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### **Boat electrofishing survey to determine catfish abundance in the Ohau Channel, Rotorua, in 2018**

The Bay of Plenty Regional Council (BOPRC) contracted the University of Waikato through the Biosecurity team to conduct a survey of the catfish abundance in the Ohau Channel. We used our 4.5 m-long, aluminium-hulled electrofishing boat to fish 7 sites in the channel (Fig. 1) for 6 to 34 mins per site (Table 1). More detailed methods are given in Hicks et al. (2017). All fish were measured for length and weight was calculated from the regression parameters in Jellyman et al. (2013; Table 2). We fished 2,415 lineal m (9,660 m<sup>2</sup>) and in 141 min of fishing we caught 303 fish, which included one juvenile catfish at site 2 (Table 2).

Water temperature at the starting point of fishing was 9.3°C at 1030 h NZST on 29 May 2018 and the fishing depth ranged between 0.2 to 1.4 m (Table 1). Specific conductivity, i.e., standardised to 25°C, was 190.8 µS cm<sup>-1</sup>, and ambient conductivity, which controls power transfer of the electrical field, was 131.2 µS cm<sup>-1</sup>. The black disc distance (BDD), which measures horizontal underwater visibility (Davies-Colley 1988), was 1.00 m.

Total fish biomass caught was 5.1 kg (Table 3), with the 28 goldfish comprising the largest biomass (3.6 kg). Common bullies were the most numerous fish species, and only a few common smelt and trout were caught (Table 4). The maximum areal biomass of goldfish was found at site 4 (2.75 g m<sup>-2</sup>; Table 5), which was about one quarter of the biomass caught in December 2017 (9.84 g m<sup>-2</sup>; Hicks et al. 2017).

The capture of numerous juvenile catfish by fyke netting in the Ramada Resort marina (sites 1-4 in this study), where we caught only a single juvenile, and the side channel (sites 5-6 in this study), where we caught no catfish, confirms that boat electrofishing is less efficient than fyke netting for catching juvenile catfish, at least at low water temperatures (9.3°C) and in the daytime. The other possibility is that fyke netting is so efficient that it removed a large proportion of the catfish.

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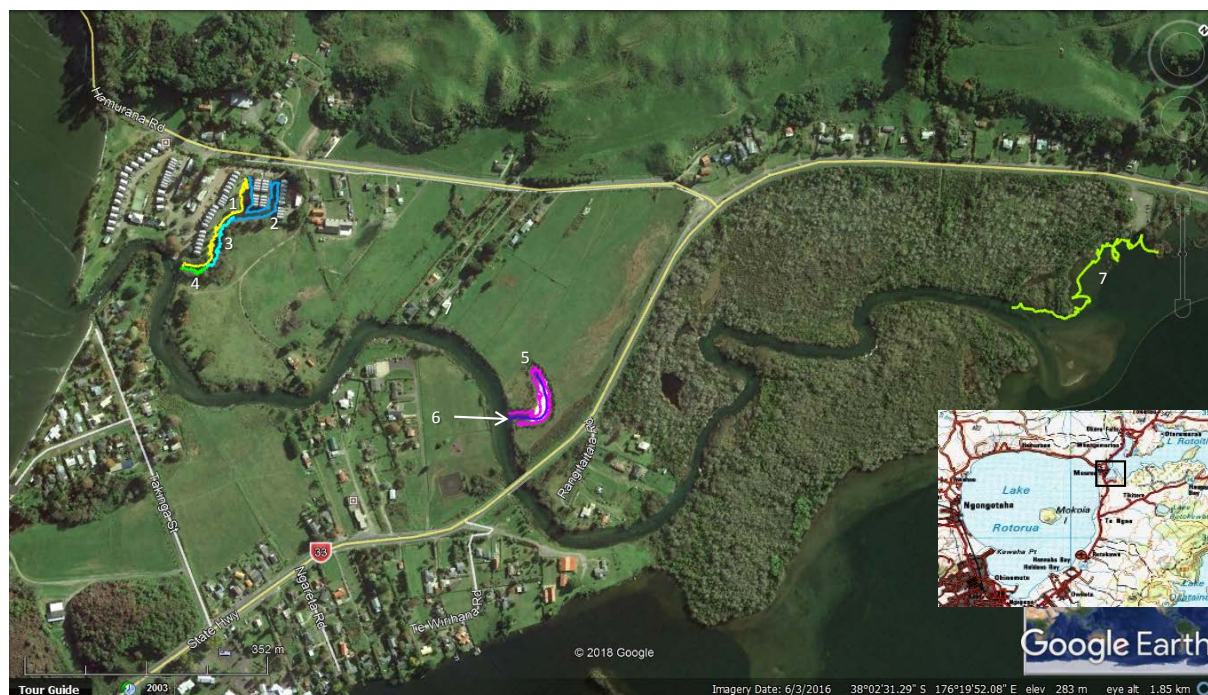


Figure 1. Fishing transects sampled on 29 May 2018 in the Ohau Channel starting from the Ramada Resort marina (site 1) down to the Lake Rotoiti end (site 7). Site numbers correspond to locations in Table 2. Inset shows the position of the Ohau Channel between lakes Rotorua and Rotoiti.

Table 2. Total number of fish caught by boat electrofishing at 7 sites on 29 May 2018 in the Ohau Channel. Blank cells indicate no catch for that site and species.

Site	Number of individuals per site					Total
	Catfish	Common bully	Common smelt	Goldfish	Rainbow trout	
1		20	3	1		24
2	1	35	14		2	52
3		49		10		59
4		41		10	1	52
5		78		7	1	86
6		1				1
7		25	4			29
Total	1	249	21	28	4	303

Table 3. Biomass of fish caught by boat electrofishing at 7 sites on 29 May 2018 in the Ohau Channel. Blank cells indicate no catch for that site and species.

Site	Biomass (g) per site					Total
	Catfish	Common bully	Common smelt	Goldfish	Rainbow trout	
1		41.4	1.9	6.2		49.5
2	5.6	61.5	10.4		13.2	90.8
3		81.4		636.2		717.6
4		69.1		1708.0	19.2	1796.3
5		116.9		1224.2	1062.9	2404.1
6		1.9				1.9
7		16.1	2.8			19.0
Total	6	388	15	3,575	1,095	5,079

Table 4. Density of fish caught by boat electrofishing at 7 sites on 29 May 2018 in the Ohau Channel.

Site	Density (number 100 m <sup>-2</sup> )					Total
	Catfish	Common bully	Common smelt	Goldfish	Rainbow trout	
1	0.00	1.23	0.18	0.06	0.00	1.48
2	0.07	2.46	0.98	0.00	0.14	3.65
3	0.00	4.08	0.00	0.83	0.00	4.92
4	0.00	6.61	0.00	1.61	0.16	8.39
5	0.00	4.52	0.00	0.41	0.06	4.99
6	0.00	0.18	0.00	0.00	0.00	0.18
7	0.00	0.99	0.16	0.00	0.00	1.15
Mean	0.01	2.87	0.19	0.42	0.05	3.54

Table 5. Areal biomass of fish caught by boat electrofishing at 7 sites on 29 May 2018 in the Ohau Channel.

Site	Biomass (g m <sup>-2</sup> )					Total
	Catfish	Common bully	Common smelt	Goldfish	Rainbow trout	
1	0.00	0.03	0.00	0.00	0.00	0.03
2	<0.01	0.04	0.01	0.00	0.01	0.06
3	0.00	0.07	0.00	0.53	0.00	0.60
4	0.00	0.11	0.00	2.75	0.03	2.90
5	0.00	0.07	0.00	0.71	0.62	1.39
6	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.01	0.00	0.00	0.00	0.01
Mean	0.00	0.05	0.00	0.57	0.09	0.71

## References

- Davies-Colley, R. J. 1988. Measuring water clarity with a black disk. *Limnology and Oceanography* 33: 616-623.
- Hicks, B.J., Bell, D.G., Powrie, W. and Douie, A. 2017. Boat electrofishing survey of fish abundance in the Ohau Channel, Rotorua, in 2016. *ERI Report No. 105*. Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand.
- Jellyman PG, DJ Booker, SK Crow, ML Bonnett & DJ Jellyman. 2013. Does one size fit all? An evaluation of length–weight relationships for New Zealand's freshwater fish species, *New Zealand Journal of Marine and Freshwater Research* 47: 450-468.