FISH MONITORING IN TRAVIS WETLAND, CHRISTCHURCH

Wildlands

R4292

FISH MONITORING IN TRAVIS WETLAND, CHRISTCHURCH

Clearing fish traps and identifying species in Angela Stream (photograph by Kenny Rose).

Contract Report No. 4292

April 2017

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1. INTRODUCTION

Travis Wetland is a Christchurch City Council Nature Heritage Park set aside to protect and develop the wetland for the education and enjoyment of everyone. Covering 119 hectares, it is the largest freshwater wetland remaining in Christchurch. It is a modified wetland, consisting of a main pond of four hectares, with a complex of smaller ponds, streams, and dry areas that all play important roles in the protection and restoration of lowland wetland plant and animal communities. The wetland (Plate 1) is connected to the Ōtākaro/Avon River via Corsers Drain and Lake Kate Sheppard.

Plate 1: Aerial view of Travis Wetland showing interconnected waterways and dry areas, the main pond is at centre left (photograph by Phil Teague, December 2005).

Rudd (*Scardinius erythrophthalmus*) were found in Travis Wetland in 2008, and since then a rudd control programme has been undertaken jointly by the Department of Conservation and Christchurch City Council. Rudd control efforts have concentrated on the large population in the main pond, with periodic sampling in other parts of the wetland. For further detail on the control programme refer to Wildland Consultants (2016). Work in other parts of the wetland was last undertaken in December 2012, and the City Council commissioned Wildland Consultants Ltd to carry out fish monitoring in these areas in 2017, and to provide suggestions for a future work programme.

2. METHODS

On 22 March 2017, 66 Gee minnow traps were set in groups of three at selected sites in Travis Stream, Angela Stream, Preeces Pond, and Hard Rush Corner. A seine net was hand-pulled through three areas of Hard Rush Corner (Plate 2) and Preeces Pond, and one area of Pond (Simon). Fyke nets were originally going to also be set, but these were not used due to biosecurity concerns (see Section 4). Specifications for the equipment used are provided in Table 1 and Figure 1 shows the sample site locations (GPS coordinates are provided in Appendix 1).

Plate 2: Seine net being pulled through Hard Rush Corner, with Gee minnow traps being set in the background (photograph by Kenny Rose).

Fish caught in the seine net (Plate 3) were recorded at the time of capture. Gee minnow traps remained set overnight (Plates 4 and 5), and were removed from the water on 23 March 2017 and fish catch recorded. All fish captured were identified to species, counted and measured. Length measurements were taken from tip of nose to end of tail and recorded to the nearest millimetre (total length, mmTL). Water temperature was measured, with a standard mercurial thermometer, at several sites during day one.

Table 1: Mesh sizes and specifications for fish capture equipment used.

Type	Mesh Size	Length	Depth	Other Details
Seine net	1.6 mm, 4.8 mm	15.2 m	1.2 m	Cloth mesh, central 1.2 m^3 capture pouch of 1.6 mm mesh with two 7 m wings of 4.8 mm mesh.
Gee minnow trap	3 mm	0.44 m	0.23 m	Cylindrical steel cage with one inverted cone entrance at each end. Diameter of opening 25 mm.

Plate 3: Seine net being cleared in Preeces Pond (photograph by John Skilton).

Data Acknowledgment
Map contains data sourced from LINZ
Crown Copyright Reserved

Report:
Client:
Ref: 07 0210
Path: E:\gis\Travis_wetland\mxd\
File: TravisWetland_GeeMinnow_SiteNota.mxd

Figure 1. Sample site locations.

0 140 280 m

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Scale: 1:5,603
Date: 12/04/2017
Cartographer: JO
Format: A3R

Plate 4: Gee minnow traps being moved for placement in Hard Rush Corner. Note the prolific beggar's tick (*Bidens fondrosa*) plants in the foreground (photograph by Jamie Pearson).

Plate 5: Gee minnow trap set and left overnight at base of tree in Hard Rush Corner (photograph by Jamie Pearson).

3. FIELD RESULTS

Four indigenous fish species were caught in the streams and ponds that were sampled (Plates 6 to 9). Table 2 lists the number and size range of each species caught, along with their conservation status and cultural significance. No rudd were caught or seen.

Table 2: Indigenous fish species caught in Travis Wetland 22 and 23 March 2017, with their conservation status and cultural significance.

Common Name	Scientific Name	Conservation Status[1]	Cultural Significance[2]	Number Caught	Length Range	
					Minimum (mmTL)	Maximum (mmTL)
Shortfin eel	*Anguilla australis*	Not Threatened	Mahinga kai	14	89	700
Inanga	*Galaxias maculatus*	At Risk-Declining	Mahinga kai	23	74	105
Common bully	*Gobiomorphus cotidianus*	Not Threatened		2	65	72
Giant bully	*Gobiomorphus gobioides*	Not Threatened	Taonga	14	70	109

Plate 6: Shortfin eels caught using seine net, Hard Rush Corner (photograph by Jamie Pearson).

Plate 7: Inanga caught using seine net, Hard Rush Corner (photograph by Jamie Pearson).

Plate 8: Common bully caught in a Gee minnow trap set in Travis Stream (photograph by John Skilton).

Plate 9: Giant bully caught in a Gee minnow trap set in Angela Stream (photograph by Kenny Rose).

[1] Source: Goodman *et al*. (2014).
[2] Indicates species collected as food (mahinga kai) or treasured species designated as taonga under the Ngāi Tahu Claims Settlement Act 1998 (Schedule 98).

Water temperature ranged from 13.0 to 15.5 degrees Celsius at the different sites, refer Table 3.

Table 3: Water temperature recorded on 22 March 2017.

Site name	Water Temperature (ºC)	Time Measured	Other Details
Travis Stream	15.0	15:35	Single measurement site
Preeces Pond	13.0	10:00	Single measurement site
Pond (Simon)	15.0	16:05	Single measurement site
Hard Rush Corner	14.0	11:00	Single measurement site
Angela Stream	13.0 - 15.5	14:10 - 15:00	Multiple measurement sites

4. DISCUSSION

The two methods used for this work - seine netting and Gee minnow traps - were chosen because they are known to be effective for the capture of a range of freshwater fish species, particularly in these types of slow-flowing and still environments (Grainger *et al*. 2014, Joy *et al.* 2013, Grainger *et al*. 2013, Portt *et al*. 2006, Hayes *et al*. 1996, Hubert 1996). Panel gill nets, as used previously for rudd removal and monitoring in the main pond, are very effective at catching active scaly fish but were not chosen for this work because the large area of waterway makes it difficult for them to be monitored to help ensure that birds are not inadvertently captured and/or injured (Neilson *et al*. 2014, Grainger and McCaughan 2014a, Portt *et al*. 2006, Hubert 1996).

Fine mesh fyke nets - an effective capture technique for various species and sizes of fish - were initially planned for this work but were not used due to biosecurity concerns for nets that would have been borrowed. Beggar's tick, an invasive plant, is present in Travis Wetland (Plate 4) and it has barbed seeds that readily attach to animals, clothing and equipment (Plate 10). There is no known way to kill these seeds and the established equipment cleaning protocols are not known to be effective (Grainger and McCaughan 2014b; Paul Champion, NIWA, pers. comm.). Fyke nets are an essential tool for future work in these streams and ponds, because they can target larger fish and have greater catchability than Gee minnow traps, but would need to be used exclusively at this site, or shared with other sites where beggar's tick is also known to be present.

Plate 10: Beggar's tick seeds (photograph by Kenny Rose).

Limitations on the use of some nets for this work meant that mostly only small fish could be sampled, and some large gaps had to be left between nets/traps in Travis Stream (the Frosts Road section) and Hard Rush Corner (Figure 1). When future work is carried out it would be preferable to have enough nets/traps of different types to ensure that all fish species and sizes can be targeted, and that all parts of the wetland can be well sampled.

A range of indigenous fish species were caught during this work. These species have also been caught during previous work in and around Travis Wetland (H. McCaughan, pers. obs.). No rudd were caught in 2017, indicating that there are few or none currently present. Although the water temperature was a little cooler than when rudd work has previously been carried out in the main pond of Travis Wetland, it was not inconsistent with temperatures during previous work in these other ponds and streams, when several species, including rudd, have been caught (H. McCaughan pers. obs.).

Water temperature was relatively consistent at each site measured, but did show a longitudinal trend in Angela Stream. This waterway starts off in a part of the wetland with established trees and other plants, so is well shaded. It then flows through areas with less plant cover, until it enters the very open Hard Rush Corner. The water temperature showed a slow increase from the shaded region (13.0°C) to the very open area (15.5°C). This would be expected, and is a good example of how streamside shading can affect water temperature.

5. CONCLUSIONS

Travis Wetland is a very important site, for its roles in the protection and restoration of lowland wetland plant and animal communities, and as a public recreation and education resource. Rudd that are present will have both direct and indirect adverse effects on this freshwater ecosystem, could adversely affect possible future indigenous species reintroduction options, and could move into connected waterways or be spread to other catchments.

The rudd control programme in Travis Wetland has been very successful to date, with none caught during the last four summer seasons. Due to Travis Wetland being connected to other waterways, some form of control or continued surveillance for rudd will need to be carried out indefinitely. Rudd numbers are now so low that they may be difficult to detect, making it important that work is focused during months of the year when the water is warm and rudd are more active. Rudd breeding patterns mean that populations can recover quickly and any increased catches will need to be responded to immediately with increased control effort.

The following approach should be used to manage possible rudd presence in these other ponds and streams of Travis Wetland. This approach is complementary to work in the main pond and suggestions provided in Wildland Consultants (2016), and should be carried out in conjunction with them:

- Travis Stream, Angela Stream, Preeces Pond, Hard Rush Corner, and Pond (Simon) should be surveyed on a three-yearly cycle. They could be sampled at the same time every three years, or they could be subdivided into three patches with one done each year.

- Overnight set-netting, using fyke nets, Gee minnow traps, and/or panel gill nets, should be undertaken, supplemented with seine netting where possible. This will enable various species and sizes of fish to be captured.

- Similar spacing of nets/traps as used in 2017 could be used in the future, but more nets/traps will be required to ensure that there are enough of various sizes to comprehensively monitor the site each time.

- Work needs to be done during the warmer months of the year and could be programmed at the same time as the work in the main pond.

- Due to the pest plant issues in Travis Wetland, particularly the presence of beggar's tick, additional dedicated fish capture equipment should be purchased by Christchurch City Council to continue work on rudd throughout the wetland. Approximately six fyke nets would be required if the area is sub-divided into three patches. If all of the area is to be sampled in one year then more fyke nets will be required. Additional Gee minnow traps and a seine net would also be useful purchases, but given that it is much easier to clear plant fragments and seeds from these items, this equipment could be temporarily sourced from other places.

ACKNOWLEDGMENTS

Christchurch City Council, particularly John Skilton, is thanked for their continued commitment to the rudd control programme at Travis Wetland. The Department of Conservation kindly provided fish capture equipment to the City Council for this work, and further equipment was offered by Environment Canterbury Regional Council (this offer was not taken up due to biosecurity concerns from pest plants present in Travis Wetland). We are also appreciative of Jamie Pearson, who volunteered for day one of this work.

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GPS COORDINATES OF GEE MINNOW TRAP LOCATIONS

Site Number	Trap Type	Easting (NZTM)	Northing (NZTM)
GEE01	Gee minnow traps (×3)	1575785.8	5185086.1
GEE02	Gee minnow traps (×3)	1575694.1	5184431.5
GEE03	Gee minnow traps (×3)	1575794.0	5184417.0
GEE04	Gee minnow traps (×3)	1575784.4	5184559.6
GEE05	Gee minnow traps (×3)	1575829.5	5184663.0
GEE06	Gee minnow traps (×3)	1575612.0	5184413.0
GEE07	Gee minnow traps (×3)	1575565.9	5184419.4
GEE08	Gee minnow traps (×3)	1575493.9	5184429.2
GEE09	Gee minnow traps (×3)	1575363.7	5184439.8
GEE10	Gee minnow traps (×3)	1575333.3	5184578.5
GEE11	Gee minnow traps (×3)	1575307.6	5184750.6
GEE12	Gee minnow traps (×3)	1575188.4	5184836.8
GEE13	Gee minnow traps (×3)	1574788.4	5185073.4
GEE14	Gee minnow traps (×3)	1574797.6	5184883.3
GEE15	Gee minnow traps (×3)	1574915.4	5184862.6
GEE16	Gee minnow traps (×3)	1574992.3	5184852.2
GEE17	Gee minnow traps (×3)	1575135.8	5184838.0
GEE18	Gee minnow traps (×3)	1575562.8	5185234.7
GEE19	Gee minnow traps (×3)	1575632.3	5185220.0
GEE20	Gee minnow traps (×3)	1575683.2	5185187.8
GEE21	Gee minnow traps (×3)	1575730.9	5185074.0
GEE22	Gee minnow traps (×3)	1575738.9	5184907.2

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