

# MEMORANDUM

Date: 4 October 2024

From: Laura Drummond

To: Environment Southland

Subject: Titiroa tide gates hearing – response to Minute of Hearing Commissioner Allan Cubitt

## 1. INTRODUCTION

I have been requested to provide a response to point 2(c) and (d) within the Minute of Hearing Commissioner Allan Cubitt dated 2 September 2024, as provided below.

- Point 2(c): Assessment of how the gates may be modified to enable the passage of kanakana.
- Point 2(d) Assessment of the downstream effects of removing the gate. What impact would this have on habitat now adapted to the current situation?

## 2. RESPONSES

The below sections outline my responses to the Commissioner's requests.

### 2.1. Kanakana passage

The desirability of improving kanakana (lamprey: *Geotria australis*) passage past the gates was discussed at the hearing. Options to improve passage when the gates are shut have therefore been investigated. While they are known to use their sucking disc mouth to climb barriers, hard edges, as present at the top of the Titiroa tide gates, are likely to limit or prevent success in climbing over gate structures as full suction cannot be maintained.

In order for kanakana to move over an edge a radius of 8-10 cm on any curve is required. This is to ensure they can use their burst and attach locomotion<sup>1</sup>. However, a wetted surface is required for attachment. This cannot be achieved at the gates without additional modifications such as a water pump to circulate water over the top of the gate structure. This is not considered a practicable option at this site. The proposed 'letterbox' design would provide improved passage for kanakana when the gates are closed and is considered a better option at this site.

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<sup>1</sup> Information provided by Dr Cindy Baker (NIWA) in an email dated 12 September 2024.

## 2.2. Downstream habitat

The habitat downstream of the gates includes the Titiroa Stream diversion channel, the mainstem and estuarine and coastal wetland environment (ToesToes/Fortrose Estuary). Restoration and enhancement of the lower river and estuarine area has been undertaken, including the retirement of previously grazed land which is regenerating into coastal wetland habitat.

To understand the potential effects of removing the tide gates Mr Gardner has undertaken additional hydrological modelling for a range of tide conditions. The output of this model shows that for a wide range of the tide scenarios the following would occur at high tide, if the gates were to be removed:

- Approximately 10 cm water level drawdown within 100 m.
- Approximately 2-3 cm water level drawdown within 1 km.
- No noticeable effect past 1 km downstream of the gates.

When considering the habitat downstream of the gates, no adverse ecological impacts of removing the gates are expected to the lower estuarine areas that have undergone enhancement. The highest water level change would occur in the diversion channel and the channelised section of the Titiroa Stream around the Tokanui-Gorge Road Highway. Natural regeneration of the retired land is still expected, provided sufficient management of this land occurs.