

**Before the Hearings Panel appointed by
Taupo District Council**

In the Matter of

the Resource Management Act 1991
(Act)

And

In the Matter of

An application for land use consent [RM240388], subdivision consent [RM240389] and variation to subdivision consent RM200118B for: 83 residential lots, 4 reserves, 5 road and over 6 stages; land use consent for earthworks and for additional building coverage, plot ratio and building setbacks; variation to Stage 9 of the previous subdivision stage.

Statement of Evidence of
Dr Hannah Mueller
for Seven Oaks Kinloch Limited
Dated: 12 August 2025

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INTRODUCTION

Qualifications and Experience

1. My full name is Dr Hannah Mueller. I am a Principal Ecologist and Director of Phoenix Ecology.
2. I hold the qualifications of Bachelor of Arts with Honours (Liberal Arts – Humanities and Life Sciences) from the University of Maastricht, a Master of Social Science with Honours (Environmental Policy), and a PhD in Biological Sciences (Freshwater Ecology) from the University of Waikato.
3. I am a Certified Environmental Practitioner (CenvP) under the Environment Institute of Australia and New Zealand (EIANZ) certification scheme (CenvP certification number 1250).
4. I practice as Principal Ecologist and have fourteen years' experience in environmental research and consulting. With a background and experience in terrestrial and freshwater ecology, I specialise in environmental impact assessments, ecological management, mitigation and restoration plans, and terrestrial fauna and aquatic surveys and monitoring.
5. I have extensive experience in the assessment and management of ecological effects for land and infrastructure development projects, including impacts on forest, scrub and wetland ecosystems, and managing effects on Significant Natural Areas. Projects (and roles) that are of particular relevance to this hearing proceeding include:
 - (a) I have been involved in numerous projects involving the management of terrestrial fauna in the Waikato and Auckland regions. In particular, I have been project manager and lead field ecologist for tree removal as part of the Puhoi to Warkworth (P2WW) (2016–2018) and Waikato Expressway–Longswamp Section (2016–2017) construction programmes. I have been the lead bat ecologist in the Environment Court proceedings and ongoing monitoring for the Auckland Regional Landfill (2022 to present). I

have also assisted with the management of impacts on bats through tree removal at the Waikato Expressway–Ngāruawāhia Section (2012–2013) and Hamilton Section (2017–2018).

- (b) I have presented expert witness evidence and attended expert conferencing and mediation process with regards to terrestrial and freshwater biodiversity on behalf of Hamilton City Council as part of the 2020 Environment Court appeal on the Amberfield residential development, Plan Change 5 (2021), and Plan Change 9 (2023).
 - (c) I have been lead ecologist in numerous ecological assessments and restoration management plans in the Waikato Region, covering effects of subdivisions, infrastructure and resource extraction projects. These projects included comprehensive ecological assessment of the wetland including freshwater and terrestrial values, including avifauna and bat surveys, the design of a comprehensive monitoring plan and an ecological restoration plan, addressing issues such as weed management and pest control.
 - (d) I have been lead ecologist for ecological management including vegetation removal and bat, bird and lizard management for numerous rural and urban subdivisions within the Auckland, Bay of Plenty and Waikato regions, which included monitoring, fauna management and compliance reporting.
 - (e) I regularly provide peer ecological advice to district and regional councils on ecological effects assessments and ecological management plans including aspects such as bat ecology, lizard ecology, wetland ecology, and freshwater ecology.
6. I have been involved in the assessment of ecological effects and ecological management associated with the proposed Seven Oaks subdivision since April 2024, and I prepared an ecological assessment of the proposal in October 2024.

7. I have visited the Site on 28 May 2024 as part of a Site walkover of the subdivision Site and the surrounding reserve areas.

Code of Conduct

8. While this is not an Environment Court hearing I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. This evidence is within my area of expertise, except where I state that I am relying on material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

9. My evidence will address the following:
- (a) Ecological values present at the Site;
 - (b) Ecological effects associated with the proposal;
 - (c) Recommendations to manage ecological effects; and
 - (d) Conclusions.

SUMMARY

10. The proposed subdivision Site (**Site**) is situated in Kinloch, on the shores north of Lake Taupo, in currently highly modified and currently grazed farmland. The development Site has conservatively been assessed to be of moderate ecological value at present, with low value biodiversity attributes and no indigenous vegetation values recorded present at the Site.
11. However, the Site, even though it is intensively grazed pastureland, provides habitat for the nationally 'Threatened' long-tailed bat, and potentially the At Risk short-tailed bat, and NZ pipit.
12. In general terms, habitat loss associated with the proposed housing development and associated infrastructure has the potential to create a

range of adverse effects on biodiversity values, during enabling works construction (resulting from direct physical disturbance), seasonal construction, and on an ongoing basis the permanent modification of present fauna habitat values, including loss of current dark spaces.

13. These potential adverse ecological effects on biodiversity values associated with the subdivision have been identified to include:

- (a) Direct mortality or injury to species during vegetation clearance and earthworks activities. Outside of bird breeding season, bird mortality would be low, however, during breeding season vegetation removal has the potential to result in the destruction of nests, eggs and fledglings (including for open grassland species);
- (b) Disturbance to present indigenous fauna species during earthworks;
- (c) Habitat loss for fauna utilising open pasture through development of currently grassed areas;
- (d) Changes in sediment discharges and stormwater runoff to receiving environments; and
- (e) Lighting and noise associated with changing existing land use from pastoral to residential.

14. The overall effect of the proposed works is expected to be **Low**, if all recommendations to avoid and minimise effects are implemented. I understand that Seven Oaks Kinloch will implement these recommendations and that these will be prescribed in the conditions of consent, if granted. In summary, these include the following measures:

- (a) Fauna management protocols to be applied only if required to avoid direct effects;
- (b) Sediment control and stormwater management (including treatment of stormwater prior to entering the watercourses);

- (c) Buffering of lighting and noise effects on the adjacent reserve areas from development through setbacks;
 - (d) The consideration of wildlife-sensitive features for outdoor lighting to minimise lighting effects; and
 - (e) Establishment of corridors as part of the subdivision reserves to enable movement of fauna species across the Site.
15. A restoration planting plan for the subdivision reserve areas is recommended to guide restoration and habitat replacement in the proposed reserves and corridors (Annexure A) with suitable plant species for the Site context. This restoration plan should outline the following aspects:
- (a) Establishment of corridors to link habitats across the Site, as much as feasible;
 - (b) Species mix and planting spacings for each restoration area;
 - (c) Planting methods;
 - (d) Maintenance and monitoring requirements to ensure full vegetation cover;
 - (e) Weed control; and
 - (f) Pest animal control.
16. Planting and pest control are expected to improve ecological flora values at the Site if implemented and maintained to achieve resilient, closed-canopy indigenous cover on an ongoing basis.
17. If all effects management measures and restoration planting are implemented, the expected adverse effects on ecological values and habitats present on Site are assessed to be adequately managed.

ECOLOGICAL VALUES

18. The project Site is located within the Taupō Ecological District (**ED**). The district comprises a rolling landscape centred around Lake Taupō of volcanic origin. Land use change within the ED has led to former scrublands being largely converted to exotic forests and sheep and cattle farms; much of the logged forest was also converted, mainly to exotic forests. The Site is located in an area that is identified as 'Chronically Threatened', 10-20% indigenous cover left under the LENZ threatened environment classification (**TEC**) system¹.
19. The Site is currently comprised of exotic grazed pasture. A small patch of exotic trees is present just outside the Site boundaries, at the northern edge of the Site. The adjoining scenic reserves offer higher botanical values, consisting of regenerating indigenous species.
20. Fauna habitat is very limited at the Site due to its open, grazed nature without any notable key habitat features. Long-tailed bats (*Chalinolobus tuberculata*, Threatened – Nationally Critical²) are present at the Site, and several indigenous bird species (notably NZ pipit, *Anthus novaeseelandiae novaeseelandiae*, At Risk – Declining³) could potentially be present as they have been found in the area, but were not observed during any of the Site assessments. Lizards are unlikely to be present in high densities due to the lack of suitable microhabitats, though ground skink such as Copper skink (*Oligosoma aeneum*, At Risk – Declining⁴) may be present in low densities.

¹ Cieraad E, Walker S, Price R, Barringer J. 2015. An updated assessment of indigenous cover remaining and legal protection in New Zealand's land environments. *New Zealand Journal of Ecology* 39(2)

² O'Donnell, C. F., Borkin, K., Christie, J. E., Davidson-Watts, I., Dennis, G., Pryde, M. A., & Michel, P. 2023. Conservation status of bats in Aotearoa New Zealand, 2022. Wellington, New Zealand: Department of Conservation, Te Papa Atawhai.

³ Robertson, H.A., Baird, K.A., Elliott, G., Hitchmough, R., McArthur, N., Makan, T., Miskelly, C., O'Donnell, C.F., Sagar, P.M., Scofield, R.P. and Michel, P., 2021. Conservation status of birds in Aotearoa New Zealand, 2021. Wellington, New Zealand: Department of Conservation, Te Papa Atawhai.

⁴ Hitchmough, R.A., Barr, B., Knox, C., Lettink, M., Monks, J.M., Patterson, G.B., Reardon, J.T., van Winkel, D., Rolfe, J., Michel, P. 2021. Conservation status of New Zealand reptiles, 2021. *New Zealand Threat Classification Series* 35. Department of Conservation, Wellington. 15 p.

21. Bats were detected at the Site during an acoustic survey conducted in September 2024 over 21 nights of monitoring. Only four single long-tailed bat passes were recorded, though activity could be higher at different times of year. Several possible short-tailed bat passes were also recorded, which could not be confirmed, though for this assessment a conservative assumption has been made that they are present based on their known existence in the nearby landscape and marginally suitable habitat⁵ features in the adjoining reserves.
22. The majority of the Site currently comprises open paddocks with minimal tree coverage remaining. However, the Site is bordered by several reserves, each containing extensive tree cover with excellent potential for bat roosting. Long-tailed bats are known to forage and commute along tree lines, making these boundary areas particularly significant. A single stand of trees is located at the northern boundary of the Site (just outside the boundary for this application), surrounded by paddocks. Bat activity was recorded here, highlighting its value as a commuting and foraging corridor.
23. Additionally, one of the manmade ponds on-Site has also recorded bat activity, emphasising the importance of these ponds as potential foraging and drinking habitats. Currently, there is little to no artificial lighting within the Site, which further enhances its suitability as high-value foraging habitat for bats, as the absence of light pollution is known to benefit nocturnal species such as long-tailed bats. Despite the limited tree presence within the Site itself, these features contribute to the Site's ecological value for bats.
24. In summary, the Site consists of currently grazed pasture, surrounded by both agricultural land use and two scenic reserves (outside the project scope) that are assessed to be of high ecological value. While botanical values at the Site overall are low (consisting only of exotic pasture grasses

⁵ The area appears to be less suitable for short-tailed bats, with unlikely presence of roosting habitat across the Site, though potential roost trees are present within the adjoining DOC reserves. If presence was confirmed in further surveys, it appears most likely that short-tailed bats use the project area to move between areas, or feed opportunistically along forest edges.

and no wetland vegetation), the area does provide potential habitat for indigenous fauna species, bats in particular. Ecological values present at the development Site have therefore been assessed overall as **moderate**.

ECOLOGICAL EFFECTS

25. The works proposed to establish the subdivision include the construction of 83 lots, with minimum of 800m², and average of 1300m². 14 out of 25 lots will have 10m setbacks from reserve, others will be 7.5m. All buildings south of Kahikatea drive will have 4.5m height limit. Buildings will be set back up to 10m from the reserve boundaries, with a minimum of 7.5 m. The construction of an associated roading network and stormwater infrastructure is also proposed. The scheme plan is attached in Annexure A.
26. In general terms, habitat loss associated with the proposed housing development and associated infrastructure has the potential to create a range of adverse effects on biodiversity values, during enabling works construction (resulting from direct physical disturbance), seasonal construction, and on an ongoing basis the permanent modification of present fauna habitat values, including loss of current dark spaces.
27. These potential adverse effects on biodiversity values during and after construction may include:
 - (a) Direct mortality or injury to species during vegetation (pasture) clearance and earthworks activities. Outside of bird breeding season, bird mortality would be low, however, during breeding season vegetation removal has the potential to result in the destruction of nests, eggs and fledglings (including for open grassland species);
 - (b) Disturbance to present indigenous fauna species during earthworks;
 - (c) Habitat loss for fauna utilising open pasture through development of currently grassed areas;

- (d) Changes in sediment discharges and stormwater runoff to receiving environments; and
 - (e) Lighting and noise associated with changing existing land use from pastoral to residential.
28. The following magnitude of effects associated with the proposed development is anticipated on the Site. The assessment has considered the temporal scale of the effect, the landscape context and effect on the range or population, as well as efforts to avoid and minimise effects as described in the next section.

Direct disturbance

29. Earthworks are proposed across the development Site to enable the construction of building platforms, roading and stormwater infrastructure. These works have the potential to disturb any fauna species that may be present, including long-tailed bats that may be roosting in mature trees if any require removal (limited to a small area of exotic trees just outside the boundary) and birds that may be nesting in open pasture. The magnitude of effect is expected to be **Low**.

Habitat loss

30. Currently grassed areas (paddocks) will be lost to residential development but are unlikely to provide substantial habitat values for indigenous species due to their heavily grazed and impacted characteristics, described above. Some loss of bat commuting and foraging habitat is expected as part of the proposal. The stand of trees at the northern boundary of the Site is expected to remain. Given the large amount of more favourable habitat for this species in the wider landscape, and the large home ranges of bats, it is expected that bats will have the ability to adapt their commuting and foraging behaviours around the rural-residential subdivision, which is unlikely to form a key or core area of their current habitat and home range. The magnitude of effect of bat habitat loss is expected to be **Low**.

31. Bird habitat loss is likely to be minimal, and limited to those species potentially utilising open pasture areas. Given the lack of mature vegetation and the Site context and habitat availability in the landscape, the magnitude of effects on native birds and their habitats is considered **Low**.
32. Proposed restoration planting and weed control across the proposed subdivision reserves offer the potential to improve habitat values in these areas.

Sediment and stormwater runoff

33. Increased amounts of sediment could discharge into any downstream receiving environments during the construction period. Increased stormwater runoff due to the increase in impervious surfaces present at the Site is expected without appropriate controls. If adequate controls are implemented as discussed in the next session, effects associated with this are expected to be **Negligible**.

Lighting and Noise

34. Lighting and noise associated with the proposed subdivision have the potential to disturb fauna in the vicinity of the impact area, particularly the adjoining reserves. This is especially the case given the currently available dark spaces at the Site, and the potential for cumulative effects as other adjacent areas have recently been developed and are proposed to be developed.
35. Artificial light at night (ALAN) has been found to negatively impact various bat species, including the relatively slow-flying short-tailed bats (*Mystacina tuberculata*). Although there are only a few unpublished records specifically related to short-tailed bats and artificial lighting (DOC, personal communication, September 2024), research on other bat species supports the concern that artificial lighting can disrupt their foraging, commuting,

and roosting behaviour⁶. Similar effects are expected associated with Long-tailed bats.

36. The magnitude of effect of lighting and noise assuming the effects management steps discussed in the next section are fully implemented is expected to be **Low**.

EFFECTS MANAGEMENT RECOMMENDATIONS

Fauna Management

37. To minimise the effects of direct disturbance to bats for any removal of mature vegetation and reduce the risk of injury or mortality, bat roost protocols⁷ should be implemented to guide any vegetation clearance required on Site. However, the removal of mature vegetation is not expected and the proposed clearance is limited to the grassed paddocks, meaning no further bat management is likely needed.
38. To avoid direct disturbance to any nesting birds, the implementation of incidental discovery protocols are recommended during peak breeding season (September – February), addressing impacts especially on NZ pipit. This would entail including site-specific incidental discovery protocols in the site induction for all employees and contractors to inform personnel of the requirements.
39. These protocols are designed to avoid as much as possible the direct impact on any fauna species during vegetation clearance and earthworks.

Sediment control

⁶ Bats and Lighting. (n.d.). BatConservResLab. Retrieved September 29, 2024, from <https://www.batconservationresearchlab.co.uk/bats-lighting>

⁷ Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols) Version 4: October 2024 approved by the New Zealand Department of Conservation's Bat Recovery Group

40. Adequate sediment and erosion control measures will need to be implemented during the construction phase and earthworks will need to be undertaken during the earthworks season to minimise sediment effects.
41. It is understood that best practice offline stormwater treatment will be implanted prior to any stormwater entering the restored watercourses on site to minimise these effects. Stormwater and erosion controls are guided by an existing earthworks consent, including monitoring of controls, and will be implemented at the Site to manage runoff for up to 'one-in-ten-year' storm events.

Lighting

42. The disturbance of fauna should be minimised through wildlife-sensitive lighting design at all lot sites adjacent to the reserve areas to minimise effects of lighting on this key habitat area.
43. Currently, a setback of up to 10 m (and a minimum of 7.5 m) is proposed from reserves⁸, and conditions will contain a consent notice that no external lighting will be permitted in this buffer to minimise the intrusion of light into the reserve areas.
44. Beyond the 10 m buffer area, where outdoor lighting is required in lots adjoining reserves, it is recommended that the following considerations are encouraged , where feasible:
 - (a) Use of shielding to avoid upward light spill (including on any street lighting adjacent to reserves);
 - (b) Temperature of no more than 2700K;
 - (c) Use of non-reflective, dark surfaces where possible; and
 - (d) Use of adaptive controls such as motion sensors for any outdoor lighting.

⁸ Refer to Annexure A

Restoration planting

45. A restoration planting plan for the subdivision reserve areas is recommended to guide restoration and habitat replacement with suitable plant species for the site context. This restoration plan should outline the following aspects:
- (a) Establishment of corridors to link habitats across the Site, to the maximum extent that is feasible;
 - (b) Species mix and planting spacings for each restoration area;
 - (c) Planting methods;
 - (d) Maintenance and monitoring requirements to ensure full vegetation cover;
 - (e) Weed control; and
 - (f) Pest animal control.
46. Reserve planting and locations have been designed with a view to establish of corridors to enable movement of fauna species across the Site, and the planting plan should reflect this intent.
47. Planting and pest control are expected to improve ecological flora values at the Site if implemented and maintained to achieve resilient, closed-canopy indigenous cover on an ongoing basis.

RESPONSE TO SUBMITTERS

WAIKATO REGIONAL COUNCIL

48. Point 2 of the Waikato Regional Council (WRC) submission raises matters of the ecological assessment. While WRC agrees, in principle, with the ecological assessment report and its recommendation, the submission asks for repetition of the surveys conducted and an inclusion of bird and lizard management plans in the conditions.
49. While additional surveys would offer further clarity on fauna species present, it is my view that the assessment has made conservative assumptions as to the presence of vulnerable fauna species, and has made precautionary recommendations to their management. The assumptions are reflected in the proposed consent conditions.
50. Incidental discovery protocols for birds could be included in the consent conditions (see paragraph 38). A Lizard Management Plan has not been recommended given the lack of suitable habitat across the Site.
51. Since I carried out my assessment and initial preparation of evidence, I understand that WRC has advised that it does not intend to appear at the hearing and supports the proposed development. On that basis, I understand that the WRC is comfortable with the proposed conditions and approach to ecological mitigation.

TUKAIRANGI TRUST

52. Tukairangi Trust's submission states that cumulative effects have not been considered in the ecology assessment. Cumulative effects are expected in relation to the previous and likely future residential development of the area. However, in my opinion, the proposed mitigation including restoration planting, setbacks from reserves and wildlife-sensitive lighting design will address these effects and the concerns of the Tukairangi Trust.

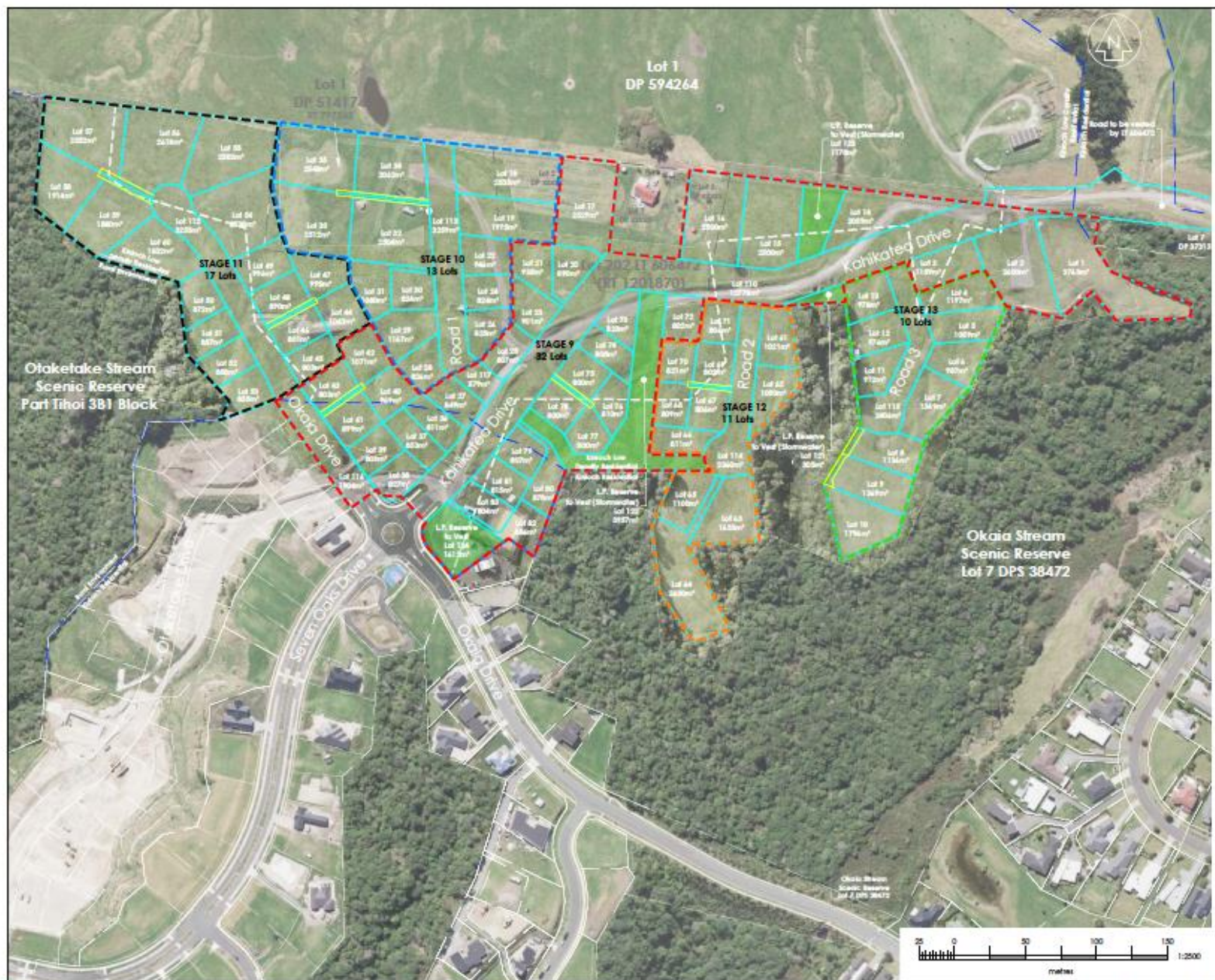
CONCLUSION

- 53. The proposed subdivision is situated on highly modified and currently grazed farmland. The development site has conservatively been assessed to be of moderate ecological value at present, with low value biodiversity attributes and no indigenous vegetation values.
- 54. However, even though it is intensively grazed pastureland, the Site may provide habitat for the nationally 'Threatened' long-tailed bat, At Risk short-tailed bat, and NZ pipit.
- 55. In general terms, habitat loss associated with the proposed housing development and associated infrastructure has the potential to create a range of adverse effects on biodiversity values, during enabling works construction (resulting from direct physical disturbance), seasonal construction, and on an ongoing basis the permanent modification of present fauna habitat values, including loss of current dark spaces.
- 56. Planting and pest control are expected to improve ecological flora values at the Site if implemented and maintained to achieve resilient, closed-canopy indigenous cover on an ongoing basis.
- 57. On the basis that the effects management measures and restoration planting I have recommended are implemented, the expected adverse effects on ecological values and habitats present on Site will be adequately addressed and no residual effects are anticipated.

Dr Hannah Mueller

12 August 2025

ANNEXURE A – SCHEME PLAN



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NOTES:

This plan has been prepared for the purpose of a resource consent application only. It is not a precise survey plan. As areas and dimensions are likely to vary upon survey it should not be attached to any sale & purchase agreements without an appropriate condition to cover such variations.

Aerial imagery has been obtained from: Taupo District Council GIS and is provided under a Creative Commons Public License and with a DJI Matrice M300 and a Zenmuse P1 Camera. It has been provided as a guide to where the boundaries are positioned, or proposed on the ground, but may not be absolute.

Owners: Seven Oaks Kinloch Limited, Public Trust, James Brandon Sheldon, Lucy Caroline Sheldon & Mark Keith Jason Comber
Record of Title: 1109165, 757345 & 757346

Adult utilities may have other services in close proximity which are not shown for the purposes of this plan. Please identify existing utility locations and depths with Taupo District Council GIS before any field investigation or construction.

Underground services shown are indicative only. It is the contractor's responsibility to identify existing utility locations and depths prior to construction.

LEGEND:

- Reserve to Vest
- District Plan Zone Boundary
- Easement
- 50m setback from DOC Reserve

CD	204600	Seven Oaks Reserve	Lot	1	17
1	204600	Seven Oaks Reserve	Lot	1	17
2	204600	Seven Oaks Reserve	Lot	1	17
3	204600	Seven Oaks Reserve	Lot	1	17
4	204600	Seven Oaks Reserve	Lot	1	17
5	204600	Seven Oaks Reserve	Lot	1	17
Rev	Date	Amendment	By	ICM	App

Project Title
**Seven Oaks Kinloch Ltd.
Okaia Drive
Kinloch**

Drawing Title
**Proposed Subdivision of
Lot 504 DP 595759 &
Lots 1 & 2 DP 514174**

Surveyed			
Designed			
Drawn	James	24/07/20	SL
Checked	Colin	08/08/20	CL
Approved	Colin	08/08/20	CL

Status **INFORMATION**

Scale A1	-	A3
Scale A2	1:2500	
Drawing Number	220225-SC001	Rev