

Water Ways Consulting

Homestead Bay Aquatic Ecology Assessment



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Cover photo: Pond, Homestead Bay

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1. INTRODUCTION

RCL Henley Downs is undertaking investigation for a subdivision development, Homestead Bay development, along the shores of Lake Wakatipu to the south of Jacks Point between State Highway 6 and the shore of the lake. The area is currently pastoral land bisected by some steep side gullies.

This report provides the assessment of water bodies and water courses and their ecological values for the Homestead Bay development.

2. METHODS

The Homestead Bay area was visited on the 15 March 2023. The two water courses and a pond on the property were all visited (Figure 1). The habitat at each site and the permanence of water in the water courses was assessed. For wetted sites the potential for fish residence and fish passage was checked and the likely macroinvertebrate communities determined.



Figure 1: The Homestead Bay aquatic assessment areas.

3. RESULTS

3.1. Pond

The unfenced pond (site HOME1, Figure 1) is situated on a hilltop (altitude 380 m) and has no inflowing tributaries. There is a small hut and oak trees¹ beside the pond (Figure 2), and duck decoys in the pond indicating the pond is used for recreation duck shooting. The pond margin is grazed pasture grass or bare ground.



Figure 2: The pond with small hut and oak trees.

An outflow was present with water flowing out of the pond at a low point along its banks. The outflow does not have permanent flow as the outflow water course was across pasture grass and bare ground (Figure 3). There was also a substantial accumulation of sheep pellets on the bare ground indicating that sheep had been resting in this area when it was dry. The outflow was likely to have commenced flowing after rainfall in the previous two days. A pipe was observed in the pond that was discharging water into the pond and this artificial input was the only water supply for the pond.

With no tributaries and no outflow connection to other water bodies the pond cannot be colonised by fish. Diving beetles, backswimmers and water boatmen were the only macroinvertebrates seen in the pond. For the most part the pond bottom is mud with the occasional stick and rock on the bottom (Figure 4).

¹ Oak trees are planted to provide acorns for ducks to eat.



Figure 3: The pond outflow on bare ground that is a sheep resting area.



Figure 4: Pond edge and muddy bottom.

3.2. Water Course 1

Water Course 1 is a water course approximately 1 km long that rises downslope from State Highway 6 and extends downstream to Lake Wakatipu. The stream was walked from the lake edge upstream for approximately 550 m. At the lake edge there was no evidence of a stream or stream course flowing

across the lake shore and above the gravel lake shore the stream channel is well vegetated with terrestrial shrubbery (Figure 5).



Figure 5: The lakeshore where Water Course 1 discharges into Lake Wakatipu.

Fifty metres upstream from the lake shore the stream emerges from a steep sided valley and pine plantation. At Site Home 2 windfall pines, valley floor vegetation and leaf litter have created a dam and upstream of this a small wet area with well-established weedy terrestrial species (Figure 6).



Figure 6: windfall pine and leaf litter creating a dam and ponded water.

This wetted area of the valley floor extends for less than 75 m between sites HOME2 and HOME3 and the water is very shallow. At Site HOME3 and upstream to site HOME4 and further the water course is dry and vegetated with terrestrial plants, often grazed grasses (Figure 7).



Figure 7: Water Course 1 at (left) top of pine plantation and (right) near site HOME4 with a terrestrial vegetation valley floor.

The rest of pine plantation the valley floor is covered with pine needle and further upstream the valley floor it is vegetated with grass. Neither area has an obvious stream course where vegetation has not established, or leaf litter has been washed away.

3.3. Water Course 2

Water Course 2 rises on the flank of the Remarkables Range, flows under State Highway 6 and down slope to Lake Wakatipu. The outflow to Lake Wakatipu across the lake front has a dry stream channel upstream of the lake shore where wave action creates the lake shore gravel/cobble beach zone (Figure 8). The stream flows out of a canyon like valley with a wide valley floor and steep, often vertical sides (Figure 9).

Upstream of the shoreline the stream has a well-established, 1 m wide incised channel with a dry gravel/cobble/boulder bed. This channel extends upstream for nearly 400 m before terrestrial grasses began to establish in the channel. Within this reach there are small boulder waterfall structures with downstream scour pools. While the channel is deep none of the scour pool retained water (Figure 10). The scour pools do indicate that when the stream flows it has the power to move cobble and gravel material downstream. Between 400 m and 500 m upstream from the lake there are a number of tributary inflows, and the channel become progressively smaller and terrestrial grasses and shrubs begin to grow in the channel. The tributaries include scour channel flowing over the canyon walls (Figure 11). Beyond site HOME8 the channel has intermittently exposed rock but is predominately overgrown with terrestrial vegetation.



Figure 8: The Lake shore and dry channel of Stream Course 2.



Figure 9: Looking upstream in Stream Course 2.



Figure 10: Scour pool in Stream Course 2.



Figure 11: Erosion channel in canyon walls.

4. ECOLOGICAL VALUE OF WATER BODIES

4.1. Pond

The pond appears to be an artificial water body, that is maintained by a water discharge rather than any natural inflows. The lack of any wetted connection to any other water body prevents fish colonisation and has only allowed a few winged insect species to occupy the pond. The presence of a small hut, duck decoys and oak trees indicate that the pond is used for recreational duck shooting, but the pond has very limited aquatic ecological values.

4.2. Stream Course 1

This is an ephemeral water course with little wetted habitat in the stream course. The short wetted section is insufficient to support fish and there is no fish passage between this wet section and Lake Wakatipu to allow fish to migrate upstream. It is likely that the stream only flows during and after heavy rainfall and the majority of the water course dries very quickly. The presence of terrestrial grasses in the mid and upper reaches of the water course shows that when wet there is not enough water-power to scour a channel nor is the duration of any wet period sufficient to eliminate the terrestrial plants. The small section of wetted channel appears to have been created by a channel blockage where windfall pines have fallen in the stream channel. This habitat is unlikely to be permanent as the blockage will fail as the trees decay and flow events flush the accumulated leaf litter downstream.

This ephemeral channel does not support any fish, nor any stream macroinvertebrates. Wet tolerant invertebrates may utilise the wet section, but the longevity of this habitat is limited.

4.3. Stream Course 2

This is an ephemeral stream with no evidence of any permanent water. The stream does have high flow events that have scoured an obvious and often deep channel along the canyon valley floor. The lower 400 m of this channel is sufficiently regularly scoured to prevent terrestrial vegetation establishing in the channel. Upstream as the flow diminishes the terrestrial vegetation has become established in the water course.

This ephemeral channel does not support any fish, nor any stream macroinvertebrates.

5. AQUATIC ECOLOGICAL EFFECTS OF THE DEVELOPMENT

5.1. Stormwater Discharges

The two stream courses are possible stormwater receiving environments. The design of the stormwater infrastructure is yet to be completed so discharge locations and volumes are yet to be determined. Once the design is complete a full assessment of the potential effects of stormwater discharges can be conducted. However, at this stage given the two water courses are ephemeral streams with no aquatic life the any stormwater inflows will not alter this and can only change the duration and size of the infrequent flow events along the water courses.