

Appendix S

Ecology (Terrestrial)

Pekapeka to Otaki SARA

Terrestrial Ecology Assessment

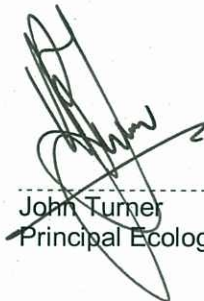


New Zealand Transport Agency

Pekapeka to Otaki SARA

Terrestrial Ecology Assessment

Prepared By



John Turner
Principal Ecologist

Reviewed By



Roger MacGibbon
Principal Ecologist

Opus International Consultants Limited
Environmental
Opus House, Princes Street
Private Bag 3057, Waikato Mail Centre,
Hamilton 3240, New Zealand

Telephone: +64 7 838 9344
Facsimile: +64 7 838 9324

Date: 13th December 2011
Reference: 3-55537.36
Status: Final

Contents

1	Executive summary	1
2	Introduction.....	2
	2.1 Purpose and scope.....	2
	2.2 Methodology	2
3	Project Description	2
4	Description of Terrestrial Ecology along the route alignment.....	3
	4.1 Overview.....	3
	4.2 Habitat features of recognised ecological significance	3
	4.3 Unregistered sites of ecological significance.....	4
	4.4 Riparian vegetation.....	5
	4.5 Fauna	5
	4.6 Significant indigenous vegetation and significant habitat of indigenous fauna assessment criteria.....	6
	4.7 Threatened species criteria.....	6
	4.8 Significant indigenous vegetation and significant habitat of indigenous fauna.....	6
	4.9 Species of ecological significance.....	7
	4.10 Maori perspective	8
5	Effects.....	9
	5.1 Positive effects.....	9
	5.2 Summary of adverse effects	9
	5.3 Habitat loss.....	10
	5.4 Hydrological effects on Marycrest bush and wetland.....	11
	5.5 Habitat fragmentation.....	11
	5.6 Edge effects resulting from vegetation clearance.....	11
	5.7 Effects on long-tailed bats.....	11
6	Degree of effects.....	12
7	Requirements.....	12
8	Addressing effects and meeting requirements.....	12
	8.1 Avoidance of effects	12
	8.2 Mitigation	12
	8.3 AEE survey requirements	13
9	Costs.....	13
	References	14

Maps15

1 Executive summary

This report provides an assessment of the effects proposed upgrade of SH1 between Pekapeka to Otaki on terrestrial, wetland and riparian ecosystems. The report will form part of the Scheme Assessment Report Addendum (SARA). The effects on aquatic ecosystems (rivers and streams) are described and assessed in a separate report.

The alignment passes through a landscape that has been highly modified by agriculture, and to a lesser extent viticulture and urbanisation. However, there are a number of areas of indigenous bush and wetland along the alignment of local and district ecological significance that will be impacted by the road. A regionally significant area of indigenous bush and wetland near Marycrest was directly affected by the original alignment proposed through this area. However, the road has been realigned and this site has now been avoided.

The main impact on the areas of indigenous bush is the loss of habitat. In all cases habitat is lost from the edge of the bush. The scale of the effect is such that for a number of sites, taking into account the significance ranking of the site, the effect is considered minor in terms of Section 6 c) of the RMA. However, in the case of the loss of vegetation from the stand of indigenous bush on the Steven's Property the effect is considered greater than minor. In this case there is a 15-20% loss of habitat from a site considered to be of district significance. This effect is considered to be one of moderate rather than major significance. Similarly, the effect on Hautere Bush F is considered greater than minor but of moderate rather than major significance, taking into account the scale of impact and the value of the site. There are a number of options that could be undertaken to mitigate these effects including increasing protection of existing areas of bush by fencing and weed removal and/or planting additional areas of bush to compensate for the areas lost.

One wetland listed in the KCDC Heritage Register, and assessed as being of local significance, will be impacted by the Project footprint. The wetland located adjacent to the railway in Otaki will be completely lost to the Project footprint. This wetland, along with the bush/wetland at Marycrest, is of particular interest to local Iwi. Options to mitigate the loss of this wetland include establishment of a new wetland on nearby Iwi land and/or development of stormwater wetland ponds for treatment of road runoff in such a way that they provide wetland habitat for native flora and fauna.

There are no significant indigenous riparian habitats impacted by the Project.

Overall the degree of effect on terrestrial, wetland and riparian ecosystems as per NZTA PSF/13 is considered to be moderate.

2 Introduction

2.1 Purpose and scope

This report provides an assessment of effects of the alignment of the proposed upgrade of SH1 between Pekapeka to Otaki on terrestrial, wetland and riparian ecosystems. The report will form part of the Scheme Assessment Report Addendum (SARA). The effects on aquatic ecosystems (rivers and streams) are described and assessed in a separate report.

This ecological assessment covers the following with respect to terrestrial, wetland and riparian ecosystems:

- a description of the terrestrial, wetland and riparian habitats, and their associated flora and fauna;
- an assessment of the ecological values of the habitats and species potentially affected by the Project;
- details of the nature and scale of the Project's actual or potential adverse effects, and the likely significance of those effects;
- and details of such measures that are necessary to avoid, remedy, mitigate or offset any effects greater than minor.

2.2 Methodology

This assessment was based on the following:

- a review of existing background information relating to the Project and Project Corridor including: Project Plans, existing ecological reports, aerial photographs and the Kapiti Coast District Plan;
- and walkthrough surveys undertaken in January and July 2011.

The field surveys focussed on recording main vegetation types, key plant and bird species during a walkthrough of ecological sites along the alignment. An assessment of habitat potential for other fauna groups (mammals, reptiles and invertebrates) was also undertaken. The level of detail of the surveys was sufficient to confirm ecological values, level of effects and broad measures to mitigate effects. A more detailed level of survey will be required for the assessment of effects needed to support the Notice of Requirements.

3 Project Description

The planned upgrading of State Highway 1 between Peka Peka and Otaki North is "part of the Wellington Northern Corridor Road of National Significance (RoNS) – a planned four-lane expressway from Wellington Airport to Levin." SH1 is the major route in and out of Wellington, linking the centres of Palmerston North, Wanganui and Levin with Wellington. By improving transport networks through the Kapiti Coast, this project will contribute to economic growth and productivity.

Currently the Peka Peka to North Otaki section of SH1 has a relatively poor and worsening safety record. It also experiences high levels of congestion during peak periods, weekends and holiday periods. This congestion is compounded by a high proportion of local traffic, and an increasing level of shopping-generated parking and pedestrian movements in the Otaki urban area. A bypass of Otaki, and the provision of a high-standard highway through the area will increase the efficiency of movements between Wellington and the North, will ease local congestion, improve safety, and will facilitate local, regional and national economic development.

The scope of this project is therefore to construct a high quality four-lane expressway bypassing the township of Otaki and the settlement of Te Horo. Together with the MacKays to Peka Peka section to the south, it forms the Kapiti Expressway and when both sections are completed will provide a superior transport corridor providing much improved, reliable and safer journeys through the Kapiti Coast. The project seeks to safeguard for double tracking of the main trunk rail line and also involves the relocation of the track through Otaki in order to accommodate the proposed expressway.

4 Description of Terrestrial Ecology along the route alignment

4.1 Overview

The alignment passes through a landscape that has been highly modified by agriculture, and to a lesser extent viticulture and urbanisation. Most of the alignment impacts areas that support no indigenous vegetation and are likely to be of limited value as habitat for indigenous fauna. There are however a number of localised features of ecological significance impacted by the alignment. Maps 1 to 4 show the locations of the ecological features referred to below.

4.2 Habitat features of recognised ecological significance

Part I of the Kapiti Coast District Plan contains the District Heritage Register. Table E of the Heritage register lists ecological sites (areas of significant indigenous vegetation and significant habitat of indigenous fauna). Inclusion of ecological sites in the Heritage Register was confirmed by surveys and ranking assessments undertaken by Wildland Consultants Ltd. (Wildland Consultants Ltd., 2003).

Table 1 below details the sites listed in the KCDC Heritage Register along the alignment and their ranking.

Table 1: Ecological sites listed in the KCDC Heritage Register

Site Name	Description	Ranking	Comment
K134 - Unnamed wetland (adj. railway Otaki) (Map 4)	Small wetland. Grazed in part. <i>Typha orientalis</i> abundant. Threatened by plant pests.	Local	Only part of the wetland was recommended for inclusion in the Heritage Register.
K038 – Hautere Bush F (Map 3)	Totara-matai Forest. Grazed beneath and lacking an understorey.	Local	
K037 – Cottle’s Bush (Map 3)	Totara-titoki-matai Forest. Recovering from grazing.	Local	

4.3 Unregistered sites of ecological significance

In addition to sites listed in the Kapiti Coast District Council Heritage Register a number of other areas supporting native flora and fauna are present along the alignment.

- mature native trees situated between Hautere Bush F and Cottle’s Bush (Map 3);
- mature native trees adjacent to Cottle’s Bush (Map 3);
- an area of indigenous forest and wetland at Marycrest (Map 2);
- an area of indigenous forest on the Steven’s Property (Map 1).

The scattered and grouped mature trees between Hautere Bush F and Cottle’s Bush are located within pasture. They are a remnant of the native bush which once covered this area. The trees are predominantly totara *Podocarpus totara* up to 14m high. The area has been significantly impacted by grazing and there is no understorey beneath the tree canopy.

Similarly there are approximately 12 mature totara trees scattered through pasture to the west of Cottle’s Bush. This area has also been significantly impacted by grazing and there is no understorey beneath the tree canopy.

At Marycrest there are two stands of mature native bush with associated areas of wetland. They comprise areas of swamp forest dominated by pukatea *Laurelia novae-zelandiae* and kahikatea *Dacrycarpus dacrydioides* and drier areas dominated by totara and tawa *Beilschmiedia tawa*. The pockets of wetland found at the edges of the bush support a variety of wetland plant species including cabbage tree *Cordyline australis* and flax *Phormium tenax*. Parts of bush and wetland have been impacted by stock grazing and weed invasion however, there is an understorey and regeneration is occurring.

The small area of forest on the Steven's property supports tawa, karaka *Corynocarpus laevigatus* and kohekohe *Dysoxylum spectabile* and a range of other native tree and shrub species. It is fenced and has an understorey.

4.4 Riparian vegetation

Most of the streams crossed by the route are grazed along their margins and are typified by closed cropped pasture grasses. Willows occur along the riparian margins of the Otaki River and Waitohu Stream however there is no native vegetation of any note along any of the waterways crossed by the alignment.

4.5 Fauna

Birds

The birdlife found along the alignment is typical of farmland with fragments of native bush and wetland. Common native and introduced species are present including; fantail *Rhipidura fuliginosa*, silverevee *Zosterops lateralis*, tui *Prothemadera novaeseelandiae*, New Zealand Pigeon *Hemiphaga novaeseelandiae*, harrier *Circus approximans*, kingfisher *Halcyon sancta*, goldfinch *Carduelis carduelis*, chaffinch *Fringilla coelebs*, blackbird *Turdus merula*, song thrush *Turus philomelos*, pukeko *Porphyrio porphyrio* and magpie *Gymnorhina tibicens*. Peacock *Pavo cristatus* were abundant in the vicinity of Marycrest. No threatened bird species were encountered during the walkover survey, and given the nature and quality of habitats present along the route no threatened bird species are expected to be significantly impacted by the Project.

Long-tailed bats

The long-tailed bat *Chalinolobus tuberculatus* is known to inhabit Kapiti Island and the Tararua Forest Park. Very recent studies in and around Hamilton have found long-tailed bats in areas where previously they were not expected to occur, including highly modified relatively open landscapes on the periphery of the City, with roosting occurring in exotic as well as native trees. In view of the experience of finding this species in modified habitat close to Hamilton, and the presence of known long-tailed bat populations on Kapiti Island and in the Tararua Forest Park, the presence of this species along the Project corridor cannot be ruled out.

Other terrestrial fauna

Threatened native invertebrates, reptiles or amphibians typically have very restricted distributions and niche habitat requirements. The habitats found within the Project corridor are not suitable for native frogs. While non-threatened reptiles, such as copper skink, may occur along the alignment it is unlikely that the habitats present will provide habitat for threatened reptile species.

Common native invertebrates are expected to be present along the alignment. However, the occurrence of threatened species is unlikely, given the degree of habitat modification that has occurred and the high degree of isolation of the remnants of indigenous habitat.

4.6 Significant indigenous vegetation and significant habitat of indigenous fauna assessment criteria

Determination of the ecological value of a habitat and its associated species is a critical part of assessing the significance of the ecological impact associated the Project. Section 6(c) of the Resource Management Act 1991 requires the protection of significant indigenous vegetation, and significant habitats of indigenous fauna. This is to be recognised and provided for by local authorities as a matter of national importance. Consequently the identification of sites that are representative of significant indigenous vegetation and significant habitat of indigenous fauna is an important part of assessing ecological values and determining the significance of ecological effects.

There are various tools and approaches that can be used to assess the ecological significance of sites. The system used to assess and rank sites in the Kapiti District is detailed in the report listing sites to be included in the Heritage Register prepared by Wildland Consultants Ltd (2003). These criteria are adapted from guidelines used to determine significant indigenous vegetation and significant habitat of indigenous fauna in the Waikato Region (Wildland Consultants, Environment Waikato, 2002). A number of sites (section 4.2 above) have already been assessed and recognised in the District Heritage Register using these criteria. This assessment will therefore assess the values of the other ecological sites identified by this assessment using these criteria.

4.7 Threatened species criteria

New Zealand's native flora and fauna were classified in terms of their risk of extinction by Hitchmough *et. al.* (2007). The document was comprehensive and covered all groups of flora and fauna. The classification system was reviewed in 2007, resulting in several new threat categories, and redefinition of some existing categories (Townsend *et al.* 2008). Based on this new system, several taxonomic groups have been reassessed and results published in a number of papers which now supersede the relevant sections of Hitchmough *et. al.* (2007): bats (O'Donnell *et. al.*, 2011), birds (Miskelly *et. al.*, 2008), freshwater fish (Allibone *et. al.*, 2010).

Where appropriate, in assessing the significance of individual species reference will be made to Hitchmough *et. al.* (2007) and papers covering the different taxonomic groups that have been subsequently reassessed following Townsend *et al.* (2008).

4.8 Significant indigenous vegetation and significant habitat of indigenous fauna

The site identified in Table 1 have already been assessed against criteria set out in Wildland Consultants Ltd (2003) as being examples of significant indigenous vegetation and/or significant habitat of indigenous fauna. This assessment concurs with the previous assessment with respect to these sites and their ranking as being sites of local significance.

Table 2 below summarises an assessment of the other unregistered sites impacted by the alignment also using the criteria set down in Wildland Consultants Ltd (2003).

Table 2: Assessment of unregistered ecological sites

Site	Ranking	Reasons
Mature native trees within pasture situated between Hautere Bush F and Cottle's Bush	Not ranked	Significantly degraded ecosystem that will continue to decline without protection. Not an example of significant indigenous vegetation, hence not ranked. However, mature native trees take generations to replace and therefore they still have modest ecological value in the context of the local landscape.
Mature native trees dispersed through pasture adjacent to Cottle's Bush	Not ranked	Ditto.
Indigenous dry forest, swamp forest and wetland at Marycrest	Regional	Under-represented habitat. Species rich. Large mature specimen trees. Range of vegetation types including swamp forest.
Indigenous forest on the Steven's Property	District	Under-represented habitat. Covers a small area. However, it is fenced and supports an understorey.

4.9 Species of ecological significance

Plants

No threatened plant species were recorded or are known to be directly affected by the alignment.

Birds

No threatened bird species were recorded during the walkover survey, or are likely to be significantly impacted by the Project given its alignment and the habitats present.

Long-tailed bats

Long-tailed bats are classified as nationally threatened (sub classification: nationally vulnerable) (O'Donnell, *et. al.* 2010). This species is endemic to New Zealand i.e. found nowhere else in the World. Long-tailed bats are one of only two native terrestrial mammal species found in New Zealand, and the only species of native terrestrial mammal potentially found in highly modified environments and close proximity to human habitation. However, while the species is classified as threatened, it is also much more widespread in the Waikato landscape than previously thought. If present within the highly modified landscapes along the Waikato Expressway alignment, it may also prove to be similarly widespread along the Kapiti Coast.

Other terrestrial fauna

The occurrence of threatened amphibians, reptiles or terrestrial invertebrates is unlikely given the modified and isolated nature of habitat fragments along the alignment. Most of the stands of trees impacted are heavily grazed beneath which limits their habitat values for ground dwelling animals. Furthermore, in most cases where native trees are to be removed only a relatively small percentage of the available habitat is being lost. The risk of significant impact on threatened reptile or invertebrate species is considered low. While, further surveys would provide a higher level of confidence around this assessment, they are not considered essential given the level of risk as determined by the habitat based assessment. However, if in the course of the AEE or consultation process further information becomes available that indicates the risk of significant impact may be higher than presently thought, the need for further surveys will be reassessed.

4.10 Maori perspective

At a meeting and site visit held on Friday 29th July ecological issues of importance to the Iwi were discussed. The wetland adjacent to the railway alignment was of significant interest being of importance from an archaeological and cultural perspective, as well as ecological. The possibility of recreating the wetland as mitigation was discussed, as was the possibility of 'capturing' the source of the spring located in the northern part of the wetland.

Capturing the source of the spring requires further investigation and consideration however this may prove extremely difficult. One solution might be to try to preserve the source and create a flow channel alongside the new road following a "natural" flow path. Indigenous riparian planting could be incorporated to the extent that available space allows.

To offset the loss of wetland there are two possible options: 1) create a new wetland on Iwi owned land to the west, 2) develop stormwater wetlands ponds into ecological habitats. This matter requires further discussion with Iwi. However, creation of wetland habitat within stormwater wetland ponds is a habitat enhancement opportunity for the Project regardless of where the mitigation for the lost wetland occurs.

Bush to the west of the affected wetland (beyond Project corridor) was considered very significant and Iwi are working with Tim Park at GWRC to look at enhancement/fencing opportunities. This area is not impacted by the Project.

Avoiding the bush and wetland at Marycrest was viewed as a very positive step for the Project to have taken. There was also recognition that the Project has brought the area to the attention of Iwi and other stakeholders. Iwi are keen to pursue protection and enhancement of the area with the land owner and other stakeholders.

The treatment and water quality enhancement opportunities provided by stormwater wetland ponds are of significant interest to Iwi and seen as a positive potential enhancement that the Project can provide.

Iwi also generally support efforts to minimise loss of bush from other sites along the alignment. Where native trees are unavoidably lost, recovery of timber for carving or other traditional uses is advocated.

5 Effects

5.1 Positive effects

Positive effects on terrestrial ecosystems resulting from new roads are rare. Trees can be planted to replace those lost however there is a significant time delay in trees reaching maturity (several human generations). While mitigation is possible, a positive result is difficult to argue where mature forest is being lost, particularly in the case of planting new replacement trees, although in the very long-term it may be possible to replace the area of bush lost and achieve no net loss of habitat.

There are however potential alternatives to planting new habitat that could provide significant offset to habitat loss. Most of the indigenous forest areas impacted by the alignment, and also the Marycrest bush fragments, are currently impacted by grazing and weed invasion. They are in a process of decline that in the long-term (potentially many years) will see them disappear from the landscape unless there is intervention. By simply fencing these areas and undertaking weed control, the long-term future of the areas of bush will be substantially improved. Furthermore, in the case of those stands of bush that have no understorey or ground cover because of grazing, exclusion of stock can be transformational in terms of the development of sub-canopy structure and natural regeneration. While, the implementation of such options is dependent upon securing land owner agreement and covenant protection, if this is achieved, then the resulting bush protection will be a significant offset to compensate for the bush lost. By preventing ongoing bush degradation with the potential for eventually losing areas completely in the long-term, a significant positive benefit is possible.

Wetlands by contrast, particularly those that have relatively low ecological values, can be created and mitigation achieved in a relatively short period of time (within 5 years). If more wetland is created than is lost then a net gain is achieved. If stormwater wetland ponds, needed to treat runoff from the new road, are designed to include wetland habitat and use native plant species, a net gain could be achieved over habitat lost. Furthermore, the higher level of treatment of road runoff from the new road compared to the existing road, provided by the wetland ponds, is likely to provide an enhancement in water quality over the existing situation.

5.2 Summary of adverse effects

The following is a summary of the key adverse effects on terrestrial, wetland and riparian ecosystems that need to be considered by this assessment:

- habitat loss to the Project footprint;
- potential effects of the hydrology of the Marycrest bush and wetland;
- habitat fragmentation;
- edge effects resulting from removing trees along the edge of stands of bush;

- effects on long-tailed bats.

5.3 Habitat loss

Table 3 below specifies the habitat losses to the Project footprint from ecological features along the alignment and also describes the significance of the effect.

As there is no significant indigenous vegetation along the riparian margins of rivers and streams, effects on riparian habitat are considered to be less than minor.

Table 3: Summary of habitat losses and significance of effect

Site	Habitat loss	Significance of effect
K134 - Unnamed wetland (adj. railway Otaki)	Wetland likely to be lost in its entirety.	More than minor effect due to large scale of loss. An effect of moderate rather than major significance given relatively poor condition of much of the wetland.
K038 – Hautere Bush F	Between 40 and 60 mature native trees lost from the western edge of the bush.	More than minor effect due to number of trees lost. An effect of moderate significance.
Mature native trees situated between Hautere Bush F and Cottle’s Bush	Approximately 20 mature trees lost from the edge.	Minor effect due to relatively low value of the stand of trees and scale of effect.
Mature native trees adjacent to Cottle’s Bush	Approximately 12 native mature trees lost to footprint.	Minor due to relatively low value of the stand of trees.
K037 - Cottle’s Bush	A few mature trees lost from extreme western edge.	Minor due to very small scale of effect.
Indigenous forest and wetland at Marycrest	Road realigned to avoid.	No habitat loss.
Indigenous forest on the Steven’s Property	15-20% of the bush lost from the eastern edge	More than minor effect due to relatively high value of site. Effect of moderate significance.

5.4 Hydrological effects on Marycrest bush and wetland

Wet pasture occurs to the south of the Marycrest bush and wetland. There is also a drain that flows from east to west along the southern edge of the bush/wetland. This drain then converges with a stream that flows west through the wet pasture. A preliminary assessment of the surface drainage within the wet pasture suggests that there is no surface connection between the pasture and the bush/wetland. However, the hydrological connectivity or lack of connectivity between the two areas will need to be confirmed during the next phase of the Project to ensure that the road design does not impact on the hydrology of the bush/wetland.

5.5 Habitat fragmentation

Very little habitat fragmentation will result from the proposed alignment. Since the bush/wetland at Marycrest has now been avoided by re-alignment there will be no habitat fragmentation in this location. Of the remaining areas of native bush affected by the Project footprint, habitat is only lost from the edge and therefore there is no habitat fragmentation effect. The wetland adjacent to the railway in Otaki will be totally removed by the alignment therefore there is no residual fragmentation effect here.

5.6 Edge effects resulting from vegetation clearance

Where trees and shrubs are cleared from the edge of areas of bush, the exposed trees can be more prone to windthrow and the understorey to desiccation. This is particularly the case in exposed coastal areas. A number of locations along the alignment will require removal of mature vegetation from the edge of existing stands thus exposing trees that may be more susceptible to wind damage. Measures to minimise such effects will need to be considered during the design process.

5.7 Effects on long-tailed bats

The main risk to the long-tailed bats is loss of potential roost trees. Roosts can occur in mature native and exotic trees that contain dry crevices or cavities. If long-tailed bats are confirmed as present along the alignment further assessment will be required to identify potential roost trees and determine the most appropriate mitigation to address likely effects. Effects on roosting bats can be reduced by timing tree removal to coincide with periods of the year when bats are least vulnerable to disturbance. Loss of roost trees can be compensated by provision of artificial roost sites and, in the long-term, replacement of trees lost.

Significant adverse effects on foraging or barrier effects from the new road are highly unlikely given that the new alignment closely follows the existing alignment i.e. the effects of the new alignment are likely to be similar to the existing situation. However, the effect of artificial street lighting on long-tailed bats is as yet poorly understood, and therefore the introduction of lighting along the new road into environments that are currently unlit, will require further assessment and consideration if bats are confirmed to be present.

Further work needs to be undertaken to assess the risk of long-tailed bats being present.

6 Degree of effects

Habitat losses have been reduced by careful design of the Project footprint in the vicinity of features of ecological significance. In particular, re-alignment to avoid the bush/wetland at Marycrest has substantially reduced the net effect of the Project on ecosystems. There will be loss of habitat of local significance and partial loss of habitat of district significance. This can be mitigated through habitat creation and enhancement. Overall therefore the degree of effect on terrestrial, wetland and riparian ecosystems is considered to be moderate.

7 Requirements

The key requirements that the Project must meet with respect to terrestrial and wetland ecology are:

- Section 6(c) of the Resource Management Act 1991 which requires the protection of significant indigenous vegetation, and significant habitats of indigenous fauna;
- NZTA's Environmental Policy (November 2004);
- NZTA's Environmental Plan (June 2008);
- Rules in the Regional Plan relating to the disturbance of wetlands.

8 Addressing effects and meeting requirements

8.1 Avoidance of effects

The footprint design has taken account of the need to minimise effects on features of ecological value along the alignment. In the case of Marycrest the route has been realigned to avoid the bush thereby avoiding both habitat loss and habitat fragmentation effects. This measure has significantly reduced the overall effect of the alignment on terrestrial ecosystems.

8.2 Mitigation

Some loss of mature native trees from the edge of a number of stands of bush will be unavoidable (see Table 3). There are a number of options that could be undertaken to mitigate these effects including increasing protection of existing areas of bush by fencing and weed removal and/or planting additional areas of bush to compensate for the areas lost. Ideally the latter would be undertaken such that the new planting was contiguous with an existing area of bush.

The unnamed wetland adjacent to the railway in Otaki will be completely lost to the Project footprint. Wetlands can, if designed well and properly maintained during the establishment phase, rapidly achieve significant ecological values (within 5 years). Options to mitigate the loss of this wetland include establishment of a new wetland on nearby Iwi land and/or

development of stormwater wetland ponds for treatment of road runoff in such a way that they provide wetland habitat for native flora and fauna.

Options for mitigating bush and wetland habitat loss need further exploration and development during the preparation of the AEE. Firm recommendations on the options to be adopted are not possible until the location and design of stormwater ponds have been determined and issues relating to the potential for protecting habitats on land outside of NZTA ownership have been explored.

8.3 AEE survey requirements

Further work needs to be undertaken to assess the risk of long-tailed bats being present. This should include consultation with DoC and other stakeholders to determine if bats have been observed in the area. However, based on experience gained from working in the Hamilton area, unless specific surveys have been undertaken, anecdotal evidence that indicates they have not been observed in a particular area is a very poor predictor as to whether bats are present or not. Surveys using automated bat detectors are the only reliable method of confirming presence/absence and such surveys would be required to provide a high level of confidence around the status of long-tailed bats along the alignment, regardless of what any anecdotal evidence may suggest as to likely presence or absence.

9 Costs

Costs to mitigate ecological effects are difficult to predict at this stage of the development process. Some costs for ecological mitigation may overlap with costs aimed at mitigating other environmental effects. For example mitigation for loss of Wetland K134 (adjacent to the railway in Otaki) may involve construction of a wetland at an alternative location away from the Project corridor in order to fully reflect the loss of the wetland on cultural and archaeological values as well as ecological. This will involve wetland construction costs as well as planting. A very rough order of cost for such a constructed wetland is \$250k/ha. The area of wetland lost is approximately 1ha. One hectare is therefore the minimum size that would be needed to be created to achieve no net loss of wetland.

If it were a case of only mitigating the loss of ecological values then it may be possible to achieve this by incorporating ecological features into the design of the proposed stormwater wetland ponds. In this case the construction and planting costs to provide for ecological mitigation would be subsidized by the costs already attributable to the construction of the wetland for stormwater treatment purposes. It is difficult to estimate what the additional cost might be, however an allowance of an additional \$50-100k/per pond would be advisable for estimating rough order of costs.

In addition to mitigation for wetland loss there will also be a requirement to mitigate loss of mature native trees and native bush. This may include new planting and/or fencing of existing bush stands. This is again difficult to estimate but an allowance of \$200k would be advisable.

If long-tailed bat roosts are found along the alignment and impacts need to be mitigated this could add \$100k-\$200k in additional detailed surveys and mitigation such as provision of artificial roost sites and removal of trees in ways that minimise risk of injury or bat mortality.

Overall, a very approximate order of costs for ecological mitigation work is estimated at between \$500k and \$750k.

References

- Allibone, R.; Bruno, D.; Hitchmough, R.; Jellyman, D.; Ling, N.; Ravenscroft, P.; Water, J. 2010. Conservation status of New Zealand freshwater fish, 2009. *New Zealand Journal of Marine and Freshwater Research* 1- 17.
- Environment Waikato; Wildland Consultants Ltd. 2002: Areas of Significant Indigenous Vegetation and Habitats of Indigenous Fauna in the Waikato Region: Guidelines to applying Regional Criteria and Determine Level of Significance. *Environment Waikato Technical Report TR 2002/15*.
- Hitchmough, R.; Bull, L.; Cromarty, P. (comps) 2007. New Zealand Threat Classification System lists – 2005. *Department of Conservation, Wellington 194p*.
- Johnson, P.; Gerbeaux, P. 2004. Wetland Types in New Zealand. *Department of Conservation*.
- Miskelly, C.M.; Dowdling, J. E.; Elliott, G.P.; Hitchmough, R.A.; Powlesland, R.G.; Robertson, H.A.; Sagar, P.M.; Scofield, R.P.; Taylor, G.A. 2008. Conservation Status of New Zealand birds, 2008. *Notornis, 2008, Vol. 55: 117-135*.
- O'Donnell, C.F.J.; Christie, J.E.; Hitchmough, R.A.; Lloyd, B.; Parsons, S. 2011. The Conservation Status of New Zealand bats 2009. *NZ Journal of Zoology*.
- Townsend, A.J.; de Lange, P.J.; Duffy, C.A.J.; Miskelly, C.M.; Molloy, J.; Norton, D. 2008. New Zealand Threat Classification System manual. *Wellington, Department of Conservation. 35 p*.
- Wildland Consultants Ltd., 2003. Kapiti Coast District Council: 2002-2003 Ecological Site Surveys. *Contract Report No. 662*.

Maps



Map 3 PP20 Pekapeka to North Otaki – SARA: Key Ecological Constraints



Map 2 PP20 Pekapeka to North Otaki – SARA: Key Ecological Constraints



Map 1 PP20 Pekapeka to North Otaki – SARA: Key Ecological Constraints



Map 4 PP20 Pekapeka to North Otaki – SARA: Key Ecological Constraints

