




Review of Te Ara Hauāuru Northwest Rapid Transit Freshwater Ecology Assessment

Prepared for:	Department of Conservation	Reviewed and approved for release by:	 Sarah Budd Principal Ecologist, Auckland Regional Manager
Author:	Richard Storey		
Report No:	7935b		
Date:	May 2026		

1.0 Introduction

NZ Transport Authority Waka Kōtahi (NZTA) is applying for statutory approvals under the Fast Track Approvals Act (2024) to construct Te Ara Hauāuru Northwest Rapid Transit (the Project). The Project involves the construction, operation and maintenance of new bus rapid transit (BRT) facilities alongside State Highway 16 (SH16) from the Brigham Creek Road/SH16 intersection through to Ian McKinnon Drive in the Auckland City Centre and includes seven rapid transit stations, one Park and Ride facility and connections to the local bus and road network.

The Project is now in the substantive application phase, and NZTA has submitted various technical reports that support its application. Department of Conservation (DOC) has been invited to prepare submissions to the consenting panel in response to the application documents. Wildland Consultants Ltd. (Wildlands) has previously submitted to DOC a review of the stream and wetland sections of the Assessment of Ecological Effects (AEE) prepared by AECOM (Wildland Consultants 2026). NZTA has recently submitted an updated Freshwater Ecology Assessment by Boffa Miskell (26 April 2026), which DOC has engaged Wildlands to review. This report represents Wildlands' response to the Freshwater Ecology Assessment.

2.0 Overview of Freshwater Ecology Assessment

The Freshwater Ecology Assessment by Boffa Miskell (26 April 2026) is a new assessment (rather than an update of the previous report by AECOM) using some of the data collected by AECOM as well as information collected during a one-day site inspection on 5 March 2026.

The approach taken to the assessment of ecological value, assessment of ecological effects and recommended measures to address the effects differs significantly from the approach in the AECOM report. Whereas AECOM based their assessments and recommendations on standard assessment methods and quantitative data, Boffa Miskell have relied more on narrative descriptions and used non-standard methods to arrive at somewhat different conclusions. Although the amounts of offsetting appropriate for impacts on streams are not large, there are flaws in Boffa Miskell's approach that make a material difference to the outcomes. These are outlined below.

3.0 Assessment of Ecological Values

Streams 1, 2, 4, 5, 6, 7, 9 and 10 are assessed as Low value while streams 3 and 8 are assessed as Moderate value. This represents a significant "downgrading" of ecological value compared with the AECOM report, which assessed one stream (Stream 10) as Low value and the remaining nine as Moderate value.



Both reports follow the EIANZ framework for assessing ecological value, considering Representativeness, Diversity and Pattern, Rarity and Distinctiveness and Ecological Context. However, whereas the AECOM report gives an assessment for each of these “matters”, the Boffa Miskell report gives only one overall assessment for each Group of sites, making it difficult to determine how the overall assessment was made.

The Boffa Miskell report underestimates the ecological value of the stream sites by assuming that a silty stream bed, slow flow and shallow depth indicate degradation. While urban impacts often result in sedimentation and can result in reduced base flow, these characteristics are typical of lowland streams in the Auckland region and do not necessarily represent degradation.

The report also describes SEV scores up to 0.56 as being “low-moderate” and scores up to 0.65 as being “moderate”, whereas according to the scoring categories used by AECOM (which align with Auckland Council’s State of the Environment reporting, so may be considered as standard) scores from 0.4 to 0.6 are moderate, and scores from 0.6 to 0.8 are good. According to these categories the SEV scores of all streams surveyed are in the “moderate” range except for Tihema Stream (Stream 5) which is “good.” Therefore, all streams should be assessed as “moderate” for representativeness.

Six threatened or at-risk (TAR) species were noted among the sites, with most sites having three or more TAR species. However, apart from Site 8, these species are not mentioned in Boffa Miskell’s assessment of ecological value. Given that each of the streams provides habitat for two or (more often) three TAR species, they should all be assessed as “moderate” or “high” for Rarity/Distinctiveness.

Following the EIANZ guidelines, sites with an assessment of “moderate” or better for at least two matters should be given an overall ecological value of at least “moderate”. Therefore, the assessment of AECOM is more appropriate than that of Boffa Miskell.

4.0 Assessment of Ecological Effects

4.1 Positive effects

Before assessing negative ecological effects, the report includes a section on positive effects. Several measures that have been incorporated in the construction methodology are identified, including the use of bridges rather than culverts, providing fish passage through culverts, salvaging fish ahead of instream works and adding restoration planting to riparian zones. It should be noted that these measures represent avoidance, minimisation and offsetting of effects. They do not represent net ecological gain as a result of the Project.

4.2 Spatial scale for assessing magnitude of effect

Boffa Miskell has chosen to assess effects on freshwater ecology at the scale of whole catchments. Increasing the spatial scale of assessments from the reach or sub-catchment scale to the catchment scale has the effect of reducing the magnitude of effect, as the proportion of the catchment affected is much smaller than the proportion of a reach or sub-catchment. Boffa Miskell states that the catchment scale “is the standard unit for assessing functional changes in freshwater systems.” This is incorrect. Although a catchment-scale assessment was used by NZTA in the State Highway 1 Cambridge to Piarere long-term improvements Fast Track application, it was strongly contested in submissions by freshwater ecologists representing DOC and regional council.



Boffa Miskell argues that “the extent of effects... remains extremely small relative to available habitat.” This ignores the problem of incremental loss of stream habitat through gradual urban development. Further, in reducing the level of effect to Low or Very low, Boffa Miskell argues that effects do not need to be mitigated. This is inconsistent with the National Policy Statement for Freshwater Management (2020, updated 2025) – see Section 5 below.

4.3 Assessment of construction effects

Both the AECOM report and the Boffa Miskell report assume that streams 2, 5 and 10 will not be directly impacted by the development. I have assumed that this is accurate and have not attempted to verify it.

The Boffa Miskell report states that riparian vegetation loss due to bridge construction is short-term. Since it appears the reference is to the riparian area that will be occupied by the bridges, the loss of riparian vegetation is clearly permanent.

The report assesses loss of instream habitat due to culverting of three streams as negligible to low and loss of hydrological function as negligible. This assessment is lower than AECOM, which assessed the magnitude of effect of culverts and bridges on streams as moderate. The difference is most likely due to the difference in the scale of reference discussed above. As discussed above, the reach or sub-catchment scale is considered more appropriate than the whole-catchment scale and therefore AECOM’s assessment is considered more appropriate than Boffa Miskell’s.

5.0 Recommended Measures to Avoid, Remedy or Mitigate Effects

Boffa Miskell states that because the level of ecological effects has been assessed as low or very low, then no mitigation of effects is required. This is inconsistent with the National Policy Statement for Freshwater Management (2020, updated 2025), which says (in Section 3.24 (3)) that to be granted a consent, applicants must “demonstrate how each step in the effects management hierarchy will be applied to **any** loss of extent or values of the river (including cumulative effects and loss of potential value), particularly (without limitation) in relation to the values of: ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values, and amenity.”

Despite its statement that no mitigation is required, Boffa Miskell proposes three measures to manage the ecological effects of the project. These are:

- Riparian planting to address losses of riparian vegetation at bridges and “loss of streambed” at culverts.
- Capture and relocation of fish and kākahi (freshwater mussels) to avoid direct harm to these animals during construction.
- Standard sediment and contaminant controls to avoid discharges of sediments and harmful substances during construction

5.1 Riparian planting

Boffa Miskell explicitly rejects the use of the SEV (Stream Ecological Valuation) and ECR (Environmental Compensation Ratio) (as per Storey et al. 2011) for calculating appropriate amounts of riparian restoration. While use of the SEV is not compulsory for offsetting impacts on streams, it is the only tool currently available that is peer-reviewed (Neale et al. 2016), commonly used, recommended by the EIANZ Guidelines (Roper-Lindsay et al. 2018) and provides a quantitative method for calculating offsets.



In place of SEV calculations, Boffa Miskell recommends new riparian planting at a 1:1 ratio (in terms of streambank length) in response to vegetation loss due to bridges, and at a 1.5:1 (also in terms of stream length) “to account for” loss of stream habitat due to culverting. Using the figures given by Boffa Miskell for lengths of bridges and culverts, these ratios would result in planting of 97 metres of streambank.

As the report has already stated that mitigation for loss of stream habitat or ecological function is not required, and as the riparian planting is not presented as an offset for loss of habitat or function, the report provides no clear rationale for the riparian planting. Therefore, it provides no basis for assessing whether the amounts of riparian planting offered are adequate.

Using the SEV, the AECOM report concluded that 213 metres of streambank should be planted to offset the effects of construction. Wildlands (2026) recalculated the amounts using a more standard SEV value for culverts and determined that 305 metres is appropriate. Both estimates are significantly greater than Boffa Miskell’s recommendation.

The reasons provided by Boffa Miskell for rejecting use of the SEV are:

Section 5.1 “I consider it is appropriate to avoid the complexity, rigidity, and ecological irrelevance of SEV/ECR in heavily urbanised streams.”

Section 5.2.1 “An alternative approach of relying on SEV/ECR calculation would add complexity without providing materially different ecological outcomes.”

It should be noted that the SEV was designed for use in urban streams, particularly for cases where urban streams are to be culverted. The above discussion shows that use of the SEV does result in materially different outcomes. While the SEV is more detailed than selecting an arbitrary mitigation ratio, it provides transparency and is based on a clearly stated and agreed set of assumptions.

Therefore, the effects of bridge construction and culverting should be offset using the SEV/ECR.

5.2 Fish capture and relocation

In contrast to the AECOM report, which provided a detailed and robust methodology for fish capture and relocation, the Boffa Miskell report provides only a brief statement of objectives. This brief statement provides no certainty that a robust methodology will be followed.

5.3 Controls on sediment and contaminant discharge

The Boffa Miskell report makes reference to “applying standard sediment and contaminant controls”. Provided these control methods are clearly described in a separate report, this is adequate.

6.0 Unresolved Concerns from Wildlands (2026)

In the previous Wildlands report (Wildlands 2026), several concerns were raised in regard to the AECOM report. These are listed below with comments on whether they have been addressed in the Boffa Miskell report.



1. Site photographs and SEV function scores were lacking. The Boffa Miskell report provides site photographs of the ten streams described, however they are adequate for only three streams. The remaining photographs do not actually show the stream so do not assist in assessing the stream condition. The Boffa Miskell report rejects the use of SEV so it does not provide any additional detail on function scores.
2. Environmental compensation ratios should use a standard value for culverts of 0.3 rather than 0.42. The Boffa Miskell report does not use ECRs at all.
3. Details should be given about how stormwater will be effectively treated (as an operational control) to avoid ongoing impacts on streams. The Boffa Miskell report does not address ongoing effects of stormwater.
4. The extending of culverts may trigger the requirement for a Complex Freshwater Fisheries Permit (as per Schedule 9 of the FTAA). This issue is not addressed in the Boffa Miskell report
5. Further specific confirmation is required that the Project will not involve any of the activities listed in NES-F Sections 52-54 in relation to effects on wetlands within or outside of the Project Area. The Boffa Miskell report does not address effects on wetlands.

7.0 Summary

The Freshwater Ecology Assessment by Boffa Miskell assesses the ecological value of eight streams as “Low” and two as “Moderate”. This is lower than the assessment by AECOM. It is based on misinterpreting the physical characteristics of the streams, mis-categorising the SEV values and omitting the value of the streams in supporting threatened and at-risk fish species. The ecological assessment by AECOM is considered more accurate than that of Boffa Miskell.

Boffa Miskell assesses the level of effects at the whole catchment scale, rather than the reach or sub-catchment scale as is standard practice. This reduces the level of effect to Low or Very Low, on which basis they conclude that no mitigation for effects on streams is required. This is inconsistent with the NPS-FM, which states that any loss of stream habitat or function must be managed by applying the effects management hierarchy. In urban areas, incremental loss of stream habitat through gradual development is a significant problem that can only be resolved by requiring small areas of stream habitat loss to be managed.

Potential ongoing effects of stormwater discharge on stream ecology have not been addressed.

Boffa Miskell offers some riparian restoration planting to account for loss of riparian vegetation from bridge construction and loss of stream habitat through culverting. However, they provide no basis for the proposed ratios of planting to vegetation/habitat loss. The final amount of riparian planting offered is approximately one-third of the amount calculated using the SEV. Despite claims to the contrary by Boffa Miskell, the SEV is appropriate for urban stream offsetting and is not difficult to apply.

Overall, it is recommended that a scientifically robust, transparent and widely accepted method is used to calculate the appropriate amount of offsetting for the effects on streams. The Stream Ecological Valuation (SEV; Storey et al. 2011) is the only method used in New Zealand that meets these criteria. Applying the SEV should not be onerous as the data have already been collected and the results have already been reviewed by Wildlands (Wildland Consultants 2026).



References

- AECOM (2025). *Te Ara Hauāuru Northwest Rapid Transit Assessment of Ecological Effects*. Prepared for NZTA, 15 December 2025. 108pp.
- Boffa Miskell (2026). *Te Ara Hauāuru Northwest Busway Freshwater Ecology Assessment*. Prepared for NZTA, 26 April 2026. 43pp.
- Neale, M. W., Storey, R. G., Rowe, D. K. (2017). *Stream Ecological Valuation: revisions to the method for assessing the ecological functions of New Zealand streams*. Australasian Journal of Environmental Management, 24(4), 392-405.
- Roper-Lindsay, J., Fuller, S. A., Hooson, S., Sanders, M. D., & Ussher, G. T. (2018). *Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems*. 2nd Edition. EIANZ Melbourne, Australia.
- Storey, R. G., Neale, M. W., Rowe, D. K., Collier, K. J., Hatton, C., Joy, M. K., ... & Quinn, J. M. (2011). *Stream Ecological Valuation (SEV): a method for assessing the ecological function of Auckland streams*. Auckland Council Technical Report TR2011/009. Auckland, New Zealand.
- Wildland Consultants. (2026). *Review of Te Ara Hauāuru Northwest Rapid Transit Assessment of Ecological Effects: Stream and Wetland Sections*. Wildlands Consultants Contract Report No. 7935. Prepared for Department of Conservation. 7pp.

Appendix 1

Experience and qualifications

My full name is Richard Godwin Storey.

I am an Associate Principal Ecologist with Wildland Consultants, with a specialty in freshwater ecology. My qualifications include a Ph.D. in Zoology from University of Toronto (Canada), a M.Sc. in Zoology from University of Auckland, and a B.Sc. in Zoology and Botany from University of Auckland.

I have a total of 23 years' professional experience as a freshwater ecologist. I have practised as an environmental consultant with Wildland Consultants since 2023. Prior to that, I was a research scientist in the Aquatic Ecology Centre at Kathmandu University from 2020 to 2023, and a scientist in the Freshwater Ecology Group at NIWA (the National Institute of Water and Atmospheric Research) from 2004 to 2019.

My area of expertise is freshwater ecology, with a focus on biological and water quality monitoring, assessments and reporting, ecological impact assessments, and restoration ecology. I have authored 25 peer-reviewed scientific journal articles, including 14 as first author, and I am co-author of three scientific books. I have written over 70 technical reports.

My experience with particular relevance to this project includes the following:

- I led the revisions and updates to the Stream Ecological Valuation (SEV), and was lead author of the technical report "Storey et al. (2011). Stream Ecological Valuation (SEV): A method for assessing the ecological functions of Auckland streams. Auckland Council Technical Report 2011/009." I have authored several technical reports on the applicability of the SEV to different stream types and different regions of New Zealand. I have taught professional ecologists to use the SEV in Auckland Council's Industry Development Series, and I have used the SEV in a number of ecological impact assessments and research projects.



- I have advised the EPA-appointed Expert Consenting Panel on freshwater matters for six fast-track applications, including one application by NZTA (State Highway 1 Cambridge to Piarere Long-term Improvements).
- I co-authored the most recent River Ecology State and Trends report for Auckland Council. This State of the Environment report summarises the state and trends of over 60 streams and rivers in the Auckland region.
- I am the lead author of a technical report reviewing the effects of stormwater management on the ecology of urban freshwater bodies “Ecological responses to urban stormwater hydrology. Auckland Council Technical Report 2013/033.”

Code of Conduct

Although this matter is not before the Environment Court, I confirm that I have read the Code of Conduct for Expert Witnesses outlined in the Environment Court's Practice Note (2023) and have complied with it in preparing this advice. If a hearing is held, I also agree to follow the Code when presenting evidence.

I confirm that the issues addressed in this brief of evidence are within my area of expertise (as described above), except where I state that I rely upon the evidence of other expert witnesses. I also confirm that I have not omitted to consider material facts known to me that might alter or detract from my opinions.

