Ecological Impact Assessment

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Nelmac, 2 Bullen Street, Tahunanui, Nelson 7011, New Zealand. Tel: 03 546 0910.
www.nelmac.co.nz

Report prepared by:

Hadyn Butler
Ecologist
Conservation & Ecology

Tel 03 546 0910
Mob 021 915 993
PO Box 9035, Annesbrook, Nelson 7044
2 Bullen St, Nelson
http://www.nelmac.co.nz

Introduction

This ecological impact assessment has been prepared to support the application for resource consent to re-align Groom Creek, a tributary of the Maitai-Mahitahi River. The re-alignment of Groom Creek is part of a wider project to construct a wetland to reduce fine sediment and oxidised nitrogen (nitrates) inputs in to the Maitai-Mahitahi River.

This report addresses only the potential and probable effects of the re-alignment on the existing stream habitat (including the riparian margins) in the project area. The potential effects (adverse and/or beneficial) of the constructed wetland have been described separately, and are not addressed here. However, the potential benefits of the constructed wetland are given consideration in the final assessment of the significance of potential effects on the stream habitat.

This report is intended to satisfy the requirements of the Resource Management Act (RMA), Schedule 4 section 6 'Information required in assessment of environmental effects' and 7 'Matters that must be addressed by assessment of environmental effects'. It does not provide a complete assessment of the activities against Part 2 of the RMA, the Nelson Regional Policy Statement 1997, or the Nelson Resource Management Plan. It is understood that this will be provided separately.

Proposed activities

The Groom Creek Wetland Project (the Proposal) aims to construct a restored wetland at the confluence of Groom Creek and the Maitai-Mahitahi River. Detailed construction plans were not available for this report. Information on the proposed activities comes from a basic concept plan (see Appendix 1), discussions with the lead design engineer (Stu Farrant of Morphum Environmental Ltd.), and information on the desired outcomes of the Proposal supplied by Nelson City Council.

The Proposal will involve the re-alignment of the existing bed of Groom Creek to divert the water to a constructed wetland complex, which in turn will flow in to the Maitai River, approximately 270m downstream of the current confluence. The existing stream bed will be maintained as an overflow channel for flood flows. The channel will be dry during normal and drought flows. It is understood that the entire project area will be planted using native species during and after the construction phase of the project.

The activities involved in the re-alignment of the stream will include earthworks, use of heavy machinery, and some vegetation clearance. Construction materials (clay, rock) may be imported to the site if they cannot be sourced locally. A culvert (or similar) will need to be placed to pass the creek under the existing forestry road, and a series of pathways and information boards will be built to enhance the recreational values of the site.

Site description

Nelmac's Ecologist, Hadyn Butler, has visited the site several times and is familiar with the vegetation and layout of the project area. A site visit specifically to describe the stream habitat within the project area was carried out on 11 July 2016.

Landscape and historical context

The project area is located approximately 6km from the Nelson town center, between the Waahi Taakaro Golf Course and the Maitai Valley Motor Camp, on the true left-bank of the Maitai-Mahitahi River.

Groom Creek is a permanently flowing first-order stream, approximately 3.6km in length.[1] The current alignment of the stream-bed is artificial, as the creek has previously been diverted. Information on this previous re-alignment is not available, but it is assumed that it occurred when the forestry road (Groom Road) was built.[2] This re-alignment is believed to have resulted in the loss of wetland habitat in the area, although some remnant wetland vegetation does exist at the site.

The Groom Creek catchment covers an area of approximately 223.7 hectares.[3] The catchment is highly modified, and land-use is primarily commercial forestry, most of which has recently been harvested and re-planted. There are also four-settling ponds attached to the Nelson City Water Treatment Plant, which are surrounded by a large area (approximately 15ha) of exotic grassland, and some areas of regenerating native bush and gorse and/or broom scrub. The majority of the catchment is privately owned, however the project area sits within the Maitai Esplanade Reserve, owned by Nelson City Council.

[1] *New Zealand River Environment Classification. Ministry for the Environment*

[2] *Susan Moore-Lavo, Environmental Programmes Adviser, Nelson City Council (Pers. comm.)*

[3] *New Zealand River Environment Classification. Ministry for the Environment*

Riparian habitat

The riparian habitat within the project area includes two distinct areas, which are separated by the Maitai Valley Walkway footbridge (see Appendix 2). The riparian area immediately upstream of the footbridge is not maintained, and is dominated by exotic weeds including old man's beard, Himalayan honeysuckle, blackberry, broom and gorse. Native bracken fern and karamu are also present in small numbers (see Figure 1). This section of the stream is moderately incised which, combined with the abundance of weeds, provides good shading for the stream.

The final section of Groom Creek below the footbridge flows through open parkland that is maintained by the Nelson City Council (see Figure 1). Vegetation in this section is dominated by exotic pasture grasses, with mature oak and willow trees. There are several native grasses and flaxes in this section and one kanuka. The stream mouth and adjacent banks of the Maitai-Mahitahi are planted with native grasses and flaxes. A lower bank profile, and the open nature of the riparian vegetation, provide poor shading for this section of the stream.

The riparian habitat within the project area has a relatively small diversity of plant species, dominated by exotics and environmental weeds. This represents a highly modified habitat of low ecological value.

Figure 1 Groom creek immediately upstream (left) and downstream (right) of the footbridge

In-stream habitat

Physical habitat

The stream within the project area is between 1-2m wide, and contains mostly riffle habitat, with a few small pools. The substrate within the stream is coarse sand with many small (<2cm) to large (>40cm) rocks, and small amounts (estimated at <5% total cover) of decaying leaf and plant matter (see Figure 2). The stream is known to have elevated levels of oxidized nitrogen, potentially affecting the diversity of macro-invertebrates and the growth of macrophytes within the stream.[4]

Figure 2 Typical substrate in Groom Creek below the footbridge: small to large rocks and coarse sand.

Macrophytes

At the time of the site visit there were moderate amounts of water cress (see Figure 3), and filamentous algae (<20% total cover). It should be noted that the site visit was conducted in mid-winter, and it is possible that there are significant seasonal changes in the abundance of macrophytes.

Figure 3 Watercress growing along the margins of Groom Creek below the footbridge

[4] *https://www.lawa.org.nz/explore-data/nelson-region/river-quality/maitai-river/groom-at-maitai-confluence/*

Macro-invertebrates

Due to the scale and extent of the proposed activities, it was not considered necessary to carry out targeted macro-invertebrate surveys for this assessment, however two juvenile koura, and one unidentified caddisfly pupae were observed during the site visit. The physical features at the site would be generally considered to be good habitat for macro-invertebrates; however, the macro-invertebrate community is likely to be affected by the elevated nitrates and by poor shading in the catchment.

Freshwater fish

Due to the scale and extent of the proposed activities, it was not considered necessary to carry out targeted surveys of freshwater fish. The New Zealand Freshwater Fish Database (NZFFD) contains only one record from Groom Creek from 2015. This survey identified one Longfin eel, 48 koura, and one unidentified eel.

The existing outfall of Groom Creek consists of a vertical fall (see Figure 4). This fall was approximately 40cm high on the day of the site visit, and probably exists during most 'normal' flows for the Maitai-Mahitahi River.[5] It is probable that this would constitute a barrier to the up-stream migration of several native fish species, including inanga, smelt, and common and giant bullies, which are known to live in the Maitai catchment.[6]

Whether this constitutes a 'natural' barrier is debatable, as the current alignment of Groom Creek is considered to be artificial.

Figure 4 Existing outfall of Groom Creek. The pictured clipboard is 375mm high

[5] Maitai-Mahitahi River flows at at Avon Terrace were recorded at 1.07m^3/sec during the time of the site visit. See: http://www.tasman.govt.nz/environment/water/rivers/river-flow/riverflow-751/#siteinfo

[6] New Zealand Freshwater Fish Database, Olley, R., Kroos, T. 2014. A summary of the distribution and spawning of freshwater fish within the waterways administered by the Nelson City Council.

Potential environmental effects

As detailed construction plans were not available for this report, the assessment of potential effects due to construction activities (e.g accidental diesel spills or sediment entering freshwater due to earthworks) is limited. The potential effects described below are considered to have a high probability and/or a long term effect. The use of hazardous substances and/or discharge of contaminants is unlikely to occur during the re-alignment and construction of the wetland complex.[7]

As stated above, only the effects to the existing section of Groom Creek and its' associated riparian margin are described in this report, however the potential effects of the wider project are given consideration in assessing the significance of the effect.

Effects on riparian habitat

Some vegetation clearance will be required to construct the new stream bed and 'inlet diversion forebay' (see Appendix 1). This will be located in the area above the Maitai Walkway footbridge, which is infested by environmental weeds. It is not expected that any vegetation clearance will be required below the footbridge, and it is unlikely that this vegetation will be adversely affected due to the re-alignment of the stream.

Given the condition and extent of the affected riparian vegetation, this should be considered to be a minor effect.

Effects on in-stream habitat

A section of in-stream habitat of approximately 120m will be permanently lost as a result of this proposal. This is a modified habitat type that is common within the Nelson area. The affected reach contains good habitat for macro-invertebrates and a moderate diversity of riffle and pool habitat, although it is poorly shaded. Longfin eel (At Risk – Declining)[8] and koura (Not threatened)[9] are known to be within the catchment, and it is likely that other native fish and brown trout are present.

There may be a temporary reduction in bank stability and sediment capture due to the clearance of weeds above the footbridge, however this is of a very limited extent.

The affected reach represents approximately 3% of Groom Creek (based on estimated total length of 3.6km), and a negligible proportion of this type of habitat within the Maitai catchment. The affected reach is representative of modified habitat of low to moderate ecological value. It does not contain significant habitat for indigenous species, nor is it critical habitat for threatened or at risk species. This should be considered to have a moderate effect on the Groom Creek catchment, but a minor effect within the wider Maitai catchment.

[7] *This relates to requirements under the Resource Management Act, Schedule 4, 6 (c) and (d).*

[8] *Goodman, J.M.; Dunn, N.R.; Ravenscroft, P.J.; Allibone, R.M.; Boubee, J.A.T.; David, B.O.; Griffiths, M.; Ling, N.; Hitchmough, R.A.; Rolfe, J.R. 2014: New Zealand Threat Classification Series 7. Department of Conservation, Wellington. 12 p.*

[9] *Grainger, N.; Collier, K.; Hitchmough, R.; Harding, J.; Smith, B.; Sutherland, D. 2014: Conservation status of New Zealand freshwater invertebrates, 2013. New Zealand Threat Classification Series 8. Department of Conservation, Wellington. 28 p.*

Mitigation

As stated above, the assessment of effects arising from construction activities is limited due to the information available at the time of writing this report. Mitigation for these effects is not addressed in this report, however will likely to include sediment controls, appropriate staging of works (e.g. carrying out earthworks during dry periods), appropriate hazard management (e.g. having a diesel spill kit on site), and temporary diversion of water flows.

Riparian habitat

The affected riparian habitat is dominated by environmental weeds and is of low ecological value. While this vegetation perform some ecological functions (shading, bank stabilization, and sediment trapping), there are very few native species there, and the planned re-vegetation using native species will remedy the loss of this vegetation. With adequate management, restoration planting will result in increased species diversity, increased dominance of native species, and improved ecological function, representing a net benefit to biodiversity.

In-stream habitat

The loss of in-stream habitat is intended to be mitigated by the construction of the wetland complex. The planned constructed wetlands provide a greater extent and diversity of freshwater habitat, potentially providing additional spawning habitat, increased shading and food resources, and improved habitat quality.

As stated above, the current outfall of Groom Creek may present a barrier to up-stream migration of non-climbing native fish species. Provision of fish passage will be a priority in the design and implementation of this project,[10] therefore there is potential to actually improve fish passage to the Groom Creek catchment, thus potentially increasing the diversity of fish species within the catchment, and increasing the extent of available habitat for native fish species.

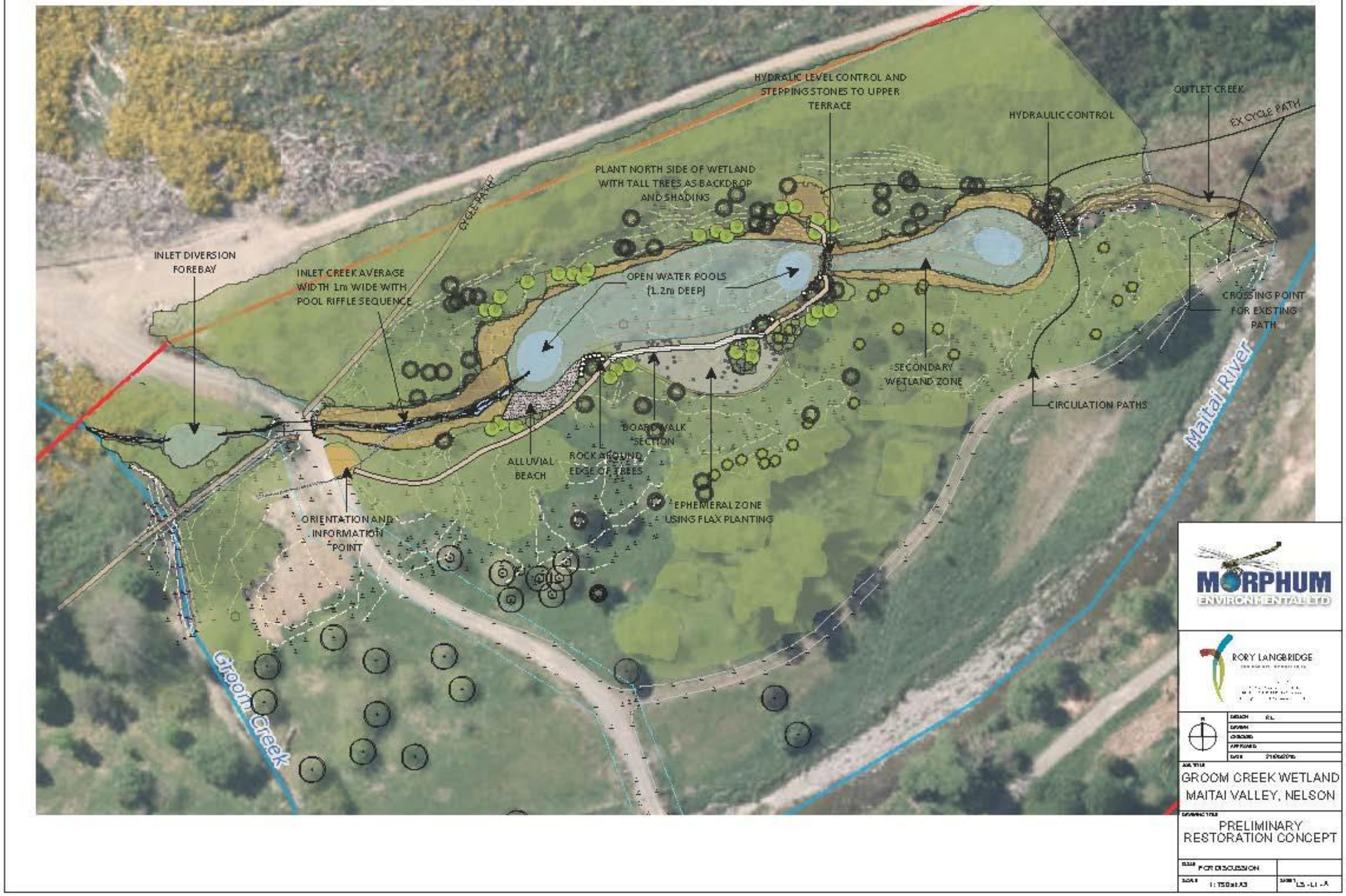
As such, the successful implementation of this proposal would result in a net increase in freshwater habitat and habitat diversity, and net positive effects for freshwater fish and macro-invertebrates in the longer term.

Summary

The Proposal seeks to re-instate wetland habitat and improve the quality of water entering the Maitai-Mahitahi River from Groom Creek. This area of potential effects is highly modified, and dominated by exotic vegetation and environmental weeds. A stretch of in-stream habitat of low to moderate ecological value will be lost due to the proposed activities, however this represents a negligible proportion of this habitat type within the Maitai catchment. Furthermore, the proposed construction of a wetland complex and associated re-vegetation with native plants, should result in a net gain in ecological value through increased diversity, extent and quality of habitat types, increased diversity and dominance of native plant species, and improved ecological function.

[10] *Stu Farrant – Pers. Comm.*

Appendix 1 – Concept Plan for Discussion



Concept plan for Groom Creek wetland restoration developed by Morphum Environmental. Reproduced with permission.

Appendix 2 Affected reach of Groom Creek