

memo

To: Hilary Lennox, Ahika Consulting Ltd
From: Matt Hickey, Water Resource Management Ltd
Date: 30/01/2019
Re: Fish Survey of the Royal Burn and New Chums Creek

On the 28th of January 2020, WRM Ltd and Ryders Consulting surveyed the Royal Burn and New Chums Creek for fish using Electric Fishing along multiple reaches. Sites selected included both above and below water takes and in reaches that contained habitat suitable for fish. Prior to this survey there had been one site sampled at the head of New Chums Creek and in the upper reaches of the South Branch of the Royal Burn.

[New Chums Creek](#)

There is one take from the upper reaches of New Chums Creek, no fish surveys had been conducted in the creek though one site had been surveyed in the race near the intake. Access to the creek is difficult. A significant reach in the middle reaches was surveyed below the take as well as a section immediately above its confluence with the Arrow (Figure 1).



Figure 1. Electric fishing survey sites for New Chums Creek. Red dots = no fish, yellow dots = rainbow trout. The existing take is also shown along with a 2m+ waterfall.

A significant reach of lower gradient stream with good cover and habitat was surveyed below the existing take and no fish were caught or observed. The invertebrate community was dominated by large body specimens such as stoneflies indicating fish (especially salmonids) are not present.

Immediately above its confluence with the Arrow, New Chums Creek was surveyed until several waterfalls were reached, the first was over a metre high while a short distance upstream a second waterfall more than 2 metres high was encountered (Figure 1).

Rainbow trout were not found between the two waterfalls but were common below the most downstream waterfall to the confluence with the Arrow.

On the day of the survey there was only a seepage flow passing the take, while in the middle survey reach flows had gained to be more than 10 l/s. At the confluence with the Arrow, flows were estimated to be in excess of 30 l/s.

Royal Burn

There are two take points from the North Branch of the Royal Burn, no fish surveys had been conducted in North Branch and there is one survey site in the South Branch above any takes. Both the upper reaches of the North and South branches were surveyed as well as below the confluence of the two branches (Figure 2).



Figure 2. Electric fishing survey sites for the Royal Burn. Red dots = no fish, green dots = brown trout. The existing takes are also shown.

Significant reaches of stream with good cover and habitat were surveyed above and below the existing takes in the North Branch of the Royal Burn with no fish caught or observed. The invertebrate community was dominated by large body specimens such as stoneflies indicating fish (especially salmonids) are not present. The same was true for the upper reaches of the South Branch.

Downstream of take 97029 and 3073B the North Branch of the Royal Burn went dry despite two thirds of the flow passing the intake, indicating that the lower section of the Royal Burn North Branch is naturally intermittent (Figure 3 and Figure 4).



Figure 3. Flow split at the bottom take on the North Branch of the Royal Burn. Red arrow indicates the take and the blue arrow is the residual flow.

Downstream of the North and South Branches confluence, the Royal Burn gains flows from groundwater inputs and appears to flow permanently. It was in this section several age classes of small trout were recorded (Figure 4).



Figure 4. Map showing the flow reaches of the Royal Burn (blue line) the dry reach (red line) and the point the North Branch went dry despite the majority of flow passing the intake for 97029 & 3078B.

Given there is no fish passage from the Arrow up the Crown Terrace to the Royal Burn it indicates fish have been liberated into the Royal Burn. Currently it is likely the intermittent reach in the North Branch is acting as a barrier to trout moving into the fish-free perennial reaches above the takes.



It is highly unlikely that this trout population is contributing to the wider Arrow fishery, nor are they of any size to be a recreational asset.

Fish Screens

Fish screens are not recommended for any of the takes from either New Chums Creek or the Royal Burn due to the lack of fish.