



## 8.0 Managing the Growth of Blue-Green Algae

### The use and protection of the Tukituki River has long been a topic of debate

Hawke's Bay Regional Council has been working on a range of plans for the catchment to provide positive environmental, social, cultural and economic outcomes for the region. A significant amount of work has been done to assess the possibility of large-scale water storage in the Ruataniwha basin.

Water storage, combined with higher minimum flows (set by HBRC) will allow the river to be returned to more natural flows during summer - especially if current irrigators can be moved to storage.

The Ruataniwha Water Scheme (RWSS), coupled with provisions in the proposed Tukituki Plan Change, aims to improve water security for farmers, unlock economic potential for Hawke's Bay and improve water quality and quantity.

### Reducing algae and slime

A key water quality issue - particularly in the lower reaches of the Tukituki River - is excessive slime and algae growth, also known as periphyton. Evidence is clear that reducing phosphorus in the river system will reduce periphyton. However, there is debate around the relative effects of decreasing phosphorus concentrations at the same time as maintaining or increasing the concentration of nitrogen, and how this might create conditions that favour undesirable algal species, such as Phormidium.

Phormidium mats observed in the Tukituki River are generally very thin and total cover is generally low. Despite this, detached mats are occasionally visible along the river margins.

National Cyanobacterial Recreational Guidelines state that alert levels should be triggered when mats break free and accumulate on the riverside. There may be risks to water users who ingest water containing detached mats or come into direct contact with them. These risks would increase if more mats were present.

The frequency and intensity of flushing flows, caused by significant rainfall events, are key factors influencing Phormidium occurrence. The proposed nutrient management for Tukituki River is unlikely to increase the risk of mats, where proposed flushing flows will remove them before they pose a significant risk.

The incidence of Phormidium does not generally appear to be a major problem in the Tukituki catchment, as it sits well below the draft guideline lower trigger (surveillance) of 20% cover.

There is no relationship between the proportion of bed covered by Phormidium mats and the incidence or concentration of toxins. Cawthron research indicates that it is probably normal to have some Phormidium in all rivers in New Zealand.

The key known drivers of Phormidium growth are:

- flow stability - long accrual period, absence of flushing flow
- substrate size - stability
- velocity (point velocity)

### Flushing flows as a management tool

The RWSS offers the potential to release artificial flushing flows to manage Phormidium in the Tukituki River. Up to 40 m<sup>3</sup>/s could be released with water storage at full supply level, and up to about 20 m<sup>3</sup>/s at lower levels. The release of these flows could be timed to coincide with natural small rainfall events for maximum effect.

Even moderate-size flushing flows could substantially enhance public health risk by removing deposited material, detaching mats, and reducing the potential for subsequent deposits.

The effect of these artificial flushing flows is currently speculative. It is difficult to predict the proportion of Phormidium mats that might be removed. The relationship between flow and mat detachment will be site-specific and has not been established in the Tukituki River. Flushing flows will probably remove a proportion of the biomass, but complete removal of firmly attached mats may not occur.



HAWKE'S BAY REGIONAL  
INVESTMENT COMPANY LTD



Hawke's Bay Regional Investment Company Ltd is a  
Council Controlled Trading Organisation of Hawke's Bay Regional Council