



Ecological Impact Assessment

Frontier Road, Te Awamutu

**Prepared for Sanderson Group Ltd
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Document Sign Off

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1. INTRODUCTION

This report¹, prepared by Ecology New Zealand Limited ('ENZL') for Sanderson Group Ltd (the 'client'), presents an Ecological Impact Assessment (EclA) for the proposed Plan Change 12 at Frontier and Pirongia Roads, Te Awamutu (the 'site'). Specifically, this report provides an assessment of the site's ecological features, context and values relevant to the proposed Plan Change and future land use. This report identifies the terrestrial and aquatic ecological values present and the potential, actual, direct or indirect impacts associated with the proposed Plan Change. Recommended methods to avoid, remedy or mitigate these impacts are also detailed.

1.1. Purpose

The purpose of this report is to assess the overall suitability of the site for urban development from an ecological perspective. It is intended that specific and detailed ecological management requirements will be addressed through subsequent resource consents associated with the development of the site.

1.2. Site Location, Description and Ecological Context

The site is located between Pirongia and Frontier Roads, Te Awamutu, and is situated within the Waipa Ecological District of the Waikato Region. The land cover is predominantly rye grass pasture, with two minor watercourses at the north and south of the site and four established residential dwellings and another in the process of being built.

Two watercourses are present on the property. The northern watercourse flows north to Frontier Road. The headwaters arise in a bunded farm pond, with mallard and pukeko on and around the open water area. The outfall from this pond was intermittent and then permanent stream to the boundary of the site. The edge of the pond was electric fenced from farm stock and the downstream course was unfenced. There was scattered mahoe (*Meliccytus ramiflorus*), karamu (*Coprosma robusta*), cabbage trees (*Cordyline australis*) and Chinese privet (*Ligustrum sinense*) shrubs along the stream banks.

The watercourse in the south is a bunded seepage area with ephemeral overland flows into the bunded area. The seepage area was dry, after a period of prolonged rainfall and does not appear to be part of a stream or a permanent or semi-permanent wetland. The downstream reach was on the adjacent property outside of the Plan Change 12 area.

Within the wider landscape context, the site lies on the edge of the urban residential area. The majority of neighbouring sites consisted of residential dwellings and vacant sites in the process of being developed.

¹ This report is subject to the Report Limitations provided in Appendix A.

This plan has been prepared by Boffa Miskell Limited on the specific instructions of our Client. It is solely for our Client's use in accordance with the agreed scope of work. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate. No liability or responsibility is accepted by Boffa Miskell Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.



Mean Number of Bat Passes Per Night (μ)

- • ≤ 0.000000
- • ≤ 0.050000
- • ≤ 0.100000
- • ≤ 0.850000
- T2 Boundary

2. METHODOLOGY

Preliminary site assessments for the project were undertaken by Boffa Miskell in early 2020². To ground truth the findings of this initial assessment, ENZL undertook a secondary site walk over on 30th July 2020. During this walk over, terrestrial and aquatic features were identified, and their associated structure, composition, quality and value were documented. Both terrestrial and aquatic ecological values were then assessed in order to evaluate the potential, actual, direct or indirect impacts associated with the proposed development.

In conjunction with site assessments, a desktop review was undertaken to ascertain information relating to the site's ecological characteristics.

Existing information reviewed included:

- DOC Bio-web Herpetofauna database;
- DOC Bat database;
- iNaturalist New Zealand; and
- New Zealand Freshwater Fish Database.

2.1. Terrestrial

On-site investigation of indigenous fauna communities included opportunistic observations of species encountered, general habitat evaluations, bird species presence and manual habitat searches for native lizards in suitable habitat. In addition to faunal assessments, on-site vegetation communities were identified and visually assessed for their botanical and biodiversity values.

Potential bat roost trees were risk rated during ENZL's site investigation (30 July 2020) in accordance with industry best practice methodologies³. Risk rating was undertaken by Simon Chapman, Principal Ecologist, who is listed on the Department of Conservations database of competent bat ecologists as a Level E (Trainer) bat ecologist.

2.2. Aquatic

A high-level assessment was carried out across the site's watercourses by ENZL, to validate the findings of the Boffa Miskell reporting. This primarily included the classification of aquatic features as ephemeral, intermittent or permanent, the documentation of overall aquatic quality, and the likely presence of native fish based on available habitat.

² Boffa Miskell, Automatic acoustic long-tailed bat survey and potential ecological Constraints, June 2020

³ Lindberg, S., Davies, F., & Eccles, G. (2017). Effects of land transport activities on New Zealand's endemic bat populations: reviews of ecological and regulatory literature October 2017.

3. ASSESSMENT OF EFFECTS METHODOLOGY

3.1.1. EIANZ Assessment

The assessment of effects on both terrestrial and aquatic values was undertaken against the Ecological Impact Assessment (EclA) guidelines (second edition, May 2018, EIANZ). The guidelines provide a transparent stepwise approach to evaluate the level of ecological effect, providing insight into the feasibility and the management of effects through avoidance, mitigation and biodiversity offsetting. These guidelines have been adopted to allow for expert judgement and the consideration of implications under New Zealand's Wildlife Act 1953.

3.1.2. Values Assessment

Four matters were used to determine the value of the ecological features present on-site, these being 'Representativeness, Rarity/distinctiveness, Diversity and Pattern, and Ecological Context'. To assign value under each of these four matters, an explanation on each matter and a series of attributes are provided for consideration in Table 4 of the EIANZ guidelines. A scoring system provided in Table 6 of the guidelines requires the combination of these assessment values to provide an overall assignment of ecological value to each feature.

3.1.3. Magnitude of Effects Assessment

An assessment of the magnitude of effects was evaluated with the consideration of impacts on identified ecological values. Impacts were considered in the context of the project footprint. Impacts are considered against several factors including:

- The scale of impacts (i.e. the real extent of the Project footprint)
- The extent or proportion of habitat loss versus local availability (e.g. the proportion of habitat loss relative to the contiguous habitat that remains)
- The duration of impacts (e.g. permanent versus temporary)
- The intensity of the unmitigated effect (i.e. the extent to which habitat loss within the Project footprint was complete or partial)

3.1.4. Overall Level of Effects Assessment

An overall level of effects assessment was undertaken using a matrix which weights the assessed ecological values against the magnitude of effects. A level of effect was determined for both unmitigated (i.e. in lieu of any avoidance, mitigation or offsetting measures being implemented) and mitigated. This assessment framework allowed for effects to be ranked on a gradient from 'Negligible' to 'Very High' and provided justification for avoidance, mitigation and offsetting requirements as appropriate.

4. ECOLOGICAL ASSESSMENT OUTCOMES

4.1. Terrestrial

4.1.1. Terrestrial Vegetation

Vegetation across the site was of low ecological quality and very low diversity with low pest plant impacts. Vegetation within the Plan Change 12 footprint was dominated by rye grass pasture with scattered exotics in the pasture. The vegetation along the watercourses included

poplar (*Populus* sp), crack willow (*Salix fragilis*), and occasional pine (*Pinus* sp) and *Acacia* species. Native sub-canopy vegetation consisted of karamu, mapou (*Myrsine australis*), and hangehange (*Geniostoma ligustrifolium*). Native ground cover was limited on-site to pasture grasses, blackberry (*Rubus fruticosus* agg.) and pastoral weeds, such as thistle dominating.

Pest plant⁴ presence was low throughout the site. Documented species were limited to occasional woolly nightshade (*Solanum mauritianum*), and blackberry.

The quality of the on-site vegetation was considered low overall. The vegetation was dominated by ryegrass pasture and exotic plant species along fence lines and areas where farm stock had been excluded. There was a low abundance and diversity of native plant species. There were no At-Risk or Threatened plant species observed at the site.

4.1.2. Terrestrial Fauna

4.1.2.1 Chiroptera (Bats)

The long-tailed bat is classified as "Threatened – Nationally Critical" (O'Donnell et al., 2018) due to predation, habitat degradation and/or habitat loss. Native bats are 'absolutely protected' under the Wildlife Act (1953). No notable bat habitat was identified on the site.

Boffa Miskell undertook an acoustic bat survey in early May 2020⁵. A total of 23 bat passes were recorded across all survey locations during the entire survey period. Bat activity was recorded at six out of the 12 survey locations, ranging from 0.05 ± 0.05 to 0.85 ± 0.60 average bat passes per night (\pm standard error of the mean [SEM]; Appendix 1 and 3).

Bat activity was detected by the seepage area and ephemeral drain within the southern extent of the project site featuring large oak, poplar and acacia trees (Automated Bat Monitor - ABM 1); by the pond towards the northern range of the site featuring large oak and poplar trees; and along the gully wetland vegetation, the driveway avenue and within the garden in the northern extent of the site featuring mature swamp cypress, willow, oak and other exotic trees (north of ABM 6) (Appendix 1)⁵. The highest level of bat activity (0.85 ± 0.60 average bat passes per night) was recorded by the seepage area within the southern extent of the site (ABM 1: (Appendix 1 and 3)⁵. ABMs that recorded at least one call, detected activity between one (5%) and two (10%) survey nights (Appendix 3)⁵.

One potential feeding buzz call was recorded at ABM 10 by the northern border of the site (Figure 2)⁵. No social calls were recorded during this survey, and no bat activity was detected within one hour of sunset or one hour of sunrise (this could indicate no roosting nearby) at any of the monitored locations during this survey⁵.

Temporal distribution of detected bat activity throughout the night for each survey location are provided in Appendix 4 of the Boffa Report⁵. During the survey period, low levels of bat activity were detected. Long-tailed bats appear to be using the ephemeral farm pond on the southern watercourse for infrequent hawking for insects around the farm pond and rare detections along the northern watercourse. During this survey period, no activity was detected

⁴ Waikato Regional Pest Management Plan, 2014-2024

⁵ Boffa Miskell, Automatic acoustic long-tailed bat survey and potential ecological Constraints, June 2020

that would indicate roosting on-site, and no clear evidence of intensive foraging within the site.

Lower levels of bat activity are to be expected for surveys conducted during colder weather conditions outside the optimal bat monitoring season (November to April). Therefore, these survey results do not allow any conclusions about the level of bat activity and how habitat features throughout the site would be utilised by bats during warmer months.

ENZL undertook a potential bat roost tree survey on 30th July 2020. As part of this survey all trees on-site were risk rated for their potential to provide suitable bat roosts. The timing of the survey aligned with the time of the year where deciduous exotic trees on-site had shed their leaves, enabling a clearer assessment of possible roosting features. No potential bat roost trees were recorded.

4.1.2.2 Avifauna (birds)

The current land-use within the project site is predominantly pasture for grazing cattle with a few areas of tall, mature vegetation dominated by exotic trees, several residential gardens, a pond, and two areas of wetlands/waterways. A lack of vegetation diversity likely limits year-round food sources and a lack of habitat limits the diversity and abundance of indigenous bird species. The bird species assemblage using the Plan Change 12 area comprised of a typical mix of common native and exotic species. No At Risk or Threatened bird species were observed during the site walk-over by Ecology New Zealand or Boffa Miskell and it is unlikely that any of these species would be more than transient visitors to the site.

Table 1: Avifauna seen/heard on-site.

Common Name	Latin Name	Threat status
Australian magpie	<i>Gymnorhina tibicen</i>	Introduced & Naturalised
European goldfinch	<i>Carduelis carduelis</i>	Introduced & Naturalised
Grey warbler	<i>Gerygone igata</i>	Indigenous & Not Threatened
House Sparrow	<i>Passer domesticus</i>	Introduced & Naturalised
Mallard	<i>Anas platyrhynchos</i>	Introduced & Naturalised
Myna	<i>Acridotheres tristis</i>	Introduced & Naturalised
North Island fantail	<i>Rhipidura fuliginosa placabilis</i>	Indigenous & Not Threatened
Pukeko	<i>Porphyrio melanotus</i>	Indigenous & Not Threatened
Ring-necked pheasant	<i>Phasianus colchicus</i>	Introduced & Naturalised
Song Thrush	<i>Turdus philomelos</i>	Introduced & Naturalised

Common Name	Latin Name	Threat status
Spur-winged plover	<i>Vanellus miles</i>	Indigenous & Not Threatened
Tūi	<i>Prothemadera novaeseelandiae</i>	Indigenous & Not Threatened
Welcome swallow	<i>Hirundo neoxena</i>	Indigenous & Not Threatened

4.1.2.3 Herpetofauna (lizards)

The habitat quality for lizards throughout the site is generally poor due to historical vegetation removal and high modification of the area. Nonetheless, habitat suitable for the native copper skink (*Oligosoma aeneum*) (Not threatened) is present at some localities on the site⁶. This native species is known to live in farmland and residential environments utilising habitats such as weedy areas, artificial and natural debris, rank grass, compost piles, and residential gardens⁷. While this species is 'Not Threatened' (Hitchmough et al., 2016), all native lizard species are 'absolutely protected' under the Wildlife Act (1953) and any lizard habitat is protected by the Resource Management Act (1991). Likewise, plague skink (*Lampropholis delicata*), which is an exotic unwanted organism, are likely present within the project site.

The table below outlines the species likely to occur on-site and their corresponding conservation status.

Table 2: Reptile species potentially utilising the Plan Change 12 site.

Common Name	Scientific Name	Conservation Status
Copper Skink	<i>Oligosoma aeneum</i>	Not Threatened
Plague Skink	<i>Lampropholis delicata</i>	Introduced and Naturalised

Habitats suitable for copper skink are as follows (ABM locations have been used as reference points and are mapped in Figure 1).

- ephemeral drain / seepage – complex dense vegetation, woody debris and rank grass surrounding ABM 1;
- residential gardens – debris, complex ground covers, compost piles and dense vegetation – locations near ABM 3 and 12; and
- pond and wetland/stream – debris, rank grass, complex vegetation – ABM 6 to 9.

⁶ Hitchmough, R.; Barr, B.; Lettink, M.; Monks, J.; Reardon, J.; Tocher, M.; van Winkel, D.; Rolfe, J. 2016: Conservation status of New Zealand reptiles, 2015. New Zealand Threat Classification Series 17. Department of Conservation, Wellington. 14 p

⁷ Van Winkel, D., Baling, M., & Hitchmough, R. (2020). Reptiles and Amphibians of New Zealand. Bloomsbury Publishing.

4.2. Aquatic

4.2.1. Freshwater (waterways, wetlands, and fish)

Freshwater ecosystem south

In the southern portion of the site near ABM 1 there is an ephemeral seep and drain that may periodically hold water for short periods of time throughout the year (Figure 1). However, this watercourse was dry when observed during heavy rain on 5th May (Boffa Miskell 2020) and July 30th (ENZL).

Freshwater ecosystem north

In the northern portion of the site near ABM 6 there was a large pond and downstream of this was an ephemeral or intermittent waterway, with associated riparian wetland, flowing towards the Mangapiko stream (Figure 1).

Native fish species that may be present in these habitats include longfin eel (At Risk – Declining), shortfin eel (Not Threatened), and black mudfish (At Risk - Declining)⁸.

4.3. Terrestrial Values Assessment

In assigning ecological value to identified terrestrial features across the subject site, the ecological matters of Representativeness, Rarity/Distinctiveness, Diversity and Pattern, and Ecological Context have been considered, based on the EIANZ 2018 guidelines.

The table below outlines the ecological values assigned to the identified ecological features of terrestrial vegetation, chiroptera (bats), avifauna (birds), and herpetofauna (lizards). The overall values assigned consider the ecological matters at an ecosystem/vegetation type, species and fauna habitat level as summarised in Table 3 below.

Table 3: Terrestrial values at Te Awamutu Plan Change 12 site

Feature	Representativeness, Rarity/distinctiveness, Diversity and Pattern, Ecological Context:	Value
Terrestrial Vegetation	Low diversity of native vegetation presence. Most of the site was covered in exotic pasture grasses.	Low
Bats	Long tailed bats (Nationally Threatened – Critical) recorded on site. Less than one bat pass per night recorded at one ABM, with most ABMs recording no bat activity. No suitable roosting or nesting habitat for long-tailed bats noted.	Very High
Avifauna	There were no threatened avifauna recorded at the site, and only low numbers and diversity of native species recorded. There was minimal indigenous bird feeding, roosting or nesting habitat.	Low

⁸ Dunn, N.R.; Allibone, R.M.; Closs, G.P.; Crow, S.K.; David, B.O.; Goodman, J.M.; Griffiths, M.; Jack, D.C.; Ling, N.; Waters, J.M.; Rolfe, J.R. 2018: Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Department of Conservation, Wellington. 11 p

Lizards	Suitable habitat is sparse on-site for ground-dwelling lizard species. Species on-site are likely limited to copper skinks.	Low
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4.4. Aquatic Values Assessment

Likewise to section 4.3, in assigning of ecological value to identified aquatic features across the subject site, the following matters were considered: Representativeness, Rarity/Distinctiveness, Diversity and Pattern, and Ecological Context, based on the EIANZ 2018 guidelines. The table below outlines the ecological values assigned to the identified aquatic ecological features being Freshwater ecosystem north, Freshwater ecosystem south, and indigenous fish.

Table 4: Freshwater values at Te Awamutu Plan Change 12 site

Feature	Representativeness, Rarity/distinctiveness, Diversity and Pattern, Ecological Context:	Value
Freshwater ecosystem North	Farm pond and ephemeral or intermittent stream grazed along most of its length, peripheral wetland areas and is a headwater reach of the Mangapiko Stream.	Moderate
Freshwater ecosystem South	Ephemeral farm pond. Dry during winter 2020. Upper reach of overland flow path on adjacent property.	Low
Indigenous fish	A detailed survey of indigenous fish species presence was deemed outside the scope of this assessment. Potential habitat available for indigenous fish.	Moderate

5. ASSESSMENT OF EFFECTS

5.1. Terrestrial Effects

5.1.1. Vegetation Clearance

The proposed plan change provides for the removal of exotic and pest plant dominated vegetation, as well as a small number of low ecological value natives to facilitate development of urban settlement on rural land. Development of the site will not impact vegetation of high botanical significance.

5.1.2. Birds

Future earthworks and vegetation clearance on-site will result in a loss of low value habitat and resources for indigenous avifauna utilising the site. The impacted vegetation is noted to only support common native and exotic species. Vegetation clearance may cause impacts on nesting birds and their eggs during the breeding season.

5.1.3. Lizards

Future earthworks and vegetation clearance on-site will result in loss of potential habitat and resources for resident lizards which may be utilising the site. In addition, vegetation/habitat clearance has the potential to result in lizard mortality.

5.1.4. Bats

No bat roost habitat has been identified across the project footprint. As such, any associated vegetation clearance is unlikely to have a direct impact on bats (i.e. injury or mortality associated with felling an occupied roost).

On a conservative basis, the proposed change in land-use within the project site may potentially have indirect impacts on long-tailed bats. This being associated with loss or degradation of commuting and/or potential foraging across the site; and ongoing disturbance from artificial light that may result in bats avoiding illuminated areas. These potential effects may lead to decreased bat activity; a change in how the project site is utilised by bats; or the complete avoidance of the project site by bats.

5.2. Aquatic Effects

Aquatic impacts which may occur across the project site include the loss of aquatic habitat for indigenous fish, potential mortality of native fish during stream works, and the loss of wetland habitat.

6. MAGNITUDE AND LEVEL OF UNMITIGATED EFFECTS

6.1. Terrestrial

The proposed Plan Change providing for urban subdivision has a low to very low risk of mortality of one or more fauna species and permanent or temporary loss of vegetation and fauna habitat. The magnitude of unmitigated effects and associated level of effect on terrestrial values is summarised below. Due to their threat status, impacts on bats have been broken in habitat impacts and injury/death impacts associated with vegetation clearance.

Table 5: Summary of the magnitude of unmitigated effects and the associated level of effect on terrestrial values.

Feature and associated impact	Ecological Value	Magnitude of Effect (un-mitigated)	Level of Effect	Comment
Terrestrial Vegetation	Low	Low	Very Low	Minor and minimal shift from baseline conditions.
Birds	Low	Low	Very Low	Minor and minimal shift from baseline conditions
Lizards	Low	Low	Very Low	Minor and minimal shift from baseline conditions.
Bats – habitat loss	Very High	Moderate	High	Major alteration of key elements/features of existing baseline condition

Bats - potential injury/death	Very High	Negligible	Low	Very slight change from existing baseline condition.
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6.2. Aquatic

The proposed Plan Change providing for urban subdivision has a low to very low risk of mortality of one or more fauna species and permanent or temporary loss of fauna habitat. The magnitude of unmitigated effects and associated level of effect on aquatic values are summarised below.

Table 6: Summary of the magnitude of unmitigated effects and the associated level of effect on aquatic values.

Feature and associated impact	Ecological Value	Magnitude of Effect (un-mitigated)	Level of Effect	Comment
Freshwater ecosystem south	Low	Low	Very Low	Minor and minimal shift from baseline conditions.
Freshwater ecosystem north	Moderate	Moderate	Moderate	loss or alteration to one or more features of the existing baseline conditions.
Indigenous Fish – Potential death/injury	Moderate	Moderate	Moderate	loss or alteration to one or more features of the existing baseline conditions.

7. MANAGEMENT OF EFFECTS

The overall level of effect under EIANZ is to be used as a “*guide to the extent and nature of the ecological management response required (including the need for biodiversity offsetting)*”. Where Regional or District Plans do not provide specific guidance for the management of effects a suggested guide is:

- For Very High levels of effect:
 - “...unlikely to be acceptable on ecological grounds alone (even with compensation proposals). Activities having very high adverse effects should be avoided.”
- For High or Moderate levels of effect:
 - Such an effect could be managed through avoidance, design, or extensive offset or compensation actions. Wherever adverse effects cannot be avoided, no net loss of biodiversity values would be appropriate.
- For Low or Very Low levels of effect:
 - “...should not normally be of concern, although normal design, construction and operational care should be exercised to minimise adverse effects.”

The need for management of effects also takes into consideration the protection of native fauna under the Wildlife Act 1953.

Whilst the majority of effects on terrestrial values are below the level of effect which would cause concern under the EIANZ guidelines, one effect will require mitigation measures. Due to the likely occurrence of native Bats within the site, which are protected under the Wildlife Act (1953), mitigation measures are required.

Impacts associated with aquatic features are below those requiring mitigation for the freshwater ecosystem to the south of the site. Impacts which do require management are largely associated with those of the higher quality areas found within the northern freshwater ecosystem and those associated with impacts on indigenous fish.

Recommendations to avoid and mitigate the effects from the proposed Plan Change are outlined in Section 7.1 and 7.2 below.

7.1. Terrestrial

7.1.1. Vegetation Clearance

Vegetation clearance will not require specific mitigation measures due to the low-quality vegetation communities present across the site.

7.1.2. Bat management

No potential bat roost trees were recorded within the site. Consequently, implementation of specific vegetation removal protocols for the management of bats is not required prior to vegetation clearance. However, development of the site has the potential to displace or disturb potential bat utilisation of the site. Therefore, Table 7 below summarises the need for further survey work to assess potential impacts on long-tailed bats, and potential options for the management of these impacts.

Table 7: Bat management options

Management options	Comments
Completion of further automated bat surveys (Nov-April).	These should be undertaken to provides more certainty on the use of the site by long-tailed bats. At current, bat utilisation is very low.
Stormwater pond design to provide better feeding habitat.	Open water areas with robust planting around them can increase invertebrates in these areas which bats feed on. Open areas of still water can be used by bats for nightly drinking.
Incorporation of low lumen, directional lighting design for external lights. Street lighting to be avoided/minimal where required.	Reduces the level of disturbance on bat commuting and foraging across the site; and specifically, near aquatic features that bats may utilise.

7.1.3. Birds

While bird management is not required under the EIANZ guidelines, all native birds are protected under the Wildlife Act (1953). Consequently, vegetation removal should be undertaken outside the bird breeding season (October – April). Where this cannot be undertaken, all woody vegetation to be removed should be inspected by an experienced ecologist to ensure they are free of active nests. Where active nests are found, these should be retained until chicks have fledged.

Landscaping and planting around stormwater detention ponds and along water courses is likely to provide positive effects for native and introduced birds on the site and it may attract additional species.

7.1.4. Lizards

Native lizards have not been confirmed to occur on-site; however, habitat is available throughout the site for ground-dwelling lizards. Therefore, a targeted survey for lizard species should be undertaken. Should they be detected, a Lizard Management Plan should be prepared by an appropriately qualified and experienced ecologist, outlining lizard management to be undertaken before and during vegetation removal. Any native lizards encountered could be relocated into habitat of equal or greater quality on-site.

7.2. Aquatic

Indigenous fish have not been confirmed to occur on-site; however, habitat is potentially available, particularly within the feature identified as freshwater ecosystem north. Targeted fish surveys should be undertaken within suitable months to determine species presence and densities. Subsequent to the findings of these surveys, a Fish Management Plan may need to be prepared by an appropriately qualified and experienced ecologist, outlining fish management to be undertaken before and during earthworks. Any indigenous fish encountered could be relocated into suitable habitat within the same watercourse, outside the proposed development site.

8. POST-MITIGATION MAGNITUDE OF EFFECTS

8.1. Terrestrial & Freshwater

The post-mitigation level of effects is outlined in **Error! Reference source not found.** 8 below. As a result of the management options outlined above, the levels of effect are expected to decrease to very low or low for all ecological features identified, under EIANZ guidelines. As such, no further management of residual effects is required. It shall be noted that, these mitigation options will be addressed in more detail and incorporated as necessary as part of subsequent resource consent applications.

Table 8: Mitigated level of effects of proposal on terrestrial and freshwater values.

Impact	Ecological Value	Suggested Management	Magnitude of (mitigated) Effect	Level of Residual Effect
Vegetation clearance	Low	Stormwater and landscape planting including enhancement and infill planting	Low	Very Low
Avifauna	Low	Vegetation clearance protocols and avoid nesting season	Low	Very Low
Lizards	Low	Develop and implement Lizard Management Plan prior to vegetation clearance	Low	Very Low
Bats	Very High	See Table 7	Negligible	Low
Freshwater	Moderate	Develop and implement Fish Management Plan prior to earthworks	Low	Low

9. CONCLUSION

This report provides an ecological impact assessment associated with the proposed Plan Change 12 between Pirongia and Frontier Roads, Te Awamutu. Overall, the value of terrestrial ecological features on the site are considered very high to low. This effects assessment is based on the limited amount of vegetation clearance required and the presence of exotic plant dominated ecosystems within the site, the absence of threatened native bird and lizard species and the absence of potential long-tailed bat roosting habitat. The ecological effects on terrestrial and aquatic values attributable to the proposed plan change and subsequent consented development, after the implementation of recommended mitigation and management actions, are considered to be low to very low in accordance with the EIANZ impact assessment methodology. With the implementation of appropriate ecological management, it is expected that any negative effects associated with the proposed plan change and subsequent development can be adequately managed.

APPENDIX A

Report Limitations

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