Where Have All Our Eels Gone – Part 2?
Results of Fish Monitoring Survey – Waiwhetu Stream, Above and Below St Ronans Ave Weir
6 February 2021

1. Introduction

The seventh survey as part of our Citizens Science fish monitoring project was undertaken on 5/6 February 2021. Six FWS volunteers plus two children helped set the nets on Friday night. Eight FWS volunteers plus the same two children assisted with retrieving the nets and identifying and counting fish on Saturday morning.

The original objectives of the fish monitoring were to determine:

- whether the St Ronans Ave weir acts as a barrier to fish passage; and
- whether modifications to the weir over time improve the ability of fish to negotiate the weir.

The first question has now been definitively answered - yes, the weir does act as a barrier to fish passage. We do not have a definitive answer to the second question but we are fairly certain that the addition of the floating fish ramp in February 2018 has had no effect whatsoever. In view of these findings, the survey objectives have expanded to monitoring fish population trends more generally.

There are two 150 m long monitoring reaches - one below the St Ronans Ave weir and the other one upstream of the weir. Fyke nets were set at three sites in each reach on the Friday night. The nets were retrieved on Saturday morning and the captured fish identified, counted and carefully released back to the stream.

The streamflow was 122 litres/sec from the Whites Line East gauge at 0800 hours at the start of the survey on Saturday morning. However there was a distinct tidal signal evident in the streamflow record at this time so the actual flow value is not reliable, only indicative. The water temperature was measured to be 16 °C at the start (Site 1) while the pH of the water was determined to be 6.5-7.

In previous years, the streamflow has been lower (95 litres/sec in February 2019 and 25-35 litres/sec in November 2020) and the water temperature slightly higher (18.2 / 17.5 °C in February 2019 and 18.5 °C in February 2020).

This report presents the results of the fish identification and count for the February 2021 survey. The monitoring sites are numbered from downstream to upstream. Sites 1-3 are below the weir (upstream of the Birdwood Road Bridge to about 30 m below the weir). Sites 4-6 are above the weir (from just downstream of the private bridge to about 10 m downstream of the Rossiter Ave Bridge).

2. Survey Results

The fish species identified from the survey to be present in the stream this survey included:

- short-fin eel
- inanga
- giant bully
- common bully
- giant kokupu

No long-finned eels were captured this time and we only found 19 short-finned eels (13 downstream of the weir and 6 upstream). Note we only captured a very small number of short-finned eels in December 2020 also

(4 downstream of the weir and 1 upstream). The number of short-finned eels is significantly down on previous years (89 downstream and 31 upstream in February 2020, 71 downstream and 13 upstream in February 2019, 28 downstream and 11 upstream in February 2018).

This time we captured a much larger number of giant bullies, all at site 3 immediately below the weir (9 in total made up by 7 large, 1 medium and 1 small fish). We also captured 1 common bully at site 1.

Following on from our December 2020 survey where we captured 2 medium size giant kokopu downstream of the weir, this time we captured 1 large giant kokopu at Site 3. As noted in our previous report on the December 2020 survey, we have always found these upstream of the weir where there is nice shady habitat.

Figure 1 shows a graph of the number of non-inanga species captured downstream of the weir over time since February 2018 while Figure 2 shows a similar graph of the same species upstream of the weir.

We captured 178 inanga downstream of the weir and 31 inanga upstream. The fish were predominantly large (including some very large ones) with a lesser number of medium fish.

Figure 3 shows the numbers of inanga captured across all surveys downstream and upstream of the weir (sites 1-3 and sites 4-6 respectively).

The number of inanga captured this year compares with 1086 downstream and 45 upstream in February 2018 865 downstream and 170 upstream in February 2019, and 330 downstream and 33 upstream in February 2020. There has been a bid decline in numbers compared to the three previous years.

3. Discussion

Two key questions arise out of this latest survey:

- Where have all our eels gone? We captured more than 100 short-finned eels in the February 2020 survey and about 80 short-finned eels in February 2019.
- Why have our numbers of inanga been declining year on year?

It was noted in the previous report on the December 2020 fish survey that Is was possible that a sequence of closely spaced flood events prior to the survey may have flushed eels and other fish downstream? It was speculated also that these floods may been responsible for the giant kokopu normally resident at Sites 4-6 being flushed over the weir downstream to Site 3 (the weir would have been completely drowned out in two of the flood events). Site 3 has a deep pool with some shade and overhanging banks which is the type of habitat preferred by giant kokopu.

The low numbers of eels and inanga found in this survey mean that it will be even more interesting to see what the fish count for these species is in the surveys over the next monitoring season (November 2021 and February 2022).

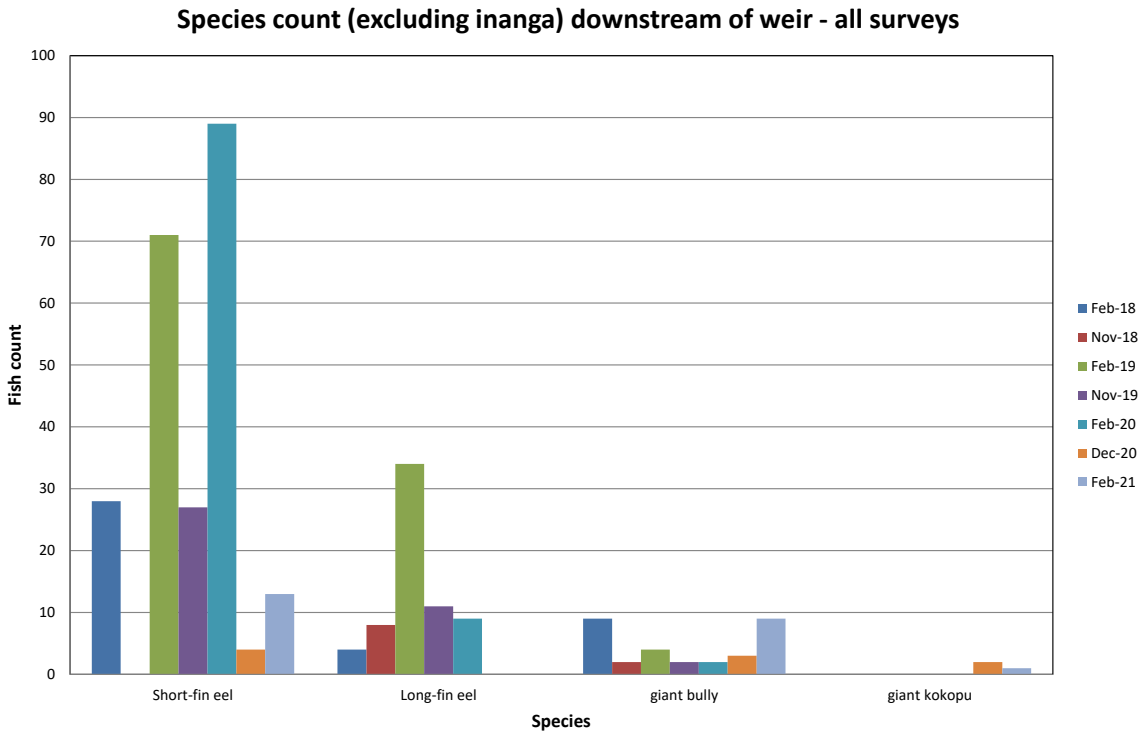

Figure 1: Number of fish captured over time (excluding inanga) downstream of weir – all surveys

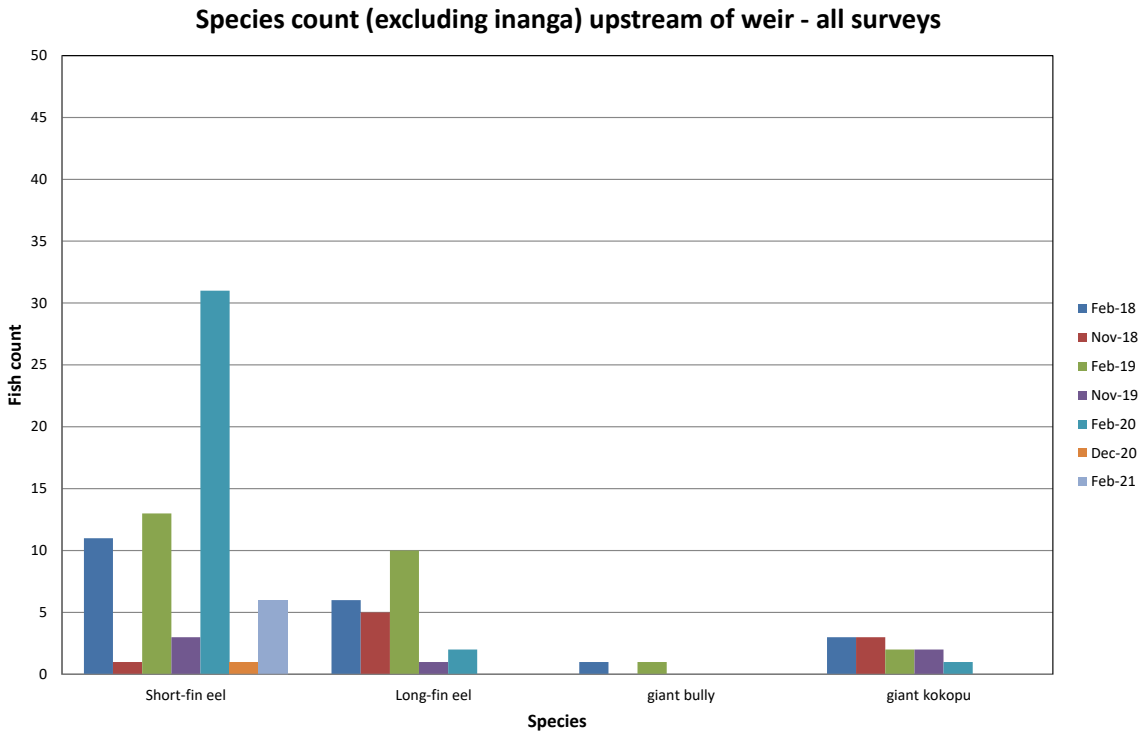

Figure 2: Number of fish captured over time (excluding inanga) upstream of weir – all surveys

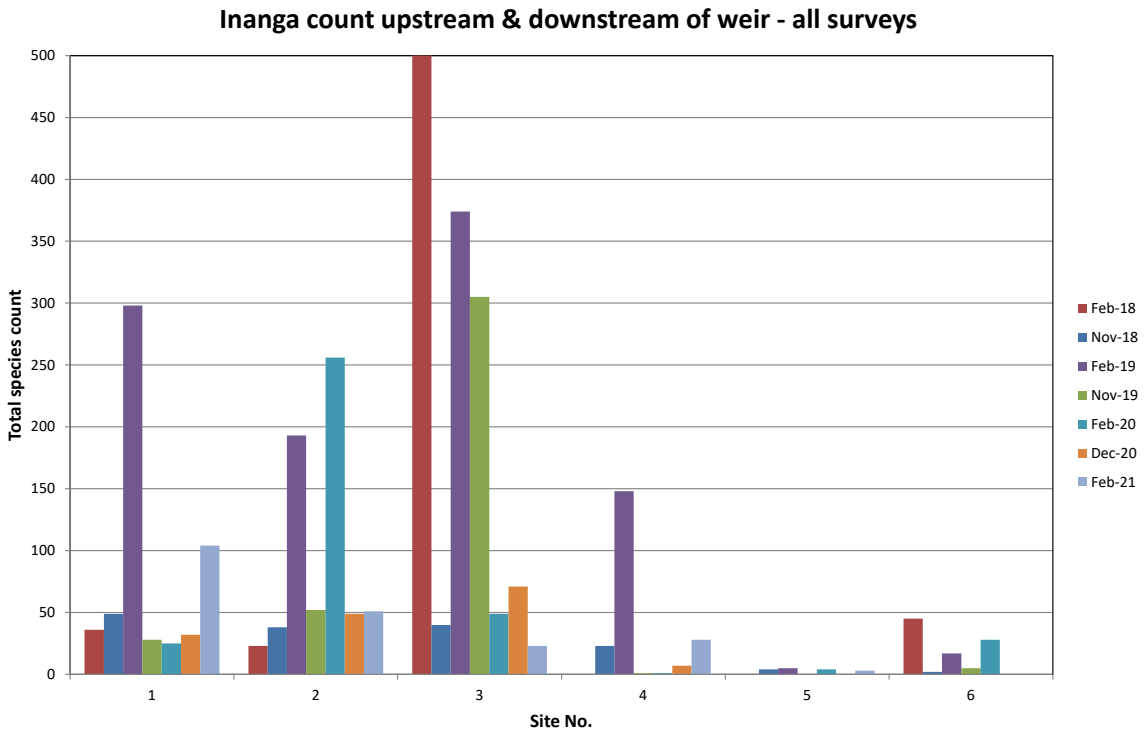

Figure 3: Number of inanga captured upstream and downstream of the weir over time – all surveys

Table 1 – Total fish count by species

Species	Site No.	Total Count
Short-fin eel	1	8
	2	5
	3	0
	4	3
	5	2
	6	1
Long-fin eel	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
Giant bully	1	0
	2	0
	3	9
	4	0
	5	0
	6	0
Common bully	1	1
	2	0
	3	0
	4	0
	5	0
	6	0
Inanga	1	104
	2	51
	3	23
	4	28
	5	3
	6	0
Giant kokopu	1	0
	2	0
	3	1
	4	0
	5	0
	6	0
Shrimps	1	6
	2	4
	3	3
	4	3
	5	1
	6	4

Table 2 – Size distribution of short-fin eels

Size	Site No.	Count
Small	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	Total Count	0
Medium	1	2
	2	3
	3	0
	4	0
	5	1
	6	1
	Total Count	7
Large	1	6
	2	2
	3	0
	4	3
	5	1
	6	0
	Total Count	12

Table 3 – Size distribution of long-fin eels

Size	Site No.	Count
Small	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	Total Count	0
Medium	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	Total Count	0
Large	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	Total Count	0

Table 4 – Size distribution of giant bullies

Size	Site No.	Count
Small	1	0
	2	0
	3	1
	4	0
	5	0
	6	0
	Total Count	1
Medium	1	0
	2	0
	3	1
	4	0
	5	0
	6	0
	Total Count	1
Large	1	0
	2	0
	3	7
	4	0
	5	0
	6	0
	Total Count	7

Table 5 – Size distribution of inanga

Size	Site No.	Count
Tiny	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	Total Count	0
Small	1	1
	2	0
	3	0
	4	0
	5	0
	6	0
	Total Count	1
Medium	1	14
	2	10
	3	2
	4	11
	5	2
	6	0
	Total Count	39
Large	1	89
	2	41
	3	21
	4	17
	5	1
	6	0
	Total Count	169

APPENDIX A - Photographs

Figure A1 – Retrieving net at Site 2 below St Ronans Ave weir (Saturday morning 6 February)

Figure A2 – Large giant bully captured at Site 3 downstream of St Ronans Ave weir

Figure A3 – Giant kokopu captured at Site 3 downstream of St Ronans Ave weir

Figure A4 – Inanga captured at Site 3 downstream of St Ronans Ave weir (note the very large fish)