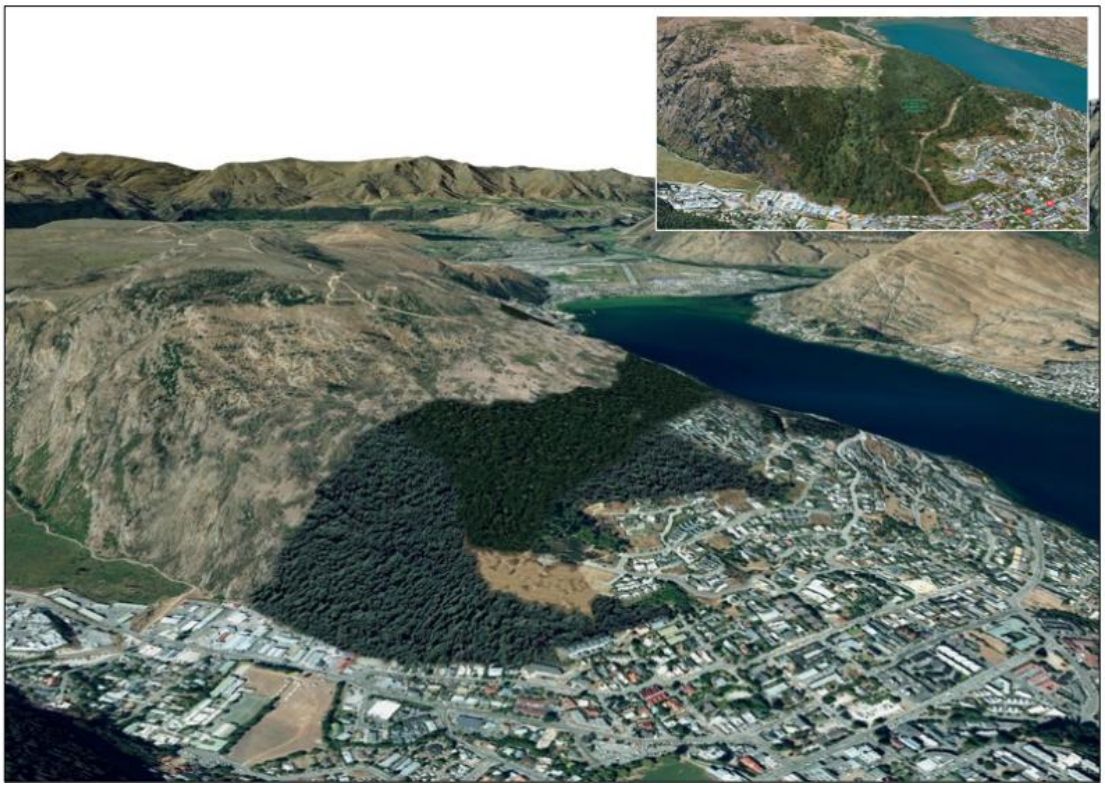

Figure 10: Proposed vision - 3D interpretation viewed from the west, and comparison with current vegetation cover (inset)

Figure 11: Proposed vision - 3D interpretation viewed from the southeast, and comparison with current vegetation cover (inset).

Future Vegetation Cover (Figure 9, 10, and 11. Appendix 3 - Restoration Species list):

Native tree species:

The urban boundary of the reserve will be planted with hardy fast-growing low flammable native trees and shrubs that can establish quickly (such as pittosporum, broadleaf, coprosma, carmichaelia, wineberry, five finger and, tutu).

Mixed native and exotic tree species:

The central area of the reserve will be planted with a mixture of native and exotic species to enhance ecological diversity. Planting some exotics will ensure that canopy cover is achieved more quickly, which in turn will minimise the "window of vulnerability" for erosion and land instability.

The role of the exotic trees is to support native forest regeneration, by acting as a nurse crop that improves soil conditions through organic matter (leaf litter) and creating sheltered conditions. The exotic species can help the natives establish by reducing wind and sun exposure and supressing competition from other invasive species.

Patch or pocket planting across the site or planting in clusters with other non-invasive exotic tree species such as elm, oak and ash will provide a more unique aesthetic and diverse colours and textures.

The selected species will help create a native forest canopy that supports and provides ecological benefits such providing habitat for native birds and insects.

Native species will be preferred where appropriate, exotic species will be selected when there is a clear benefit to achieve the above.

Grey tussock and shrubland species:

Sub-alpine grassland and grey shrubland species typical of the wider Central Otago/Lakes District landscape will be planted above 620m.

Landscape

Te Tapunui Queenstown Hill is a steep mountain block. The conifers form contiguous vegetative cover. The changes to vegetation are to be carefully managed and are staged to ensure amenity values are maintained. Future landscape values will be enhanced in the long term with the implementation of this ~~forestry~~ restoration plan.

Leaving the existing lower risk wilding species in place where possible will provide a temporary vegetation buffer which will lessen the impact on landscape values than clearing. The buffer will also help soften the visual impacts of harvesting in management zones above.

Re-grassing the site as soon as operationally possible after each area is harvested will provide vegetation cover and a natural appearance when viewed from the Whakatipu ~~b~~Basin.

~~Forestry~~ Site Assessment

Te Tapunui Queenstown Hill Reserve Forest Yield Estimation, 2021

In 2021, a survey was conducted combining LiDAR data and ground-based forest surveying to estimate tree volumes and identify areas with the highest timber volumes (Figure 12). This approach used remote sensing for detailed mapping and ground measurements for accuracy to assess forest resources.

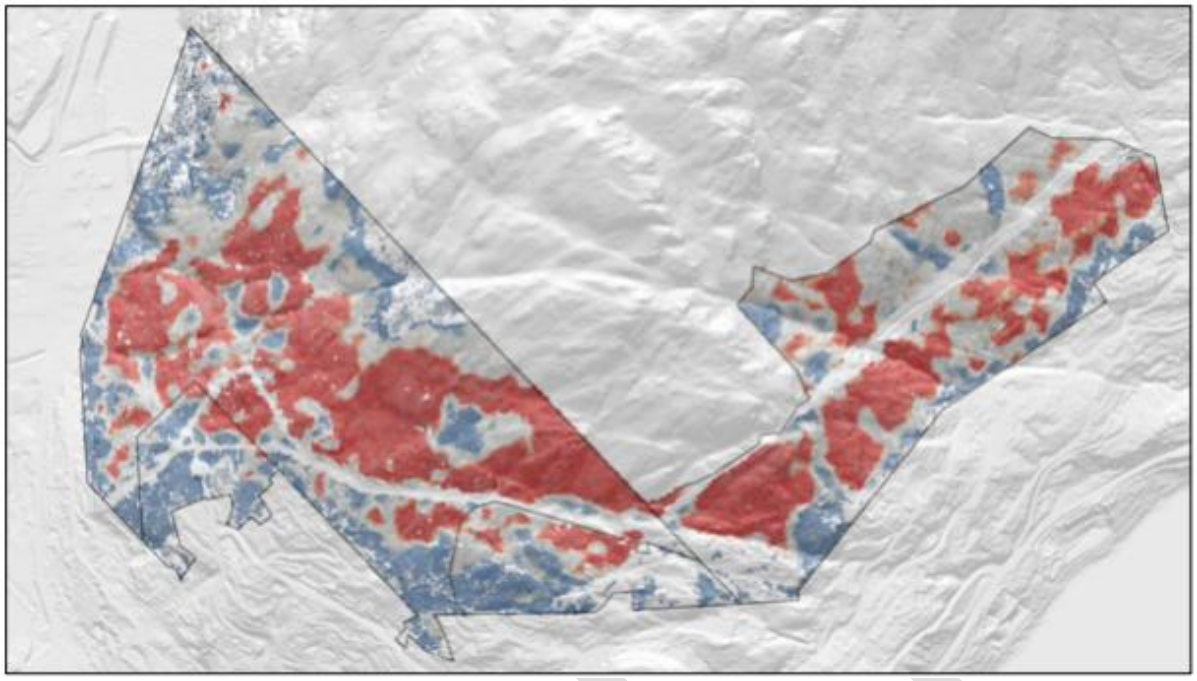

Figure 12: Highest merchantable volume areas in red (Interpine report)

A 39-hectare area of forest within the Reserve has been identified as having the highest volume of merchantable timber. The harvestable tree species include D. fir, radiata pine, larch, and cypress.

The Reserve was not planted as a production forest, but it does contain some merchantable timber. However, ~~C~~challenges such as slope, rock outcrops, access, and the presence of power lines will impact the feasibility of logging. Harvesting may not generate an economic return due to the site constraints, although it may offset some costs associated with the operation. ~~.~~

Management Zones

The Reserve has been divided into six Management Zones based on the vegetation present, harvesting methodology and site restoration (see Figure 13). Each Management Zone contains the following:

- Key action
- Size
- Topography and characteristics
- Vegetation
- Forest yield
- Implementation plan - Site Restoration and Maintenance

Note forestry access to each of the Management Zones will be designed and confirmed in the future Outline Plan application, which will detail exact harvest methodology, forestry roads and tracking within the site.

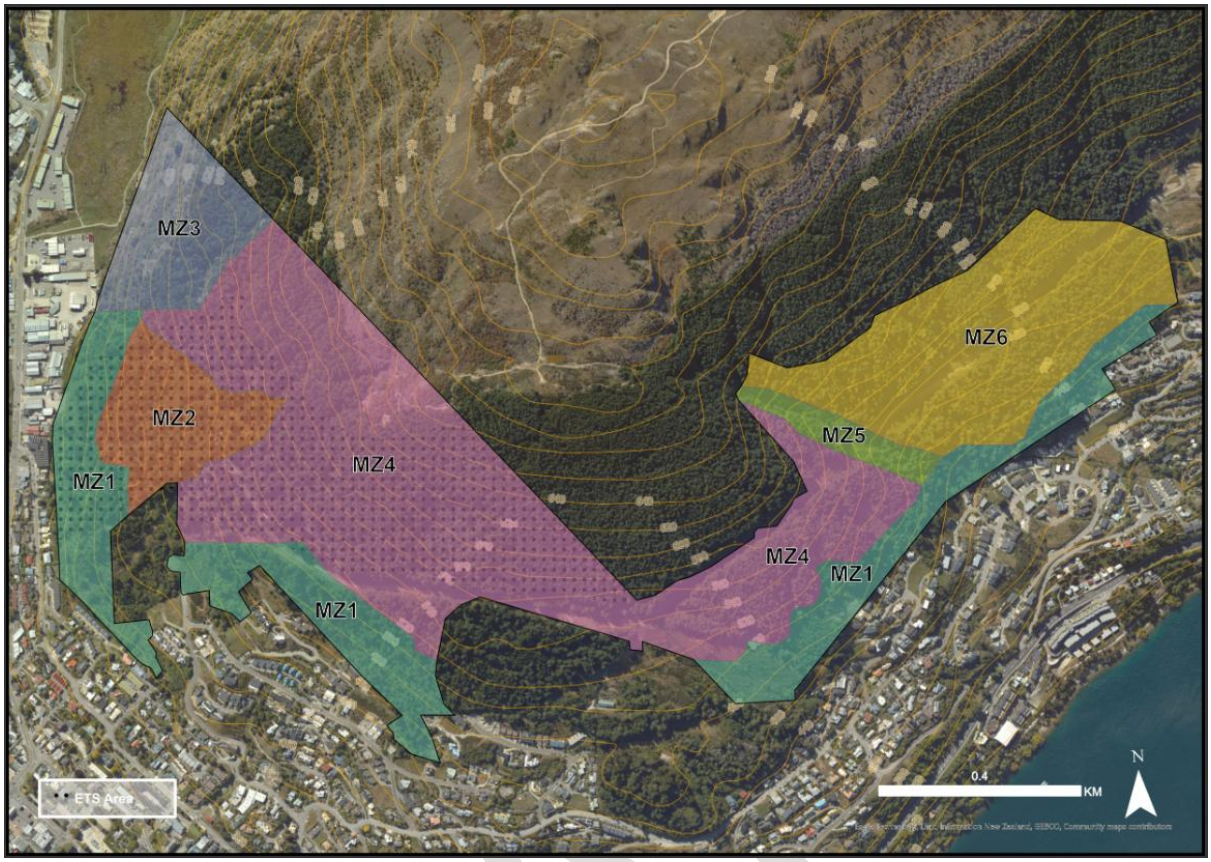

Figure 13: Proposed management zones

Management Zone 1 (MZ1)

Key Action: Fell all remaining wilding conifers in this zone using ground-based techniques, leaving other weed species on site as a revegetation buffer to the urban boundary below.

- West MZ1 – remove any older and young emerging wilding trees from this zone.
- East MZ1 – fell and extract all wilding trees.

Area: 21.7 ha

Forest Yield: Zero yield expected from this MZ, due to the age and form of the wilding trees.

Topography and characteristics: This zone is steep in places and is the nearest to privately-owned residential and industrial properties.

Vegetation: This zone is dominated by weed trees species, particularly rowan, sycamore and holly. Other weed species, including blackberry, create a dense understorey. Some native ferns and coprosma occur infrequently.

A number of mature cypress, D. fir, radiata pine and silver birch are present, but they are not abundant on the lower slopes.

MZ1 Implementation plan – tree removal, site restoration and maintenance

- Undertake a ground-based harvesting programme for all remaining wilding conifers in MZ1. Revisit the western portion of this zone to remove any emerging young wilding conifer growth.
- Where possible and practicable create a 20 m firebreak where the site borders residential properties.
- Remove large slash on the urban boundary, because of the high wildfire risk.
- Leave other (non-wilding) vegetation standing until resource is available to clear it. Restoration to achieve a native species-dominated canopy can be undertaken at a later date.
- Once wilding clearance and restoration activities upslope are underway, it is recommended that ground-based felling and chemical treatment of the remaining weed tree species in this zone (rowan, sycamore, hawthorn) is undertaken, to prevent seeding into adjacent areas of restoration. The initial year or two could focus heavily on removing invasive or undesirable weeds that threaten the ecosystem or future plantings.
- MZ1 will be divided into several smaller treatment areas for restoration.
- This zone will be planted with hardy fast-growing low flammable native trees and shrubs that can establish quickly (such as pittosporum, broadleaf, coprosma, carmichaelia, wineberry, five finger, tutu). An intensive programme of planting over many years will eventually convert the dominant canopy cover in these areas to native species, and the result will provide a fringe along the slower slopes of the site that is contiguous with the dominant vegetation type in the gullies (Appendix 3: Restoration Species list).
- Allow for ongoing maintenance for 3 - 5 years until planted native species are established.
- Ongoing maintenance after the initial clearance, which would comprise regular monitoring and follow-up treatments (e.g., spot spraying or manual removal) will help prevent regrowth.
- The annual budget would influence the scale and speed at which weed clearance and planting can occur. In some years, only basic weed control and smaller-scale planting might be feasible, while in others, a larger portion of the area might receive treatment.
- Community groups or neighbouring properties could adopt areas and volunteer to assist with the ongoing maintenance program in the zone.

Fire Break

Where possible it is recommended that a fire break is created in MZ1 as this area is adjacent to residential properties. This should be a minimum of 20 m wide, with 5 m of this cleared to mineral earth. This break would reduce the risk of a fire on a neighbouring property spreading onto the site and provide access to the area should a fire start.

Management Zone 2 (MZ2)

Key action: To reduce disturbance to the native understory and lower the risk of soil erosion in this zone, mature larger trees targeted by the following methods:

- Herbicide, drill and fill
- Fell to waste
- Removed with low impact harvesting techniques

Young wilding tree regrowth will be felled to waste.

Area: 7 ha

Forest yield: Zero yield recovered from this zone.

Topography and characteristics: Several steep-sided gullies with flowing creeks traverse MZ2 in an east-west direction. These creeks appear to be largely perennial and have carved flow paths into the underlying bedrock. Large rocky outcrops and cliff faces are common throughout this zone.

Access for logging operators and equipment would be difficult (if not impossible), with steep sided gullies and bluffs particularly hazardous.

Vegetation: Mature radiata pine is the dominant canopy species, with some D. fir and cypress also common. Some of the radiata pine trees are exceptionally large, with low, widespread branches, In the gullies, sycamore, rowan, hawthorn and holly are the dominant tree species, with both mature and seedling trees of these species present.

The understorey is diverse and dense, and dominated by native ferns in places. Coprosma seedlings occur occasionally. Some foxglove, cotoneaster and other weeds are also present

Figure 14: Example of vegetation present in MZ2

MZ2 Implementation plan – tree removal, site restoration and maintenance

- Treat wilding conifers and other weed trees using herbicide or fell to waste methods, taking care to avoid adverse effects on existing native vegetation and surface water bodies.
- In some areas of the zone it may be possible to harvest the trees using low impact harvesting techniques
- Underplant/interplant with suitable native species where practicable (Appendix 3).
- Over-sow harder-to-access areas of MZ to suppress weed invasion, Perennial rye and cocksfoot should be avoided as these grass species can be too competitive against native seedlings.
- Clear dead trees where they pose a risk to public safety.
- Allow for ongoing maintenance for 3 - 5 years until planted native species are established.
- Safe access to restoration areas will be required for several years. Working under decaying wilding trees can become extremely hazardous within 2 - 5 years of treatment as dead material starts to fall. If the wilding conifers are left dead standing, then planting operations should commence as soon as possible to allow time for planting and maintenance before the site becomes too unsafe to access.

Management Zone 3 (MZ3)

Key Action: The trees will be targeted using herbicide or fell to waste or low impact harvest extraction methods, the technique used will be dependent on the size of each tree being treated.

There are a number of trees in the northern-most part of MZ3 perched precariously on rock faces immediately above industrial properties and the wetland reserve walking track on Gorge Road (Figure 15). Specialist arborist assessment and careful removal will be required for these trees.

Area: 7.6 ha

Forest yield: Zero yield recovered from this zone.

Topography and characteristics: This zone has very steep and hazardous terrain and includes some of the steepest terrain on the site. Rocky outcrops, gullies and cliff faces are abundant, and operation of heavy machinery in this area would likely lead to erosion and land instability. Much of this area is difficult to traverse.

Rock climbing/via ferrata activities are in MZ3, local climbing organisations and tour operators must be consulted well in advance of any wilding control operations commencing and access must be prohibited while the risk of harm to site users cannot be avoided.

Vegetation: There is good coverage of mixed-age and mixed-sized D. fir and radiata pine on the upper slopes, but canopy cover is sparser on the rocky faces. Hawthorn and rowan occur in more exposed areas.

Figure 15: Example of vegetation present in MZ2

MZ3 Implementation plan – site restoration and maintenance

- Treat wilding conifers and other weed trees using herbicide or fell to waste methods. Targeted specialist arborist removal of very high-risk trees will be required.
- Investigate if some trees can be harvested using low impact harvesting equipment and techniques.
- The steep and rocky nature of this site and the thin topsoil layer in places will make restoration difficult. Over-sow with grasses and/or early native successional forest species, opportunities for maintenance will be limited once the dead tree start to decompose.
- This vegetation will also help to suppress (but will not eliminate) emergence of wilding conifer seedlings. Maintenance in this management zone will be minimal due to access issues, so only native species where there is abundant local seed available (e.g. mānuka) should be used.
- Nearby wilding seed sources (e.g. from Te-Taumata-o-Hakitekura Ben Lomond) and remaining seed in the soil will mean that ongoing control of emerging seedlings will be required until these two seed sources are removed/depleted. Aerial application of herbicide may be the only feasible method for managing emerging weed tree seedlings, but any herbicide use needs to be targeted so as not to cause damage to the grass or other more desirable successional vegetation.

Management Zone 4 (MZ4)

Key Action: Clear fell the wilding tree species using ground based or hauler harvesting methods.

Area: 47.1 ha

Forest yield: This zone contains merchantable timber, and a relatively high yield is expected.

Topography and characteristics: Parts of MZ4 are steep and there are several cliffs and rocky outcrops (especially in the upper slopes). Site slope, rock outcrops, limited access, and the presence of power

lines will create challenges to logging operations, which may result in minimal net gain or even a negative financial return from the harvesting of these trees.

The rock outcrops have been mapped and rock fall hazards assessed; mitigation measures will be included in the outline plan and harvest plan.

Vegetation Survey: Radiata pine is common in the western-most part of this zone, but D. fir is the dominant canopy species elsewhere.

Large, old, and wide radiata pine, which were likely some of the original exotic conifer species in the area, occur in the mid-slopes of MZ4. These trees often have large, heavy limbs that are beginning to break off, which creates a hazard and results in un-merchantable timber.

Large areas of MZ4 are dominated by D. fir that is of relatively uniform height but somewhat mixed volume. These areas have no understorey - not even regenerating D. fir seedlings - and the forest floor is covered in a thick layer of needles.

Mature larch occurs in parts of the upper slopes and also infrequently elsewhere. Some hawthorn, rowan, sycamore and smaller weed species occur occasionally in more exposed areas and on the forest margins. Very few native species are present.

MZ4 Implementation plan – site restoration and maintenance

- Harvest all merchantable timber using clear felling methods.
- Design forestry access infrastructure in this zone with the desired end use in mind (walking trails).
- Ensure that the time walk remails accessible or an alternative route to the basket of dreams and summit is available during harvesting operations.
- Due to the proximity of the site to urban boundary and the high fire risk at the site, it is recommended that at a minimum slash that meets the following definition is removed from site:
    - Slash longer than two metres, and with a large-end diameter of more than 10 cm, must be removed after harvesting.
    - Where budget allows, some slash will be mulched and spread across the harvested area to help with weed suppression and to provide ease of access for future planting. This option is extremely costly and will only be considered in high profile location.
- Establishing vegetative cover across MZ4 as soon as possible following clear felling harvest activities by over-sowing harvested areas with grass species and top dressing. Over-sowing and topdressing should occur in the spring or autumn immediately following harvesting.
- Over-sowing with grass will help to suppress D. fir and other weeds species, but it will not stop them altogether. Post-harvest, the site will be subject to rapid woody weed establishment, particularly from germinating D. fir seed, but also a range of other weeds including hawthorn, sycamore, rowan, briar, broom and gorse (among other weed species). The most efficient method of managing emerging D. fir seedlings and other weeds is by targeted aerial and

ground application of herbicide. The method of weed control across the site will be determined by the proximity of neighbouring residents. Unmanned Aerial Vehicles (UAV) / drones could be considered for this targeted aerial work. Access roads created for logging purposes could ensure easy-access for these ground-based operations.

- Follow-up control can be managed by ground-based crews (hand-pulling, spraying using backpack spray units, or spray using a spray unit via hose from a truck or tractor).
- A staged planting programme of native and exotic tree species will be undertaken (Appendix 3: Restoration Species list). Planting ~~exotics w~~the site to ~~ill~~ ensure that canopy cover is achieved ~~more~~ quickly, which in turn will minimise the "window of vulnerability" for erosion and land instability.
- ~~Restoring this zone with a sequoia-dominated exotic forest will ensure that much of this aesthetic is retained.~~
- Patch planting across the site or planting in clusters with other non-invasive exotic tree species such as elm, oak and ash may also be desirable to provide a more diverse aesthetic for MZ4 than the monoculture appearance provided by the current conifer-dominated forest
- Allow for ongoing ground-based maintenance and weed control immediately prior to the first year of planting to remove any weeds that might have established, the control will continue for 3 - 5 years until planted native species are established.
- Replant the upper part the zone (above 620 m) with subalpine grassland and grey shrubland landscape that is more typical of the wider Central Otago/Lakes District landscape (Appendix 3: Restoration Species list).
- Community groups may be able to assist with hand-pulling wildings and other weeds in areas where it is safe to provide public access.

Figure 16: Current aesthetic provided by MZ4

Figure 17: Example of vegetation present in MZ4

Management Zone 5 (MZ5)

Key Action: To reduce disturbance to the native understory and lower the risk of soil erosion in this zone, mature larger trees targeted by the following methods:

- Herbicide, drill and fill
- Fell to waste

Area: 2.2 ha

Forest yield: No yield is expected to be recovered from this MZ

Topography: This zone is steep and contains several bluffs and rocky outcrops that make access by foot difficult and vehicle access impossible. There is one large bluff in particular that has prevented the continuation of the access road for the overhead power line.

Vegetation: Due to the topography there are a number of areas where larger trees have not been able to establish. D. fir is the dominant trees species, with abundant sycamore and blackberry present in areas with lower D. fir canopy coverage.

MZ5 Implementation plan – site restoration and maintenance

- Treat wilding conifers and other weed trees using herbicide or fell to waste methods, taking care to avoid adverse effects on existing native vegetation and surface water bodies.
- Underplant/interplant with suitable native species (Appendix ~~X~~3: Restoration Species list).

- Over-sow harder-to-access areas of MZ to suppress weed invasion, Perennial rye and cocksfoot should be avoided as these grass species can be too competitive against native seedlings.
- Clear dead trees where they pose a risk to public safety.
- Allow for ongoing maintenance for 3 - 5 years until planted native species are established.
- Safe access to restoration areas will be required for several years. Working under decaying wilding trees can become extremely hazardous within 2 - 5 years of treatment as dead material starts to fall. If the wilding conifers are left dead standing, then planting operations should commence as soon as possible to allow time for planting and maintenance before the site becomes too unsafe to access.

Management Zone 6 (MZ6)

Key Action: Clear fell the wilding tree species using ground based or hauler harvesting methods and replant with a mix of suitable exotic and natives to ensure a rapid establishment to minimise reinvasion of wildings

Area: 19.7 ha

Forest yield: This zone contains merchantable timber, and a medium yield is expected.

Topography: Steep land is common throughout this zone.

Vegetation: Due to the topography there are a number of areas where larger trees have not been able to establish. There are, however, also large areas of dense canopy cover. D. fir is by far the most dominant tree species across this zone. These trees are of a uniform size at similar altitude, but of varying volume. Where there is a dense coverage of these trees, there is little understorey and the forest floor is covered in a thick layer of needles.

Some hawthorn, rowan, sycamore and smaller weed species occur occasionally in more exposed areas and on the forest margins. Very few native species are present.

Figure 18: Example of vegetation present in MU6

Figure 19: Conifer forest to the west of MU6, as seen from Kelvin Heights, with dead trees seen along the upper margin

MZ6 Implementation plan – Tree Removal, site restoration and maintenance

- Harvest all merchantable timber using clear felling methods.
- Design forestry access infrastructure in this zone with the desired end use in mind (walking trails).
- Ensure that the time walk remails accessible or an alternative route to the basket of dreams and summit is available during harvesting operations.

- Due to the proximity of the site to urban boundary and the high fire risk at the site, slash longer than two metres, and with a large-end diameter of more than 10 cm, must be removed after harvesting.

- Where budget allows, some slash will be mulched and spread across the harvested area to help with weed suppression and to provide ease of access for future planting. This option is expensive and therefore will only be considered in high profile locations.
- Establishing vegetative cover across MZ4 as soon as possible following clear felling harvest activities by over-sowing harvested areas with grass species and top dressing. Over-sowing and topdressing should occur in the spring or autumn immediately following harvesting.
- Over-sowing with grass will help to suppress D. fir and other weeds species, but it will not stop them altogether. Post-harvest, the site will be subject to rapid woody weed establishment, particularly from germinating D. fir seed, but also a range of other weeds including hawthorn, sycamore, rowan, briar, broom and gorse (among other weed species). The most efficient method of managing emerging D. fir seedlings and other weeds is by targeted aerial and ground application of herbicide. The method of weed control across the site will be determined by the proximity of neighbouring residents. Unmanned Aerial Vehicles (UAV) / drones could be considered for this targeted aerial work. Access roads created for logging purposes could ensure easy-access for these ground-based operations.
- Follow-up control can be managed by ground-based crews (hand-pulling, spraying using backpack spray units, or spray using a spray unit via hose from a truck or tractor).
- A staged planting programme of native and exotic tree species will be undertaken (Appendix 3: Restoration Species list). Planting ~~exotics~~ the site will ensure that canopy cover is achieved ~~more~~ quickly, which in turn will minimise the "window of vulnerability" for erosion and land instability.
- Restore the upper half of MZ6 above the power line corridor to create a subalpine grassland and grey shrubland landscape, plant out with grey tussock shrubland species to improve the native biodiversity values of the area (species list)
- It is recommended that the land to south (downhill) of the powerline corridor is replanted in forest species as soon as possible (Appendix 3: Restoration Species list)
- ~~Replant this zone with a sequoia-dominated exotic forest.~~ Patch planting across the site or planting in clusters with natives and other non-invasive exotic tree species such as elm, oak and ash (Appendix 3: Restoration Species list).
- Allow for ongoing ground-based maintenance and weed control immediately prior to the first year of planting to remove any weeds that might have established. The control program will continue for 3 - 5 years until planted native species are established.

Environmental Management

A detailed Environmental Management Plan (EMP) will be developed to ensure the appropriate environmental management practices are followed during the harvest operation.

The EMP will include:

- Strategies to manage environmental aspects and risks, based on associated best practice.
- Provides a framework for monitoring, reporting, review and continual improvement.

The EMP will provide guidance for effective stormwater management. The following measures will be incorporated into harvest planning, operational practices, and post-harvest management to minimise erosion, protect water quality, and maintain site stability.

Slash Management: Slash is tree waste left behind after commercial forestry operations. The greatest risk from slash arises when it becomes mobilised and is transported within or beyond the forest boundary.

To manage this risk, it is recommended that, at a minimum, any slash that can be safely retrieved and meets the following criteria from the Resource Management (National Environmental Standards for Commercial Forestry) Amendment Regulations 2023:

- Slash longer than two metres with a large-end diameter greater than 10 cm.

Vegetation Cover: Vegetation helps slow water movement, promote infiltration, and stabilize disturbed soils. Re-grassing and planting should be done as soon as possible after harvest.

Drainage Patterns and Watercourse Protection: Consideration of the site's natural drainage patterns, including wetland areas and streams, is necessary to avoid disruption. All streams must be protected from sediment and contaminants. To achieve this:

- Establish riparian buffers (vegetated strips) along all waterways to filter runoff and trap sediment.
- Divert and filter stormwater flows to minimise sediment-laden water entering watercourses.
- detail on sediment control within the site during and after the operation is complete.
- protection of water quality through the creation of buffers between harvesting activities and surface water bodies.

Harvest Pplan, Road and Track Design: Forestry roads and skid tracks need to be designed with an understanding of the Reserves flow paths. All roads will be designed to the NZ Forest Road Engineering Manual 2020.

- Identify and maintain natural flow paths.
- Include strategies for stabilisation of disturbed areas.

Maintenance and Monitoring: Regular maintenance of stormwater features is vital to ensure ongoing effectiveness. This includes:

- Keeping culverts, drains, and water bars clear of debris.
- Repairing storm damage promptly to prevent further erosion.

Pest Animal Management

Successful restoration of the Reserve will require intensive pest animal management, particularly goats. There is a significant feral goat population at the site and these goats have adapted to human presence. It would only take a small number of goats to decimate an area of planted seedlings and so the importance of goat control cannot be understated. There may also be deer, pigs, possums, rabbits and hares that require control. As with any mammalian control, there is rarely one solution that is suitable for every situation. An adaptive herbivore control programme that incorporates several methods will, therefore, need to be developed for the site. For this to be effective it should be implemented concurrently on Queenstown Hill Station. Implentation of this control programme is critical to the success of this restoration plan.

In terms of goats, an obvious solution may be to erect a deer fence around the entire site. However, given the challenging terrain and the desire to incorporate the Queenstown Hill Station into the proposed strategy (which would result in a very large area to fence), this is not considered practicable. Fencing smaller subzones such as MZ4 may be possible, but this does not negate the need to undertake control work outside of these subzones

The next strategy would be shooting, which may be challenging on this property due to recreation access and the proximity to residential areas but is achievable when undertaken by an experienced professional and with reserve closures and adequate notice to the police and the public. It is recommended that an intensive goat shooting programme is undertaken before any planting commences. This should be followed up with regular monitoring and further control work as soon as the site is reinvaded. This monitoring will be able to detect if any other herbivores (rabbits etc.) are also invading the site and require control, although the most suitable control method may be different for different species.

The local Queenstown Hill trapping group has been active within the Reserve since 2018. There will be future opportunities to collaborate with community groups and other organisations on pest management, including the Whakatipu Wildlife Trust, Southern Lakes Sanctuary, and the Otago Regional Council.

Fire Hazard Mitigation

The current wilding conifer-dominated forest poses a significant fire risk, particularly if wood volumes are left unchecked. A formal flammability assessment of the current vegetation cover compared to the proposed vegetation cover has not been undertaken as part of this report. However, it is noted that the proposed vegetation cover is likely to pose a lower fire risk for the following reasons (especially if the strategy is extended onto Queenstown Hill Station):

- Removal of uncontrolled flammable wilding conifer forest;
- Improvement of the soil water balance resulting from wilding conifer removal;
- Rapid removal of dense ground cover of pine needles in harvested areas;
- Large areas of forest replaced by sub-alpine grassland, which is also flammable but doesn't burn for as long;

- Replacement of uncontrolled weedy areas with native species-dominated vegetation, which is not deciduous and can, therefore, provide better-regulated sub storey conditions year-round; and
- Replacement of highly flammable conifers with a range of native species including broadleaf (Griselinia littoralis) which has lower fire susceptibility.
- Better access to, and utilisation of certain parts of the site, which allows for easier maintenance of material that may pose a fire risk and improved access for emergency services in the event of a fire.

Other considerations

The forestry plan impacts the community and surrounding landscape, as outlined below:

Recreational Experience: The removal of wilding conifers will alter the experience of the Timewalk trail, which is valued by locals and visitors. The transition to a more open landscape will change the feel of the trails, especially during the first 5-150 years while vegetation is re-established. This is a common occurrence for trail networks within plantation forests. The long-term benefit will be an enduring trail in a permanent mixed species diverse forest.

Mountain Biking: While informal unauthorised mountain biking trails are present within the Reserve, they will be removed during the tree harvesting process. These trails, some of which cross public and private land, are not currently part of an official trail network. Council will work with the key stakeholders to develop a post-harvest trail masterplan for the Rreserve.

Visual Landscape Changes: The dense tree cover, familiar to the community, will be significantly altered. Some people may not support this change in landscape, particularly as we transition to the long-term goal of establishing a more ecologically resilient and diverse environment.

Impact on Neighboring Properties: Tree removal will have mixed effects on neighboring properties. While some landowners support the removal due to shading and invasive spread, others may be concerned about the increased visibility of their property or changes to privacy. Replanting with appropriate species aims to address these concerns. There will be effects from the harvesting activity on some properties such as noise and increased tree removal related vehicle movements.

Natural hazards: There are concerns about rockfall, stormwater, and slash movement during harvesting and while new vegetation establishes on site. Specific measures during the operation will manage these risks, including erosion control and ongoing monitoring to ensure public safety.

Fire Hazard: The removal of wilding conifers will significantly reduce a the fire hazard in the area. The proposed replanting with low-flammability vegetation will further decrease fire risks.

Biodiversity: The plan will enhance biodiversity within the Reserve. By replacing wilding conifers with native and carefully selected non-invasive species, the Reserve will see improved flora and fauna diversity, contributing to the overall ecological health of the area.

Funding constraints: There is no dedicated funding in the current LTP for the restoration plan, but some alignment with existing wildfire mitigation budgets is possible. Future funding may also come from government programmes, co-funding with other organisations, or limited timber offsets. Any tree removals must include clear plans and budgets for replanting and restoration.

Next Steps

An Outline Plan (as required by the designation) will be prepared and submitted to the QLDC regulatory authority for approval.

The Outline Plan will contain the following:

- A Harvest Plan which includes exact methodology, forestry roads and tracking within the site.
- An Environmental Management Plan
- A high level plan for redesign and establishment of recreational activities within the site, which The draft Te Tapunui Queenstown Hill Reserve Management Plan contains polices which support working with key stakeholders to develop and implement a Trail Masterplan.
- Detailed pest control plan - Pest management is crucial in the success of the project.

There are opportunities within the restoration plan to carry out staging of the harvest, removing the trees over a shorter or longer period. An option is coupe felling whereby smaller areas of trees are removed. There are advantages and disadvantages to delaying the program and the restoration plan allows this flexibility.

Monitoring will be undertaken to evaluate the effectiveness of the restoration plan, with reviews enabling adjustments based on the monitoring outcomes.

Financial implications:

There is no funding in the QLDC Long Term Plan (LTP) 2024-2034 to implement the restoration plan.

The LTP includes a capital budget of $21 million to progress the wildfire reduction program. Specifically, there is a wildfire mitigation budget of $1,067,000 in year 2026/27 of the LTP; and there are elements of the restoration plan which may align to this funding.

The Reserve was not planted as a production forest, but it does contain some merchantable timber. However, challenges such as slope, rock outcrops, access, and the presence of power lines will impact the feasibility of logging. Harvesting may not generate an economic return due to the site difficulties, although it may offset some costs associated with the operation.

Government initiatives which could help with tree removals and tree planting may be available in the future. An example is the National Wilding Conifer Control Programme which is led by Ministry for Primary Industries.

Any tree removals in management zones **must** be accompanied by a budget that includes provisions for replanting and ongoing maintenance. A detailed plan for regeneration is required for all trees

removed. This requirement ensures that any tree removal is followed by a clear commitment to timely and sustainable restoration.

Other related documents and references:

Te Tiriti o Waitangi
Reserves Act 1977
Resource Management Act 1991
Conservation Act 1987
Health and Safety Act 2015
Wildlife Act 1953
Wild Animal Control Act 1977
Fire and Emergency New Zealand Act 2017
National Environmental Standards for Commercial Forestry 2023
Otago Regional Pest Management Plan
National Wilding Confer Strategy
FENZ 'Flammability of indigenous plant species' guide
A Kāi Tahu Blue Green Network Ki Uta Ki Tai

Te-Taumata-o-Hakitekura Ben Lomond and Te Tapunui Queenstown Hill Reserve Management plan
QLDC District plan
QLDC Climate and Biodiversity Plan

Note that this is not an exhaustive list – additional policies may be relevant and any future variations of the polices listed.

References:

2020, NZ Forest Owners Association Inc, NZ Forest Road Engineering Manual
2021, QLDC, Queenstown Hill Reserve Forest Yield Estimation Ref. No: J6049, Interpine Group Ltd
2022 QLDC, Draft Queenstown Hill Options and Issues, Forestry Plan, Ahika
2024, QLDC Rockfall Hazard Assessment Queenstown Hill, Geosolve
2025, QLDC, Queenstown Hill Deforestation Stormwater Runoff Assessment, Beca
NZ Forest Owners Assoication Publications - https://www.nzfoa.org.nz/resources/publications

Appendix 1:

C.71 Designation # 373, # 374 and # 375 – Forestry Purposes (RM100722)

Link - Proposed District Plan - Queenstown Lakes Proposed District Plan

1. The purpose of the designation is to enable the Queenstown Lakes District Council ("the Council") to carry out forestry operations within the designated forestry reserves.

"Forestry operations" means the use of the land primarily for the purpose of planting, tending, managing and harvesting of trees for timber or wood production.

2. (All forestry operations will be carried out using best management practices under the New Zealand Environmental Code of Practice for Plantation Forestry, Second Edition, May 2008; together with any subsequent updates or editions. (http://www.fitec.org.nz/Resources/NZ-Environmental-Code-of-Practice-for-Plantation-Forestry/).

3. All forestry operations must comply with the management policies and programmes set out in the following current plans:

   a) Ben Lomond and Queenstown Hill Reserve Management Plan adopted 3 August 2005;

   b) Ben Lomond and Queenstown Hill Forestry Plan adopted March 2006; and

   c) Coronet Forest Management Plan dated 26 July 2001;

   or any updated versions of these plans adopted by the Queenstown Lakes District Council in accordance with condition (iv) below.

4. The current Ben Lomond and Queenstown Hill Forestry Plan and the Coronet Forest Management Plan ("the Forest Plans") shall be reviewed and updated by 31 December 2012, and thereafter every 5 years, and shall address the following matters:

   a. policies and, where applicable, proposed programmes in relation to the re-establishment and/or re-vegetation of production forest, together with areas to be retired from production forestry following harvesting operations. The re-establishment and/or re-vegetation plans shall include the following (as applicable):

      i. details of any production forest re-establishment programmes; including plant schedules, density of planting and grades of plants by botanical name;
      ii. areas of land to be retired from production forest following harvesting operations, together with the proposed future re-vegetation (including plant schedules and botanical names) and maintenance programmes;
      iii. details of all indigenous species planting programmes, where applicable. Indigenous species should be planted, inter alia, to establish permanent non-linear forest and shrub land margins of no less than 20m in width to integrate production forest into the outstanding natural landscape, and to limit wilding spread. The botanical names of species, location and extent of planting to achieve landscape integration (where required), together with proposed maintenance programmes, should be included;
      iv. proposed control of any wilding regeneration following harvesting operations, both within re-established or re-vegetated areas and in proximity to remnant stands of existing indigenous Beech forest. The Forestry Plans shall provide that any wilding generation is to be eradicated within two years of harvesting;

v. the Forestry Plans shall provide that re-establishment or re-vegetation of harvested areas will occur as soon as practicable and no later than two years after the completion of harvesting operations.

b. areas where additional indigenous Beech species are to be planted (adjacent to Beech remnants) with priority in those areas that will link Beech remnants. Planting programmes for the establishment of indigenous Beech species shall run concurrently with harvesting programmes;

c. details of indigenous eco-systems to be protected and extended within the Ben Lomond reserve, including One Mile Creek;

d. policies in relation to the impact and requirements of the New Zealand Emissions Trading Scheme and subsequent implications for the longer term management of the production and non-production forests.

All updates of the Forestry Plans shall be subject to consultation with the community using the Special Consultative Procedure set out in section 83 of the Local Government Act 2002 before adoption by the Council.

5. No forestry harvesting operations will be undertaken within 30m of the Skyline or Ziptrek leased areas unless the prior consent of the affected leaseholder(s) has been obtained.

   *Note: As lease operations expand or reduce, the 30 metre buffer zone will be adjusted accordingly to include/exclude the lease area from harvesting operations.

6. The Requiring Authority shall consult with the following parties that may be potentially adversely affected by harvesting operations. These parties must be consulted at least one month prior to an Outline Plan being submitted in relation to the particular forest:

   Queenstown Hill Forest

   a. Department of Conservation; and

   b. any other lease holders within the designated area.

7. An Outline Plan is required for the harvesting of trees for timber or wood production prior to any harvesting taking place. The Outline Plan shall be prepared in accordance with the requirements of the New Zealand Environmental Code of Practice for Plantation Forestry (as defined in condition (ii) above) and shall address the following matters:

   a. a site plan shall be prepared, defining:

      i. site and boundaries of the forestry designation;

ii. location and extent of existing beech remnants or other indigenous forest;

iii. location and extent of heritage or cultural sites to be protected;

iv. land contours and features;

v. the location and extent of proposed harvesting and associated works, including proposed structures;

vi. the staging and stage boundaries of proposed harvesting;

vii. extent of replanting for production forest, for permanent forest margin 'buffer' planting, and all areas of indigenous planting;

viii. areas of marginal forestry to be retired;

b.. the extent and location of existing and new tracking works required for the duration of the works shall be outlined;

c. a re-establishment and/or re-vegetation programme for the harvested area in accordance with the relevant Forestry Plan shall be included. The programme should contain details of the matters set out in condition (iv) above where applicable (by reference to the relevant Forestry Plan) and shall comply with all of the requirements set out in that condition.

d. forestry operations shall be undertaken in accordance with the Harvesting Hazard Management document (attached as Appendix 1 to these conditions). An assessment of natural hazards within the harvesting area shall be undertaken to identify the effects of natural hazards on and off site and the Outline Plan shall provide details of the following matters:

i. mitigation on-site and off-site of the natural hazards identified;

ii. contingency plans to reduce adverse effects of hazards should the proposed mitigation not be effective;

iii. long term management of slope stability, where appropriate.

e. the Outline Plan shall have regard to the relevant objectives and policies of the Queenstown Lakes District Council District Plan.

8. Any structures necessary for forestry operations shall be located so as not to break the line or form of any ridges, hills or prominent slopes. Structures shall be located so as to be reasonably difficult to see from surrounding public locations and shall be coloured in dark recessive colours, within the tones of grey, green or brown with a light reflectivity value less than 36%, and shall appear recessive within the landscape. All structures and traces of their presence shall be removed on completion of silvicultural operations or

harvesting as applicable.

9. Harvesting should occur only along natural boundaries (such as the edges of stream beds or stands of indigenous vegetation), and should endeavour to avoid the creation of arbitrary lines in the landscape which do not harmonise with underlying features or topography. Harvesting in geometric blocks should be avoided where possible.

10. The method of harvesting should minimise any adverse effects on visual amenity and soil disturbance. To avoid adverse effects of any temporary or permanent roads or other earthworks on the landscape, helicopters should be used for harvesting operations where practicable. Otherwise earthworks should be undertaken in a way that minimises cut and fill. Batters must be rehabilitated as soon as possible and no less than 6 months following harvesting operations. All earthworks are to be restored to original ground level as soon as harvesting has been completed and re-vegetated immediately.

Appendix 2:

Te Tapunui Queenstown Hill

Referred to as	Record of Title	Legal Description	Classification	Area
Te Tapunui Queenstown Hill Reserve (containing the entrance to the Te Tapunui Queenstown Hill Time Walk)	569609	Lot 4 Deposited Plan 447835	Recreation Reserve	6.05 Ha
Te Tapunui Queenstown Hill Reserve	732627	Lot 2 Deposited Plan 496901 and Section 1 Survey Office Plan 503041	Recreation Reserve	61.98 Ha
Te Tapunui Queenstown Hill Reserve	26956	Lot 602 Deposited Plan 306902	Local Purpose Reserve (Beautification)	0.43 Ha
Te Tapunui Queenstown Hill Reserve	109819	Section 2 Survey Office 317364	Conservation	40.66 Ha
			Total area	109.12 Ha

Appendix 3:

Restoration Species list

At a minimum it is expected that 1,100 trees per hectare will be planted. In some areas across the Reserve many more trees and shrubs per hectare will be planted.

All planting will occur in pockets or small cluster planting across the Reserve. Planting trees and shrubs in proximity will support each other by providing shelter while encouraging faster growth.

1. **Native tree species** found in the Whakatipu Basin which will be planted within the Reserve to maximise the resilience include:

Mountain beech (Fuscospora cliffortioides), red beech (Fuscospora fusca), Silver beech (Lophozonia menziesii), Hall's tōtara (Podocarpus ~~totara~~ laetus), mānuka (Leptospermum scoparium~~Mscoparium~~), broadleaf (Giriselinia littoralis), kōhūhū (Pittosporum tenufolium), kōwhai (Sophora microphylla), ribbonwood (Plagianthus regius), mountain lacebark (Hoheria lyallii), lancewood species (Pseudopanax crassifolius and Pseudopanax ferox~~),~~ cabbage tree (Cordyline australis).

2. **Grey tussock and shrubland species** :

Suitable species include coprosmas, olearias, Hhoherias glabrata, tussocks, matagouri (Discaria toumatou), corokia (Corokia cotoneaster), cottonwood (Ozothamnus leptophyllus), mountain pinkberry (Eptecophylla juniperina subsp. juniperina), poataniwha (Melicope simplex), porcupine shrub (Melicytus alpinus).

3. **Non-invasive exotic tree species** such as elm, oak and ash.

Botanical Name	Common Name
Abies alba	European silver fir
Abies species	fir
~~*Acer platanoides*~~	~~Norway maple~~
~~*Acer rubrum species*~~	~~red maple~~
~~*Acer x freemanii 'Jeffersred'*~~	~~autumn blaze maple~~
Aesculus species	chestnut
Cedar varieties	cedar
Cedrus atlantica	Atlantic cedar
Eucalyptus	eucalypts
Fagus sylvatic	Purpurea Copper Beech
Fraxinus angustifolia	Raywoodii, Claret Ash
Juglans regia	Walnut
~~*Liriodendron tulipifera*~~	~~tulip tree~~
Malus species	Apple (heritage species if available)
Olea species	olive tree
Picea	spruce
Pip fruit species	fruit tree (heritage species if available)
Plantanus species	plane
~~*Populus deltoides*~~	~~eastern cottonwood, necklance poplar~~
~~*Populus nigra*~~	~~black poplar~~
Quercus ellipsoidalis	Northern Pin Oak
Quercus palustris	pin oak, swamp Spanish oak
Quercus petraea x robur	Hybrid English Oak
Quercus robur	English oak
Quercus rubra	Red Oak
~~*Sequoia giganteum*~~	~~giant sequoia~~
Tilia x europaea	common lime
Ulmus procera	English elm
Ulmus varieties	elm