

Before the Queenstown Lakes District Council Hearing Panel

Under the Resource Management Act 1991

In the matter of the renotification of two submissions on Stage 1 of the Queenstown Lakes Proposed District Plan concerning the zoning of land at Arthur's Point by Gertrude's Saddlery Limited and Larchmont Enterprises Limited

Statement of evidence of Kelvin Lloyd on behalf of Gertrude's Saddlery Limited and Larchmont Enterprises Limited

15 November 2022

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**anderson
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Introduction

- 1 My full name is Kelvin Michael Lloyd. I am a Senior Principal Ecologist at Wildland Consultants Ltd.
- 2 I hold the degrees of Bachelor of Science with First Class Honours (1996), and Doctorate of Philosophy (2000), both obtained from the University of Otago, where my studies were undertaken at the Department of Botany. Subsequent to University study I was awarded a three-year Post-Doctoral Fellowship from the Foundation for Research, Science and Technology, during which I was employed by Landcare Research Ltd in Dunedin. I have been employed by Wildland Consultants Ltd from 2004 to the present, based in Dunedin.
- 3 I am an author of 22 scientific papers published in peer-reviewed national and international scientific journals, as well as several popular articles. I have also presented aspects of my research at national and international scientific conferences. I have lectured in plant ecology at 3rd year level at the University of Otago. I remain an honorary research associate of Landcare Research Ltd and continue to publish research papers in collaboration with other scientists as time permits. I am a member of the New Zealand Ecological Society, the New Zealand Botanical Society, the Ornithological Society of New Zealand, the New Zealand Biosecurity Institute, the New Zealand Native Forest Restoration Trust and the New Zealand Plant Conservation Network.
- 4 My work as an ecological consultant has covered a wide range of vegetation types, including wetlands, grasslands, shrublands, forests, and alpine vegetation. This work has included ecological investigations of areas of vegetation throughout New Zealand, including sites in Northland, Auckland, Hawkes Bay, Wairarapa, Horowhenua, Wellington, Chatham Islands, Marlborough, Nelson, Canterbury, Buller, Westland, Otago, and Southland. I am an author of almost 320 contract reports covering these assessments and I have prepared expert evidence in 34 Environment Court or similar cases in relation to these projects.
- 5 I have considerable experience in the Queenstown Lakes area, which includes:
 - a. Provision of expert advice to Queenstown Lakes District Council in 2017 on rezoning proposals for industrial land use at Coneburn and for skifield subzoning at Coronet Peak.
 - b. Expert evidence on behalf of Otago Regional Council in 2019 on the proposed Queenstown Lakes District Plan. This included

assistance at mediation where ecologist conferencing resulted in a framework for the vegetation clearance permitted standards and rules.

- c. Numerous ecological assessments and ecological management plans for proposed residential and subdivision sites in the upper Clutha basins, including sites in the vicinity of Sunshine Bay, Luggate, Hawea Flat, Wanaka, Mt Iron, and Little Mt Iron.
- d. Monitoring wetland condition in the Shotover Confluence swamp.
- e. A detailed ecological survey of Mt Dewar, above the Arthurs Point site, in 2007.
- f. Mapping potential natural ecosystems across Otago (2020)¹. This project required a deep understanding of ecological patterns and gradients.
- g. Assisting the mapping of significant indigenous fauna habitats across Otago Region (2020), including significant habitats near the Arthurs Point site².

6 I also have significant experience in wilding conifer control, both in terms of undertaking control and planning for it. This experience includes:

- a. Being part of a voluntary wilding conifer control group during which I helped control wilding conifers across numerous sites in Otago from 1998-2003.
- b. In 2014 I was the main author of a report on methods for prioritisation of wilding conifer control sites across New Zealand (including in the Queenstown area)³. This involved coming up with a new prioritisation scheme that used expert responses to rank wilding conifer invasiveness in different land cover types. Wildlands developed a national scale wilding conifer vulnerability

¹ Wildland Consultants 2020: Mapping of potential natural ecosystems and current ecosystems in Otago Region. *Wildland Consultants Contract Report No. 5015a*. Prepared for Otago Regional Council.

² Wildland Consultants 2020: Mapping of significant habitats for indigenous fauna in terrestrial, freshwater, and marine ecosystems in Otago Region. *Wildland Consultants Contract Report No. 5015b*. Prepared for Otago Regional Council.

³ Wildland Consultants 2014: Methods for the prioritisation of wilding conifer sites across New Zealand. *Wildland Consultants Ltd Contract Report No. 3754a*. Prepared for the Ministry of Primary Industries.

map as part of this process. An additional report applied the methods to rank priority sites for wilding conifer control⁴.

- c. In 2018 Wildlands was contracted to re-prioritise the remaining sites using the same methods.⁵ In 2019, I led a project to model the potential spread of wilding conifers across New Zealand, which was based on a complex GIS process.⁶

- 7 In 2019 I compiled a report on the Arthurs Point site subject to this rezoning hearing owned by GSL and LEL based on desktop information. This report is appended to my evidence as Appendix 1.

Scope of evidence

- 8 In preparing this evidence, I have reviewed the following reports and statements:

- (a) QLDC Section 42A report prepared by Ms Evans;
- (b) Draft brief of evidence prepared by Dr Reece Hill;
- (c) Draft brief of evidence prepared by Mr Jeffrey Brown.

- 9 I have prepared this evidence in relation to:

- (a) The ecological context of the site;
- (b) The ecological values of the site;
- (c) The positive effects of conifer removal;
- (d) Likely successional trajectories if the land is not used for residential development

Ecological context of the site

- 10 The site is located in the Shotover Ecological District, within the Lakes Ecological Region. The climate comprises hot summers, cold winters, and a relatively dry climate in the rainshadow of the Main Divide, with annual

⁴ Wildland Consultants 2014: Prioritisation of wilding conifer sites across New Zealand - results. *Wildland Consultants Ltd Contract Report No. 3754b*. Prepared for the Ministry of Primary Industries.

⁵ Wildland Consultants 2018: Methods for national reprioritisation of wilding conifer management units. *Wildland Consultants Contract Report No 4666a*. Prepared for the Ministry of Primary Industries.

⁶ Modelling of the potential spread of wilding conifers across New Zealand. *Wildland Consultants Contract Report No 4666b*. Prepared for the Ministry of Primary Industries.

rainfall ranging from 650-1,600 millimetres per annum.⁷ Conservation land comprising the 'Conservation Area – Big Beach/Shotover River' wraps around the western, southern, and eastern margins of the site, while existing / developed Arthurs Point urban area bounds the site to the north. Like the proposed rezoning site, the Conservation Area land to the south is dominated by exotic conifers. A draft ecological restoration plan recently developed for the Arthurs Point area denotes the conservation area as Management Unit D-2, and actions proposed for this area include felling the exotic conifers, replanting the area with indigenous tree species, and controlling weeds⁸.

- 11 The draft ecological restoration plan notes that Douglas fir (*Pseudotsuga menziesii*), larch, and radiata pine (*Pinus radiata*) dominate large areas at Arthurs Point and have outcompeted indigenous plants and would continue to be a seed source for wilding spread to neighbouring areas. Sycamore (*Acer pseudoplatanus*), which is a highly invasive exotic broadleaved tree, is also present in the area.
- 12 I understand that self-seeded wildings have dominated the Site since approximately the 1970's, commensurate with when the Site was no longer upkept as improved pasture connected to adjacent working farms.

Ecological values of the site

- 13 The site has, until clearance very recently, been dominated by self-seeded larch (*Larix decidua*); a tall deciduous conifer that is associated with long-distance spread and has resulted in such spread in the local area. This spread has extended to nearby landscapes of Mt Dewar and the country to the North (Wildlands Consultants 2007). While the Site itself has largely been cleared of trees, there remains wildings surrounding the Site over the Conservation Area and residential land, to the west, south and east of the Site. The infestation of these wilding conifers over the Site means that no indigenous vegetation is present, although some shade-tolerant indigenous plants (such as shield fern) may be present in the forest understorey. The forest may have provided limited habitat for common indigenous forest birds, particularly insectivorous species such as pipihi/silvereye (*Zosterops lateralis*), riroriro/grey warbler (*Gerygone igata*), and piwakawaka/fantail

⁷ McEwen M. 1987: Ecological regions and districts of New Zealand. New Zealand Biological Resources Centre Publication No 5, Part 4. Department of Conservation, Wellington.

⁸ Wildland Consultants 2022: Ecological restoration plan for Arthurs Point, Queenstown. *Wildland Consultants Ltd Contract Report No. 6198*. Prepared for Keeping Arthurs Point's Original Wildlife and the Arthurs Point Community Association.

(*Rhipidura fuliginosa*) but it has not been identified as an important habitat for indigenous forest birds⁹.

- 14 The Site therefore exhibits very low ecological values either under its previous wilding cover form, and subsequently since the deforestation of the Site occurred.

Positive effects of conifer removal

- 15 Removal of wilding conifers from the proposed rezoning area has been a very positive ecological effect, as otherwise the conservation area (which is proposed for exotic conifer removal) would be subject to ongoing invasion of exotic conifers from the mature trees on the rezoning site. While other areas of exotic coniferous forest are present upstream and downstream, these are also proposed for removal under the draft restoration plan.¹⁰ Wilding conifer control in all of these areas would be less meaningful if the prominent wilding conifer seed source on the proposed rezoning site was left intact to comprise an ongoing source of wilding conifer invasion to adjacent areas.
- 16 As a consequence of the recent felling of the rezoning site, this also ensures that the adjacent removal of wildings becomes a priority, and a requirement, under the Otago Regional Pest Management Plan 2019 (good neighbour rules).
- 17 As discussed in the attached report, the removal of these wildings on the Site, in particular mature Larch, has consequential ecological benefits for the wider Arthurs Point Area and surrounding landscapes which are particularly vulnerable to ongoing wilding conifer invasion.

Successional trajectories after wilding conifer control

- 18 As a consequence of the recent felling of the Site, follow-up control will also need to be undertaken to address regeneration of wilding conifers from seed that is exposed to light. In the absence of such control, the site would become re-infested with wilding conifers and other weeds.

⁹ Wildland Consultants 2020: Mapping of significant habitats for indigenous fauna in terrestrial, freshwater, and marine ecosystems in Otago Region. *Wildland Consultants Contract Report No. 5015b*. Prepared for Otago Regional Council.

¹⁰ Wildland Consultants 2022: Ecological restoration plan for Arthurs Point, Queenstown. *Wildland Consultants Ltd Contract Report No. 6198*. Prepared for Keeping Arthurs Point's Original Wildlife and the Arthurs Point Community Association.

- 19 I have read the draft zone provisions appended to Mr Brown's planning evidence and note the requirements for future lot owners to undertake ongoing weed and pest management control in addition to the prescribed native revegetation areas indicated on the Structure Plan. I support the need for these ongoing management controls to ensure that follow-up control of regenerating conifers and any invading sycamore is adequately undertaken over the Site.
- 20 Large Lot Residential development of the Site, as set out in the draft Structure Plan, would provide a comprehensive land use for the future of the Site. As set out in Mr Brown's planning evidence, the zone provisions provide for the future registration of instruments binding lot owners to implement and maintain specified revegetation areas of indigenous trees, and pest plant control, on an ongoing basis. This should result in permanent suppression of wilding conifers and any invading sycamore on the site, preventing the site again from becoming a seed source for wilding tree spread to adjacent areas.
- 21 I understand from Dr Hill's evidence that the soils over the Site have low productive value, and in addition to other constraints of the Site it is unlikely to be used for a primary production purpose in the future. If the Site was therefore not rezoned for residential/revegetation, and was not used for primary production, reinvasion of wilding and pest plant species would occur in the absence of ongoing active pest management of the land.
- 22 The draft structure plan prescribes the locations of required indigenous planting involving a range of indigenous plant species. Taller trees among these, including kohuhu (*Pittosporum tenuifolium*), mountain beech (*Fuscospora cliffortioides*), and tarata (*Pittosporum eugenioides*) provide dense shade that will inhibit regeneration of wilding conifers and can be used in any high-risk sites for wilding conifer reinvasion.
- 23 The revegetation areas proposed over the Site will enhance nature conservation values, and provide an opportunity to connect with any future revegetation of the adjacent Conservation Area, once wilding conifers have also been cleared from that land.

Conclusion

- 24 Overall I consider the rezoning proposal will result in a net conservation benefit for the Site and its surrounding environment given:
 - (a) The scale of native revegetation proposed to be undertaken by future lot owners, and the requirement for those areas to be maintained on

an ongoing basis, alongside control of pest species and plan obligations;

- (b) The consequence of removal of wilding conifers over the Site, and the resulting rezoning will reduce risk of the Site reverting to wilding species in the future (in particular given the alternative primary productive uses of the Site are limited);
- (c) The consequence of removal of wilding conifers over the Site being a catalyst for clearance work to now occur on the adjacent Conservation Area, consistent with ecological restoration plans for Arthurs Point;
- (d) The consequence of native revegetation over the Site providing a future opportunity to connect with and enhance conservation benefits for any future revegetation to be undertaken on the Conservation Area, after wilding clearance is undertaken.

Kelvin Lloyd

15 November 2022

Attachment - Ecological Report

ECOLOGICAL BENEFITS OF EXOTIC CONIFER CONTROL AT ARTHURS POINT, QUEENSTOWN



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environments



ECOLOGICAL BENEFITS OF EXOTIC CONIFER CONTROL AT ARTHURS POINT, QUEENSTOWN



Google Earth view (January 2013 imagery) of Arthurs Point, showing a dense infestation of wilding conifers.

Contract Report No. 5178

September 2019

Project Team:

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Prepared for:

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Reviewed and approved for release by:



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1. INTRODUCTION

Gertrude Saddlery Ltd owns land at the southern end of Atley Terrace, Arthurs Point, Queenstown, which is currently largely covered with wilding conifers, mainly larch (*Larix decidua*; Plate 1) but also pines (*Pinus* spp.) in the western part of the site. The site is zoned for Residential activities in the proposed Queenstown Lakes District Plan. Gertrude Saddlery requires a brief report on the ecological effects and benefits that would occur if all of the wilding conifers on the land were to be cleared and subsequent regeneration controlled. This report describes the effects that could result from the proposed clearance.



Plate 1: Mature larch trees on the Gertrude Saddlery land at Arthurs Point.

2. METHODS

A desktop assessment was undertaken, drawing on relevant ecological information including ecological context information and previous experience and other reports from the local area. Aerial imagery of the site was also evaluated.

3. ECOLOGICAL CONTEXT

3.1 Shotover Ecological District

The Arthurs Point site is located in the Shotover Ecological District, within the Lakes Ecological Region. The climate comprises hot summers, cold winters, and a relatively dry climate in the rainshadow of the Main Divide, with annual rainfall ranging from

650-1,600 millimetres per annum (McEwen 1987). Remnants of red beech (*Fuscospora fusca*) forest occur along the shores of Lake Wakatipu, with mountain beech (*Fuscospora cliffortioides*) forest in gullies up to the treeline (McEwen 1987).

3.2 Former vegetation

It is likely that mountain beech forest was formerly the dominant vegetation on Arthurs Point prior to anthropogenic deforestation, as it is the dominant species of remaining forest remnants in the area. However red beech may have also been present depending on soil depth and productivity. Subcanopy broadleaved trees would have included kapuka/broadleaf (*Griselinia littoralis*), three finger (*Pseudopanax colensoi*), putaputaweta (*Carpodetus serratus*), horopito (*Pseudowintera colorata*), and there may have been sparse podocarps including rimu (*Dacrydium cupressinum*) and/or Halls totara (*Podocarpus laetus*).

3.3 Local context

The Gertrude Saddlery site is bounded by conservation land and a marginal strip on its riverside margins, and residential areas elsewhere (Figure 1). Further away from the site, there are extensive areas of low producing grassland, tall tussock grassland, subalpine shrubland, and mixed exotic shrubland. These cover types range from moderately to very high vulnerability to wilding conifer invasion (Wildland Consultants 2016; 2017). Unshaded areas in Figure 1 are mostly high producing exotic grassland and indigenous forest, which have low vulnerability to wilding conifer invasion (Wildland Consultants 2016; 2017). There are extensive areas that have high vulnerability to wilding conifer spread to the south, west, and north of the Arthurs Point site, with the Arrowtown Basin to the northeast the only sizeable nearby area with very low vulnerability to wilding conifer spread (Figure 2).

4. ECOLOGICAL BENEFITS OF CONIFER CONTROL

4.1 Reducing wilding conifer spread

Control of the larch and pine trees on the Gertrude Saddlery Ltd land will be positive because they are mature conifer trees on a somewhat elevated site, which means that large numbers of cones will mature and produce seed annually and this seed will have a higher likelihood of being uplifted by wind for wider dispersal. Larch trees in particular have capacity for long-distance spread, and have demonstrated this capacity locally on nearby Mt Dewar and the country to its north (Wildland Consultants 2007).

Control of these trees will not eliminate the local wilding conifer seed source, as the wilding conifers on conservation land below the site will persist. However those conifers are in a less exposed site and will pose a slightly lower risk of wilding conifer spread.

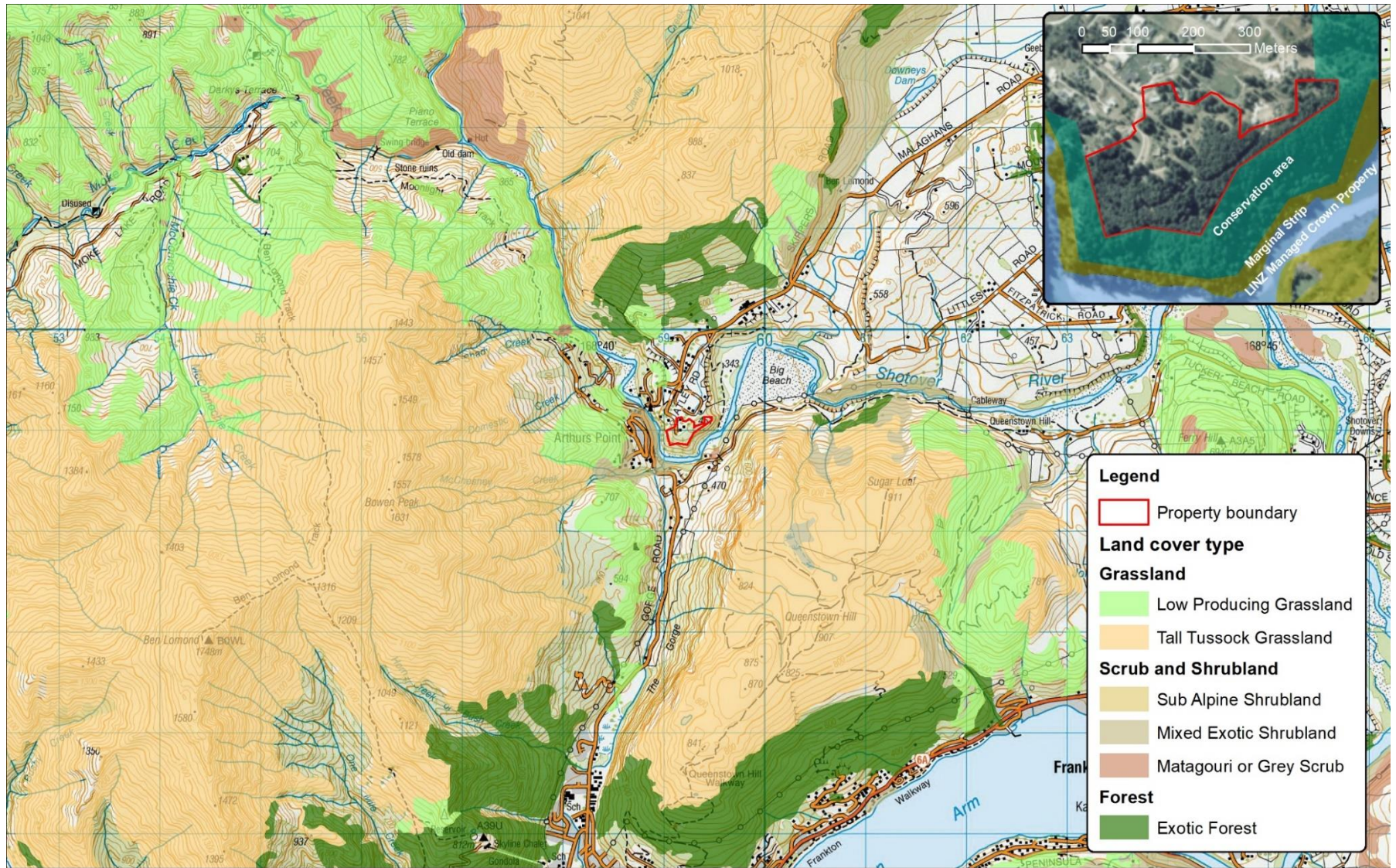
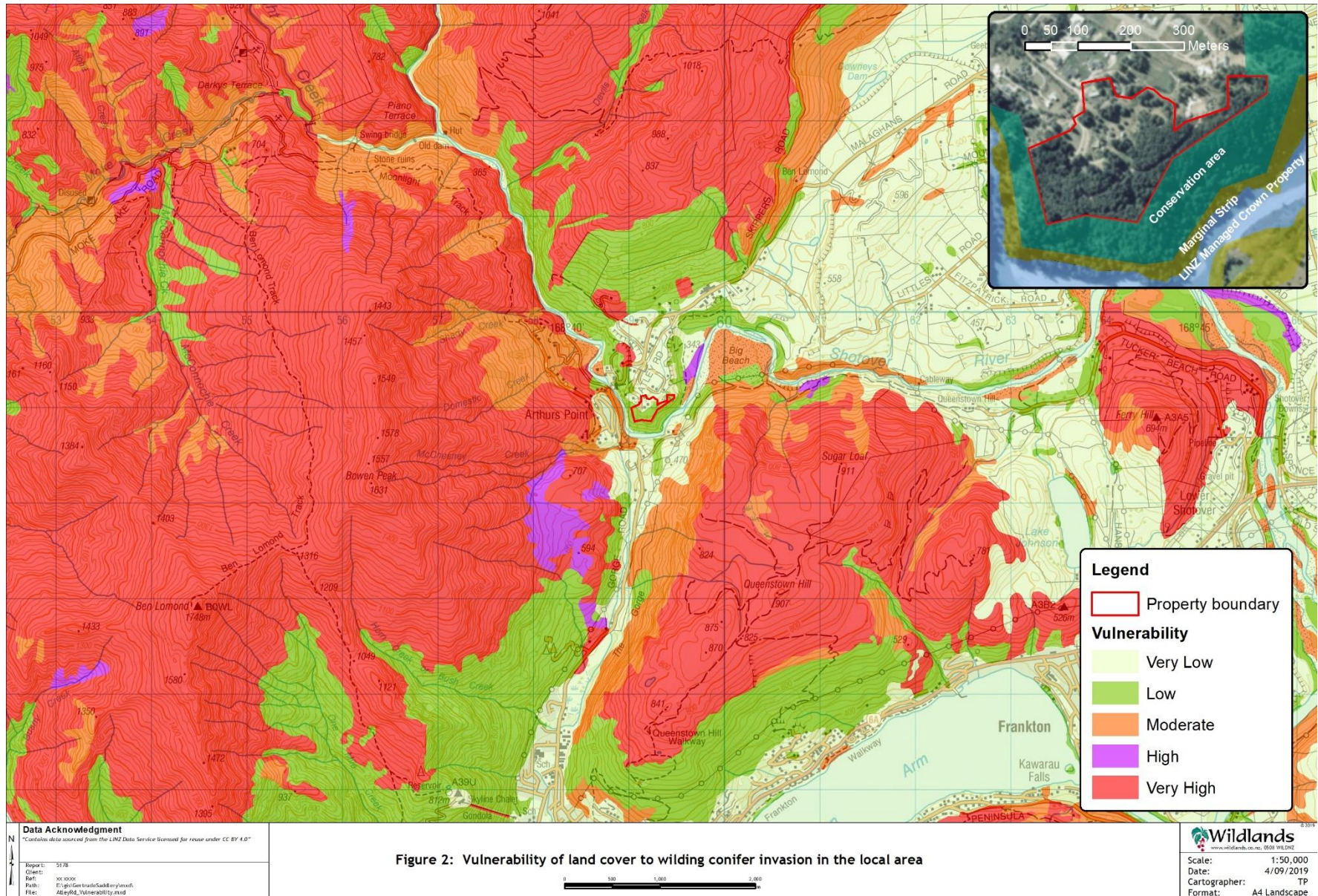


Figure 1: Location of the Gertrude Saddlery site



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 Scale: 1:50,000
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 Format: A4 Landscape



4.2 Prioritising of control on adjacent land

Another benefit of controlling the wilding conifers on the Gertrude Saddlery land is that it makes it more of a priority to also undertake control of wilding conifers on the adjacent conservation land. Currently, there would be little value on controlling the wilding conifers on the adjacent land, as significant seedfall onto the cleared area would come from the mature trees above on the Gertrude Saddlery land. Controlling the wilding conifers on the Gertrude Saddlery land will remove this problem and will significantly reduce the potential for reinvasion of the conservation land after control.

4.3 Supporting wider local wilding conifer control

Wilding conifers are being actively managed in the Queenstown area, with significant control of wilding conifers being undertaken on the Coronet Road faces of Mt Dewar, the lower slopes of Bowen Peak above Gorge Road, the south-eastern slopes of Queenstown Hill, and on various sites below Ben Lomond. While control of wilding conifers on the Gertrude Saddlery land at Arthurs Point would not add significantly to the area of wilding conifers being controlled locally, it would nevertheless support and be of benefit for the wilding conifer control being undertaken in the surrounding landscape, by removing a seed source and prioritising control of wilding conifers elsewhere at Arthurs Point.

4.4 Post-control management

If the wilding conifers on Gertrude Saddlery land are controlled, options for further positive actions, by restoring indigenous biodiversity where appropriate, could be considered. As discussed above, the likely historic vegetation on the site would have been beech forest with scattered emergent podocarps and a broadleaved subcanopy. This would be an ecologically-appropriate outcome for any planting that is considered.

5. CONCLUSIONS

The Gertrude Saddlery land is mostly covered in mature larch trees, a species that is notable for its capability for long distance spread. Extensive parts of the local landscape are vulnerable to wilding conifer invasion, so removal of the wilding conifers on Gertrude Saddlery land would reduce the risk of wilding conifer spread to these areas. Control of wilding conifers on the Gertrude Saddlery land would also help to prioritise control on adjacent conservation land, and would support and benefit the control of wilding conifers that is being undertaken elsewhere in the local landscape. Additional positive actions would include the restoration of indigenous forest on any parts of the site that are not required for residential activity.

ACKNOWLEDGMENTS

Carey Vivian (Vivian+Espie Ltd) is thanked for providing useful information and photographs of the site.

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