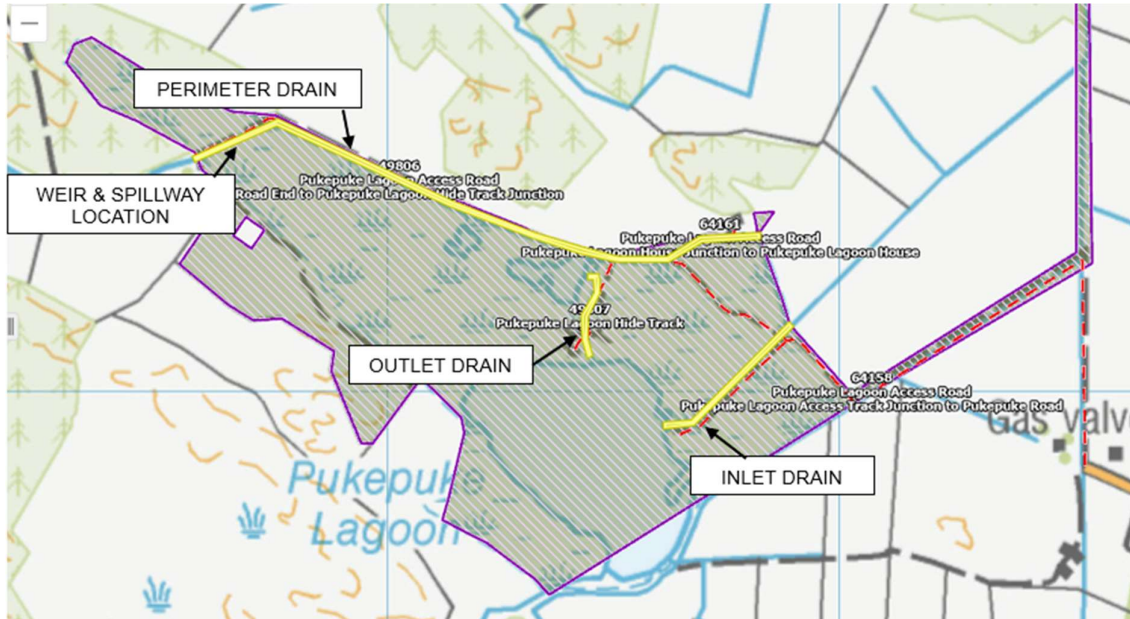


Ecological Assessment of the Drainage Channels at Pukepuke Lagoon

Introduction

This report has been prepared following a site visit on 7 April 2025 by Aaron Madden, Biodiversity Project Manager, Green by Nature, and Robert Rose, Senior Environmental Advisor, Manawatu District Council.

As part of MDC's concession with the Department of Conservation, the Oroua Drainage board can mechanically remove vegetation within the easement area that covers the inlet, outlet and perimeter drain (identified by the yellow lines on the map below) to maintain capacity.



Before undertaking any mechanical clearance, MDC were keen to have an ecological assessment completed to identify the following (limited to the easement area):

- Invasive weeds
- Note any pest aquatic fish (Carp)
- A general description of the vegetation within the easement
- recommendations around the use of spray to control invasive plants (if applicable).

Observations

The dominant species in the Inlet Drain are water celery (*Helosciadium nodiflorum*) and raupō (*Typha orientalis*). Both ends of the Inlet Drain were dry but there was a short section of shallow water about midway, with common duckweed (*Lemna disperma*) amongst the raupō.

There is some scattered field horsetail (*Equisetum arvense*) both in the bed and amongst the exotic grasses beside the eastern end of the Inlet Drain. No field horsetail was noted at the western end.

Vegetation on the northern side of the Inlet Drain is mainly raupō with some occasional harakeke/flax (*Phormium tenax*), giant umbrella sedge/toetoe upoko-tangata (*Cyperus ustulatus*) and ti kōuka/cabbage tree (*Cordyline australis*). The southern side is more open, with exotic grasses occupying the spaces between the raupō and harakeke. A single plant of asparagus (*Asparagus*

officinalis) was noted at the top of the bank on the southern side. Great bindweed (*Calystegia sylvatica*) is present at low levels on both sides. There is a rough vehicle track along the southern side of the Inlet Drain, a couple of metres from the edge.



Water celery and raupō are the dominant species in the bed of the Inlet Drain.

From the Lagoon until the footbridge across the Outlet Drain, the bed is mostly raupō with some water celery. On the other side of the footbridge, it is almost entirely water celery all the way to the Perimeter Drain. The drain is flanked by harakeke with raupō and occasional cabbage trees. There is a rough vehicle track along the eastern side of the Outlet Drain, a few metres away from the edge.



Between the footbridge and the Lagoon, raupō dominates the bed of the Outlet Drain.



Water celery in the Outlet Drain, looking north from the footbridge.

Vegetation in the Perimeter Drain is mostly a mix of water celery and common duckweed. Shallow water was present for most of the drain length although the bed was dry for several metres before the weir. On the southern side of the Perimeter Drain, raupō dominates the vegetation with occasional harakeke and *Carex secta*. The northern side is more open, with occasional harakeke, cabbage trees, mingimingi, *Carex secta* (purei), raupō, *Carex geminata* (cutty grass, rautahi), giant umbrella sedge, and *Bolboschoenus fluviatilis* (marsh clubrush, kukuraho, pūrua grass) amongst various exotic grasses. There is a vehicle track along most of the northern side of the Perimeter Drain that varies in distance from 2 to 10m from the edge.



Western end of the Perimeter Drain, looking west towards the weir.



At the eastern end, with less common duckweed and more raupō, both in the bed and on the northern banks.

No pest aquatic fish were noted.

Recommendations

Mechanical clearing would be sufficient to keep the drain channels open for a reasonable period (until the next round of mechanical clearing). There are no weed species present that demand chemical treatment to achieve this.

However, from an ecological standpoint, it would be advisable to consider chemical control of the field horsetail at the western end of the Inlet Drain before it reaches the margin of the Lagoon. It would require multiple treatments per year over at least a couple of years so that would have to factor in the decision on whether to attempt control. It also assumes that it hasn't reached the margin already – none was seen on the day of the site visit but further searching would be advisable if there was an appetite to control it.

During the mechanical clearing, efforts should be made to protect the following native species:



Carex geminata (cutty grass, possibly planted) on the northern side of the track along the Perimeter Drain. Keep drain cleanings on the southern side of the track along this section.

Bolboschoenus fluviatilis (marsh clubrush, kukuraho, pūrua grass) – an upright plant with triangular stems, growing to about 1m.

Plants of this species growing in the bed of the drain can be removed but effort should be made to protect the individuals growing on the banks.





Carex secta (*purei*) – a native grass-like sedge. The leaf tips are often orange, especially on plants in full light.



Coprosma propinqua (*mingimingi*) – a small-leaved shrub or small tree growing next to some cabbage trees near the weir.

Cyperus ustulatus (giant umbrella sedge) – has long stalks with dark brown seed heads.



Out of Scope Issues and Recommendations for Further Investigation

During the site visit, mention was made of thoughts to plant taller native species along one side of the drains for shade. This would have several benefits, one of which being that weed regrowth in the drains would be reduced, allowing for longer periods between mechanical clearing.

Planting the northern side of the Inlet Drain and the western side of the Outlet Drain is likely to have a significant effect on regrowth of water celery, in particular. There is limited scope for planting the Perimeter Drain given the access for mechanical clearing operations is from the northern side – the very side that would need to be planted to achieve shading.

Suitable native tree species for the site would include kahikatea (*Dacrycarpus dacrydioides*), kōhūhū (*Pittosporum tenuifolium*), narrow-leaved lacebark (*Hoheria angustifolia*), and mingimingi (*Coprosma propinqua*). Suitable eco-sourcing protocols would need to be followed to ensure success, especially with the likes of kōhūhū, which is a highly variable species.

The fish passage structure at the weir needs some repair work but it could also be an opportune time to review the suitability of the weir itself. It is possible that the weir is not achieving its goals.

It may be time to look at the way the entire site is managed as it will become increasingly difficult to fight the natural sequence of a coastal lake ecosystem becoming a wet forest ecosystem. Controlling undesirable species while encouraging desirable species would be prudent to ensure the site is not over-run with weedy exotic species. Already, there is evidence that holm oak (*Quercus ilex*), presumably planted to provide duck food, is spreading into areas that weren't planted.

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