Results of Fish Monitoring Survey – Waiwhetu Stream, Above and Below St Ronans Ave Weir 11th February 2023

1. Introduction

The eleventh survey as part of our Citizens Science fish monitoring project was undertaken on 10th/11th February 2023. Three FWS volunteers helped set the nets on Friday night. Seven FWS volunteers 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. The large number of inanga captured upstream of the weir this time (nearly 30% of the total) suggests the ramp could be effective as the flow over the weir since the 3 December 2022 survey rarely dropped to 70-80 litres/sec which is the flow we suspect is suitable for inanga to burst swim up the back face of the weir. However we remain uncertain about the ramp's effectiveness.

Over time, the fish 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 86 litres/sec from the Whites Line East gauge at 08:30 hours at the start of the survey on Saturday morning. The water temperature was measured to be 16.5 °C at the start (Site 1) while the pH of the water was determined to be 7.

The water temperature (16.5 °C) was similar to the temperature in February 2021 (16.0 °C) but lower than in February 2020 (18.3 °C) and in February 2019 (18.2-17.5°). Temperature is dependent on night temperature.

This report presents the results of the fish identification and count for the February 2023 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 to be present in the stream from this survey include shortfin eel, longfin eel, inanga, giant bully, common bully, giant kokopu and shrimp.

Figures 1-5 present the results of the fish count:

- Figure 1 shows the number of fish captured over time (excluding inanga) downstream of weir from all surveys
- Figure 2 shows the number of fish captured over time (excluding inanga) upstream of weir from all surveys
- Figure 3 shows the number of inanga captured downstream of the weir over time from all surveys
- Figure 4 shows the number of inanga captured upstream of the weir over time from all surveys
- Figure 5 shows the size distribution of inanga across each net site 1-6

Key observations from these figures are:

- Eel numbers continue to be low both downstream and upstream of the weir (Figures 1 and 2).
- Giant and common bullies continue to be present downstream of the weir (Figure 1). The large number of common bullies captured at Site 3 (21) indicates this species is successfully breeding in the stream. These fish were predominantly of medium size.
- Giant kokopu (one fish this time) continue to be present upstream of the weir (Figure 2) after briefly being found downstream of the weir in the December 2020 and February 2021 surveys (Figure 1). This time the one fish was captured at Site 6 (mostly these fish have been captured at Site 4).
- The number of inanga present downstream of the weir is up on recent years but not as good as presvious maximum previous counts at this time of the year in February 2018 and 2019 (Figure 3).
- There were a surprisingly large number of inanga present upstream of the weir, c.f. 98 compared to 240 downstream of the weir (Figure 4). One very large fish (> 10 cm in length) was captured at Site 4.
- The largest number of inanga downstream of the weir was found at Site 3. These fish were predominantly of medium size (Figure 5).

- **3. Figures**

Figures A1-A8 in Appendix A show selected photographs from the February 2023 survey.

- Figure A1 –A3 shows common bullies
- Figure A4 shows giant kokopu
- Figure A5 shows the large inanga
- Figure A6 shows 3 eels

4. Summary

In summary:

- Eels continue to be present in low numbers compared to previous years.
- The number of common bullies captured in net 3 was high.
- Some large inanga were present with one very large one (> 10 cm) at Site 4.

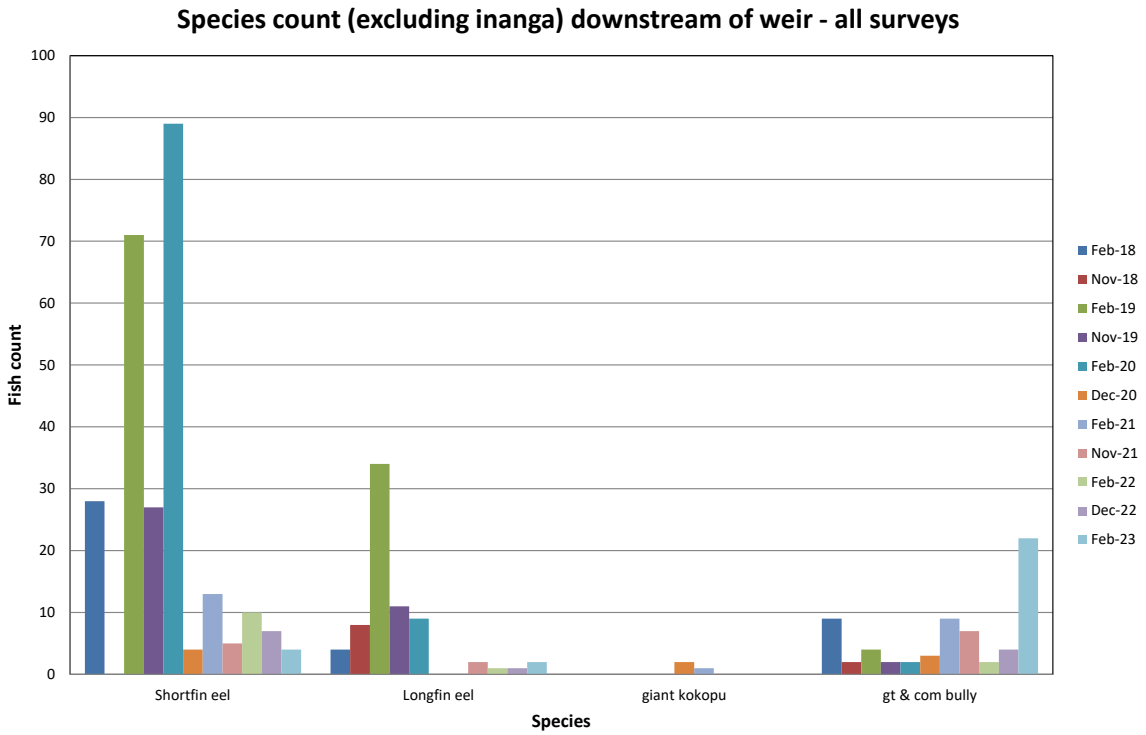

Figure 1: Number of fish captured over time (excluding inanga) downstream of weir – all surveys

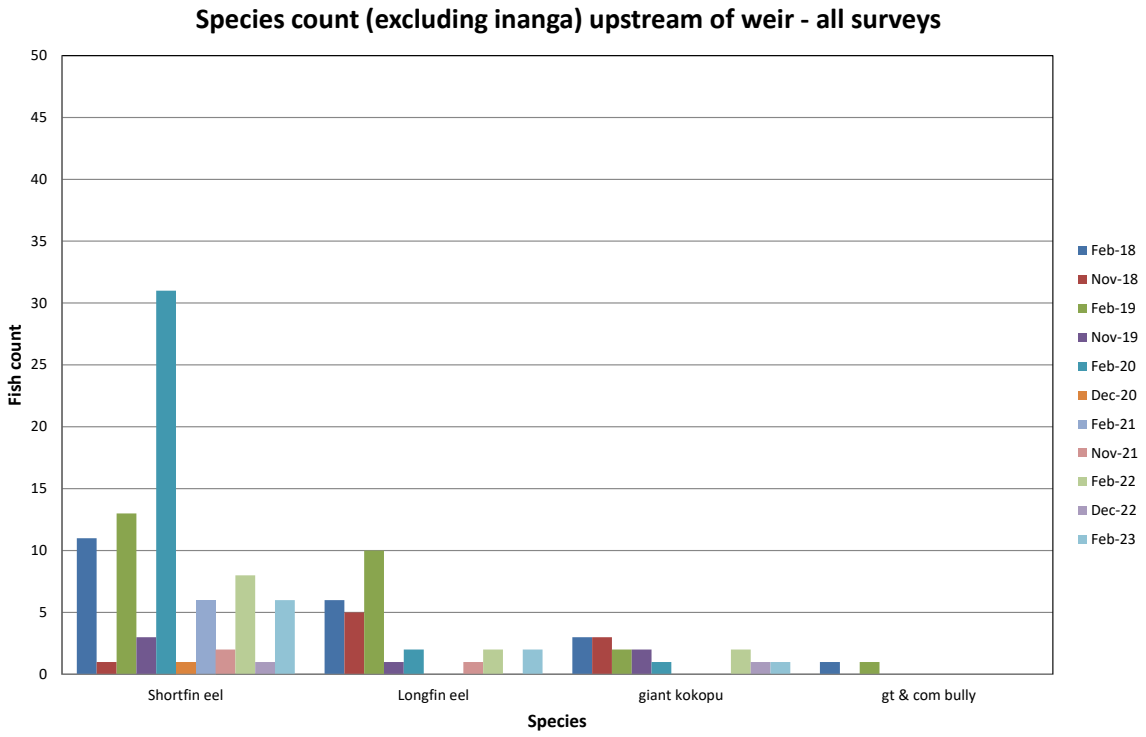

Figure 2: Number of fish captured over time (excluding inanga) upstream of weir – all surveys

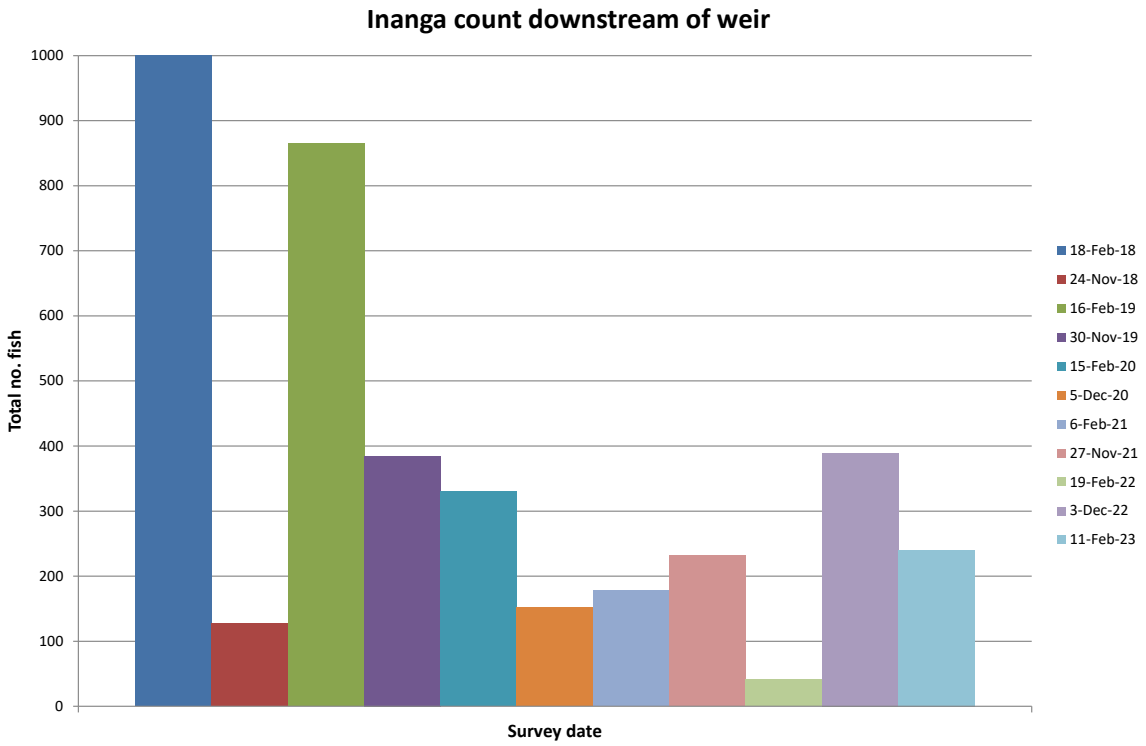

Figure 3: Number of inanga captured downstream of the weir over time – all surveys

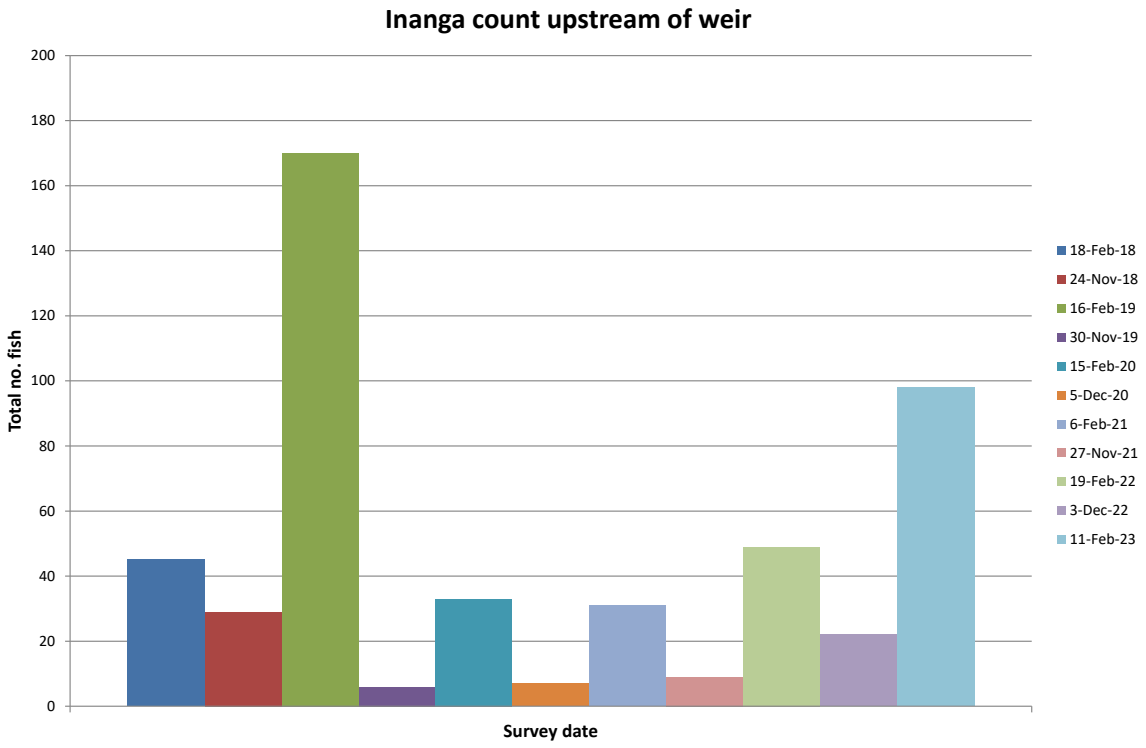

Figure 4: Number of inanga captured upstream of the weir over time – all surveys

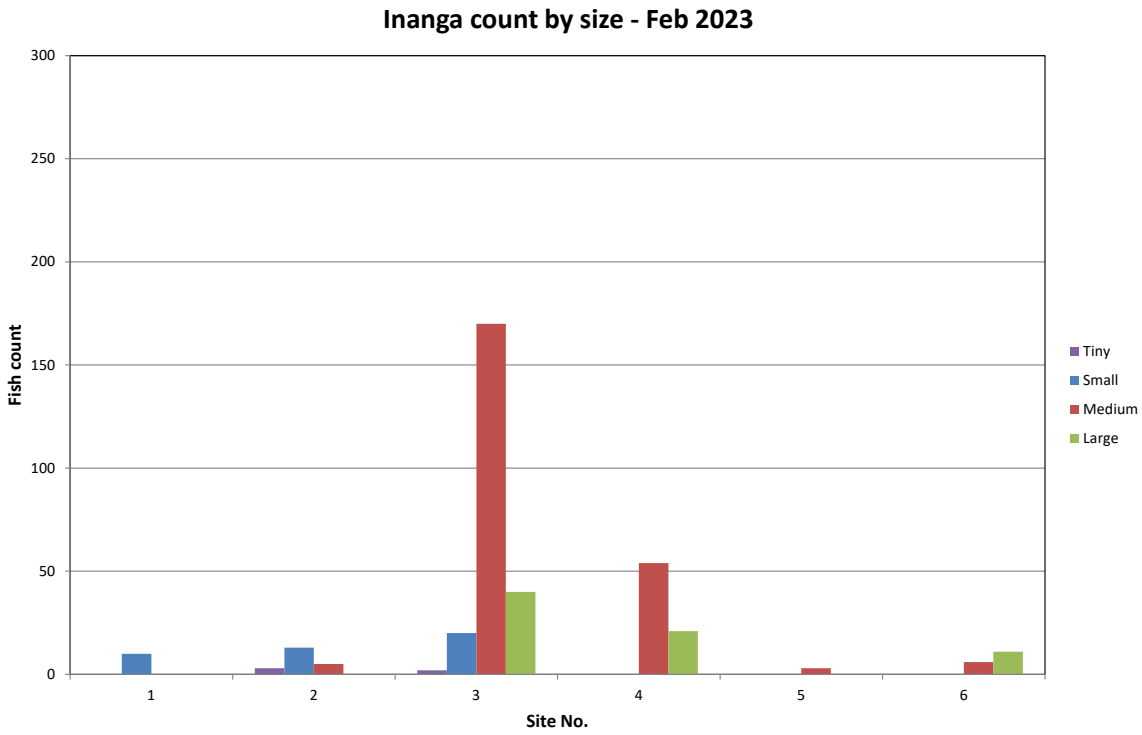

Figure 5: Size distribution of inanga across each net site

Table 1 – Total fish count by species

Species	Site No.	Total Count
Short-fin eel	1	2
	2	1
	3	1
	4	2
	5	1
	6	3
Long-fin eel	1	0
	2	0
	3	2
	4	0
	5	2
	6	0
Giant bully	1	0
	2	0
	3	1
	4	0
	5	0
	6	0
Common bully	1	0
	2	0
	3	21
	4	0
	5	0
	6	0
Inanga	1	0
	2	24
	3	216
	4	77
	5	3
	6	18
Giant kokopu	1	0
	2	0
	3	0
	4	0
	5	0
	6	1
Shrimps	1	0
	2	0
	3	0
	4	0
	5	0
	6	0

Table 2 – Size distribution of short-fin eels

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

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	2
	6	0
	Total Count	2
Large	1	0
	2	0
	3	2
	4	0
	5	0
	6	0
	Total Count	2

Table 4 – Size distribution of giant bullies

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	1
	4	0
	5	0
	6	0
	Total Count	1

Table 5 – Size distribution of giant kokopu

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	1
	Total Count	1

Table 5 – Size distribution of inanga

Size	Site No.	Count
Tiny	1	0
	2	3
	3	2
	4	0
	5	0
	6	0
	Total Count	5
Small	1	0
	2	16
	3	4
	4	2
	5	0
	6	1
	Total Count	23
Medium	1	0
	2	5
	3	170
	4	54
	5	3
	6	6
	Total Count	238
Large	1	0
	2	0
	3	2401
	4	21
	5	0
	6	11
	Total Count	72

APPENDIX A - Photographs

Figure A1 – Common bullies

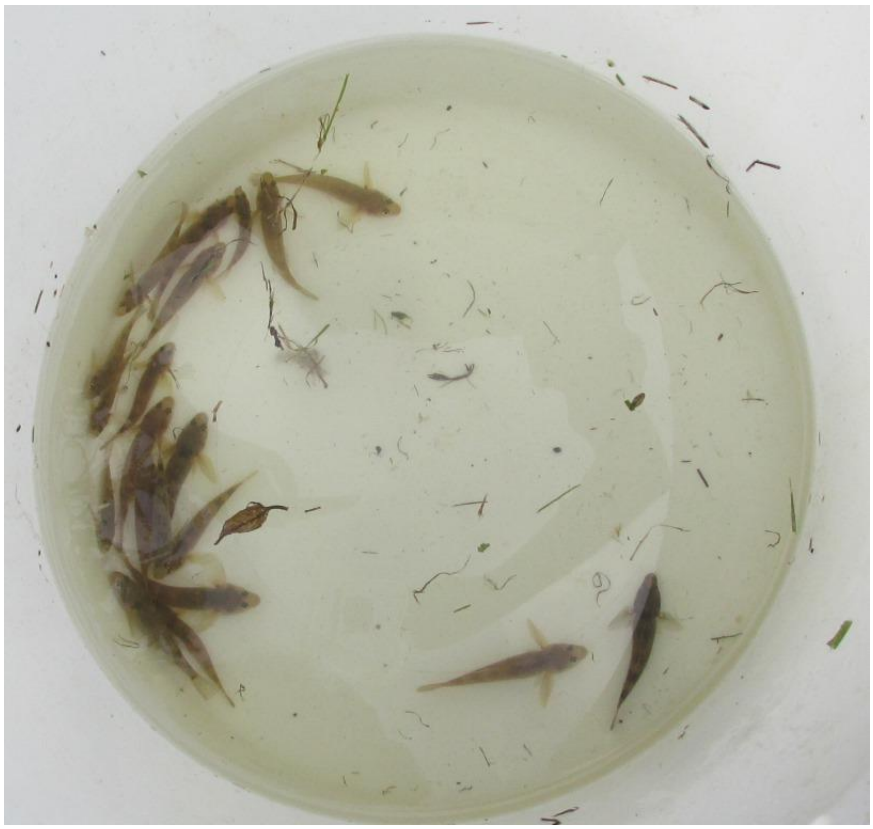

Figure A2 – Common bully

Figure A3 – Another common bully

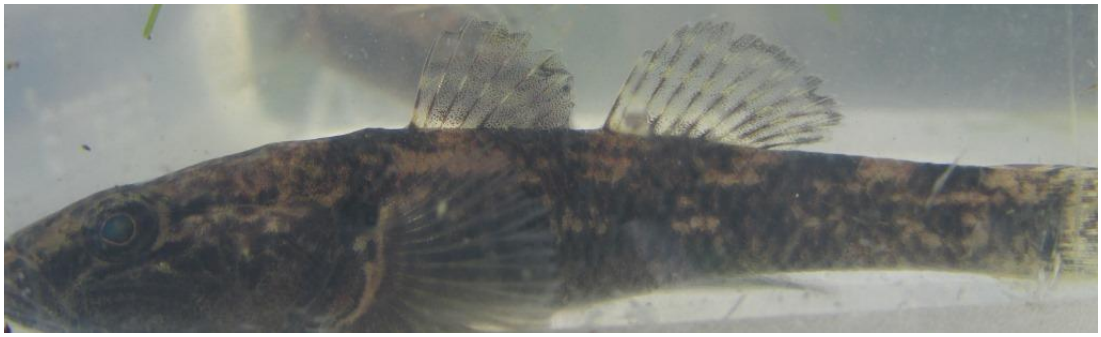

Figure A4 – Large giant kokopu

Figure A5 – Large inanga

Figure A6 – Eels