



## **Introduction**

Environment Southland have received a retrospective resource consent application from the Fiordland Trails Trust (FTT) to modify a wetland due to construction of a multi-use trail on the eastern margin of Lake Manapouri and resource consent application for the diversion of surface water, the diversion of groundwater and for wetland modification associated within the installation of a third culvert at Leg 6 of the Lake 2 Lake Te Anau to Manapouri Multi Use Trail

Wildland Consultants Ltd were engaged by Environment Southland to assist with assessment of ecological aspects of the application. This evidence describes the qualifications of staff member Dr Kelvin Lloyd who undertook the assessments, and summarises the conclusions made.

## **Qualifications and experience**

My name is Kelvin Michael Lloyd. I am a Principal Ecologist employed by Wildland Consultants Ltd since 2004, based in Dunedin.

I have a PhD and BSc(hons) from the University of Otago. Subsequent to University I was employed by Landcare Research for three years of post-Doctoral research. I am an author of 21 peer-reviewed scientific research papers and over 250 contract reports. I have presented evidence at Environment Court level on 30 occasions, and in 23 resource consent hearings.

I am very familiar with Southland Region having undertaken numerous ecological assessments across the region, and having mapped potential natural ecosystems across the region. I have considerable experience in wetland assessments, having mapped current and potential wetlands in Southland, identified regionally significant wetlands in Otago, mapped and monitored numerous wetland types in the Tekapo Military Training Area, and provided advice on specific wetlands throughout New Zealand in relation to the effects of development activities on these wetlands.

In 2018 I presented evidence on behalf of Environment Southland on wetland values, state, and trends, at the hearing on the proposed Southland Water and Land Plan. I subsequently undertook field work and reporting to establish the causes of loss of Southland wetland extent.

## **Involvement in the case**

Wildland Consultants was contacted by Environment Southland staff in February 2019 asking for a review of the ecological assessment<sup>1</sup> accompanying the application for retrospective resource consent to clear and modify wetland vegetation and habitat crossed by the Manapouri to Te Anau segment of a multi-purpose trail constructed by the Fiordland Trails Trust. Specifically, technical comment on the effects assessment, fish passage, habitat changes, and any other relevant comment was sought.

---

<sup>1</sup> Beale Consultants 2018: Te Anau-Manapouri multi-purpose trail. Ecological assessment of Leg 6 wetland crossing. Prepared for the Fiordland Trails Trust.

I undertook a desktop assessment<sup>2</sup> of the Applicant's ecological report, concluding that the adverse effects of the trail on the wetland were more than minor, due to hydrological effects that were likely to change the composition of the wetland over time. I suggested that remediation, mitigation, or compensation actions could potentially address these effects.

Subsequent to providing this report to Environment Southland, in March 2019 I corresponded by telephone and email with Simon Beale (the ecologist acting for the Applicant). In this exchange I supported infilling of the excavated ditch on the upper side of the trail, and monitoring of the infilled material and its colonisation by indigenous sedges. I advised Environment Southland that this would partly mitigate the adverse ditch excavation effects, but that there would still be a residual adverse effects of wetland clearance.

In April 2019 I wrote an additional report<sup>3</sup>, setting out the basis for the above opinion. In this report I concluded that infilling the drainage ditch would remediate hydrological effects on the wetland, and that mitigation of the adverse effects of wetland clearance could be Scotch broom and control of upstream willow trees, which could potentially reduce the residual effects of wetland clearance to a less than minor extent.

Subsequently, FTT advised that the willow trees were on private land, so it was instead proposed to control woody weeds in an approximate 0.2 hectare area centred on the trail. FTT would also discuss removal of the upstream willow trees with the landholder. In a further report<sup>4</sup> I concluded that the residual adverse effects of wetland vegetation clearance caused by track construction would be addressed by these mitigation options, and that if the actions suggested earlier were also undertaken with sufficient care and diligence, then the overall ecological effects on the wetland should be less than minor. I noted that my conclusions were limited because they were made without the benefit of having visited the site.

Subsequent to this FTT applied for a new consent to divert surface water, divert ground water, and modify the wetland. This consent was applied for on the advice of a hydrological expert that an additional culvert was required beneath the trail.

I visited the site on 4 November 2019 to assess the wetland in the field, and to assess the potential effects of installing the additional culvert. This site visit was helpful in more accurately defining the extent of the wetland vegetation, which occupied the entire gully floor above the trail, but was confined to the margins of the two streams below the trail. I also noted that during trail construction, excavated substrate had been dumped in the wetland above the cycle trail.

---

<sup>2</sup> Wildland Consultants 2019: Review of effects of Fiordland Trail on wetland values. Wildland Consultants Contract Report No. 4957. Prepared for Environment Southland.

<sup>3</sup> Wildland Consultants 2019b: Review of effects of Fiordland Trail on wetland values. Wildland Consultants Contract Report No. 4957. Prepared for Environment Southland. Dated 8 April 2019.

<sup>4</sup> Wildland Consultants 2019: Review of effects of Fiordland Trail on wetland values. Wildland Consultants Contract Report No. 4957c. Prepared for Environment Southland. Dated 11 April 2019.

In addition to the remediation and mitigation actions suggested in our earlier reports, I wrote an additional report<sup>5</sup> in which I considered that removal of the spoil mound in the wetland upstream of the trail should be undertaken, and the original ground surface restored.

We did not support the proposed installation of a third culvert between the two existing culverts under the trail, as this would only exacerbate the adverse hydrological effects of trail construction on the wetland above the trail.

We further suggested that weed control for the benefit of wetland vegetation should focus on the entire area of wetland vegetation above the trail, and should focus on control of Scotch broom (*Cytisus scoparius*), blackberry (*Rubus fruticosus* agg.), and any invading woody weeds. We also suggested removing a rowan (*Sorbus aucuparia*) tree located some 15 metres below the cycle trail, and any associated rowan regeneration.

The reports that contain these findings are appended to the S42A report.

## Conclusions

The adverse hydrological effects of spoil dumping and ditch excavation on the upstream wetland could be remedied by removing the spoil dump, infilling the ditch, and reinstating the former wetland ground surface. Installation of a third culvert is not supported as it would generate additional adverse effects and provide no obvious benefits. Weed control over the entire wetland area above the trail and additional control of rowan below the trail would mitigate the residual adverse effects of wetland clearance. Overall, if all of these positive activities were undertaken to an appropriate standard, in my opinion the residual adverse effects on the wetland would be less than minor.



NAME Kelvin Lloyd  
POSITION Principal Ecologist

---

<sup>5</sup> Wildland Consultants 2019: Review of effects of Fiordland Trail on wetland values. Wildland Consultants Contract Report No. 4957d. Prepared for Environment Southland. Dated 6 November 2019.