Community & Services Committee

14 August 2025

Report for Agenda Item | Rīpoata moto e Rāraki take [1]

Department: Community Services

Title | Taitara: Te Kararo Queenstown Gardens Conifer Succession Plan

Purpose of the Report | Te Take mō te Pūroko

The purpose of this report is to consider approving Te Kararo Queenstown Gardens Conifer Succession Plan.

Recommendation | Kā Tūtohuka

That the Community & Services Committee:

1. **Note** the contents of this report;

2. **Adopt** Te Kararo Queenstown Gardens Conifer Succession Plan; and

3. **Direct** staff to enter a Memorandum of Understanding (MOU) with the Friends of the Whakatipu Gardens (FOG) and the Whakatipu Wilding Control Group (WCG) and any future Queenstown Gardens stakeholders to record overarching principles of Te Kararo Queenstown Gardens conifer succession plan.

Prepared by:

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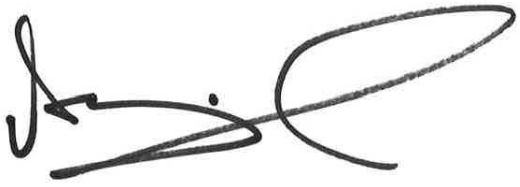
Title: Parks Planning Manager
3 July 2025

Reviewed and Authorised by:



Name: Ken Bailey
Title: General Manager, Community Services
11 July 2025

Context | Horopaki

1. Te Kararo Queenstown Gardens (the Gardens) is a valued public space and plays a central role in Queenstown's cultural and natural heritage, offering an environment for locals and visitors to enjoy a range of activities in amongst plenty of plant life. The Gardens comprise of five parcels of land totalling fifteen hectares.

2. There are approximately five hectares of conifers within the perimeter of the Gardens. These conifer species are classified as a pest in the Otago Regional Pest Management Plan 2019-2029, and cause a range of adverse effects, including:

    - Biodiversity loss: these trees create a dense canopy that blocks sunlight, suppresses understory growth, and disrupts natural regeneration processes, significantly reducing native flora and fauna in the area.
    - Degradation of soil quality: needle litter contributes to soil acidification and reduces nutrient availability, resulting in poor soil health that challenges the establishment of other plant species.
    - Seed spread risk: wilding conifers are battled with throughout the Queenstown Lakes. Pest conifer seed travels by wind and can spread into surrounding natural areas.

3. The Gardens' conifer trees serve as a windbreak, shielding the site from wild weather while offering essential protection and shelter for the internal rose gardens, ornamental trees, and recreational activities such as bowls and tennis. But their pest status and advancing age are a significant threat to the landscape's long-term sustainability. Careful management is required to transition to a more ecologically diverse shelterbelt in the area.

4. The Queenstown Gardens Reserve Management Plan 2011 requires the development of a tree succession plan for the gradual replacement of Douglas fir conifers within the Gardens.

5. The draft Te Kararo Queenstown Gardens Conifer succession plan (the Plan) outlines the phased removal of the conifer trees over several decades (60-80 years). The succession plan aims to replace conifers with native and suitable exotic plants to help restore biodiversity and ecology in the area, enhance public use of the space, and ensure it thrives for future generations.

6. The draft plan was shared with the FOG and the community for feedback and below is a summary of the key dates:

Date	Action
Feb – March 2025	Queenstown Lakes District (QLDC) Parks team and FOG review the Draft Te Kararo Queenstown Gardens Tree Succession Plan.
3 April 2025	Draft plan shared with the Community and Services Committee at a public workshop.

4 April – 12th May 2025	Draft plan shared with the Queenstown Gardens stakeholders and wider community for feedback. 3 drop-in sessions were held in Te Kararo Gardens. A total of 44 submissions were received.
May – July 2025	QLDC Parks team and FOG reviewed the feedback, and the draft plan was updated.

Analysis and Advice | Tatāritaka me kā Tohutohu

7. The draft plan was open for submissions between 4 April and 12 May 2025 and was supported by three drop-in sessions held in the gardens. 44 submissions were received via QLDC's online submission portal Let's Talk and by email (Attachment A).

8. Of the 44 submissions received:
   - 23 supported
   - 4 neutral
   - 17 opposed

9. Key themes that arose through the submissions were:

Landscape and amenity
Most of the submissions that opposed the Plan were concerned about the landscape effects and the loss of amenity from the tree removal.

Shelter
Many submitters raised concerns about the potential loss of shelter, highlighting the importance the existing conifer stand plays in providing shelter to the Gardens and the wider Queenstown Bay area.

Wilding conifer pest trees
It was noted during the drop-in sessions that the plan did not clearly indicate it applied only to the conifer trees within the Gardens, and not to all trees as part of a broader succession plan. Many submissions expressed support for the removal of pest trees, with some specifically advocating for a gradual approach. Several responses questioned the use of the term 'invasive' to describe wilding tree species in their current location, noting that the surrounding mountains are also covered in these conifers. There was concern that using this term could be used to undermine the plan, which is intended to be implemented over many years.

Replacement species

There was strong support for native revegetation, with specific mentions of using southern rātā and kōwhai. However, some concerns were raised about the slow growth rates of native species.

Timeframe

Submitters expressed support for the proposed 60–80 year timeframe, recognising the need to allow new trees time to establish and gain height.

Memorandum of Understanding

There were suggestions to include hold points and periodic reviews throughout the implementation of the Plan. To formalise this process, it was suggested that QLDC, FOG and the WCG (not excluding future Gardens stakeholders' groups) will enter a MOU which records the agreed overarching principles of the Plan.

10. The Parks team reviewed the submissions and presented the feedback to the FOG in a workshop session held in May. The feedback was considered, and the Plan was updated to incorporate changes informed by the submissions (Attachment B).

11. To mitigate the concerns of submitters who opposed the plan, trial planting sites will be established before any trees are removed. In addition, there is a commitment to establishing a MOU with stakeholders to support ongoing engagement, transparency, and collaboration as the project progresses.

12. The changes are detailed in Attachment C. The changes included:

- Identified 'new' early planting areas in Year 1 as trial sites (Spring 2025).
- Replaced the term "invasive" in the document with "undesirable" or "pest Species".
- Revised the planting strategy section to include the native/exotic species mix (40% native/60% exotic).
- Improved the planting map to clearly show the shelterbelt and overall planting strategy.
- Clarified the life expectancy of the conifers, noting that Douglas firs are long-lived, while radiata pines are not and are nearing the end of their life.
- Added an annual assessment period during planting phases and updated the activity descriptions to reflect this.
- Noted that future plantings and species selection should consider the Queenstown Ice Arena building and the QLDC Field Team buildings.
- The MOU will outline how the groups manage the operational components of the Plan, including the establishment of a management group to oversee implementation, make decisions on key milestones and hold points, and guide the principles shaping the Plan's implementation. This includes seasonal planting walkover assessments to evaluate the progress and establishment of new plantings and discuss the next stages of the Plan.

13. This report identifies and assesses the following reasonably practicable options for assessing the matter as required by section 77 of the Local Government Act 2002.

14. Option 1 Adopt the Te Kararo Queenstown Gardens Conifer Succession Plan

Advantages:

- Ensures there is a clear, actionable framework for the systematic removal of the aging undesirable conifers from Te Kararo Queenstown Gardens and their replacement with suitable species.
- Supports Council's obligation under the Queenstown Gardens Reserve Management Plan to develop a tree succession plan for the gradual replacement of Douglas fir conifers within the Gardens.
- Meets objectives in the Otago Regional Pest Management Plan. The wilding threat will be mitigated over time by gradually removing the maturing seed source.
- If supported, the Plan will enhance biodiversity outcomes by revegetating the site with more ecologically appropriate species.
- The draft plan aligns to the WCG's Strategic Plan 2023-2033 as endorsed by QLDC.

Disadvantages:

- The Plan may not be supported by all community members.

15. Option 2 Do not adopt the Te Kararo Queenstown Gardens conifer succession plan

Advantages:

- The current landscape surrounding the Gardens, which the community is accustomed to, will remain unchanged.
- There will be no cost to the Council if the plan is not implemented.

Disadvantages:

- There will be no succession plan for the conifers in the gardens as they reach maturity.
- Council will not meet the policies in the Queenstown Gardens Reserve Management Plan which require the gradual replacement of Douglas fir.
- Council will not meet the objectives in the Otago Regional Pest Management Plan.
- There will not be an opportunity to enhance biodiversity outcomes by revegetating the site with more ecologically appropriate species.

16. This report recommends **Option 1** for addressing the matter because this will ensure a clear plan is in place to systematically remove the undesirable conifers from the Gardens, replacing them with native and suitable exotic species. The Plan allows the area to retain its shelter function while enhancing biodiversity, transforming the site into a resilient and vibrant public space that reflects both ecological and cultural values.

Consultation Process | Hātepe Matapaki

Significance and Engagement | Te Whakamahi I kā Whakaaro Hiraka

17. This matter is of medium significance, as determined by reference to the Council's Significance and Engagement Policy 2024 because of the high community stakeholder interest in the Gardens which is an area highly valued by the community.

18. The persons who are affected by or interested in this matter are users of the Gardens, residents/ratepayers of the Queenstown community, commercial lease and licence holders, visitors to Queenstown, residential neighbours and businesses and local recreation and conservation groups and organisations.

19. The Council has undertaken targeted stakeholder engagement and wider community consultation. The draft plan received feedback between 4 April and 12 May 2025.

Māori Consultation | Iwi Rūnaka

20. The Council shared the Plan with Aukaha and Te Ao Marama Incorporated.

Risk and Mitigations | Kā Raru Tūpono me kā Whakamaurutaka

21. This matter relates to the Community & Wellbeing risk category. It is associated with RISK10005 Ineffective planning for community services or facilities within the QLDC Risk Register. This risk has been assessed as having a high residual risk rating.

22. The approval of the recommended option will allow Council to avoid the risk. This will be achieved by providing a clear detailed plan for how Council intends to remove undesirable conifers from Te Kararo Queenstown Gardens and transition to a more sustainable and ecologically diverse shelterbelt.

Financial Implications | Kā Riteka ā-Pūtea

23. The preparation and finalisation of the Plan is intended to be delivered within existing operational budgets

24. There is no specific funding in the Long Term Plan (LTP) 2024-2034 to implement the Plan.

25. Stage one, the Spring 2025 planting across five trial sites, could be funded through existing budgets within the LTP.

26. There may be local and national initiatives which would help fund tree removals and tree planting. An example is Trees that Count.

Council Effects and Views | Kā Whakaaweawe me kā Tirohaka a te Kaunihera

27. The following Council policies, strategies and bylaws were considered:
    - Vision Beyond 2050: Our Vision and Mission - QLDC
    - The Reserves Act 1977
    - Parks and Open Spaces Strategy 2021.
    - Draft Climate & Biodiversity Plan 2025-2028
    - Whakatipu Wilding Conifer Control Group Strategic Plan 2023-2033
    - Otago Regional Pest Management Plan 2019 -2029
    - Queenstown Gardens Reserve Management Plan 2011

28. The recommended option is consistent with the principles set out in the named policies. It aligns with the Queenstown Gardens Reserve Management Plan 2011 which requires development of a tree succession plan for wilding conifers in the Gardens.

29. This matter is not included in the Long Term Plan. If the plan is adopted, the project will be scoped, and funding will be sought through the long-term plan to advance the 60–80 year vision.

Local Government Act 2002 Purpose Provisions | Te Whakatureture 2002 o te Kāwanataka ā-Kīaka

30. Section 10 of the Local Government Act 2002 states the purpose of local government is (a) to enable democratic local decision-making and action by, and on behalf of, communities; and (b) to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. Adoption of the Plan will support these outcomes by providing a detailed framework to commence the succession plan for replacing conifers in the Gardens. As such, the recommendation in this report is appropriate and within the ambit of Section 10 of the Act.

31. The recommended option:
    - The trial planting can be implemented through current funding under the Annual Plan; however, the remainder of the project will need to request funding via future Long Term Plans.
    - Is consistent with the Council's plans and policies.
    - Will slightly alter the level of service provision within the Gardens due to the maintenance requirements to support tree growth.
    - Will not transfer the ownership or control of a strategic asset to or from the Council.

Attachments | Kā Tāpirihaka

A	Submissions received April – May 2025 draft Te Kararo Queenstown Gardens Conifer Succession Plan
B	Te Kararo Queenstown Gardens Conifer Succession Plan - July 2025 FINAL
C	Final Draft Revisions Te Kararo Queenstown Gardens Conifer Succession Plan - July 2025

Attachment A: Submissions received April – May 2025 draft Te Kararo Queenstown Gardens Conifer Succession Plan

Submissions responses - Draft Te Kararo Queenstown Gardens conifer succession plan					
Name:	**Organisation (if any):**	**What is your position regarding the**	**Please explain the reason for your position:**	**Please share any other comments you have here:**	**Key themes**
Matt Dobb		I oppose it	I think this is a terrible idea and will definitely ruin the look of the town. It currently has a beautiful alpine look and this will never look the same and we will lose the towns iconic image. I understand the need to stop the wilding pines in other areas but this will be a mistake to do it in the gardens.		Concerned about landscape effects of tree removal
Keri Garrett		I support it	I support replacement of invasive wilding pines with those species outlined in the QLDC proposal		Support wilding tree removal
Samantha Taylor		I support it	For all the reasons in the draft document I support this. I'm a big supporter for native revegetation. The native plants of this region are unique and not found in any other countries. They help in painting a unique experience for visitors and should be celebrated. Current conifers are odes to other countries created at a time when New Zealands rich ecology was misunderstood. We should be proud of the uniqueness of this ecology not trying to remind visitors of other countries they may have been to.	Just a minor note. To my knowledge Coprosma robusta's natural range ends at Banks peninsula so eco sourcing will be difficult. Coprosma lucida to my knowledge grows naturally along the lake and is very similar.	Support for native revegetation
Guy Hughes	Lsnz	I support it	I haven't read it yet but I support the gradual removal of wilding or planted conifers and a replacement with more suitable plants. Particularly I support a shoreline and cliff area implementation of southern rate as are prominent around the shore towards sunshine bay.	Will add more after I have read the draft and would like to be involved in the replanting.	Support gradual wilding tree removal Support planting of Southern Rata along the shore Community involvement in replanting
Meesha		I oppose it	A biased and pushed view to continue removing more wilding pines with little thought to the reality of them returning. This is iconic, the shelter from the existing trees, disc golf, the Canadian feel as you run around the park settings. I see your plan is for mainly native plantings, a beech takes 20+ years to even get to 10m high and the white pine even longer. This isn't coming to help with wind and shelter for a long and that's if they survive. Also what's your definition of these trees coming to the end of their lives? According to all the native pushes wilding pines grown soo quickly so they mustn't be too old? We have enough native areas, can't we just leave one amazing tourist destination to have a little wow factor. It's iconic for a reason, it's different and beautiful the way it is.		Concerned about loss of shelter Concerned about landscape Concerned about natives growth rates
Roger somerville		I support it		Please remove all wilding pines. Please replace only with natives, including some mighty southern rata and kōwhai.	Support wilding tree removal Support native planting (Southern rata and Kowhai)
Chris Grose		I support it	Getting rid of the wilding trees ASAP should be an absolute priority. Planting natives should be the only way to replant these areas. QT being an international destination should showcase the best of us as NZers. Picking and planting our native trees to show off the best of our country in this planned garden upgrade is a once in a multi-generation opportunity.		Support wilding tree removal Support native revegetation
Matt Jones	Queenstown Nursery	I support it	As a local nursery that currently supplies QLDC, we would be very interested in working with the council on this project. Our locally grown plants would be the perfect choice for this project, being grown in Arrow Junction and we are also able to supply the labour to install these plants.		Support native revegetation
Miles Holden		I oppose it	As a neighbour to the gardens for over 30 years I belive that it should be kept as it is…. An amazing community amenity and an important area that serves its purpose….. funds should be spent in other areas….. this is an idealogical move that is not necessary.	QLDC have other more important issues to focus on leave the gardens as they are!! Loved and well used	Do not support the proposed tree removal concerned about loss of amenity
Karen Pringle		I oppose it	Trees provide oxygen; shelter; homes for birds homes for insects a place for diverse fungi to thrive. Large trees are essential for biodiverslity birds particularly need large trees.Opinions on type of tree are just that opinions do not creat oxygen we need to stop this cutting of trees. We absolutely need every tree whether we judge them or not diversity is vital to health. The joy of walking in queenstown gardens is seeing happy people I there and that's down to the trees the oxygen the diversity and range of trees.	Think about your children and grandchildren	Do not support the proposed tree removal concerned about loss of amenity
Terry Gaitor		I oppose it	Native trees or plants should be the only options planted by councils nationwide, no exotic species, there tends to be more pollen from exotic species which causes allergies	Make New Zealand beautiful by bringing it back to its native fauna coverage which also helps our fragile native species to recover	Revegetation should only use native species

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Rachel Primrose	'-	I support it	Invasive conifer species need to be phased out over time, and this plan does it in a controlled and considered way.	The windbreaks of non-invasive species as planned seem to create a wind tunnel around the south-east side of the gardens and I would like to see a slight re-design to prevent a funnel effect.	Support wilding tree removal
Jimmy Carling	RoyalTree Ltd	I support it	The objectives and reasoning behind them I believe to be a true representation of the situation at hand. There are key points worth reiterating. The shelter provided by the Firs is invaluable and extends beyond the gardens to Queenstown Bay and steamer wharf where I have enjoyed many an evening outside at Atlas unaffected by strong southerly winds. The mature ornamental trees within the gardens exist in their shape and form due to this shelter. Sudden wind loading from loss of shelter could not only affect tree health but also turn the gardens into a hazardous place. These hazards are acknowledged and mention increased risk of branch or whole tree failures. THAT SAID! The extensive wilding conifer work will be for nothing if the Douglas Fir shelter belt issue is never addressed. I think the time frame suggested is wise - my biggest concern initially was that this would be attempted within a short timeframe. Remembering that trees operate on a different lifecycle, this is not a transformation that can be pulled off in a decade. 60 years+ may seem a long time but in tree years this is a relatively swift turnaround. Our fast growth rates observed in the region should lend themselves well to a successful reforestation within this time frame. I do support the idea of increasing biodiversity though as the southern and western areas of the gardens are desolate underneath the Fir canopies.	Overall I think the succession plan has been well put together and addresses many of the concerns I had. I would add a couple of ideas into the mix which I would ask that QLDC discuss with Tend Trees. Firstly I really believe that one of the biggest hindrances will be frisbee golf. Even as someone who enjoys it and has played it on many occasions, it is the elephant in the room when it comes to tree health in the gardens. I have seen first hand the extensive damage to trunks that lie in the path of the frisbee course. Hard frisbees strike the trees and chip bark off, sometimes deeply so into the vital cambium layer responsible for wood production to the inside and bark production to the outside. The tree then reacts and attempts to callus around the wound and seal it closed. Only for this reaction wood to then be damaged by frisbee activity. The tree then attempts to seal this additional damage and so it goes. Some trees have callus growth on callus growth on callus growth. The trunks are deeply scarred and the consistent damage places a constant strain on the trees. QLDC have also struggled to establish new trees as the frisbees break vital young branches and scaffolds. There needs to be total redesign of how this sport is played in the gardens if it is even played at all. We would not have the gardens if the sport was played back in it's founding days. Yes it's fun. Will it help this project? Absolutely not. Potentially one of it's greatest threats. My other contribution to the thought process regards the perimeter trees. I understand that the plan at the moment would be to remove these last. I think more thought needs to be given to this. I also think that the illustration in section 5 "replanting strategy" doesn't feature enough tall growing shelter around the perimeter. I think there needs to be a continuous run of good tall growing conifers along the southern and western aspects and this should be several trees deep. I think a priority should be to get these non invasive conifers establishing around the entire south to west perimeter and this should be started immediately on the OUTSIDE of the current perimeter trees. Where space is restricted and open space does not exist to the outside, the "good" conifers could be planted under the lake side half of the drip line with some cautious crown lifting of the existing firs above them to facilitate their establishment. As these saplings grow and approach the lower canopy of the firs above, further crown lifting would take place to provide more light and space. In essence the new wave of vital perimeter trees (non wilding conifers) would chase out the current pest perimeter trees. In theory this should result in minimal changes to wind loading through the gardens and that vital wind protection could be maintained throughout.	The current stand provide shelter to ornamental trees and to the wider Queenstown and Queenstown Bay. Support proposed timeline for wilding tree removal. Support increasing biodiversity with new planting. Frisbee golf damages trees, need to consider the course and its affect on new trees. Plant conifers on outside of current stand now to provide future shelter. Do not support native vegetation as the primary defence against the wind as natives are unlikely to provide the same shelter. Natives can be damaged by snow.

Submissions responses - Draft Te Kararo Queenstown Gardens conifer succession plan					
Name:	**Organisation (if any):**	**What is your position regarding the**	**Please explain the reason for your position:**	**Please share any other comments you have here:**	**Key themes**
				I don't support native vegetation as the primary defence against the wind. Whilst natives will surely thrive and handle wind they don't achieve the same heights as say Redwoods or Grand Fir. Shelter is key but it is also vital that the shelter is high to maintain the wind protection across the bay and to businesses/recreational areas on the bay's northern side. I light heartedly touched on enjoying the shelter from my favourite watering hole at steamer wharf... Jokes aside we have often remarked at the swell pummeling up from the south across the end of the bay whilst the bay itself is tranquil. The bay being sheltered is important for boats and operators who have to load and unload passengers from vessel to jetty. Having natives on the perimeter is unlikely to afford the bay the same shelter. I have also witnessed natives extensively damaged in snow events which are a fact of life in our alpine environment. On this matter alone I think having native primary shelter to be a risky move. Exotic conifers have great timber properties and large structural root systems/buttress roots and will survive our extremes well and deal with snow events better. Look at any shelter belt in New Zealand and you will see it is almost always Cypress/Fir/Pine. As long as they are non wilding species, I say a perimeter of conifers is our best line of defence. Summarising the above - frisbee golf - what to do? And let's get new perimeter trees around the south and west going ASAP.	
Fraser		I support it	I think it's a great idea to remove the pines and restore the whenua and restore it it to something better fitting with the local environment. The pines have left the area around the pines an unappealing area to explore or spend time in.	I strongly belive that the replanting efforts should consist of entirely native species serving as a perfect showcase, for visitors and locals alike, the importance of respecting the local whenua and undoing the mistakes of the past. As shown in the local activity "Time Tripper" the bay was full of beautiful bush and that is how I would envision a replanting effort, native bush is what was mean to be in this area and will give visitors a true experience of wild NZ without the need of a manicured approach of adding more exotics.	Revegetation should only use native species. Support wilding tree removal
Ross Hoskin		I am neutral to it	If the trees have reached the end of their lives then they should be replaced. They need to be replaced by other trees. It is also important to reallize those trees provide shelter to the Rose Gardens from the wind.	I ask that the current Council make the correct decision. Thanks	Important to recognise the shelter provided by the current stand. Support removal if at end of life.
Melanie		I oppose it	I like the Gardens how they are, the trees make sure there is no wind in the gardens and this makes it special.	I also think for frisbee golf the trees are perfect, many people take pictures of them and everybody enjoys their time there. Why spend more money on this if it is perfect already?	Do not support a change, recognise the shelter provided by the trees
Nigel williamson	New Zealand Trails	I support it	I applaud council for the well considered, staged approach to removing and replacing these invasive species		Support staged approach to removing the wilding trees
Brock Anderson		I oppose it	Leave the current trees / landscape the way it is, the area is bordered by water on 3 sides and urban development on the end - there is no risk of the “invasive” vegetation spreading. Not to mention the conifers look beautiful and make it easy to walk through in the park. “Natives” are not so easy and often grow sporadically and make the space look messy and overgrown, not to mention the native vegetation this far south is actually just shrubs and scraggly bush, not worthy of being in a “cultivated” garden environment	Less is more, QLDC influence on the natural spaces should be as minimal as possible and focus on maintaining what is already here	Do not support the proposed tree removal. Do not support native revegetation
Rick Federkeil		I oppose it	Invasive? This is an isolated pocket of trees bounded by the lake on 3 sides and the city on the only land boarder. it can't invade anything. The plan is going to completely ruin the look and feel of the peninsula and town. Walking through the giant trees and playing disc golf amongst them is one of my favourite things about Queenstown. What you should be doing is selective harvesting of the oldest trees as they die and immediately start planting new pine trees of the same type to fill in the forest as the existing trees die off. Ideally, the new trees would be from a nursery so that they are a reasonably large size already when they are planted.		Question the use of the term invasive. Concerned about landscape and effect on amenity. Replace with same species when they die

Submissions responses - Draft Te Kararo Queenstown Gardens conifer succession plan					
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Torrens Roose-butcher		I oppose it	That plantation is part of the charm of Queenstown. I appreciate planting natives is good to do, however we do need some pockets of foreign plants and trees to appreciate diversity. It's like going to a zoo and all the foreign animals have been replaced with kiwi and weta, it defeats the point of a zoo and becomes abit boring.		Support pockets of exotic trees
Sharnie Cassells		I oppose it	The trees we currently have are iconic to Queenstown and should not be touched		Do not support the proposed tree removal
Mark Beach		I support it	Understand the reason for the succession plan and fully support it. Time to reintroduce natives to the area over a period of time so that their introduction is done sensitively and without losing the look of the area.		Support the succession plan. Support introducing natives into this area
Gwen Brown		I oppose it	This is a waste of council money and will ruin the gardens that Queenstown is famous for. The trees protect town from the wind and are isolated from other areas with native plants.		Do not support the proposed tree removal . Important to recognise the shelter provided by the current stand.
Tim		I am neutral to it	The removal of pine trees located on the peninsula, I certainly support. There is a lot of opportunity to improve that space for recreation. As for the pines closer to town and surrounding the college they have been there for decades and look magnificent. Albeit they are old and will soon have to come down. I believe there should be plenty of medium to large native trees planted to recreate a similar landscape in that specific area.		Support the succession plan. Support planting large natives.
Glenda Darling		I support it	The impact of seeds and also fire risk of these trees and their age. Also the values of having a microcosim of native bush for native species to thrive but also a space for locals to learn about native species and also visitors to the region		Support the succession plan. Support planting natives.
Barbara Daxenberger		I support it	It's currently very dark in there and the trees don't reflect NZ's diverse landscape. I appreciate that they are not cut down immediately but replaced in stages.		Support the succession plan.
Tom Spencer		I support it	Supporting replacement of dangerous exotics with natives to enhance biodiversity both on the peninsula and the surrounding hills		Support the succession plan. Support planting natives.
Phil De La Mare	Past Chair NZ Douglas-fir Research Cooperative, past Forest Owners rep Central Otago Wilding Group	I am neutral to it	I support the concept of a management plan for the gardens, but not some of the detail proposed	Problems identified in the document are: Advancing age - the oldest Douglas-fir are approaching 140 years, but the species grows naturally to 300 years in the US, so they are in no danger of being over-mature any time soon. Biodiversity loss - any dense stand canopy will block sunlight to understory plants regardless of species. This is not unique to one species and the same will occur under a stand of densely planted beech if they are not thinned out eventually. Thinning is the best solution, not a species replacement. Degradation of soil quality - this is misinformation presented as fact. All tree species reduce soil pH to a greater of lesser extent. The growing range for native beech soil pH is 5.5-6.5 which mirrors Douglas-fir. The conifers have been doing a fantastic job building up an A horizon in an area which previously would have had skeletal soils based on early photos showing limited scrub cover and grasses. Based on forest industry experience elsewhere, soils developed under conifers are perfectly suited for re-establishment of other plant species. The idea that they are in poor health is nonsense and is just adopting 50 shades of green narrative. Seed spread risk - no-one will dispute this, but the gardens are not a take-off site for seed. If the council used the wilding calculator, then it should be putting its efforts into removal of Douglas-fir on higher altitude sites as a priority. Prime take-off sites include the commercial stand behind Skyline's luge and similar higher altitude stands which should be prioritised first.	Noted advancing age, not at maturity, compared to their native environment. Support the concept of a management plan but do not support the proposed tree removal . A dense stand canopy will block sunlight to understory plants regardless of species. Soil under conifers are suited for re-establishment of other plant species. Question the use of the term invasive, not a take off site. Miyawaki method will use more seedlings than conventional planting, they will have to be thinned.

Submissions responses - Draft Te Kararo Queenstown Gardens conifer succession plan					
Name:	**Organisation (if any):**	**What is your position regarding the**	**Please explain the reason for your position:**	**Please share any other comments you have here:**	**Key themes**
				The wilding calculator was developed by Scion's Nick Ledgard over 40 years ago and while many have tried to discredit it, it has proved so robust that it has for some time been part of the National Environmental Standard for Commercial Forests. The high altitude stands are the priority for seed spread risk, so this should not be presented as a problem for the gardens. There is also a plan to use an experimental establishment method called Miyawaki. I thought dense stocking was identified as a problem, not a solution. It sounds like a good marketing plan from your nurseryman because you will use far more seedlings than conventional planting, then they will all have to be thinned before they choke out the under-storey.	
Chaewon Kim		I support it			
Bethany Rogers		I support it	Good idea. It's time to slowly bring in some new, predominantly native trees and plants as the first die, so that the gardens can be enjoyed for another 100+ years.	Some carefully selected tall trees in one section would be nice – the towering look is magical although I understand the problems such trees can create. What will be done with the pines removed? I'd like to see it gifted to the community in some way and put to good use.	Support the succession plan. Support replacement with tall species. Suggest wood donated to the community.
Jake Allen	Personal	I oppose it	The existing Conifer Trees are an iconic part of Queenstown and a great place to play disc golf. I strongly oppose the removal of these trees and suggest funds for this project are reallocated to more pressing issues.	As above.	Do not support the proposed tree removal
Hannah White		I oppose it	Ridiculous that the focus is on these trees when there is the Ben Lomond forest overlooking it which is a far bigger fire risk and spread of wilding pines. We live bordering the forest in Fernhill and I've long advocated about the fire risk to the houses nearby but nothing has ever been done. Now to see money being spent on trees that beautify the gardens and provide a much needed wind break is frustrating.		Do not support the proposed tree removal . Question the use of invasive, not a take off site.
Chris Hill		I oppose it	Hope on a plane and have a look at the Sydney Botanical Gardens. There are hundreds of non-native plants and trees there. There not fussed about them so why are you. You are just going to stuff up the great look of Queenstown!	Leave the trees alone . Finish andall your other stuff ups first	Do not support the proposed tree removal
Bea Calvert		I am neutral to it	I appreciate the idea and think it's about time the destructive wilding conifers colonising this area are addressed but think the plan needs amendment around the proposition of more conifers being planted.	I would like to see more native species local to this area planted, alongside fruit and nut trees perhaps which can be foraged by the community - offering opportunities for workshops, community events and connection to the landscape. I think that despite the native trees being generally initially slow to establish, this is a gradual, generational plan and plants should be considered for their long-term effect on the environment in such areas as seed dispersal, soil compatibility, use to the general public, rather than prioritising their shelter belt abilities. Planting more conifers especially is taking a step backwards and needs to be reevaluated for both it's short and long-term viability and limiting effects on the overall environment you're trying to foster.	Support wilding tree removal. Support native revegetation. Would like fruit and nut trees to be planted.
Jeremy		I support it	Natives will support much greater biodiversity and should be celebrated in this iconic location . No one thinks of exotic pines when you think of a garden		Support native revegetation

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Name:	**Organisation (if any):**	**What is your position regarding the**	**Please explain the reason for your position:**	**Please share any other comments you have here:**	**Key themes**
Pamela Rees Haworth	Wakatipu Reforestation Trust & Wakatipu Garden Club	I oppose it	Queenstown GARDENS is exactly that - a garden. I totally agree with eliminating the Douglas firs but don't agree with replacing them with natives. We have more than enough native plantings around the basin and natural natives on DOC land. To plant natives on our peninsula is to oppose the current theme that Nick Leefe started in creating a GARDEN. Besides the suitable natives you've listed are far too slow growing. The variety of colour and texture could easily be continued with the planting of fast growing exotics especially deciduous trees. It is already colourful then continue the colour. Look how colourful Arrowtown is and there's not a native in sight.	If you feel visitors need to see natives they can see plenty of that just off Park Street. Because this was untouched natives from years ago and in a separate area then leave t. But the actual Gardens themselves need to be a GARDEN. I know your head gardener is English therefore still sees our native plants as "exotic" because when I lived in England NZ hebes, cabbage trees and flax were growing everywhere. But this is not the theme of our Gardens.	Support the succession plan. Do not support native tree planting
Jill Hodgson	Whakatipu Reforestation Trust - (however my feedback is my personal opinion)	I support it	Future proofing the area is important and the detail of this plan is to be commended. Wilding pines are an issue throughout the region and QLDC is leading the way to show residents and visitors how succession planning can work. I like the mix of native and exotics and believe that the area be enhanced by this work.	My only negative is that I won't be around in 60 years to see the area in all it's glory. I also like that the gardens area will be extended as it is visited by locals and visitors and can get quite congested at times. Thanks to all for putting the plan together.	Support the succession plan.
Sam de Reeper		I support it	New Zealand has a unique environment that needs to be protected and promoted. Please increase the number of species native to NZ in the Queenstown Lakes District	Can we review the street trees to promote Native species	Support native revegetation
Megan Phillips		I support it	I think creating a prominent garden in central Queenstown provides a place for locals and tourists to connect and learn about native species (both flora and fauna). It will be a very large, lengthy and expensive project but will showcase how exotics can be replaced with natives after hundreds of years	Concern about the cost longterm of this project as can image soil treatment will be the biggest hurdle but as the redwoods would need a lot of management as they continue to age and increase in safety risk, believe this project achieves a better outcome as good for nature , people and education.	Concern about the implementation cost
Sonja Kooy		I oppose it	The town has been going through so much change and has been a construction site for such a long time. The gardens are a calm established green space for the community to enjoy among the chaos of the construction. There is still so much going on and so much not finished, starting another project compromises the town again yet again. It is stressful living in a town that is a continual construction site. The trees are a beautiful feature and a much needed wind break. No new plantings will be established enough to provide any wind break for at least 20 years. Give the community a break if wilding pines need to be cut down finish some of the projects before starting a new one. It seems that the easy trees get cut leaving the ones that are harder. This will not eradicate the species. Do some maintenance on some of the other green spaces that is not being done before starting on a new project. This is not something that should be a priority. There are so many other priorities before a beautiful space like the gardens is made into an unfinished space. We have put up with construction around the town center for years leave a space free of construction. We have a right to enjoy the community spaces while we are alive not just for the next generation. Just because funding may be available now this does not mean it should be done. The Arterial Road is a prime example of this. It is a road to nowhere and has not made any improvements to getting around, does not have any further funding to finish it. Any funding should be put into getting some of the hard to get ones to finish other wilding pine projects. A staged project will not make it any better it will just extend the feeling that it is unfinished space and compromise this calm community space the community enjoys for longer. The quality of life of the people living in Queenstown has been really compromised by all the continual and unfinished projects. The gardens are gorgeous the way they are. Leave it alone. Trees do not all need to be natives. Our people are multicultural our plants can be as well.	Everywhere you look our beautiful mountains are being scarred with bike trails and other wilding pine projects that have not been finished. Enough is enough before it is too late.	Do not support the proposed tree removal . Concern the plan will affect the amenity. Support natives and exotics.

Submissions responses - Draft Te Kararo Queenstown Gardens conifer succession plan					
Name:	**Organisation (if any):**	**What is your position regarding the**	**Please explain the reason for your position:**	**Please share any other comments you have here:**	**Key themes**
miles holden		I oppose it	This is my second submission and I am doing so after having an open discussion with other long term locals that live close to the QT gardens, it seem unrealistic to refer to the pines in question as nearing the end of life, in fact 1400-1800 years is the expected life of the trees in question. I also have problem with removing trees that provide amazing shelter with slow growing native that will not provide shelter. I think a very idealistic view has been taken around these trees and given some of the other decisions that have been made around our town in the last 5 years I do not trust the council to make the right decision. I believe it should be left as is for now.	If there had been some headway made in removing other wilding pines on Qt hill and the ben lomond reserve I think it would then be an obvious follow on to action a plan like this, I belive locals that have been here for longer than 40 years should be making this ultimate decision. Queenstown has lost confidence in any decision making QLDC is responsible for so therefore leave it alone!!	Concerned about the loss of shelter. Trees are not at their end of life but are advancing.
Suzanne Rose - on behalf of WCG	Whakatipu Wilding Control Group (WCG)	I support it	WCG acknowledge the history and foresight of our forebears in putting aside this special peninsula location for the Queenstown Gardens. Members of the WCG deeply value this Reserve and wish to see any plans enhance its environment, ambience, and role as a welcoming gathering place for both the community and visitors. Rather than WCG fielding questions about wilding species and the presence of Douglas fir in the Gardens, WCG hopes to shift the focus toward deepening appreciation for this unique and special place — a setting where locals take pride and visitors are inspired by the diverse plantings.	Attched as PDF	Replanting as soon as possible. WCG seeks to be involved in the assessment/review periods. Suggest major review undertaken at both the 20 and 30-year mark to assess growth. Concerned about the steady progression of the plan in relation, essential to have consistent funding. Important to get the plan underway. Importance of keeping the community informed. Original old Kowhai trees should be mapped and protected,.
Jay Cassells	Friends of the Wakatipu Gardens (FOG)	I support it		Attched as PDF	Use of the term invasive species Amend plan to consider undesirable conifers only Conifers provide as a wind break and shelter Trail planting to be undertaken as soon as possible Provide clearer direction on the mix of native and exotic species to be planted MOU between QLDC, FOG and WCG (and /or affected stakeholders), details relationship and review/hold points in plan prior to and after any annual operational period. Bird activity should be considered.
Ted Graham	Ice Arena	I support it	Current concern is that the trees are a health and safety risk when swaying in the strong winds Support progressing removals earlier in zone 1 and 2. Tree removal activities such as noise and diversion at back of building wouldn't impact rink business during the day. Preference for majority of new planting species to be below roof height of building at mature height in order to reduce plant debris falling on roof therefore minimising rink's maintenance. Or species that don't create plant debris. Would like to put solar panels on the roof at a future date, would like species which do not affect the performance of the solar panels. Preference for new planting to be set back from building to allow for maintenance around the outside of the building. The plan needs to be updated to reflect the setback from the building. Need to consider planting setbacks in relation to root trainers so that there is no effect on the building in future. Preference for new planting to accommodate some lake views from future potential window modifications on the rink building.		Address the set-backs behind ice arena building. Note viewshaft and species to be planted behind the building.

QUEENSTOWN GARDENS
CONIFER SUCCESSION PLAN

SUBMISSION

INTRODUCTION

I refer to our meeting at 1.30 on 11 March 2025.

It was attended by Karen Boulay, Joce Sandford, Jewell Cassells and me. Other representatives of Friends of the Gardens (FOG) (e.g., Lorraine Cooper), were unable to attend at the changed time.

QLDC was represented by you, Lee Rowley, Dave Spencer, and Stef White

ACKNOWLEDGEMENT AND THANKS

First, thank you for giving us an early look at your plans.

Although there are still many members of FOG who wish to say something about them and some matters which are not yet sufficiently detailed to comment upon, it is very helpful to have an opportunity to consider this subject which is of considerable importance to the community and to future generations.

Second, the work you have done appears extensive and so is very reassuring to those of us who have, as you know, often had to grapple with some ad hoc decisions or inadequate thinking regarding this reserve, which is a recognised and very valuable public asset.

Please accept and pass on our thanks to all of those who have put in this work.

GENERAL COMMENTS

This is a very important moment in the history of the Gardens.

At least potentially, the proposed plans for the trees will influence the future of the Reserve to a degree at least as significant as the original establishment of the Gardens. All those involved will or should be conscious of the gaze of the those who have gone before us and who have bequeathed or continuously protected this reserve.

Below, are some general comments which I can make on behalf of those to whom I have been able to speak or whose views I know.

As you appreciate, members of FOG are private citizens with considerable time constraints and, perhaps especially so, during the relevant discussion period.

A good example is Teresa Chapman whom, as you know from her comments to date, has considerably well formed and strong views about the trees in the Gardens.

I note her contribution because of her long-term interest in the subject and because of her knowledge of the Gardens gained as the longstanding President of the Queenstown Tennis Club.

In this role she has been able to continuously observe the bird life, human activity, weather conditions, (especially wind, sun and temperature) and the beneficial effect of the trees on the amenity and climate of the Gardens. This "real life" experience is very relevant to a consideration of the changes proposed for the trees.

So we must specifically reserve the FOG position with regard to the plan (including for the purpose of allowing Teresa to express her views) and to make further specific comments on the detail draft plan.

The general points are these:

1. **FOG SUPPORT**

In principle, of course, FOG supports sensible long horizon planning for the management of the trees in the gardens.

This is the intent of the Reserve Management Plan and is, anyway, good husbandry. Clearly there must be some continual culling and replanting so as to maintain the health of the trees in the reserve and, specifically, so they may ensure, as you note, the most beneficial climate conditions possible for the Gardens.

It is also wise to plan, as you appear to have, over long period of time and with sound underlying methodology.

BUT WITH CRUCIAL PROVISOS

There some provisos to this support:

1.1 ALL MATTERS CONSIDERED .

However planning must be done in a practical and sophisticated manner taking into account all knowledge derived from the history of the reserve and such reasonable future contingencies as may reasonably be anticipated.

Ideally, also, the plans should be free of the undue influence of fashionable or current attitudes including about trees species. Hopefully the use in the draft plan of such terms as *Invasive species* and *Invasive Wilding Conifers* is not evidence of that.

It is not accepted that such trees should be absolutely so characterised nor that in their present location they have any of the adverse effects on the environment which may occur elsewhere in the district.

1.2. THE WINDBREAK

As noted above, and by Lee, the importance of the conifers as a wind break for the Gardens (and the CBD) is paramount.

It is said that the former and well respected Head Gardner, Nick Leefe considered that were the trees to be removed the ambient temperature of the CBD would be reduced by 4°.

Accordingly in the view of FOG no action should be undertaken at any stage which reduces the present effectiveness of the trees as a windbreak or windbreaks

1.3 SUCCESSION PLANTING BEFORE CULL

FOG submits that, generally, no culling or felling of the trees, especially the conifers, should occur without first planting a replacement tree of a similar species. And allowing sufficient time for such replacement tree to be established

You will see immediately that this relates particularly to the conifers which operate as a wind belt as mentioned in 1.2 and which are, as your report acknowledges, crucial to the health and conditions of the gardens in the reserve. There may be, as your excellent work predicts, at least to some extent, culling or felling which will be required without the establishment of planting of a successor tree. However as a general principle the replacement species of tree must be established and the integrity of the wind break maintained.

However, we make this point separately here because of the recent experience at Hotops Rise where the "succession planting" was either not done or done late and was limited only to native species.

Thereafter, the irrigation and maintenance of the young shrubs sometimes appeared to be inadequate or infrequent.

This has occurred on other occasions and we must note again that, despite numerous assurances, there still has been no replacement for an oak felled by QLDC over 10 years ago

We also have reservations about how urgent all this is. We wish to discuss this further with you.

1.3 SPECIES

We submit that, whilst having no in principle objection to the planting of native trees or soil improvement or other demonstrable benefits of the plan, care should be taken to maintain the *heritage* nature of the exotic tree planting which presently characterises the Gardens.

FOG has strong views on the retention of *Individual conifers* (p9)

We recall too that here was a general push to have native planting at the east end of the reserve?

1.4. BUDGET

Again. as you note, a appropriate and continuously sustainable budget must be provided for.

What we are concerned with here is the difference between a good plan, one which has the merit of being designed for long period into the future and the reality of successive councils having neither the will nor the budget to execute it. Contemplation of recent LTPs and other plans and their respective cost overruns, cutbacks and funding challenges combined with the present fiscal state of affairs is salutary.

This work must not be left incomplete or inadequately executed such as to deprive the community of the treasure it presently enjoys.

2 questions, (amongst others), arise.

What is to be the role of private funding and on what terms?

Can FOG assist with networking or fundraising and in what way?

1.5 . RESERVE MANAGEMENT PLAN-FOG ROLE

It is inevitable over the proposed span of the operation of the draft plan that there will be multiple generations of QLDC personnel with responsibility for various aspects of the Gardens.

It is clear from recent history that Gardens staff turnover and the shuffling and recasting of QLDC roles and responsibilities has been continuous and extensive.

As a result, to an increasing extent, as the district grows, the true *institutional memory* of the Gardens further ceases to be that of QLDC but rather that of residents and, relevantly, members of FOG.

In addition, the agenda of QLDC, (or at least some of its agencies), has recently occasionally diverged from that of the community it serves e.g. the regrettably wasteful Hotops Rise bike path experience.

FOG submits that it is therefore important, (and perhaps in answer to 7.2.5?), that there be a provision inserted in the Reserve Management Plan to the effect that FOG, (or a successor group), is to have an effective role in all the considerations and decisions in respect of the operation and review of succession plan.

We are able to assist drafting a provision for that purpose and look forward to discussing an appropriate mechanism with you.

1.6 BIRDS AND BEES

FOG is interested to know what study- has been undertaken of bird activity and migration? Appropriate provision should be made for continual monitoring and enhancement of bird life in the reserve. The same is true of bees and other insects.

1.7. ROOT SYSTEMS

Appropriate provision should be made for accommodation of root systems and subsoil cultures.

1.8. TENNIS, BOWLS, FRISBY GOLF, LUMA

Appropriate provision should be made for these organisations or events and other community recreational activities.

2. FOG COMMENT TO DATE

In addition to the comment made by Teresa Chapman and her email we note the comments made by Lorraine Cooper in her email of 4 March.

It will be unnecessary to emphasise the considerable experience which Lorraine has of the reserve and the Gardens not only in her earlier position as Lady Mayor but as a very local resident and one who has turned out on every significant occasion in which there has been a challenge to or an issue arising in respect of the integrity of the gardens..

You also of course have the views of Karen Boulay , the secretary of the FOG whose lifelong experience and devotion to the Gardens must also be given considerable weight.

Similarly, we note also the valuable comments of Joce Sandford and Jewell Cassells (who was born in Queenstown).

As noted above, there are others who have expressed some views about the succession plan and we must reserve the position with regard to the FOG response until they are available.

We would be grateful if in any proposed timetable you would allow sufficient time for these other views to be expressed.

There is considerable detail in your plan and that is to be applauded but it does represent something of a challenge to those whose time is limited.

3. MEMORANDUM

Purpose : Interpretation

A . During discussions between FOG and the Council concerning the FOG submission on the Succession Plan, it was agreed that the report to the Community and Services Committee (and any Council decision) should be accompanied by a memorandum.

The purpose of this memorandum is to record the agreed overarching principles which should apply whenever interpretation is required by Council (or any other party) in respect of the Succession Plan.

The plan provides for a long period of 60 to 80 years and, inevitably, there will be many occasions when it may be necessary for those in the future concerned with the welfare of the gardens to consider what was intended by those who put the plan in place.

These future contingencies cannot be known at the time of the adoption of the plan by Council any better than those in prospect in the 1860s for those who established the reserve. It is their remarkable foresight and regard for community well-being which all of us engaged in this plan seek to replicate and continue.

The history and Taonga character of the reserve and the Gardens is recorded in the plan and it is accepted by all that full regard must be had to the importance of the Gardens to the community and decisions taken irrespective of tree husbandry/management should fully reflect that.

B. The succession plan provides for various events to take place at specific times for example filling in Zone X by such and such a date and assessment to take place on such and such a date.

However it is agreed by Council that such dates and times must not be strictly adhered to if the overarching intent (or spirit) of the plan as set out in these principles is not achieved.

For example, if weather conditions (including of course those arising from climate change) or lack of funding or some other contingency occurs which makes adherence to the plan timetable inimical to such intent/ spirit then the assessment group or whoever is then in charge should adapt the timetable so as to ensure the principles to be honoured.

The principles:

1. That no felling of trees should take place unless and until replacement trees are planted (or prepared eg in a nursery for immediate and effective planting) so as to replace those trees which are to be felled. It is accepted that, whilst conifer management in the district is very important, there is no special urgency in the felling of conifers in the Gardens.

2. The crucial operation of the present trees as a windbreak is paramount and principle 1 one should be applied with that in mind

3. No felling of trees should take place unless and until there is funding in place adequate and available to meet principle 1.

4. The reserve management plan will be amended to reflect these principles and its terms complied with; specifically clause 19 so as to provide for the engagement of the Friends of the Gardens or any successor organisation.

Management Group

It is agreed that there will be established a management group comprising representatives of the Council, FOG, WCG and any other organisation whose objects or business concern the well-being of the reserve for the benefit of the community.

The representatives of this group should be kept fully informed by Council and every effort it made to engage the community so as to get the benefit of the memory, knowledge, expertise and resources of those living in the region.

Very best wishes and thanks
Jay Cassells
Chair
FOG(64)21511152
1 April 2025

Te Kararo Queenstown Gardens Conifer Succession Plan

Date: 1st July 2025

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Brief:

This succession plan presents a strategic approach to systematically remove undesirable conifers from Te Kararo Queenstown Gardens, replacing them with native and suitable exotic species. The primary aim is to retain the function of the existing shelterbelt while enhancing biodiversity, transforming the shelterbelt into a resilient and vibrant public space that reflects both ecological and cultural values. The phased implementation will ensure the Gardens remain a cherished and sustainable asset for future generations.

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1. Introduction

The establishment of conifers around Te Kararo Queenstown Gardens peninsula has served a key functional purpose, acting as a windbreak that provided critical shelter for the establishment of amenity tree planting and supporting the Gardens as a valued and usable public space. This shelter enabled the successful growth of diverse tree and plant species within the Gardens, contributing to the early development of the landscape. However, over time, these conifers have become a dominating feature of the Gardens, and their advancing age requires careful management and transition to a more sustainable and ecologically diverse shelterbelt.

Current Role of the Conifer Plantation

The conifer plantation covers approximately 5 hectares, about 33% of the Gardens total 15 hectares (152,400 m²). The conifer trees serve as a windbreak, sheltering other trees and providing a more comfortable environment for recreational activities within the reserve. This protective function is critical in maintaining the usability of the Gardens, particularly in exposed areas where strong winds can deter visitors and damage other vegetation.

The mature conifer plantation is estimated to sequester approximately 51 metric tonnes of CO_2 per year[1]. Although beneficial, this contribution to carbon capture does not offset the long-term ecological damage caused by these undesirable species.

Ecological Impact of Pest Plants

The spread of pest species, such as wilding conifers, within the Queenstown Lakes District has led to significant ecological imbalances through soil degradation, biodiversity loss, and seed spread risks. The dense canopy of these trees blocks sunlight, suppresses understory growth and disrupts natural regeneration processes, significantly reducing native flora and fauna. Their needle litter contributes to soil acidification and reduces nutrient availability, resulting in poor soil health that challenges the establishment of other plant species. Additionally, the monoculture created by these conifers increases fire risk, posing further environmental threats.

Seed sources, such as the protruding peninsula of Te Kararo Queenstown Gardens, enable the spread of wilding species into surrounding natural areas, compounding the ecological challenges and threatening local ecosystems. Previous conifer control measures within the Gardens have been inconsistent and reactive, lacking a comprehensive strategy to systematically remove and replace these undesirable species.

The conifers surrounding the peninsula are predominantly Douglas fir (*Pseudotsuga menziesii*), a longer-lived evergreen that produces dense needle litter, contributing to soil acidification, and Radiata Pine (*Pinus radiata*), a fast-growing species with a lifespan of less than 100 years. Both of these are considered pest species due to their due to their invasive spread and ecological impacts.

[1] based on an assumed density of 500 trees per hectare and an average sequestration rate of 20 kilograms of CO_2 per tree annually

Purpose of the Succession Plan

The primary purpose of this succession plan is to provide a clear, actionable framework for the systematic removal of undesirable conifers from Te Kararo Queenstown Gardens and their replacement with suitable species. The plan outlines specific actions, timelines, responsibilities and resources required to achieve project goals over the coming decades.

A strategic approach involving Zones, Stages and Phases has been developed to gradually remove conifers and reintroduce a diverse range of plant species to enhance the Gardens' ecological resilience. By replanting with a mix of native and suitable exotic species, the plan aims to restore ecological balance, improve soil health and create a sustainable landscape that provides aesthetic, recreational and cultural benefits.

This succession plan is aligned with regional and national strategies, such as the New Zealand Wilding Conifer Management Strategy and the Queenstown Gardens Reserve Management Plan (2011), both of which advocate for the removal of undesirable conifers to protect ecosystems. Additionally, the plan supports the broader environmental goals of Queenstown Lakes District Council (QLDC), including enhancing public spaces and ensuring the sustainable management of natural resources for future generations.

Importantly, the plan recognises the need for a gradual, carefully managed removal process to mitigate the risks associated with sudden wind load changes, ensuring that the overall landscape and the framework of highly valued tree assets within the Gardens remain stable throughout the transition.

Immediate Need for Action

Immediate action is required to prevent further ecological degradation and restore Te Kararo Queenstown Gardens to a more natural and resilient state. The conifers are damaging the Gardens' current landscape and threatening the broader ecological integrity of the region.

The phased approach detailed in this succession plan spans several decades, making timely action crucial. Delaying the start will exacerbate the existing issues and heighten risks to garden visitors as the maturing conifer trees approach the end of their life cycle.

2. Key Challenges

Gradual vs. Large-Scale Removal Approaches

One of the primary challenges facing the succession plan is balancing the need for conifer removal with the potential impacts on the Gardens' existing trees and public safety. Large-scale removal poses risks, such as sudden changes in wind dynamics, which can destabilise remaining trees and expose them to damage. While trees naturally adapt their structure to withstand wind over time, through a process called thigmomorphogenesis[2], sudden exposure to increased wind can result in branch or complete tree failure. A gradual, staged approach mitigates these risks by allowing trees and landscapes to adapt over time, while transitioning to a more diverse shelterbelt canopy.

The staged removal approach also helps manage water retention, as trees play a crucial role in intercepting rainfall through their canopies. This slows down the rate of rainfall, allowing water to gradually infiltrate the soil and reduce the risk of soil erosion and surface flooding. When large numbers of trees are removed all at once, this natural water interception is lost, leading to increased surface runoff that can potentially overwhelm stormwater systems. Furthermore, removing many trees, particularly those providing wind protection, may temporarily affect the gardens' usability.

Planting Conditions and Soil Challenge

The monoculture established by conifers has influenced local biodiversity, with the dense canopy limiting understory growth and reducing light availability for a variety of plant species. This presents a challenge for reintroducing more diverse plant species.

While conifer soils can support the re-establishment of diverse plant species, having a pH range similar to that of native beech forests, some areas exhibit compacted or nutrient-limited conditions due to long-term monoculture. To enhance soil quality and support successful replanting, organic amendments such as compost, mulch, or biochar can be applied. These interventions can improve soil structure, encourage microbial activity, and increase nutrient availability, facilitating the transition to a more diverse ecosystem.

Reinvasion Risks

The Gardens' location on a peninsula, coupled with its own conifer seed source, increases the risk of reinvasion both within the Gardens and into surrounding natural areas. Conifer seeds can travel significant distances, spreading rapidly and undermining control efforts. Continuous monitoring of the Gardens will be essential to identify new wilding seedling growth quickly.

Public Perception

Managing the public perception of the succession plan is essential, particularly when visible changes, such as extensive tree removals, are underway. The public may have emotional or cultural connections to the existing landscape, so communicating the project's long-term benefits is important.

Funding and Resource Limitations

Securing sustainable funding is vital for the continued implementation of the succession plan. The project's long-term nature, with removal and replanting occurring over multiple decades, requires consistent financial resources.

[2] the response of plant cells to mechanical stimulation. For example, the thigmomorphogenetic response of trees in windy environments is to grow shorter, with thicker trunks and stronger roots.

3. Succession Plan Outline

The succession plan prioritises the systematic removal and thinning of undesirable conifers from Te Kararo Queenstown Gardens through a structured approach involving distinct **Zones**, **Stages**, and **Phases**. This gradual approach ensures that wind protection for amenity and heritage trees within the Gardens, as well as public safety, is managed carefully, mitigating the risks associated with increased wind exposure.

A key focus of the plan is to reintroduce a diverse mix of native and exotic species to enhance biodiversity and create a more resilient, ecologically balanced landscape. Additionally, tall-growing, suitable conifers not recognised as pest species will be strategically planted to preserve the crucial windbreak function currently provided by the existing conifer stands. The wind shelter properties of the existing conifers, particularly the edge trees, will be leveraged to protect and support the establishment of new plantings during the transition.

Continuous monitoring of wind impacts, tree health, stability and the establishment of new plantings will guide adaptive management decisions. Ongoing assessments will inform necessary adjustments to both removal and planting strategies as required, ensuring the plan remains flexible and responsive to evolving conditions.

Zoning, Stages and Phases

Using LiDAR mapping and site assessments, the removal strategy has been divided into 12 distinct **Zones** based on existing canopy gaps, groupings and their role in providing wind protection. Each Zone is then assigned **Stages** and **Phases** to determine the sequence of removal and replanting efforts.

Each Stage represents a ten-year cycle, while each Phase corresponds to one year. This structured approach enables gradual, manageable progress, as well as monitoring and reassessment.

The table below shows the **Zone**, **Stage** and **Phasing** structure used to form the Maintenance Schedule.

The overlay map, *Figure 1,* shows the 12 Zoning areas and individual conifers located throughout the reserve.

Table 1: Succession Plan Maintenance Schedule

	Stage 1 (Years 1-10)										Stage 2 (Years 11-20) *etc...*									
	Phases (years)										Phases (years) *etc...*									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
ZONE 1																				
ZONE 2																				
ZONE 3 *etc..*																				

Figure 1: Zoning Overview & Individual Douglas Fir identified for removal

Zoning, Stages and Phases (cont.)

The detailed maintenance schedule, including specific removal and replanting timelines, can be found in ***Appendix 1 – Succession Plan Maintenance Schedule***. This schedule outlines key milestones and indicative dates, with initial removals planned to begin in Year 1 and extend over a 70-year period.

While the proposed timeline is flexible and can be adjusted to accommodate budgetary constraints or other considerations, the overall structure of the schedule should be adhered to. This phased approach allows sufficient time for newly planted shelter species to establish and mature, ensuring that replacement trees provide adequate cover before subsequent removals.

By staggering activities across multiple zones, the Gardens will maintain a continuous flow of operations. This approach ensures that as trees in one Zone adapt to increased wind exposure, work can progress in other areas, balancing the landscape's transition.

The 70-year timeframe is considered the minimum duration required to balance the removal of undesirable conifers and the establishment of an effective replacement shelter. Accelerating the process could compromise the Gardens' ability to maintain windbreak functions and damage the internal framework of trees within the Gardens, and impact the usability of the Gardens by the public and clubs.

Activity by Zone

Each Zone will undergo a structured sequence of activities designed to manage removal, replanting and long-term management. A description of each activity is identified in the following table:

Table 2: Maintenance Schedule Activities

Activity	Description	Timeline	Key Activities	Monitoring & Evaluation
Shelterbelt Removal	Systematically thin out shelterbelt conifers in phases to reduce wind load gradually.	Est. 70 years from starting year	Select trees for thinning; Leave trees to acclimate to new wind exposure. Ensure safe public access during operations	Inspect trees for wind damage; Adjust thinning strategy if needed. Monitor soil erosion; Reevaluate shelterbelt effectiveness
Shelterbelt Rest	Pause operations to allow remaining trees to adapt to new conditions.	Allow three years rest minimum between removal phases.	Minimal intervention; Inspect trees regularly.	Record tree health; Plan for next removal phase.
Planting	Introduce native and exotic species in cleared areas, ensuring they are suited to local conditions.	During rest periods.	Prepare soil; Plant tree species; Install protective measures for young plants.	Monitor plant growth; Replace failed plants.
Weed Control	Regularly remove new wilding seedlings and maintain new planting areas.	During rest periods.	Identify and remove new wilding seedlings; Inspect new planting health.	Track seedling recurrence; Evaluate success of new tree plantings
Assessments (Removal & Planting)	Assess overall success and plan the next phase removal. Review planting progress and long-term maintenance requirements	Prior to each removal phase. During & after planting seasons	Conduct a comprehensive review; Plan for ongoing maintenance. Involve key stakeholders i.e. FOG & WCG	Document long-term outcomes; Adjust management strategies if needed.

FOG = *Friends Of Wakatipu Gardens And Reserves*
WCG = Whakatipu Wilding Control Group

Initial Focus and Early Stages

The first stage (*Stage 1: Years 1-10*) of the succession plan will focus on critical goals, including establishing Operational Access, Focal Areas and Individual Conifers removals. These early stages are identified on the map below, *Figure 2*.

Operational Access

Operational access trails have been selected based on the natural contours of the land and existing entry points. Forming these access trails early will improve mobility for planting and removal equipment, teams and materials/soil amendments. A larger portion of tree removals may occur in the early stages to allow for the clearance of these access trails.

Focal Areas

Removing trees in these areas will align with the *Te Kararo Queenstown Gardens Development Plan*, creating viewshafts to connect visitors with the surrounding landscape and recreational spaces to relax.

Individual Conifers

Throughout the main Gardens, individual conifers can be removed at any time during the process, as their presence does not significantly affect wind dynamics. Arborist crews should carry out the removal in a controlled manner to minimise damage to the surrounding landscape. These removals will create space for the establishment of specimen trees, facilitating the Gardens' succession plan for its amenity trees.

It is crucial to emphasise that trees like the 'Five Sisters', Ponderosa Pines and Larch trees, provide significant amenity value due to their landscape presence, and the community wishes to retain them until the end of their Safe Useful Life Expectancy (SULE[3]), despite their classification as pest species.

[3]refers to the estimated period a tree can be safely and beneficially retained in its environment, considering factors like health, structural stability, and site conditions.

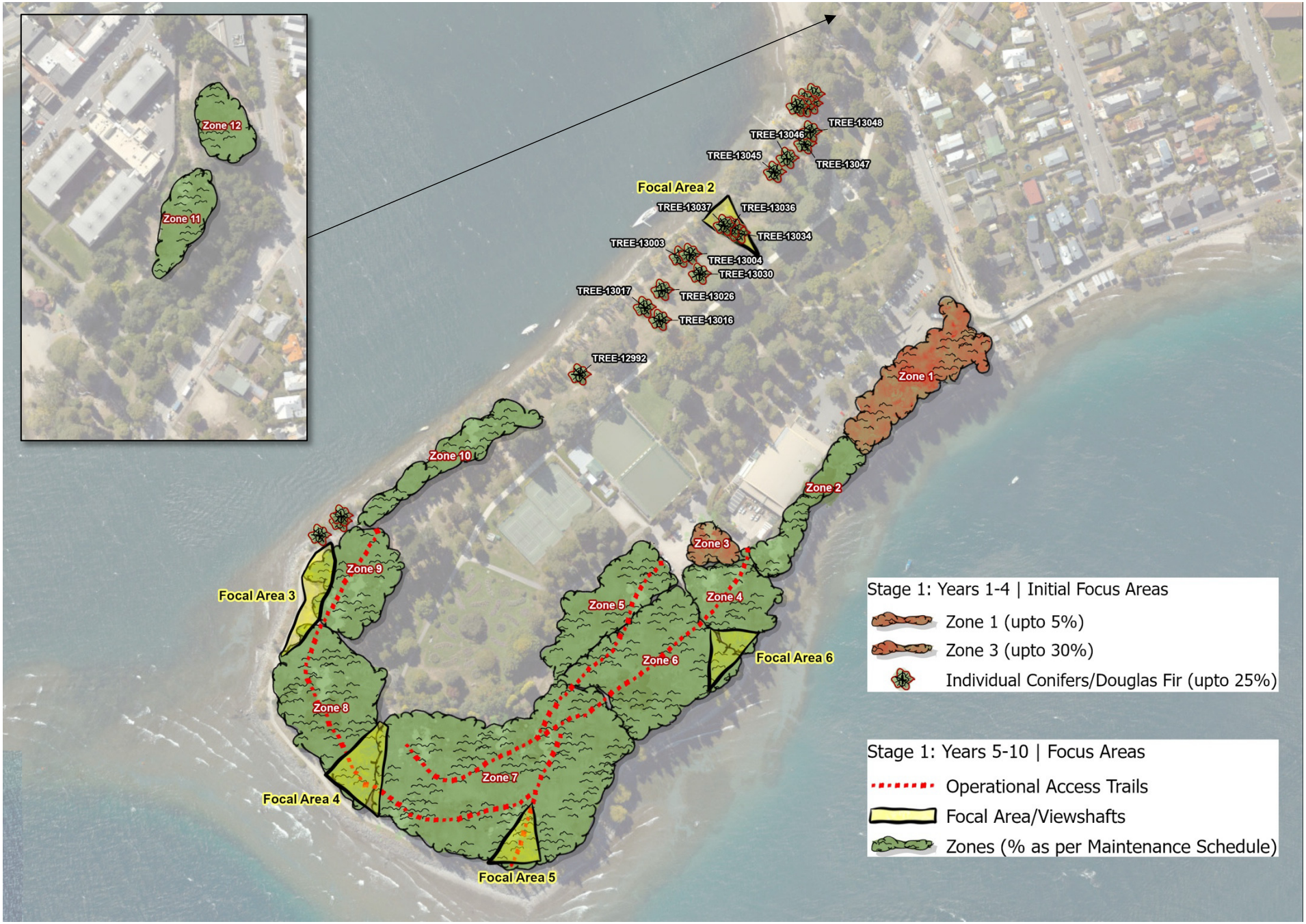


Figure 2: Initial Focus Areas Early Stages

4. Removal and Control Strategy

Methods of Tree Removal

The removal of conifers within Te Kararo Queenstown Gardens will employ a combination of mechanical felling and arboricultural dismantling. This approach ensures safe and efficient removal while minimising environmental impacts and maintaining public safety.

4.1.1 Mechanical Felling

Conifers will be felled using mechanised equipment in low public use zones where access allows, and large quantities of trees can be removed quickly. Felling will be staged carefully to avoid damaging nearby trees and vegetation.

4.1.2 Arboricultural Dismantling

Arboricultural dismantling will be employed in sensitive zones near high-value trees, public areas, or structures. This method involves manually sectioning trees in a controlled manner, reducing the risk of collateral damage and ensuring precision in constrained spaces.

4.1.3 Materials and Debris

Timber will be removed from the site. Branches will be processed into wood mulch of appropriate grade to assist with replanting efforts. The mulch will either be spread directly around planting areas to enhance soil moisture retention and suppress weeds or left in piles to age before further use. Any excess mulch that exceeds on-site requirements will be transported offsite.

4.1.4 Tree Stumps

In high-visibility or heavily frequented public areas, tree stumps will be either ground down or mechanically removed to improve aesthetics and ensure safe access for both users and equipment. In lower-priority zones, stumps will be cut low to the ground, and planting will be established around them, allowing for natural decomposition over time.

Ground and Weed Control

Ongoing efforts after the initial removal will focus on managing regrowth and preventing reinvasion of wilding conifers. Ground crews will conduct regular inspections of replanting zones to identify and promptly remove new seedlings.

Targeted herbicide treatments or manual control methods will be employed to prevent conifer re-establishment. Herbicide applications will be carefully managed to minimise environmental impacts, with applications timed for optimal weather conditions. Regular follow-up treatments will address any regrowth, with the frequency of treatment adjusted based on monitoring results. The goal is to reduce herbicide use over time while maintaining effective control.

Control measures and strategies will be adjusted as needed to ensure the long-term success of restoration efforts. Engaging the community in reinvasion prevention through initiatives and volunteer seedling removal days will provide additional support and increase awareness of the importance of ongoing conifer control.

Timing and Safety Considerations

The timing of removals will be critical to minimise disruption and ensure public safety. Operations will be scheduled during off-peak times, such as early mornings, weekdays, or low-tourism seasons, to reduce impacts on park users and QLDC Field Staff.

Removal activities in the *Succession Plan Maintenance Schedule* have been aligned into four-year cycles. This approach ensures efficient execution of removal operations within designated periods while providing intervals of rest and minimising disruption within the Gardens.

To ensure safety, protocols will include path closures, clear signage, and barriers to restrict public access to active work areas. Protective measures, such as barriers around sensitive vegetation and waterways, will also be in place. Low-impact machinery will be prioritised, and pre-removal assessments will identify and mitigate potential risks or challenges. Regular communication will keep park visitors informed about the schedule and purpose of removal operations.

5. Replanting Strategy

The replanting strategy aims to restore ecological balance, enhance biodiversity, and maintain functional shelter following tree removals. By prioritising early planting, optimal seasonal conditions, and a mix of native and exotic species, the strategy supports long-term restoration while addressing immediate site needs. Species recommendations and zoning plans are provided in *Appendix 1: Succession Plan Maintenance Schedule* and *Appendix 2: Species Selection Guide.*

Objectives and Approach
The replanting strategy focuses on:

- Rapid introduction of pioneer and secondary species to create shelter, improve soil conditions, and establish microenvironments.
- A 40% native and 60% exotic species mix to balance ecological restoration with functional shelter.
- A multi-layered canopy structure combining closed-canopy forest, open woodland, and scattered pockets to enhance ecological diversity and visual appeal.
- Strategic retention of existing conifer groups, particularly along the lakeshore, to provide temporary shelter until new plantings are established.

Planting will commence in the season following tree removals, primarily in Autumn and Spring, when conditions are most conducive to establishment.

Critical to the project's success, early planting opportunities in identified zones (see Appendix 1) should begin as soon as possible, with trial planting undertaken prior to Year 1 removals, to test methodologies and monitor success. **Subsequent removal phases will proceed only if tree establishment is successful.**

Planting Phases
Replanting is divided into two phases to ensure progressive restoration and adaptability.

5.1.1 Initial and Secondary Planting (Early to Mid-Stages)

Planting will begin immediately after conifer removal in designated zones as space and light become available. This phase combines:

Pioneer species (e.g., Kānuka): Resilient and adaptable, these species stabilise soil, enhance nutrient cycling, and create microenvironments. They are planted in clusters to establish presence effectively.

Secondary species (e.g., Kōwhai, Native Beech, Giant Sequoia): Inspired by successes at reserves like Jardine Park, taller native and exotic trees will be introduced concurrently to expedite canopy development, provide wind protection, and enhance biodiversity.

New shelter will replace the existing conifer windbreak using tall, fast-growing conifer species (see Appendix 2). The map below illustrates the strategic placement of conifers and other tall-growing trees used to create a functional, less intrusive shelter alongside open woodland areas, improving space usability.


Planting Strategy
Forest Closed Canopy
Woodland Open Canopy
Coniferous Forest: Tall growing Conifers such as Redwoods mixed with native hardwoods like Beech, forming a closed forest canopy
Mixed Woodland: Blend of native and exotic species, creating an open, diverse canopy and spacious woodland setting
Recreational Open Areas: Grassy expanses and low landscaped zones, designed for public recreational use
40% Native
60% Exotic
Targeted Tree Planting Distribution

Replanting Strategy (cont.)

5.1.2 **Final Planting (Later Stages)**

This phase focuses on filling gaps, introducing additional species to enhance habitat value, and replacing failed plantings. Additional plant variety and understorey vegetation will be prioritised to ensure a fully established ecosystem with vertical height, wind protection, and ecological diversity.

Species Selection and Planting Design

Native species will be eco-sourced from the Queenstown region, where possible, to ensure local provenance. Recommended spacing ensures optimal growth:

- Large trees (e.g., Native Beech): 2–3 meters apart to allow dominance.
- Shrubs and smaller trees (e.g., Kānuka): 1 meter apart for effective establishment.
- Grasses and ground covers: 500–800 mm apart for quick coverage.

A comprehensive species list, including large trees and understorey vegetation, is available in Appendix 2. Where early plantings may be affected or damaged by subsequent removals, strategic planning prioritises pioneer species in at-risk areas, as their soil-enhancing benefits persist even if trees are lost.

Planting locations will accommodate existing infrastructure, such as the Ice Risk and Field Team buildings, ensuring new plantings do not obstruct access, interfere with operations, or hinder maintenance activities like exterior repairs.

Replanting Strategy Summary

The replanting strategy integrates ecological restoration with functional design. By combining pioneer and secondary species, retaining select conifers for temporary shelter, and aligning plantings with optimal seasons, the approach ensures progressive restoration. The resulting multi-layered canopy will enhance biodiversity, provide improved wind protection, and create an enjoyable, resilient landscape.

Soil Enhancement and Preparation

To support the successful establishment of new plantings, soil conditions can be optimised through targeted enhancement practices. Applying organic materials, such as mulch, compost, biochar, or mycorrhizal inoculants, can improve soil structure, enhance water retention, and promote nutrient availability. These amendments foster a favourable environment for root development and plant growth, building on the existing soil foundation developed under the conifer plantation.

In areas where compaction is observed, soil conditioning may involve tilling or screefing to loosen soil and improve aeration. Following this, organic matter can be incorporated, and mulch applied around plant bases to conserve moisture, suppress weeds, and regulate soil temperature. These practices support robust root establishment and overall plant health.

Soil nutrient levels will be monitored throughout the replanting phases to identify any site-specific deficiencies. Based on these assessments, targeted applications of fertilisers or additional organic amendments may be used to optimise growth conditions. For detailed guidelines and best practices on soil conditioning and nutrient management, refer to ***Appendix 3—Soil Enhancement Techniques and Best Practices***.

Long-Term Maintenance and Monitoring

Ensuring the success of replanting efforts requires consistent monitoring and adaptive management to respond to challenges as they arise. This adaptive approach ensures that replanting efforts remain resilient and effective, supporting the long-term restoration goals.

Newly planted areas will be inspected regularly to monitor plant health, check for signs of stress or failure and manage wilding species that may compete with new growth. Maintenance will include watering, mulching and replacing any failed plants.

Protective measures, such as tree guards, plant shelters, targeted pest control and public awareness, will safeguard young plants from damage and activities like frisbee golf. Adjustments will be made based on observed impacts to ensure plant survival and success.

QLDC will enter into a Memorandum of Understanding (MOU) with Key stakeholders such as the Friends of Whakatipu Gardens (FOG), Whakatipu Wilding Control Group (WCC) and any future Queenstown Gardens stakeholders. The MOU will include seasonal planting walkover assessments to evaluate the progress and establishment of new plantings, and discuss the next stages of the Plan.

Alternative Planting Methodologies

One potential approach to enhance the replanting strategy within the Gardens is the **Miyawaki method**, a technique for creating dense, fast-growing and ecologically resilient forests. This method involves planting species in close proximity, closely mimicking natural forest regeneration processes.

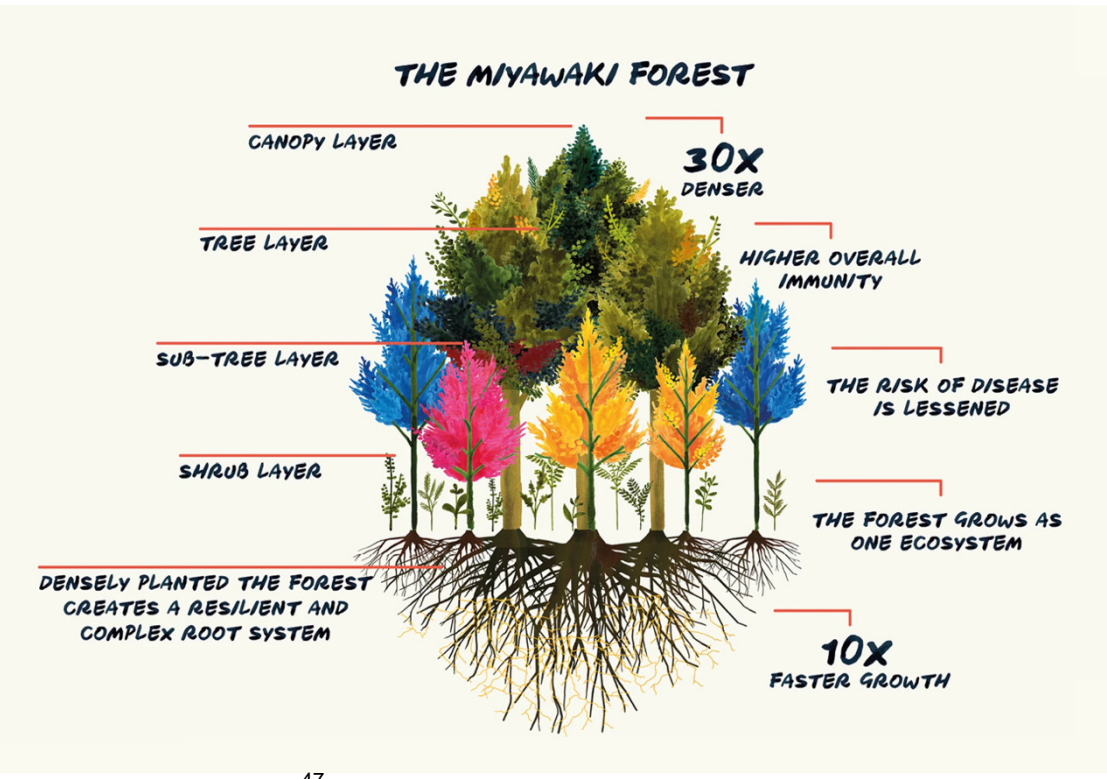
The Miyawaki method encourages plant growth much faster than traditional planting techniques, with vegetation maturing up to 10 times quicker. This acceleration can significantly reduce the time needed to establish a functional shelter and achieve soil restoration.

A critical element of this method is **thorough site preparation**, which involves digging deep and wide pits and enriching the soil with biomass such as compost before planting. These organic additions enhance soil fertility, promote microbial activity and improve soil structure. By enriching the soil beforehand, the root systems of newly planted species benefit from optimal conditions for rapid growth, efficient water retention and improved nutrient absorption. The close planting means plants grow taller quicker as they compete for available light.

Once established, Miyawaki forests require less maintenance due to their density. The compact planting improves moisture retention, suppresses weed growth and provides resistance to environmental stressors, such as drought, pests or vandalism. This self-sustaining characteristic makes the Miyawaki method a cost-effective and efficient solution when combined with more conventional planting techniques.

The benefits of using the Miyawaki method can be seen in this video by Kent County Council (UK), where they explored techniques to improve tree establishment and survival rates, supporting the expansion of urban tree cover: https://www.youtube.com/watch?v=0VizWfEIW1U

While the Miyawaki method's high planting density may not be suitable for the entire shelterbelt area, it could be advantageous in isolated pockets. By selectively implementing this technique or other alternative methods, the Gardens can facilitate swift restoration in essential areas.



6. Monitoring and Adaptive Management Strategy

The Succession Plan's success hinges on a robust monitoring and adaptive management framework, enabling flexibility to respond to evolving conditions during conifer removal, replanting, and restoration. Advanced technologies, such as Geographic Information Systems (GIS) and LiDAR, will track progress and provide data to guide decisions on future removal and replanting phases.

Key performance indicators, including tree health, growth rates, soil quality, control method efficacy, and wind load impacts, will be monitored to inform timely adjustments to the plan. Wind load assessments will determine whether more cautious or extensive removal strategies are needed at each stage.

Regular evaluations, combining detailed in-depth surveys and walkover assessments, will measure the success of removal and replanting efforts. These assessments will ensure alignment with the plan's objectives.

Continuous stakeholder engagement will ensure the plan reflects community values and incorporates public feedback. Involving stakeholders in the decision-making and walkover assessments will build a broad base of support that helps drive its success, fostering a sense of ownership and stewardship within the community.

Effective communication strategies, such as visual examples and signage, will educate the community about the ecological benefits of the plan. Emphasis will be on the importance of conifer removal for the Gardens' long-term health and sustainability.

7. Conclusion and Recommendations

The succession plan for Te Kararo Queenstown Gardens offers a comprehensive framework for systematically removing undesirable conifers and re-establishing with native and suitable exotic species.

Success hinges on a well-coordinated approach incorporating thorough planning, robust stakeholder engagement, ongoing monitoring, and adaptive management practices. With effective implementation, the Gardens will evolve into a thriving, biodiverse landscape, reflecting the area's natural beauty and cultural significance, leaving a lasting legacy and safeguarding the Gardens for future generations.

Expected Outcomes

7.1.1 Restoration of Biodiversity

The systematic removal of conifers will facilitate the re-establishment of native plant species, enhance habitat for local fauna, and promote biodiversity. This will create a more balanced and thriving ecosystem aligned with regional conservation goals. To complement the restoration, select exotic species will also be introduced to maintain diversity and colour and continue the botanical theme within the Gardens' existing character.

7.1.2 Improved Soil Health and Landscape Function

Soil enhancement measures will build on the existing soil foundation established under the conifers, optimising conditions for the successful establishment of new plantings. These improvements will enhance soil health, supporting a more diverse and resilient landscape.

7.1.3 Enhanced Recreational and Aesthetic Value

The transformation of the Gardens will improve their visual appeal, providing a more diverse and dynamic landscape that enhances the visitor experience. New plantings will create further seasonal interest, enhance the aesthetic appeal and provide natural windbreaks that will protect the Gardens, its heritage trees and other key amenities.

7.1.4 Strengthened Community Engagement and Stewardship

The project will cultivate a deep sense of ownership and stewardship by actively involving the community and key stakeholders, such as Friends of Wakatipu Gardens (FOG), Whakatipu Wilding Control Group (WCG) and any future Queenstown Gardens stakeholders. This collaborative and inclusive approach will ensure the Gardens remain a treasured public asset, authentically reflecting the values, priorities, and aspirations of the community, past, present, and future.

7.1.5 Adaptive Management for Long-Term Success

Ongoing monitoring and adaptive management will ensure the plan remains responsive to new challenges and opportunities. This approach will allow for continuous refinement of management practices, ensuring that the Gardens are resilient to changing environmental conditions and can thrive well into the future.

Key Recommendations for Plan Implementation

7.2.1 Secure Funding for Long-Term Implementation

The plan's success depends on robust, sustainable funding. QLDC should actively pursue diverse funding streams, including government grants, local fundraising campaigns, and strategic partnerships with businesses and community organisations. Collaborating with initiatives like **Trees That Count**, which connects businesses to native tree planting projects, can amplify resources. Additionally, QLDC should develop comprehensive contingency plans to address potential funding shortfalls, ensuring uninterrupted progress and long-term viability.

7.2.2 Plan for Long-Term Maintenance and Adaptive Management

To ensure the Gardens' transformation is sustainable, long-term maintenance plans must be established, with adaptive management strategies that can respond to changing conditions. A dedicated team should oversee the project, adjusting the plan as needed.

7.2.3 Implement Robust Monitoring and Reporting Mechanisms

Effective monitoring and reporting are crucial for tracking progress, measuring success, and informing management decisions. Monitoring protocols should be established, utilising GIS technology, site assessments, and regular stakeholder feedback sessions.

7.2.4 Develop a Public Communication Strategy

A clear and proactive communication strategy should be developed to manage public perception and educate the community on the plan's benefits. This strategy should include regular updates and educational materials that highlight the ecological, cultural, and recreational improvements resulting from the project.

7.2.5 Promote Community Involvement in Planting and Maintenance Activities

Encouraging community participation in planting days and ongoing maintenance activities will enhance public support and contribute volunteer resources. Educational programs that involve schools and youth groups should be considered to inspire the next generation of environmental stewards.

Recommendations for Broader Application and Future Projects

7.3.1 Apply Lessons Learned to Similar Projects in the Region

The insights gained from the Te Kararo Queenstown Gardens succession plan should be documented and shared to guide future restoration projects throughout the Queenstown Lakes District. This unique and complex project will offer valuable lessons, including the effectiveness of conifer removal and replanting techniques, as well as soil enhancement strategies.

7.3.2 Expansion of the Botanical Gardens

The removal of conifers will create an opportunity to expand the Botanical Gardens into the upper plateau of Zones 5, 7, and 8. Engaging landscape designers early in the project will be key to realising this vision.

7.3.3 Explore Opportunities for Ecological Education

This project offers a unique opportunity to educate the public about native biodiversity, the impacts of pest species and the importance of sustainable landscape management. Interpretive signage can be developed to showcase the Gardens as a living example of ecological restoration.

8. Appendices

Appendix 1 - Succession Plan Maintenance Schedule *(Spreadsheet)*
Appendix 2 - Species Selection Guide
Appendix 3 - Soil Enhancement Techniques and Best Practices

References and Supporting Documentation

1. Te Kararo Queenstown Gardens Development Plan
   A comprehensive plan detailing the long-term vision for Te Kararo Queenstown Gardens, including landscape enhancements, historical considerations, and environmental management strategies that align with the goals of the succession plan.

2. Queenstown Gardens Reserve Management Plan 2011
   This document provides the foundational guidelines for managing Te Kararo Queenstown Gardens, including policies on tree management, landscape preservation, and community engagement. It supports the alignment of the succession plan with existing management frameworks.

3. New Zealand Wilding Conifer Management Strategy 2014
   A national strategy that outlines best practices for wilding conifer control across New Zealand, emphasising collaborative approaches, funding mechanisms, and long-term management goals.

Appendix 1: Succession Plan Maintenance Schedule Te Kararo Queenstown Gardens

July 2025 v1

Zone	Activity	Start Date	Completion
ZONE 1	*Activity*	*Start Date*	*Completion*
Narrative: Begin by thinning smaller diameter trees to create opportunities for planting. Undertake strategic individual removals to improve access for equipment. Next, commence thinning trees evenly throughout the zone, focusing on Radiata that are nearing the end of their life cycle. Preserve clusters of lakeside trees to provide shelter for new plantings. Assess the requirement for height reductions as necessary based on wind dynamics assessments. Conduct crown lifting operations to increase light for new plants as required.	Shelterbelt Removals	Year 1	***100% by Stage 2***
	Shelterbelt Rest		
	Planting	Year 2	
	Weed Control		
	Assessment - Removals	Assessment - Planting	
ZONE 2	*Activity*	*Start Date*	*Completion*
Narrative: Minor opportunity for early planting. Start by thinning smaller diameter trees to create space for planting opportunities and undertake strategic individual removals to improve access for equipment. Conduct crown lifting operations to increase light for new plants as required. Keep new plantings well clear of buildings/ice rinks.	Shelterbelt Removals	Year 5	***100% by Stage 2***
	Shelterbelt Rest		
	Planting	Year 2	
	Weed Control		
	Assessment - Removals	Assessment - Planting	
ZONE 3	*Activity*	*Start Date*	*Completion*
Narrative: Begin by removing a selection of trees, including Radiata that are nearing the end of their lifespan and a pocket at the SE of the group to enable space for establishing new shelter planting. Complete removal within Stage 1 is possible, however assess the changes in wind dynamics before proceeding to the next removal phase. Select removal of narrow and exposed trees in Zone 4 maybe necessary.	Shelterbelt Removals	Year 1	***100% by Stage 1***
	Shelterbelt Rest		
	Planting	Year 2	
	Weed Control		
	Assessment - Removals	Assessment - Planting	
ZONE 4	*Activity*	*Start Date*	*Completion*
Narrative: In the early stages, establish access trails and carry out removals for the Focal Area 6. Retain parts of the lakeside trees for shelter to aid planting establishment, while crown lifting to enhance light and air movement.	Shelterbelt Removals	Year 5	***100% by Stage 3***
	Shelterbelt Rest		
	Planting	Year 6	
	Weed Control		
	Assessment - Removals	Assessment - Planting	

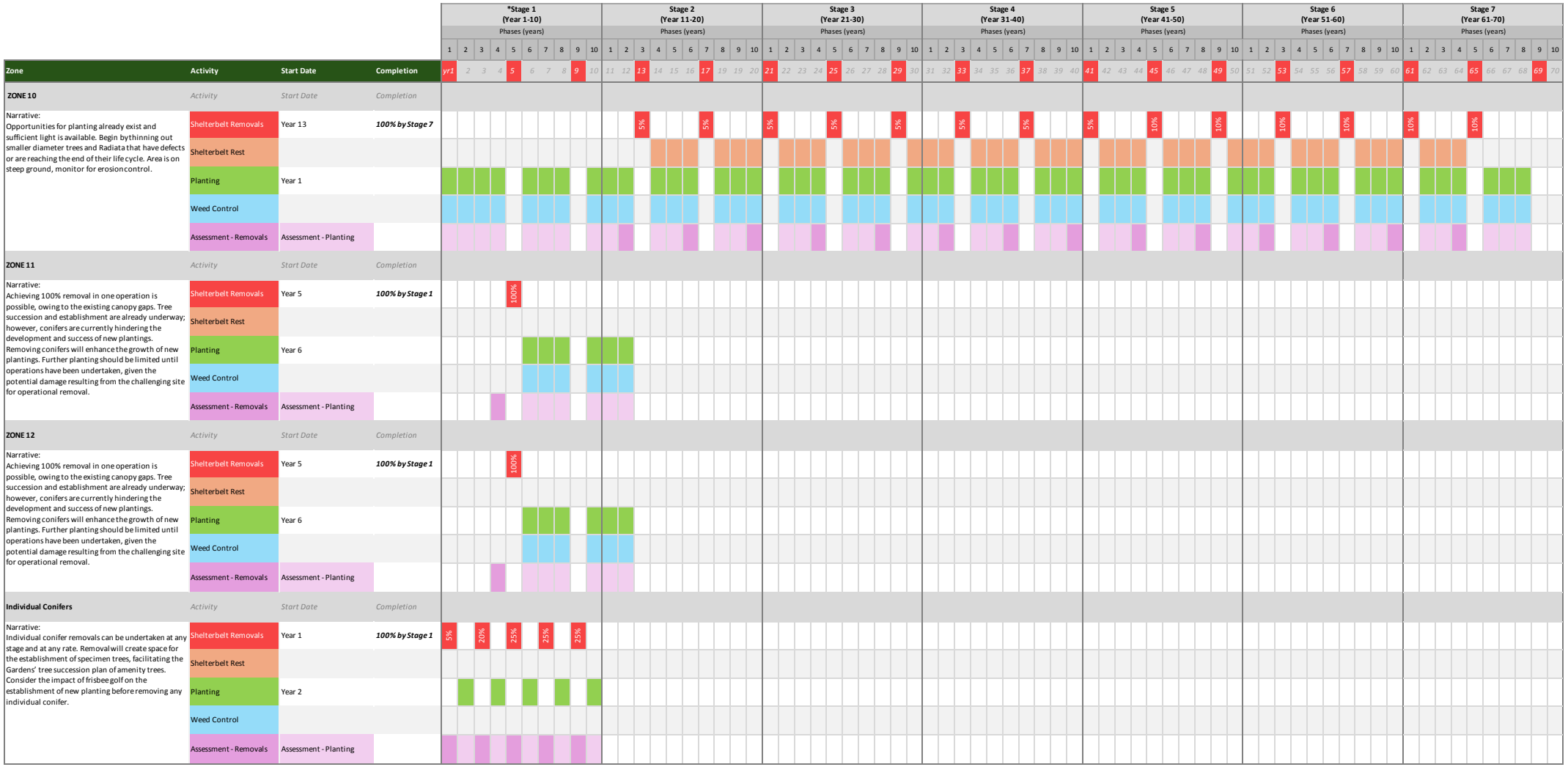
	*Stage 1 (Year 1-10)	Stage 2 (Year 11-20)	Stage 3 (Year 21-30)	Stage 4 (Year 31-40)	Stage 5 (Year 41-50)	Stage 6 (Year 51-60)	Stage 7 (Year 61-70)
Phases (years)	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
	yr1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 19 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70
Shelterbelt Removals	5% 10% 15%	30% 40%	15% 20% 20%				
Shelterbelt Rest							
Planting							
Weed Control							
Assessment - Removals							
Shelterbelt Removals	10% 20%	30% 40%					
Shelterbelt Rest							
Planting							
Weed Control							
Assessment - Removals							
Shelterbelt Removals	30% 70%						
Shelterbelt Rest							
Planting							
Weed Control							
Assessment - Removals							
Shelterbelt Removals	10% 10%	10% 15%	15% 20% 20%				
Shelterbelt Rest							
Planting							
Weed Control							
Assessment - Removals							

*Stage 1: Early removals will focus on operational access trails, smaller diameter trees, trees with defects, and those reaching the end of their life cycle, as well as removals for the Focal Area identified in the Queenstown Gardens Development Plan.

Appendix 1: Succession Plan Maintenance Schedule Te Kararo Queenstown Gardens

July 2025 v1

Zone	Activity	Start Date	Completion	*Stage 1 (Year 1-10) Phases (years) 1 2 3 4 5 6 7 8 9 10	Stage 2 (Year 11-20) Phases (years) 1 2 3 4 5 6 7 8 9 10	Stage 3 (Year 21-30) Phases (years) 1 2 3 4 5 6 7 8 9 10	Stage 4 (Year 31-40) Phases (years) 1 2 3 4 5 6 7 8 9 10	Stage 5 (Year 41-50) Phases (years) 1 2 3 4 5 6 7 8 9 10	Stage 6 (Year 51-60) Phases (years) 1 2 3 4 5 6 7 8 9 10	Stage 7 (Year 61-70) Phases (years) 1 2 3 4 5 6 7 8 9 10
				yr1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 19 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70
ZONE 5	*Activity*	*Start Date*	*Completion*							
Narrative: This Zone has the tallest trees within the shelter belt, protecting the Gardens' taller amenity trees, as well as the wider Bay/CBD. Begin by establishing the access trail for and thinning trees within the group to create lightwells. The focus should be on the gradual removal of vertical structure, either through whole tree removal or height reductions. Monitor wind dynamic changes of the trees within the Gardens.	Shelterbelt Removals	Year 5	***100% by Stage 7***	10% 5%	5% 5%	5% 5% 5%	5% 5% 5%	5% 5% 5%	5% 10%	10% 10%
	Shelterbelt Rest									
	Planting	Year 6								
	Weed Control									
	Assessment - Removals	Assessment - Planting								
ZONE 6	*Activity*	*Start Date*	*Completion*							
Narrative: Opportunity for spot planting around the edge for early planting; crown lift trees near new planting to improve growing conditions. Early stages should establish access trails, remove pockets within the group to create lightwells, and Focal Area 6. Retain portions of lakeside trees for planting and wind shelter until new trees have established.	Shelterbelt Removals	Year 5	***100% by Stage 7***	10% 5%	5% 5%	5% 5% 5%	5% 5% 5%	5% 5% 5%	5% 5%	5% 10% 10%
	Shelterbelt Rest									
	Planting	Year 2								
	Weed Control									
	Assessment - Removals	Assessment - Planting								
ZONE 7	*Activity*	*Start Date*	*Completion*							
Narrative: Opportunity for early interplanting along the edge, crown-lift trees to improve these areas for new plant establishment. Early stage removals to establish access trails and Focal Area 5 & 4. Gradually thin and remove within the group to create lightwells. Retain portions of lakeside trees for planting and wind shelter until new trees have established.	Shelterbelt Removals	Year 5	***100% by Stage 7***	10% 5%	5% 5%	5% 5% 5%	5% 5% 5%	5% 5% 5%	5% 5%	5% 10% 10%
	Shelterbelt Rest									
	Planting	Year 1								
	Weed Control									
	Assessment - Removals	Assessment - Planting								
ZONE 8	*Activity*	*Start Date*	*Completion*							
Narrative: Opportunity for early interplanting along the edge, crown lift trees to improve these areas for new plant establishment. Early stage removals to establish access trail and area surrounding Focal Area 4. Gradually thin and remove within the group to create lightwells, focusing on Radiata reaching the end of life. Retain portions of lakeside trees for planting and wind shelter until new trees have established	Shelterbelt Removals	Year 5	***100% by Stage 7***	10% 5%	5% 5%	5% 5% 5%	5% 5% 5%	5% 5% 5%	5% 5%	5% 10% 10%
	Shelterbelt Rest									
	Planting	Year 1								
	Weed Control									
	Assessment - Removals	Assessment - Planting								
ZONE 9	*Activity*	*Start Date*	*Completion*							
Narrative: Begin by thinning out smaller-diameter trees and Radiata that have defects or are nearing the end of their life cycle. Opportunities for planting already exist along the edge. Exposed to prevailing winds, retain the lakeside Conifers until new planting and shelter have been established internally.	Shelterbelt Removals	Year 5	***100% by Stage 7***	5% 5%	5% 5%	5% 5% 5%	5% 5% 5%	5% 5% 5%	5% 5%	10% 10% 10%
	Shelterbelt Rest									
	Planting	Year 1								
	Weed Control									
	Assessment - Removals	Assessment - Planting								



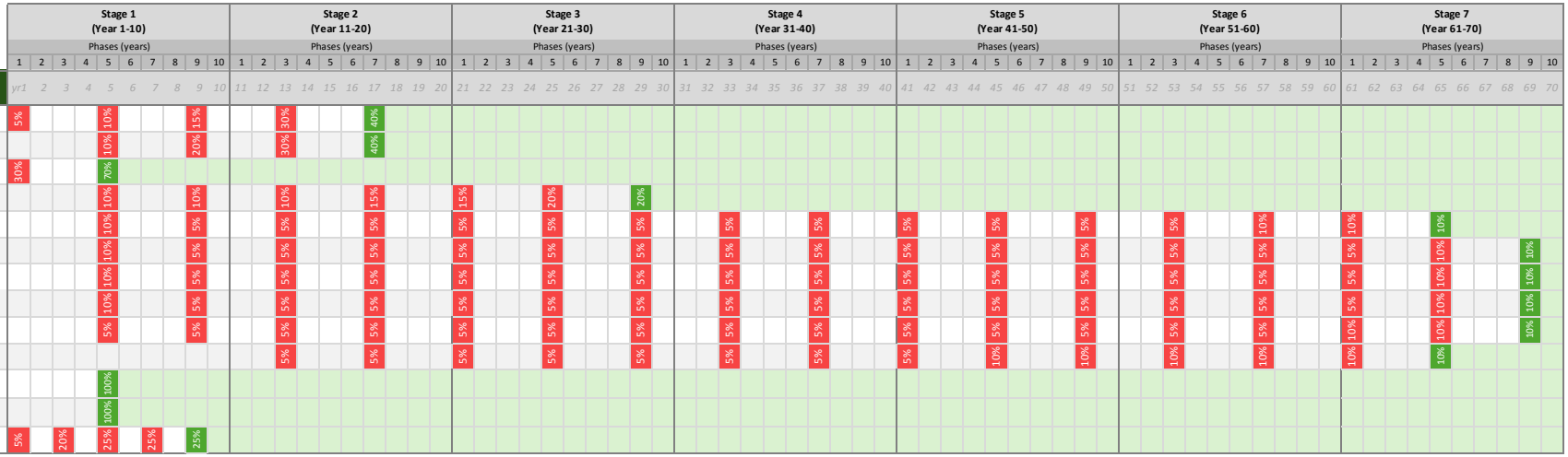
Zone	Activity	Start Date	Completion
ZONE 10	*Activity*	*Start Date*	*Completion*
Narrative: Opportunities for planting already exist and sufficient light is available. Begin bythinning out smaller diameter trees and Radiata that have defects or are reaching the end of their life cycle. Area is on steep ground, monitor for erosion control.	Shelterbelt Removals	Year 13	***100% by Stage 7***
	Shelterbelt Rest		
	Planting	Year 1	
	Weed Control		
	Assessment - Removals	Assessment - Planting	
ZONE 11	*Activity*	*Start Date*	*Completion*
Narrative: Achieving 100% removal in one operation is possible, owing to the existing canopy gaps. Tree succession and establishment are already underway; however, conifers are currently hindering the development and success of new plantings. Removing conifers will enhance the growth of new plantings. Further planting should be limited until operations have been undertaken, given the potential damage resulting from the challenging site for operational removal.	Shelterbelt Removals	Year 5	***100% by Stage 1***
	Shelterbelt Rest		
	Planting	Year 6	
	Weed Control		
	Assessment - Removals	Assessment - Planting	
ZONE 12	*Activity*	*Start Date*	*Completion*
Narrative: Achieving 100% removal in one operation is possible, owing to the existing canopy gaps. Tree succession and establishment are already underway; however, conifers are currently hindering the development and success of new plantings. Removing conifers will enhance the growth of new plantings. Further planting should be limited until operations have been undertaken, given the potential damage resulting from the challenging site for operational removal.	Shelterbelt Removals	Year 5	***100% by Stage 1***
	Shelterbelt Rest		
	Planting	Year 6	
	Weed Control		
	Assessment - Removals	Assessment - Planting	
Individual Conifers	*Activity*	*Start Date*	*Completion*
Narrative: Individual conifer removals can be undertaken at any stage and at any rate. Removalwill create space for the establishment of specimen trees, facilitating the Gardens' tree succession plan of amenity trees. Consider the impact of frisbee golf on the establishment of new planting before removing any individual conifer.	Shelterbelt Removals	Year 1	***100% by Stage 1***
	Shelterbelt Rest		
	Planting	Year 2	
	Weed Control		
	Assessment - Removals	Assessment - Planting	

Appendix 1: Succession Plan Maintenance Schedule Te Kararo Queenstown Gardens - Summary

July 2025 v1

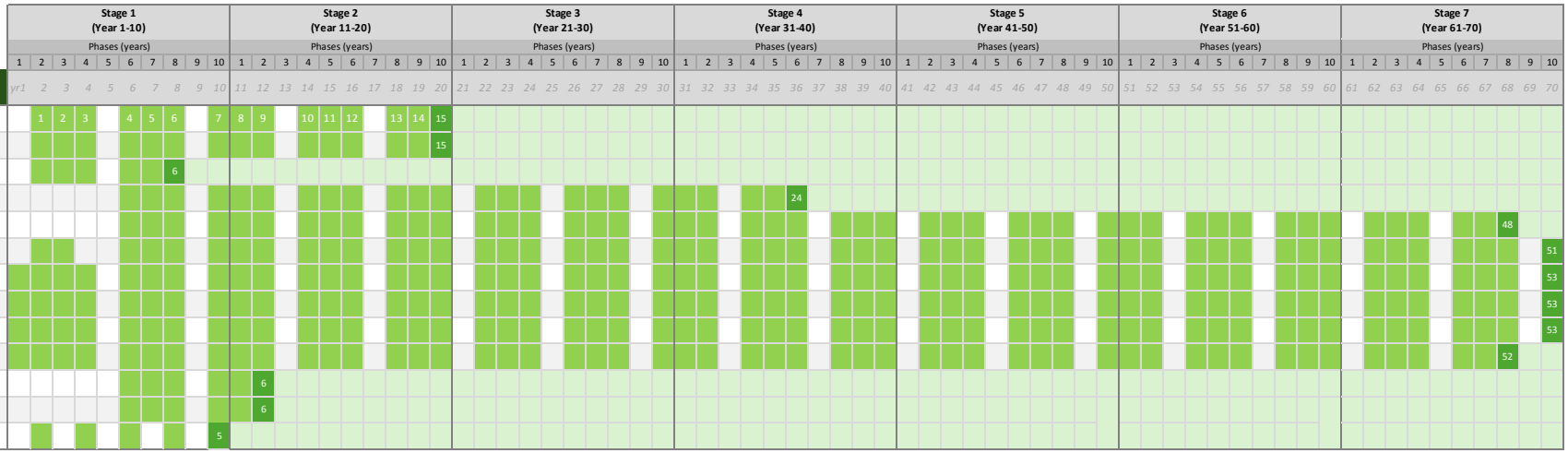
Removal & Planting Summary

Zone	Activity	Start Year	End Year	Duration (yrs)
ZONE 1	Shelterbelt Removals	1	17	17
ZONE 2	Shelterbelt Removals	5	17	13
ZONE 3	Shelterbelt Removals	1	5	5
ZONE 4	Shelterbelt Removals	5	29	25
ZONE 5	Shelterbelt Removals	5	65	61
ZONE 6	Shelterbelt Removals	5	69	65
ZONE 7	Shelterbelt Removals	5	69	65
ZONE 8	Shelterbelt Removals	5	69	65
ZONE 9	Shelterbelt Removals	5	69	65
ZONE 10	Shelterbelt Removals	13	65	53
ZONE 11	Shelterbelt Removals	5	5	1
ZONE 12	Shelterbelt Removals	5	5	1
Individual	Shelterbelt Removals	1	9	9



Planting Summary

Zone	Activity	Start Year	End Year	Planting Seasons (yrs)
ZONE 1	Planting	2	20	15
ZONE 2	Planting	2	20	15
ZONE 3	Planting	2	8	6
ZONE 4	Planting	6	36	24
ZONE 5	Planting	6	68	48
ZONE 6	Planting	2	70	51
ZONE 7	Planting	1	70	53
ZONE 8	Planting	1	70	53
ZONE 9	Planting	1	70	53
ZONE 10	Planting	1	68	52
ZONE 11	Planting	6	12	6
ZONE 12	Planting	6	12	6
Individual	Planting	2	10	5



Appendix 2 -Species Selection Guide

A comprehensive guide to the native and suitable exotic species that will be used in replanting efforts, including information on their ecological roles, growth characteristics, and suitability for different conditions within Te Kararo Queenstown Gardens. Including a list of native species from *Growing Native Plants in the Wakatipu* by Wakatipu Reforestation Trust.

Species	Type	Ecological Role	Growth Characteristics	Suitability
Pioneer Native Species (non-exhaustive)				
Olearia avicenniifolia (Tree Daisy)	Native	Provides shade and wind protection for slower-growing species	Grows 2-4m; fast-growing shrub tolerates harsh conditions	Suited to dry, rocky sites, provides quick cover for exposed areas
Kunzea serotina (Kānuka)	Native	Provides early shelter, nitrogen-fixing, creates microenvironments	Grows 10-15m; thrives in dry, rocky, low-nutrient soils	Excellent for stabilising soil in rocky outcrops, supports succession
Phormium cookianum (Mountain Flax)	Native	Stabilises soil, attracts nectar-feeding birds	Grows 1-2m; tolerates dry to moist, rocky soils	Ideal for rocky slopes, erosion control in non-wetland areas
Ozothamnus leptophyllus (Tauhinu)	Native	Rapid coloniser, provides cover in exposed areas	Grows 1-2m; tolerates dry, windy conditions	Perfect for dry, rocky outcrops post-conifer removal
Secondary and Tertiary Native Species (non-exhaustive)				
Sophora microphylla (Kōwhai)	Native	Attracts native birds, provides habitat and visual interest	Grows 8-12m; prefers well-drained, moist soils	Enhances biodiversity, medium canopy in moist, rocky areas
Olearia lineata (Thin Leafed Tree Daisy)	Native	Provides quick cover, supports dry-site succession	Grows 4-6m; adapted to dry, rocky conditions	Ideal for dry, exposed rocky sites post-conifer removal
Aristotelia serrata (Wineberry/Makomako)	Native	Provides food for birds with berries, adds medium canopy	Grows 5-10m; prefers moist, well-drained soils	Excellent for forest margins in moist, sheltered areas
Carpodetus serratus (Putaputaweta)	Native	Contributes to biodiversity, tolerates shaded areas	Grows 6-10m; thrives in moist, well-drained soils	Ideal for secondary planting in moist, shady spots
Griselinia littoralis (Kapuka/Broadleaf)	Native	Provides medium canopy cover, habitat for birds	Grows 6-10m; tolerates wind and rocky soils	Great for filling canopy gaps, hardy against wind
Pittosporum tenuifolium (Kōhūhū)	Native	Creates microclimates, stabilizes soil	Grows 5-10m; tolerates wind and poor soils	Provides shelter for delicate species in moist areas
Elaeocarpus hookerianus (Pōkākā)	Native	Enhances biodiversity, provides habitat for birds/insects	Grows 10-15m; tolerates moist to dry conditions	Effective in semi-shaded, rocky plantings
Plagianthus regius (Lowland Ribbonwood)	Native	Fast-growing, provides shade and habitat, stabilizes soil	Grows 10-20m; prefers moist, fertile soils	Ideal for quick shelter in moist, well-drained areas
Melicytus ramiflorus (Māhoe)	Native	Improves soil, attracts birds with berries, dense canopy	Grows 5-10m; fast-growing in moist conditions	Provides dense cover in sheltered, semi-shaded areas
Cordyline australis (Tī Kouka/Cabbage Tree)	Native	Attracts birds, adds structural diversity	Grows 8-15m; tolerates moist, rocky soils	Suitable for moist, rocky areas, supports fauna
Pseudopanax ferox (Fierce Lancewood)	Native	Adds structural diversity, transitions to canopy tree	Grows 4-6m; tolerates moist, well-drained soils	Ideal for mid-succession, unique juvenile form
Coprosma propinqua (Mingimingi)	Native	Stabilizes soil, attracts birds with berries	Grows 4-6m; tolerates dry to moist soils	Versatile for rocky, exposed to semi-shaded sites
Hebe salicifolia (Koromiko)	Native	Provides quick cover, attracts pollinators	Grows 4-6m; tolerates moist to dry conditions	Ideal for early succession in rocky, moist areas
Exotic Species (non-exhaustive)				
Platanus varieties i.e.. x acerifolia (London Plane)	Exotic Deciduous	Provides broad canopy cover, aesthetic and structural balance	Grows up to 30m	Ideal for shade and structure in high-use public areas
Tilia x europaea (Lime)	Exotic Deciduous	Adds seasonal interest and shelter	Grows up to 25m	Suitable for aesthetic value and providing valuable shelter
Quercus varieties i.e.. robur ‘Fastigiata’ (English Oak)	Exotic Deciduous	Provides structural form and wind resistance	Grows up to 20m; fastigiate form	Ideal for exposed areas, offering wind tolerance and visual appeal
Ulmus varieties i.e.. procera (English Elm)	Exotic Deciduous	Provides wind tolerance and broad canopy	Grows up to 35m	Suitable for large areas where shade and shelter are needed
Fagus sylvatica (European Beech)	Exotic Deciduous	Adds structural diversity and dense shade	Grows 25-30m; slow-growing	Ideal for adding long-term shade and visual structure
Carpinus betulus (European Hornbeam)	Exotic Deciduous	Provides dense hedge and structural shelter	Grows 20-25m; dense foliage	Suitable for structured hedges and windbreaks in urban gardens
Betula varieties i.e.. utilis (Himalayan Birch)	Exotic Deciduous	Tolerates a range of soils and conditions, provides fast-growing shelter	Grows 15-20m; fast-growing	Ideal for open areas requiring quick canopy cover and soil stabilisation.
Acer varieties i.e.. platanoides (Norway Maple)	Exotic Deciduous	Provides broad canopy cover, seasonal interest, and habitat for urban wildlife	Grows 20-25m; fast-growing, tolerates a range of soils and urban conditions	Ideal for urban settings, parks, and large gardens requiring shade and aesthetic appeal
Aesculus varieties i.e.. hippocastanum (European horse chestnut)	Exotic Deciduous	Adds structural diversity, provides shade, and supports pollinators with flowers	Grows 20-30m; prefers moist, well-drained soils, moderately fast-growing	Suitable for large open spaces, parks, and avenues where shade and visual impact are desired
Juglans regia (English walnut)	Exotic Deciduous	Provides food (nuts) for wildlife and humans, adds structural diversity	Grows 15-25m; prefers deep, fertile, well-drained soils, moderately slow-growing	Ideal for large gardens, or open areas where nut and shade are valued

Species	Type	Ecological Role	Growth Characteristics	Suitability
Native Shelter Species (non-exhaustive)				
Fuscospora cliffortioides (Mountain Beech)	Native	Provides canopy cover, habitat for fauna	Grows 15-20m; prefers well-drained, rocky soils	Excellent for exposed, rocky areas, wind-tolerant
Fuscospora fusca (Tawhai Raunui, Red Beech)	Native	Forms long-term canopy, dense foliage for wind shelter	Grows 25-35m; suited to moist, well-drained soils	Perfect for wind-resistant canopy in moist areas
Podocarpus totara (Tōtara)	Native	Dense foliage for windbreaks, biodiversity enhancement	Grows up to 30m; slow-growing, adaptable	Long-lived shelter for rocky, well-drained sites
Metrosideros umbellata (Southern Rata)	Native	Supports fauna, provides nectar and habitat	Grows 15-20m; suited to moist, cooler climates	Ideal for moist, rocky areas, canopy formation
Prumnopitys taxifolia (Matai)	Native	Dense, long-lived windbreak and habitat	Grows 20-25m; slow-growing, adaptable	Durable shelter for moist, rocky areas
Hoheria sexstylosa (Lacebark)	Native	Fast-growing, provides early canopy and wind protection	Grows 8-10m; prefers moist, well-drained soils	Quick shelter for moist, rocky sites, supports succession
Lophozonia menziesii (Silver Beech)	Native	Provides tall canopy, enhances biodiversity	Grows 20-30m; suited to moist, rocky soils	Long-term shelter for moist, semi-shaded areas
Suitable Exotic Shelter Species (non-exhaustive)				
Sequoiadendron giganteum (Giant Redwood)	Exotic Shelter Tree	Creates iconic, towering landscape features, provides strong wind protection	Grows over 60m; highly wind-tolerant	Ideal for creating iconic and functional shelter in large open areas
Sequoia sempervirens (Coast Redwood)	Exotic Shelter Tree	Provides wind protection, grows rapidly in suitable conditions	Grows 50-70m; very long-lived	Suitable for large spaces where fast-growing, tall windbreaks are needed
Abies varieties i.e.. grandis (Grand fir)	Exotic Shelter Tree	Strong windbreak species with symmetrical, tall structure	Grows up to 75m	Ideal for large landscape areas requiring dense, tall shelter
Picea varieties i.e.. abies (Norway Spruce)	Exotic Shelter Tree	Provides dense shelter and is effective at blocking wind	Grows up to 35-55m; prefers cooler climates and well-drained soils, fast-growing	Excellent for areas requiring fast-growing, high shelter, especially in cooler regions
Cedrus varieties i.e.. deodara (Deodar Cedar)	Exotic Shelter Tree	Fast-growing, evergreen, coniferous tree that provides excellent wind shelter	Grows 40-50m	Ideal for wide open areas requiring strong shelter
Eucalyptus varieties i.e.. nitens (Shining Gum)	Exotic Shelter Tree	Provides rapid shelter, stabilizes soil, attracts pollinators	Grows 20-30m; fast-growing, tolerates frosts to -14°C, requires well-drained soils	Ideal for cold, drier regions, offering quick, tall shelter in well-drained sites
Cupressus × leylandii (Leyland Cypress)	Exotic Shelter Tree	Provides fast-growing, dense shelter and wind protection	Grows up to 20-30m; very fast-growing and adaptable to a range of soils and climates	Ideal for quick shelterbelt establishment, and could be removed later if undesirable
Chamaecyparis lawsoniana (Lawson's Cypress)	Exotic Shelter Tree	Creates dense foliage suitable for wind protection and screening	Grows up to 30-50m; prefers well-drained soils and cooler, moist environments	Great for providing a tall, dense windbreak in areas that experience cooler, moist climates
Cupressus macrocarpa (Monterey Cypress)	Exotic Shelter Tree	Fast-growing, tall, and hardy windbreak species	Grows up to 30m	Perfect for exposed windy areas
Cupressus arizonica (Arizona Cypress)	Exotic Shelter Tree	Offers good wind resistance and dense foliage for shelter	Grows up to 15-20m; drought-tolerant, thriving in dry soils and hot climates	Best for dry, arid regions where strong windbreaks are required
Populus varieties i.e.. nigra (Black Poplar)	Exotic Shelter Tree	Fast-growing, stabilizes soil, provides quick canopy cover and wind protection	Grows 20-30m; very fast-growing, thrives in moist, fertile soils	Suitable for riparian zones, shelterbelts, or areas needing rapid shelter and soil stabilization

Growing Native Plants in the Wakatipu by Wakatipu Reforestation Trust

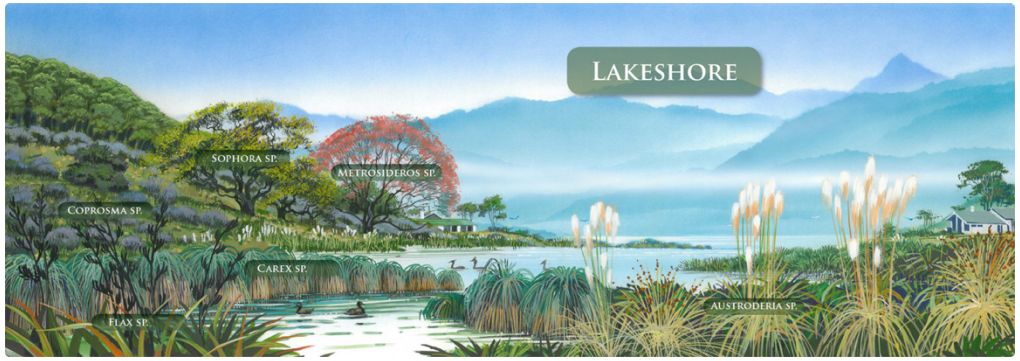
Tall Trees 15m to 25m
Elaeocarpus hookerianus (pōkākā)
Fuscospora cliffortioides (tawhai rauriki, mountain beech)
Fuscospora fusca (tawhai raunui, red beech)
Lophozonia menziesii (tawhai, silver beech)
Plagianthus regius (manatu, lowland ribbonwood)
Prumnopitys taxifolia (matai, black pine)
Metrosideros umbellata (southern rātā)
Podocarpus totara (tōtara)

Medium size trees 8m to 10m
Aristotelia serrata (makomako, wineberry)
Carpodetus serratus (putaputaweta, marble leaf)
Coprosma linariifolia (mikimiki yellow wood)
Cordyline australis (tī kōuka, cabbage tree)
Fuchsia excorticata (kōtukutuku, konini, tree fuchsia)
Griselinia littoralis (kapuka, broadleaf)
Hoheria sexstylosa (houhere, lacebark, ribbonwood)
Melicytus ramiflorus (māhoe, whitey wood)
Pennantia corymbosa (kaikomako)
Pittosporum tenuifolium (kōhūhū)
Sophora microphylla (South Island kōwhai)

Small Trees to large shrubs 4m to 6m	
Coprosma crassifolius	Olearia aviceniifolia
Coprosma, intertexta	Olearia bullata (swamp tree daisy)
Coprosma lucida (karamū)	Olearia fimbriata (robust tree daisy)
Coprosma propinqua (mingimingi, mikimiki)	Olearia lineata (narrow-leaved tree daisy)
Coprosma virescens	Olearia odorata (scented tree daisy)
Corokia cotoneaster (korokia)	Phyllocladus alpinus (mountain toatoa)
Hebe salicifolia (koromiko)	Pseudopanax colensoi var. ternatus (orihou, three finger)
Leptospermum scoparium (mānuka)	Pseudopanax ferox (fierce lancewood)
Lophomyrtus obcordata (rahotu)	Myrsine australis (mapou, red matipo)
Melicope simplex (poataniwha, wharangi)	Myrsine divaricata (weeping mapou)

Small Shrubs
Carmichaelia petriei (native broom)
Coprosmas acerosa & brunnea (dwarf coprosmas)
Hebe biggarii
Hebe buchananii
Hebe hectori (whipchord hebe)
Hebe pimeleoides var. faucicola
Hebe pimeleoides var. pimeleoides
Heliohebe cupressoides
Melicytus alpinus (porcupine shrub)
Muehlenbeckia complexa (scrambling creeper)
Ozothamnus leptophyllus var vauvilliersii
Podocarpus nivalis (snow tōtara)

Flaxes, Ferns, grasses, sedges and other plants
Phormium cookianum (whaririki, mountain flax)
Phormium tenax (harakiki swamp flax)
Astelia fragrans (bush lily)
Austroderia richardii (toi toi)
Chionochloa rigida (narrow-leaved snow tussock)
Festuca novaezelandiae (hard tussock)
Poa colensoi (blue tussock)
Carex buchananii
Carex secta (makura, oio)
Asplenium gracillimum
Blechnum pennamarina
Polystichum vestitum (prickly shield fern)



This appendix outlines the soil enhancement techniques that will be employed throughout the restoration process in Te Kararo Queenstown Gardens, focusing on reversing the negative impacts caused by long-term conifer dominance. Best practices are included for improving soil health, addressing nutrient deficiencies, and preventing soil erosion to support the successful establishment of new plantings.

1.1 Soil Amendments

Amending the soil is a critical step in restoring the fertility and structure needed for successful plant growth. The following guidelines provide recommendations for organic amendments, including compost, mulch, and biochar.

Compost

Timing: Applied during early planting phases to enhance soil structure and moisture retention.
Benefits: Improves aeration, water retention, and nutrient availability, particularly in soils degraded by conifer needle litter.

Compost improves soil structure, increases organic matter, and promotes microbial activity. Application rates should range from 10-20cm in depth. Compost should be incorporated into the soil during initial site preparation, especially in areas where soil compaction or low organic content is evident.

Mulch

Timing: Applied after planting to maintain moisture and reduce temperature fluctuations.
Benefits: Helps maintain soil temperature, improves water retention, and protects soil from erosion.

Mulch provides soil insulation, reduces water evaporation, and suppresses weed growth. A layer of mulch (5-10cm deep) should be applied around new plantings but kept clear from the plant stem to prevent rot.

Biochar

Timing: Incorporated into soil during the preparation of planting zones.
Benefits: Increases water-holding capacity, enhances soil microbial diversity, and provides a long-term carbon sink.

Biochar is a long-lasting carbon-rich material that improves nutrient retention and microbial health in soils. It should be mixed with compost at a rate of 5-10% by volume.

Mycorrhizal Inoculation

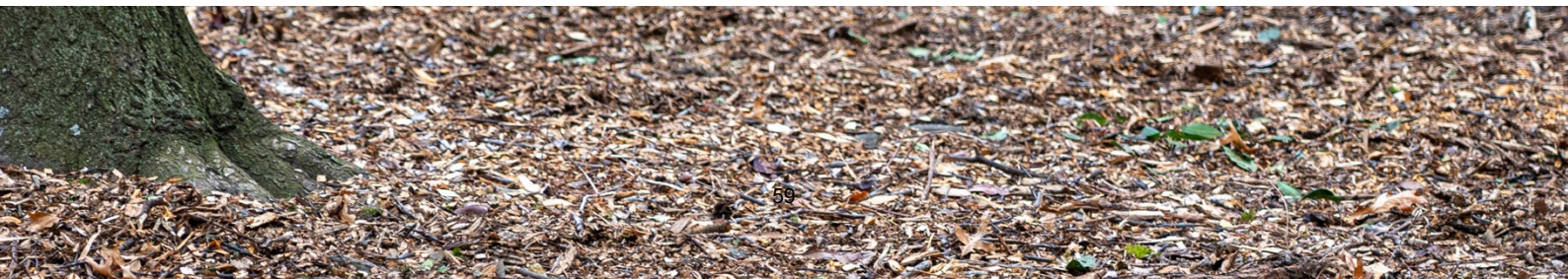
Timing: Applied during planting to enhance root development.
Benefits: Promotes nutrient uptake and plant resilience.

Mycorrhizal fungi form symbiotic relationships with plant roots, improving nutrient and water absorption. Inoculants should be applied directly to the root zones during planting.

Compost Tea

Timing: Applied during planting and throughout the growing season
Benefits: Enhances soil microbial activity and nutrient availability.

Compost tea is a liquid amendment that boosts beneficial microorganisms in the soil, promoting plant health. It should be applied as a soil drench or foliar spray.



1.2 Soil Conditioning

Soil conditioning is an essential part of site preparation for planting, ensuring that the ground is adequately prepared to support root establishment and overall plant health. The following protocols outline the key steps in soil conditioning.

Tilling and Screefing

Tilling: Mechanical tilling will break up compacted layers of soil, enhancing aeration and improving water infiltration.
Screefing: Involves removing the surface cover to expose the soil, allowing for better root penetration and nutrient absorption. This method is particularly useful in areas that have accumulated heavy organic debris or conifer needle litter.

Soil conditioning involves both tilling, which breaks up compacted soil and incorporates organic matter and screefing, which clears surface vegetation or organic debris (needles and cones) to expose the soil. Organic matter such as compost and biochar should be incorporated into the soil during tilling to improve soil structure, nutrient levels and microbial activity. This provides a more favourable environment for plant roots to establish and grow.

1.3 Nutrient Management

Nutrient management is essential to counteract the nutrient depletion caused by years of conifer dominance. The following strategies will support plant establishment by addressing soil nutrient deficiencies:

Slow-Release Fertilisers

Application Rates: Based on soil testing, slow-release fertilisers should be applied at 50-100g per square metre, depending on the species being planted.
Monitoring: Soil nutrient levels should be monitored every 6-12 months to track the progress of soil fertility recovery. Soil samples should be analysed for macronutrients (N, P, K) and micronutrients such as calcium, magnesium, and sulphur.
Corrective Actions: If soil testing reveals deficiencies in key nutrients, targeted amendments such as lime for pH adjustment or organic matter for improving microbial activity should be implemented.

Organic or slow-release fertilisers will be applied to provide essential nutrients gradually over time. Nitrogen, phosphorus, and potassium (NPK) fertilisers should be used based on soil test results, with applications tailored to meet the needs of different species.

Cover Crops

Benefits: Increases organic matter, improves soil structure, and prevents nutrient leaching during periods of soil disturbance.

Planting cover crops such as clover or grasses can improve soil fertility by fixing nitrogen and preventing erosion. These crops should be sown during rest periods between tree removals and replanting phases.

1.4 Watering and Irrigation

Proper watering and irrigation are crucial for the successful establishment of new plantings, particularly in the early stages of restoration. The following strategies ensure optimal moisture levels for plant growth while conserving water resources:

Drip or Irrigation Lines

Timing: Where practical, Drip irrigation systems will be used regularly during the first 2-3 years of establishment, especially during dry periods.
Benefits: Provides targeted watering, reduces water waste, and ensures that young plants receive the moisture they need to establish strong root systems.

Drip irrigation systems will be installed where feasible and existing water supplies exist, delivering water directly to the roots of newly planted species. This method reduces water loss from evaporation and ensures efficient use of water.

Watering Schedule

Timing: Watering should be done early in the morning or late in the afternoon to minimise water loss through evaporation.
Monitoring: Soil moisture sensors can be used to monitor the effectiveness of the watering schedule and prevent overwatering.

A regular watering schedule will be maintained for newly planted trees and shrubs, particularly during the first two growing seasons. Watering should be more frequent during the dry summer months, with adjustments made based on weather patterns and soil moisture levels.

Mulching for Moisture Retention

Benefits: Reduces the frequency of irrigation, improves water retention in the soil, and provides additional protection against temperature fluctuations.

The application of mulch around new planting areas will help retain soil moisture and reduce the need for frequent watering. Organic mulches, such as wood chips, can slow the evaporation of water from the soil.

Water-Saving Measures

Benefits: Minimises water usage while ensuring plant health and resilience in drier areas.

Drought-resistant and native species that are adapted to local moisture conditions will be prioritised for planting in areas with limited water availability. This reduces the need for extensive irrigation and ensures long-term sustainability.

1.5 Erosion Control Measures

Preventing soil erosion is crucial during tree removal and replanting phases. Erosion not only depletes soil nutrients but also damages the landscape, making it difficult for new plantings to establish. The following techniques will ensure soil stability throughout the restoration process:

Temporary Ground Covers

Timing: Applied immediately after tree removal and before new plantings to stabilise the soil surface.
Benefits: Provides temporary protection against erosion while improving soil health through root development.

Planting quick-growing grasses or using biodegradable mats will help stabilise soil during periods of tree removal. These ground covers prevent soil displacement from wind and rain, reducing erosion risks while allowing for future replanting.

Silt Fences and Erosion Barriers

Application: Installed in areas prone to soil displacement or runoff, particularly on slopes or near water bodies.
Benefits: Keeps soil on-site and prevents it from being washed into surrounding areas, thus protecting local ecosystems and water quality.

These barriers should be installed around areas where heavy machinery is used or where soil is likely to be disturbed during removal activities. Silt fences prevent soil runoff into waterways or adjacent areas. Erosion Barriers could consist of felled logs strategically place and backfilled with soil/mulch and planted.

Stabilisation Plantings

Timing: Planted as soon as possible after tree removal to stabilise soil before other species are introduced.
Benefits: Provides long-term erosion control and improves soil structure, ensuring successful establishment of subsequent plantings.

Early-stage pioneer species, such as Kānuka or erosion-resistant grasses, should be planted in areas susceptible to soil erosion. These plants are quick to establish and help anchor the soil with their root systems.

July 2025 Final Draft Revision Notes:

Main Report:

- Removed Invasive wording from the document and changed to Undesirable or Pest Species
- Removed Ponderosa & 5 sister pictures, and from maps. Emphasised that these will not be removed and will see out their life cycle
- Mentioned how the removal of Individual Conifers will create space for amenity planting, supporting a gardens amenity tree succession plan
- Added Trees That Count as a funding avenue for businesses
- Revised on planting strategy section and added native/exotic % mix (40%/60%)
- Add FOG & WCG involvement with seasonal assessment/walkover
- Noted that planting should not hinder the Ice Rink building and the Field Team Buildings.
- Improve the Planting map with a clear shelterbelt and planting strategy
- Improved section on soil degradation, and mention how conifers have a pH range similar to that of native beech forests
- Expanded on Miyawaki method, clearly stating it could be suitable in isolated pockets but not the entire garden
- Mentioned how Douglas Fir are long-lived but Radiata Pine are not, and reaching the end of life
- Updated Initial Stages map to include focus in Years 1-4 & Years 5-10

Appendix 1 - Succession Plan Maintenance Schedule *(Spreadsheet):*

- Remove specific years ie 2025 and added year 1, 2, 3 etc instead.
- Added more context for each zone, with a clear description at the start of the table
- Added annual assessment period during planting phases. Updated the activities description to reflect, adding in key stakeholders i.e. FOG & WCG
- Added Individual Conifers to the schedule
- Identified early planting areas for Year 1 (trial sites)
- Changed from 60 to 70 years
- Lowered % in Year 1 removals to be less aggressive, ie. (Zone 1: Year 1 - 5%), (Zone 3: Year 1 -30%), (Individual Conifers up to 25%)
- Adjust timeframes and % for some zones

Appendix 2 - Species Selection Guide:

- Updated species list and added more species

Appendix 3 - Soil Enhancement Techniques and Best Practices:

- Added Mycorrhizal Inoculation and Compost Tea