

REVIEW OF TERRESTRIAL EFFECTS AND PROPOSED MITIGATION FOR PROPOSED IMPROVEMENTS ALONG THE PINEHAVEN STREAM



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REVIEW OF TERRESTRIAL EFFECTS AND PROPOSED MITIGATION FOR PROPOSED IMPROVEMENTS ALONG THE PINEHAVEN STREAM

DRAFT

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1. INTRODUCTION

Urban Edge Planning Ltd is processing a Notice of Requirement application for Upper Hutt City Council and Greater Wellington Regional Council for stream improvements along the Pinehaven Stream (see Figure 1) and require a review of the following:

- Ecological effects associated with vegetation removal: two reports, one by Forbes Ecology (2019) on vegetation and one by Aristos Consultants (2017) on birds. A summary of these reports is also provided by Jacobs New Zealand Ltd.
- Suitability of proposed replanting (from the stream bank edge landward).
- Suitability of the proposed riparian planting plan, monitoring and maintenance (this is for Greater Wellington Regional Council).



Figure 1: Designation extent overview of the proposed works corridor (DCM Urban 2019).

The review is set out using headings similar to above, as well as using headings from the assessment of terrestrial ecology by Forbes Ecology (2019) and Aristos Ecology (2017). This review provides advice as to whether the terrestrial ecological effects relating to vegetation removal and associated with the different council jurisdictions are going to be mitigated appropriately.

2. ECOLOGICAL EFFECTS ASSOCIATED WITH VEGETATION REMOVAL

2.1 Forbes Ecology Report

1. INTRODUCTION

This section describes the broad scope to the works planned and describes vegetation within the works corridor as being generally planted within private gardens. It states that planted vegetation is beyond the scope of an assessment of ecological effects, and that the report is focussed only on mature or remnant indigenous trees which cannot, or are unlikely to be avoided by the stream improvement works. The report does not address potential effects on indigenous birds as this has been covered in a separate report (Aristos Consultants 2017).

The report does not assess the ecological significance of the planted garden vegetation as habitat for significant indigenous fauna, such as lizards and insects. It is highly likely that lizards, including threatened species, will be utilising this habitat.

2. METHODS

2.1 Site visits

This section seems appropriate.

2.2 Ecological values assessment

This section briefly describes the Environment Institute of Australia and New Zealand (EIANZ) 2018 guidelines for evaluation of the ecological significance of mature or remnant indigenous trees within the works corridor.

This section seems to be appropriate.

2.3 Ecological significance assessment

This section describes Policy 23 of the Wellington Regional Policy Statement (RPS). This is a statutory document and Policy 23 sets out criteria for classification of significant indigenous ecosystems and habitats. It does not describe the rules in the Upper Hutt District Plan regarding urban trees and urban tree groups.

The report recognises the RPS significance process as binary (significant or not significant) but fails to recognise the potential of planted gardens to provide habitat for significant indigenous species. There are a number of urban tree groups within the works area (Figure 2).



Figure 2: Urban Tree Groups from the Upper Hutt District Plan. The arrows show two groups which lie along the stream¹.

2.4 Ecological effects significance

This section describes the EIANZ guidelines relating to assessing level of ecological effects.

This section seems to be appropriate.

2.4.1 Ecological management response

This section describes EIANZ guidance on determining levels of effects.

This section seems to be appropriate.

3. INDIGENOUS VEGETATION AND HABITATS

3.1 Ecological values

3.1.1 Indigenous trees

This section describes trees which may potentially be affected by the proposed works including: eight kōwhai (*Sophora microphylla*), three black beech

¹ <https://www.upperhuttcity.com/Services/Tree-Management>

(*Fuscospora solandri*), and one kahikatea (*Dacrycapus dacrydioides*). All but one of the trees are described as having low ecological value, based on their conservation status. One black beech is described as having moderate ecological value due to its age. This tree has protected status in the Upper Hutt District Plan.

It would be useful if the following further information could be provided:

- The size (DBH) and approximate heights of each of these trees.
- The species and DBH of all large exotic trees likely to be removed and whether or not they are listed in the District Plan as an Urban Tree or part of an Urban Tree Group.
- Whether the trees stand alone, or are part of an area of regenerating vegetation.
- The habitat values of the individual trees.
- A description of each of the vegetation types to be affected and their relative ecological value, based on the likelihood that they provide habitat for rare fauna species as per RPS Policy 23(b).
- A map of all the vegetation types likely to be affected by works, including exotic and planted vegetation.
- A table indicating the area of each vegetation type to be affected.

3.1.2 Exotic trees

A number of oaks and firs, and one *Prunus* sp. are listed with the addresses where they were observed but without any further detail regarding what size or species they were. These trees are described as having negligible ecological value and were therefore not assessed in terms of ecological effects.

It would be useful if the following further information could be provided:

- The species and DBH (and approximate heights) of all large exotic trees likely to be removed.

4. ECOLOGICAL SIGNIFICANCE ASSESSMENT

4.1 Assessment of GWRC RPS Policy 23

The trees have been assessed from a botanical and vegetation type perspective but not in terms of ecological habitat provision and the fauna species which could potentially utilise the habitat. Only black beech trees were determined to be significant and this was due to black beech forest being classified as Regionally Vulnerable under the Threatened Environment classification for New Zealand (Walker *et al.* 2015).

The value of the vegetation as habitat for rare fauna has not been discussed c.f. RPS Policy 23(b).

5. VEGETATION CLEARANCE EFFECTS

5.1 Clearance or modification of Indigenous vegetation and habitats

5.1.1 Magnitude of adverse effects

Tree removal is recognised as being irreversible and of permanent duration. No effects are anticipated beyond the physical loss of the affected trees. For a larger than individual property scale, the magnitude of these losses is described as being negligible.

It would be useful if the habitat value of all of the vegetation to be lost, particularly for lizards, was assessed.

5.1.2 Levels of adverse effects

The level of effects relating to tree removal is described as low. Effects during the construction period are not addressed.

It would be useful if all other effects relating to habitat loss were addressed.

6. EFFECTS MANAGEMENT

6.1 Mitigation and offsetting principles and frameworks

6.1.1 The mitigation hierarchy

This section describes the Business and Biodiversity and Offsets Programme (2012¹) good practice measures to manage effects using the mitigation hierarchy.

This section seems adequate.

6.2 Management of effects

This section describes efforts made during the design stage to avoid the loss of trees. It states that the loss of remaining trees can be managed on the basis of rehabilitation/restoration plantings. A replacement ratio of 3:1 is suggested for the eight kōwhai that will be removed, 10:1 for the three black beech trees, and 5:1 for the single kahikatea.

It is usual for the compensation ratio to refer to the area of vegetation/habitat lost, rather than the number of trees. It appears that this is the only mitigation being recommended in the report.

¹ <http://bbop.forest-trends.org/>

6.3 Proposed rehabilitation/restoration treatments

Plant provenance is discussed in this section.

This section is adequate.

6. CONCLUSION

This section summarises the rehabilitation/restoration treatment and concludes that if it follows the recommended replanting ratios it will adequately compensate for the loss of thirteen indigenous trees.

This section should be revised to address the further information requests above.

SUMMARY COMMENTS ON THE FORBES ECOLOGY REPORT

This report would benefit from consideration of the values of indigenous and introduced vegetation, including planted vegetation, as habitat for indigenous fauna, and the effects of removal of those habitats on fauna, particularly lizards. A full description of the various vegetation types that will be lost from the works corridor would be helpful along with a quantification of the area of each vegetation type.

There is a high likelihood that terrestrial skinks will be adversely affected by the project. Exotic rank grasslands, flaxes, and other ground cover will likely contain lizard populations. These lizards are most likely to be terrestrial skinks, especially the northern grass skink (*Oligosoma polychroma*, Not Threatened¹) and copper skink (*O. aeneum*, Not Threatened). However, ornate skink (*O. ornatum*, At Risk-Declining) are possibly also present.

Arboreal geckos are less likely to be affected by the removal of trees, as they are typically in poor abundance in urban / peri-urban environments. The most likely arboreal geckos are the ngāhere gecko (*Mokopirirakau* 'southern North Island', At Risk-Declining) and barking gecko (*Naultinus punctatus*, At Risk-Declining). There are records of all these species in Pinehaven and adjacent suburbs and foothills. A lack of records for the works corridor does not necessarily mean that lizards are not present.

A lizard survey of the works corridor should be required as a condition of consent:

- To assist with the preparation a lizard management component in the Ecological Management Plan if lizards are found to be present.
- To secure a Wildlife Act Authority (Wildlife permit) for the project, if lizards are present.

Please note that processing of a Wildlife Act permit application typically requires at least three months. If lizards are not found to be present during the survey there is no need to undertake any further work nor secure a Wildlife Act permit for lizards.

¹ Hitchmough *et al.* 2016

2.2 Aristos Consultants report

1. **INTRODUCTION**

This provides an introduction to the proposed works.

This section seems appropriate.

2. **BACKGROUND**

2.1 **Pinehaven catchment and bird habitat**

This describes the locale surrounding the stream.

This section seems appropriate.

2.2 **Proposed stream works**

This section is very brief and contains a note to the effect that it will be updated once engineering plans have been finalised.

This section does not contain any reference to the area of land likely to be affected or the proportion of this which may provide habitat for birds.

3. **METHODS**

3.1 **Field survey**

This contains information on the sites and dates of all bird counts undertaken and a map showing the sites.

This section seems appropriate.

3.2 **Literature search and other information sources**

This section describes various databases consulted and anecdotal evidence of birds in the locale.

This section seems appropriate.

3.3 **Data analysis**

This section describes data and restrictions on analysis which mean that sites cannot be compared but the data as a whole provides a baseline for future monitoring.

This section seems appropriate.

4. RESULTS AND DISCUSSION

4.1 Field survey

This section provides a generalised description of bird habitat along the works corridor and presentation of bird count data.

This section seems appropriate.

4.2 Bird records from Pinehaven catchment

4.2.1 Wi Tako Reserve

This section provides a description of bird habitat and bird count data for the reference site, Wi Tako Reserve.

This section seems appropriate.

4.2.2 Pinehaven catchment

This section provides a description of bird habitat and bird records from desktop research.

This section seems appropriate.

4.3 Bird species diversity and relative abundance

This section compares results from each of the bird count stations.

This section seems appropriate.

4.4 Effects of proposed structural works on bird ecology

As well as describing the works proposed for each section, and the effects of the works on birds, this section also covers suggestions for avoidance and mitigation. The report states that when vegetation utilised by birds for food is removed during the works, birds will switch to other sources. A table is provided listing large introduced and indigenous trees that lie within the proposed works footprint. This is based on the Jacobs NZ Ltd plans from September 2017.

It would be useful to have the following further information:

- A map and photographs showing points of reference would be useful, including Willow Park, Sunbrae Drive culvert, vegetation, and any other relevant features.
- Whether Aristos Consultants recommend the avoidance of vegetation removal during the nesting season?
- An assessment of the total area of bird habitat to be lost in the medium-term as a result of the proposed works and a discussion regarding the pressure that this will place on remaining bird habitat in the valley.

4. **SUMMARY AND RECOMMENDATIONS**

This section summarises information from previous sections including descriptions of the locale, the works corridor, bird species for both the locale and the corridor and conclusions regarding the overall effect of the works on birds in the works corridor. Effects are described as being minor to less than minor despite medium-term loss of seasonal food supply and loss of habitat until vegetation is re-established. Sites additional to the works corridor are suggested for enhancement planting and pest plant and animal control.

This section has been mis-numbered and should be Section 5.

It would be useful to have further information on the following:

- Quantification of the total area of vegetation/habitat loss and how this will affect bird populations in Pinehaven in the medium term.
- Is pest animal control recommended to increase the carrying capacity of the remaining bird habitat in Pinehaven in the medium-term to mitigate the loss of habitat along the works corridor and if so where should it be undertaken and for how long?
- What area of land is available for additional mitigation planting outside of the works corridor?

SUMMARY COMMENTS ON THE ARISTOS ECOLOGY REPORT

This report was produced in 2017 and would benefit from the inclusion of information about the areas of the various vegetation types which will be lost as a result of the proposed works. This would allow a better assessment of the medium-term effects of this on the bird populations at Pinehaven.

2.3 Jacobs NZ Ltd summary assessment of environmental effects

10.7 Ecology

10.7.1 Terrestrial ecology

Flora

This section refers to individual, large indigenous trees only.

There is no vegetation and habitat section here or in the Forbes ecology report this was taken from.

Avifauna

This section implies that there will be gaps along the works corridor created by the removal of specific trees.

Conversely, the landscape planting plans in Appendix F of the Application appear to show that almost all vegetation is likely to be removed from the works corridor.

Lizards

As neither of the ecological reports addresses lizards it is unclear where this section on the likelihood of lizards being present has come from, or what justification there is for the statement.

This section is not supported.

Bats

Neither of the ecological reports mention bats so it is unclear where this opinion on the likelihood of bats being present has come from.

No surveys have been undertaken in this area. However, there is habitat for bats to roost in higher up the catchment and also in Witako Reserve. Larger trees in the project area could possibly be potential bat roosts. It is known that bats like to hunt insects along streams with riparian vegetation.

Construction Phase

This section states that the proposed works will significantly disturb the riparian environment but that this disturbance will be temporary and is considered to be a minor adverse effect.

The following further information is required:

- An explanation of how disturbance to terrestrial habitat during construction will be mitigated in order to reduce the effects from significant to minor.

3. SUITABILITY OF PROPOSED LANDWARD REPLANTING

The resource consent application (DCM Urban Design; Appendix F) includes landscape planting plans and a plant schedule. The length of stream to be affected by the works is about one kilometre in length and flows along a narrow c.15 metres wide corridor in a residential area. The works will generally be undertaken on private property in a flood protection designated corridor.

The plan divides the planting schedule into five vegetation types: specimen trees, buffer species, climbers, riparian rarely wet, and riparian partially wet.

The list of specimen trees includes 86 plants of species which grow to heights of well over 20 metres and in time up to 50 metres tall. Along one 35 metre property boundary there are plans to plant six large podocarp trees. Twenty-one tree species are listed in the plant schedule including two exotic species. However, 47 tree species are listed in

a plant check list for nearby Wi Tako Reserve¹ and many of those are of smaller stature than those in the schedule.

The plan includes large numbers of kāpuka (*Griselinia littoralis*) (337) wharariki (*Phormium cookianum*) (168), and harakeke (*Phormium tenax*) (505). None of these species is present on any plant checklists for the area and kāpuka and harakeke are inappropriate for streamside planting in this area.

The following further information is required:

- Are there alternative sites where large stature trees might better be sited than close to dwellings?
- What area of land in the works corridor will be planted with indigenous and introduced tree species to mitigate the long-term loss of vegetation and habitat for fauna.

The following should be required as a condition of consent:

- Extended specimen and buffer planting schedules including a larger proportion of small trees and a higher diversity of species to provide year-round food for birds, and excluding kāpuka, wharariki, and harakeke, and any other indigenous trees which do not already occur locally.

4. SUITABILITY OF PROPOSED STREAMSIDE RIPARIAN REPLANTING

The DCM Urban Design (2019) landscaping plans and plant schedule include areas labelled riparian rarely wet and riparian partially wet. Examples of cross sections for these planting types are shown in Figures 3 and 4. The streambank planting plans include a mix of species that will not grow so tall as to densely shade neighbouring houses. However, the L3 Riparian 2 list includes nine species, only two of which (*Austroderia fulvida* and *Veronica stricta* var. *atkinsonii*) are naturally-occurring in the catchment. *Ficinia nodosa* and *Muehlenbeckia astonii* are both coastal species and unlikely to be successful alongside what will, at times, be a fast-flowing stream, and the *Carex* species are likely to be overwhelmed by weeds such as *Tradescantia fluminensis*. Short-stature, sun-loving species that hold the stream banks along with appropriate flood-resistant understorey species are required for this area.

In at least one area there are existing concrete structures in the stream (Plate 1). It is unclear whether or not more of such structures are planned. The planting plan (Figure 4) attempts to use plants to soften these structures. However, only extremely hardy species will survive in these arid, but occasionally inundated places. Species requiring a cool moist root run such as *Clematis paniculata* and *Metrosideros carminea* are inappropriate for such sites.

¹ See www.nzpcn.org.nz/factsheet_index.aspx

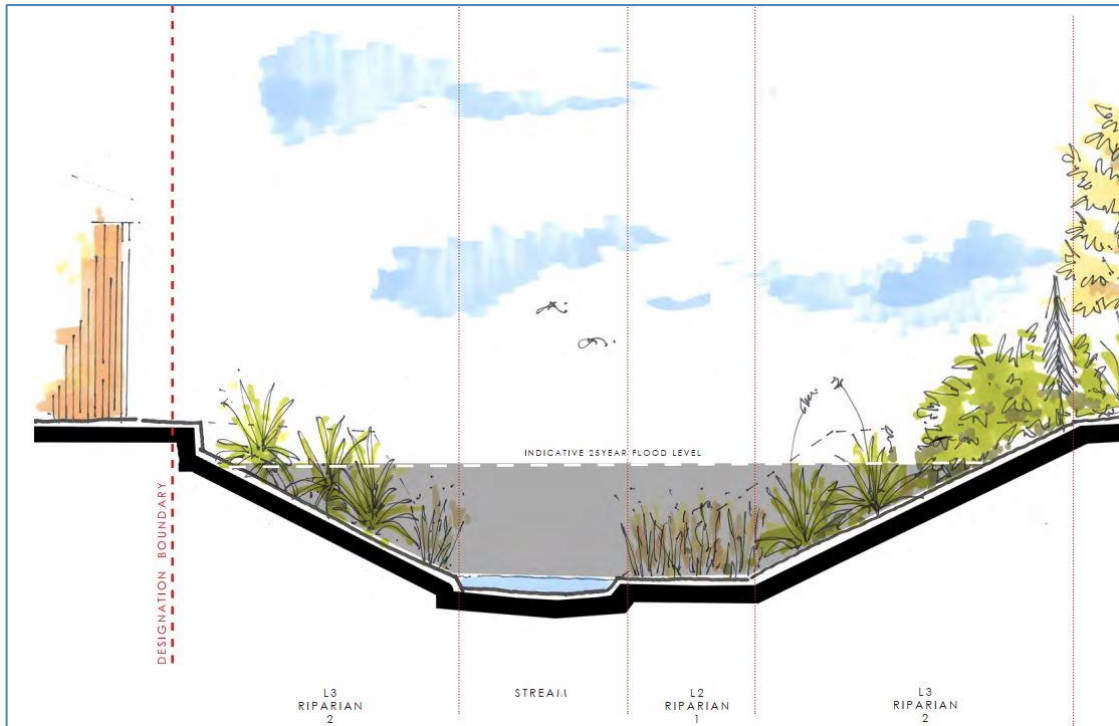


Figure 3: Planting of indigenous riparian species in the stream corridor which can tolerate wet conditions (DCM Urban Design Page 18).

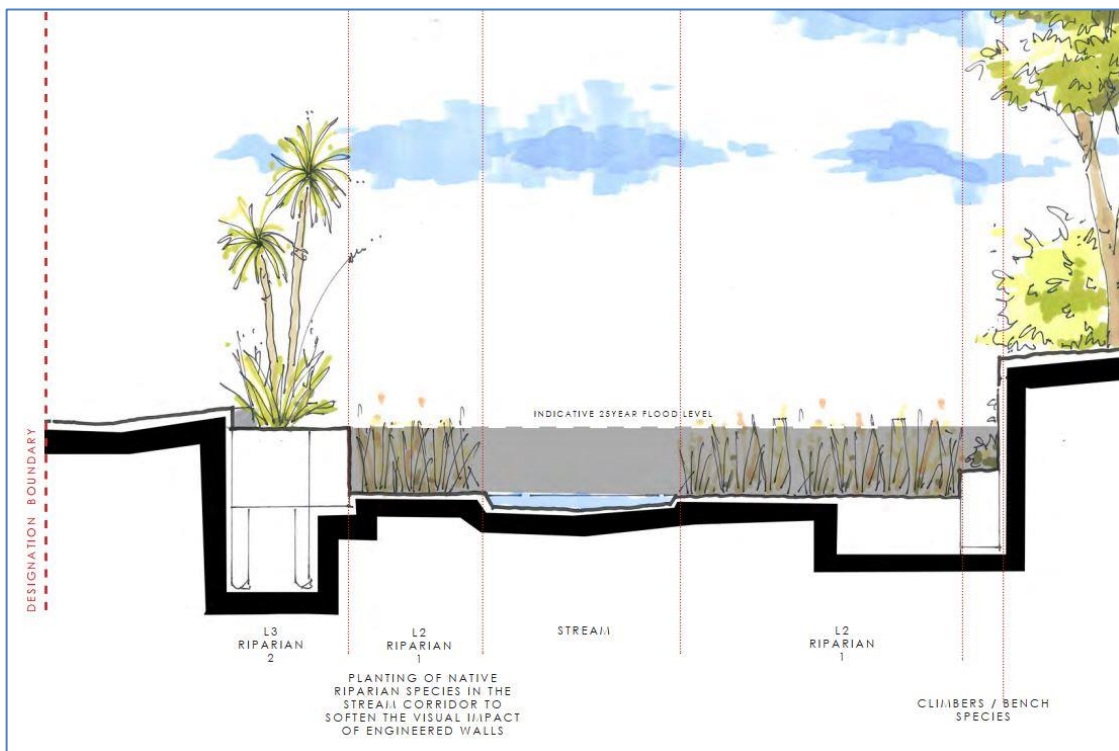


Figure 4: Planting of indigenous riparian species in the stream corridor to soften the visual impact of engineered walls (DCM Urban Design Page 30).



Plate 1: Existing concrete structures in Pinehaven Stream
(DCM Urban Design Page 14).

DCM Urban Design cross sections (Figures 4 and 5) show planting in the active channel of the stream close to the water's edge. This is inappropriate because it reduces galaxiid spawning habitat and would encourage the deposition of fine sediment.

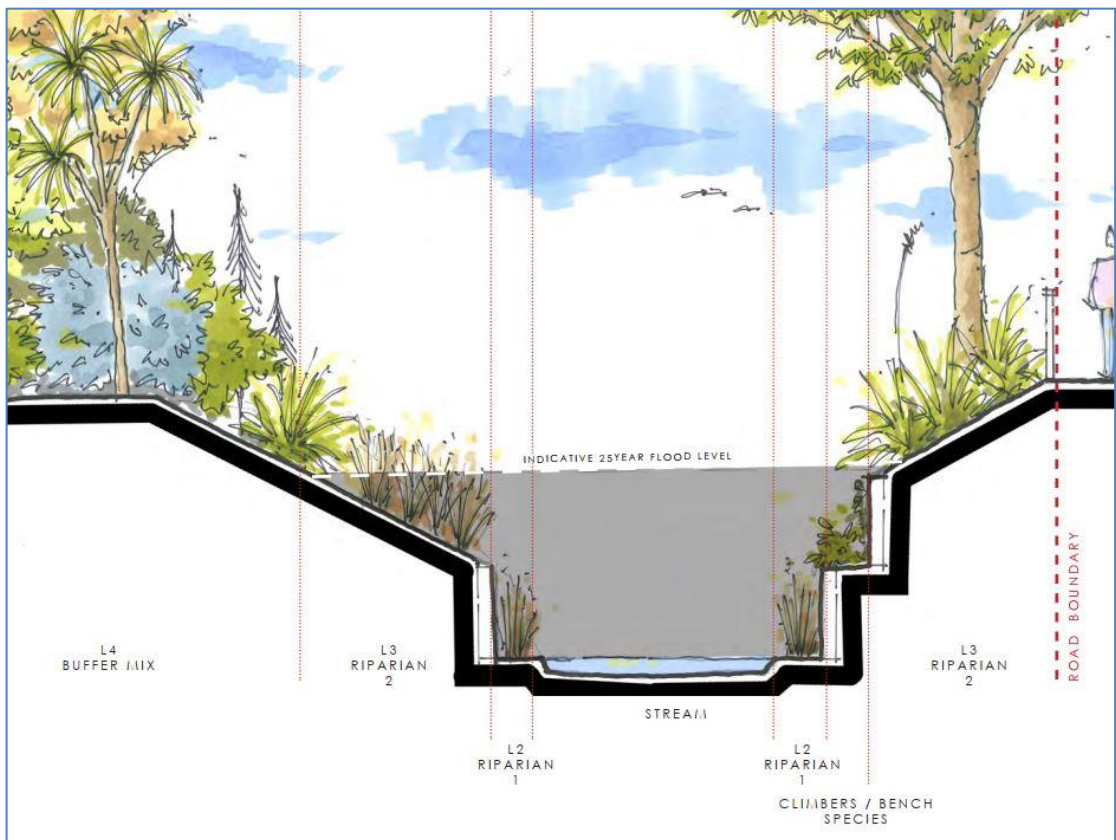


Figure 5: Planting of indigenous riparian species in the stream corridor
(DCM Urban Design Page 16).

Wharariki has been proposed for areas which are rarely wet. This species is prone to sudden collapse disease and should never be planted in massed groupings. The disease is caused by a phytoplasma (a bacterium), transmitted by the native flax plant hopper¹.

The following further information is required:

- How many areas of existing concrete structures require amenity planting?
- Are any additional planted structures planned?

The following should be required as a condition of consent:

- Bank-holding species, including tī kōuka/cabbage tree (*Cordyline australis*), mānuka (*Leptospermum scorparium*), whekī (*Dicksonia squarrosa*), kōwhai (*Sophora Microphylla*) and tutu (*Coriaria arborea*), should be planted on the upper parts of the rarely wet riparian zone along with rangiora (*Brachyglottis repanda*) and *Olearia rani*; with a sparse understorey of hook grass (*Uncinia uncinata*), *Austroderia fulvida*, rarauhe (bracken fern *Pteridium esculentum*), *Asplenium oblongifolium*, and, rarely, wharariki reaching down into the lower part of the bank.
- *Libertia grandiflora*, *Libertia ixioides*, *Uncinia uncinata*, rarauhe and *Haloragis erecta* subsp. *erecta* could be planted on and around concrete structures.
- No planting should be undertaken in the active channel, an area inundated during all, except very light, rainfall events.

Note: Indigenous species only have been recommended for stream banks as these provide the greatest amount of habitat for indigenous fauna, including insects for drift-feeding galaxiid fish.

5. SUMMARY AND CONCLUSIONS

Review of Assessment of Effects Reports

The **Forbes terrestrial ecology report** lacks descriptions of types and area of all vegetation likely to be affected by the works. Until further information is provided it is not possible to assess whether the planting proposed is adequate mitigation for the vegetation to be lost.

The following further information is required:

- A description of each of the vegetation types to be affected and their value based on the likelihood that they provide habitat for rare species of fauna as in RPS Policy 23(b).

¹ www.nzpcn.org.nz

- A map/s of all the vegetation types likely to be affected by works, including exotic and planted vegetation.
- A table indicating the area of each vegetation type to be affected.
- An assessment of the value of the various vegetation types as habitat for rare fauna including lizards and bats following RPS Policy 23(b), including both canopy trees, understorey and groundcover.
- The size (DBH and approximate heights) of each of the large individual trees to be lost and whether or not they are listed in the District Plan as an Urban Tree or part of an Urban Tree Group.
- The species, DBH, and approximate heights of all large exotic trees likely to be removed and whether or not they are listed in the District Plan as an Urban Tree or part of an Urban Tree Group.
- Whether the trees are stand alone, or are part of an area of regenerating vegetation.
- The habitat values of the individual trees.
- A description of the effects of the proposed works on all vegetation, including canopy, understorey and ground cover.
- An explanation of how the long-term effects of removal of all types of vegetation/habitat will be mitigated by the proposed planting.

The following should be required as a condition of consent:

- Undertake a lizard survey across the works corridor. If lizards are found:
 - Prepare a Lizard Management Plan.
 - Secure a Wildlife Act Authority for the project.

The **Aristos report** discusses the relative value of vegetation as habitat for birds, and the following further information is required:

- An evaluation of whether vegetation clearance should be avoided during the bird nesting season, and if not why not?
- An assessment of the total area of bird habitat to be lost as a result of the proposed works and evaluation of the pressure that this will place on remaining habitat in the valley.
- Comments on any mitigation that might be required.

The following should be required as a condition of consent:

- Undertake intensive pest animal control in Wyndham Park and Fendalton Reserve for five years to mitigate the short-term loss of bird habitat along the works corridor. Note: this is similar to what was recommended for medium-term loss of bird habitat at Kiwi Point Quarry in the Ngauranga Gorge.

The **Jacobs NZ Ltd summary report** discusses lizards and bats, and construction effects, subjects which were not covered in either of the other reports. The following further information is required:

- Information on the potential habitat value for bats of the existing stream channel and riparian vegetation.
- An explanation of how significant disturbance to terrestrial habitat during construction will be mitigated in order to reduce the effects from significant to minor.

Suitability of Proposed Landward Replanting

The **DCM Urban Design plans** have been drawn up to include some replacement trees for those to be lost during the proposed works. Other plantings are largely appropriate for amenity purposes but there is no indication as to how they will mitigate for the loss of all vegetation types and for the loss of habitat for indigenous fauna. The following further information is required:

- An assessment of whether there are alternative sites in Pinehaven, along Hulls Creek, or along the Hutt River, where large stature trees might better be sited than close to dwellings?
- The area of land in the works corridor to be planted with indigenous and introduced tree species required to mitigate the long-term loss of vegetation, and habitat for fauna.

The following should be required as a condition of consent:

- Extended specimen and buffer planting schedules including more small trees and a higher diversity of species to provide year-round food for birds; and excluding kāpuka, wharariki, and harakeke and any other indigenous trees which do not already occur locally.

Suitability of Proposed Streamside Riparian Replanting

The **DCM Urban Design plans** indicate significant areas of streamside riparian planting. None of the reports, however, indicates linear or areal extent for each type of riparian planting. Neither is there any indication that some of the existing riparian may be permanently lost as a result of hard-engineered streambanks.

Species selected for planting in this area are generally inappropriate and would either fail to grow or would be ineffective at providing bank protection.

The following further information is required:

- An evaluation of how many areas of existing concrete structures require amenity planting?
- Are any additional planted structures planned?

The following should be required as a conditions of consent:

- Bank-holding species including, but not limited to, tī kōuka/cabbage tree (*Cordyline australis*), mānuka (*Leptospermum scorparium*), whekī (*Dicksonia squarrosa*), kōwhai (*Sophora Microphylla*) and tutu (*Coriaria arborea*), should be planted on the upper parts of the rarely wet riparian zone along with rangiora (*Brachyglottis repanda*) and heketara (*Olearia rani*); with a sparse understorey of hook grass (*Uncinia uncinata*), *Austroderia fulvida*, rarauhe (bracken fern *Pteridium esculentum*), *Asplenium oblongifolium*, and, rarely and singly, wharariki, reaching down into the lower part of the bank.
- *Libertia grandiflora*, *Libertia ixioides*, rarauhe, and *Haloragis erecta* subsp. *erecta* could be planted on and around concrete structures.
- No planting should be undertaken in the active channel, an area inundated during all, except very light, rainfall events.

Note: Only indigenous species have been suggested for stream banks as these provide the greatest amount of habitat for indigenous fauna, including insects for drift-feeding galaxiid fish.

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