

Inland Fisheries Service

Wild Rainbow Trout Management 2023



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Version Number:

V6

Date:

January 2024

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Introduction

The Inland Fisheries Service (IFS) recognises the value of maintaining wild fisheries as they are best suited to our environment and provide a much sought-after angling experience. We only stock waters when wild populations are not adequately maintained by natural recruitment, and we use wild fish whenever possible. Stockings are guided by the *Tasmanian Inland Recreational Fishery Management Plan 2018-28* and risk assessments for each water.

Wild rainbow trout spawning runs 2023

We used fish traps at yingina / Great Lake and the River Derwent at Lake King William to monitor and enhance the wild rainbow trout fishery.

Table 1. Total captures of rainbow trout, Liawenee (yingina / Great Lake) and River Derwent (Lake King William) traps 2015-23.

Trap	2023	2022	2021	2020	2019	2018	2017	2016	2015
Liawenee Canal – yingina / Great Lake Est. 2006	4,417	5,402	2,310	923	988	1,093	349	587	540
Sandbanks Creek – yingina / Great Lake Est. 2015	0	189	0	0	0	0	0	0	19
River Derwent – Lake King William Est. 2016	0	112	15	0	0	0	0	0	0

Background

At Liawenee Canal, rainbow trout captured in the fish trap are counted, sorted by sex and moved into purpose built spawning channels away from the brown trout. This enhances spawning success and increases recruitment to the yingina / Great Lake fishery. A fry trap on the spawning channel allows the counting of fry and monitoring of recruitment. The trap also provides access to rainbow trout fry for stocking wild rainbow trout fisheries if required.

The Sandbanks Creek fish trap can be used to monitor rainbow trout spawning runs in yingina / Great Lake. This fish trap is however, restricted by inconsistent flows relating to rainfall in the catchment. This year the trap was not operated as it has been determined that there is an insufficient spawning run at Sandbanks Creek to justify operating the fish trap.

The River Derwent fish trap at Lake King William, can be used during the rainbow trout spawning run when conditions are favourable. This year was the lake level was flooding the trap during the rainbow trout spawning run so it was not operated.

Wild rainbow trout caught in traps

yingina / Great Lake – Liawenee Canal

Since 2014, rainbow trout entering the Liawenee Canal trap have been counted. During 2023, a total of 4,417 fish were counted. This is 985 less than last year but considerably more than all years previous (Table I and Figure I).

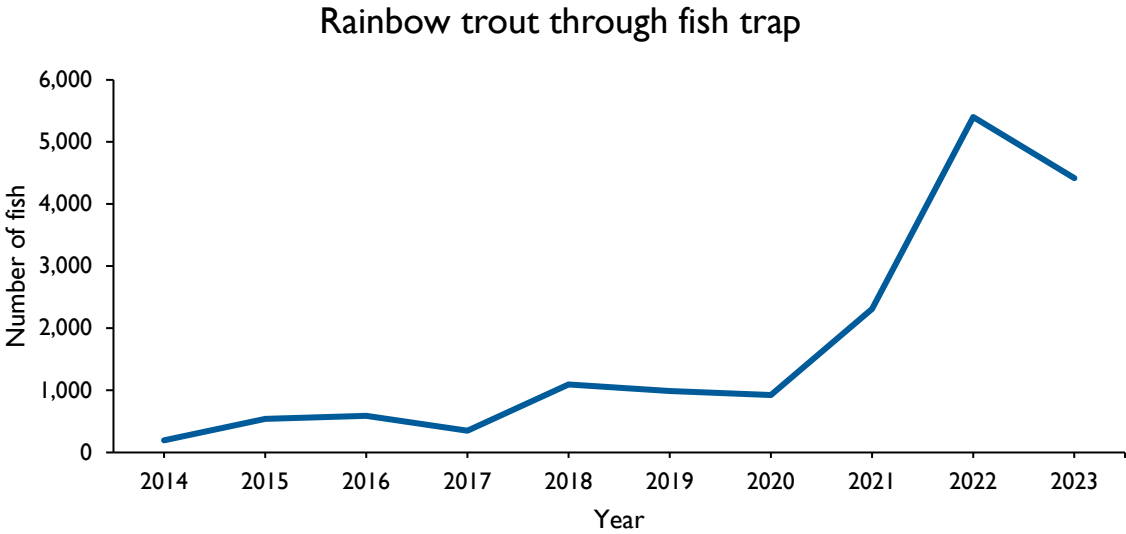


Figure 1. Total counts of rainbow trout, Liawenee trap 2014-23.

This year the Liawenee Canal trap was opened on 22 August. Liawenee Canal had moderate to low flows for much of the rainbow trout spawning run. The trap was closed on 1 November. A total of 4,417 rainbow trout were captured throughout the run, consisting of 1,632 males and 2,785 females.

Figures 2 and 3, shows the total number of males and females in the trap accumulated over the spawning runs in 2022 and 2023, respectively. It is notable that the total amount of females in both years is very similar, however, in 2023 there is 956 less males being represented in the run.

There doesn't appear to be a strong correlation between either the water flow or air temperature with the number of fish being recorded in the trap. It was noted anecdotally that rainbow trout in the spawning channels were most active on warm evenings after sunny days. This is not represented clearly in Figures 4 and 5 because there is a delay between when the fish enter the trap and when the trap and when they are counted as they are removed. Water flows in 2023 were significantly reduced from the flows recorded during the 2022 spawning run.

Liawenee Canal spawning run 2022

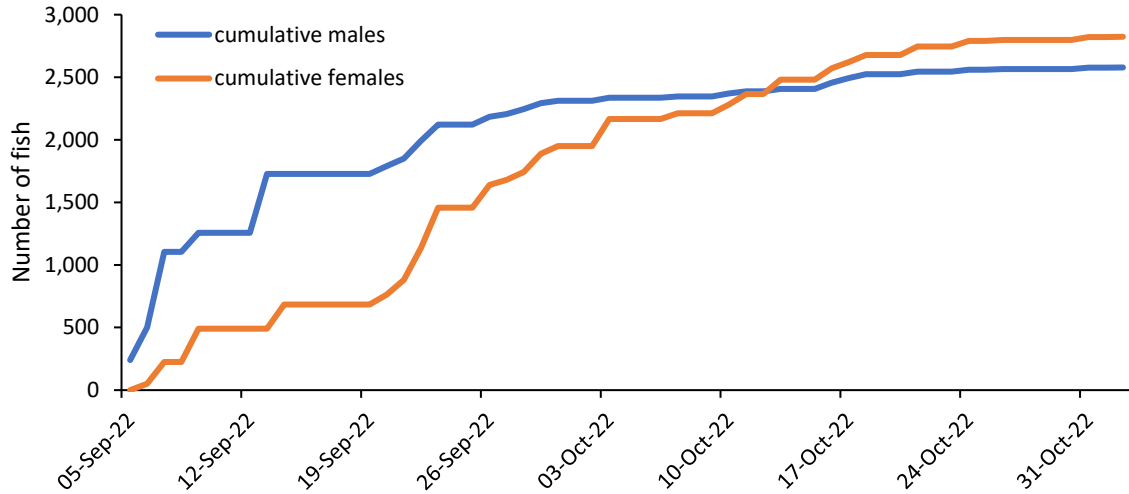


Figure 2. Number of male and female rainbow trout captured in the Liawenee Canal fish trap (counted when they were removed from the trap), accumulated over the 2022 spawning run.

Liawenee Canal spawning run 2023

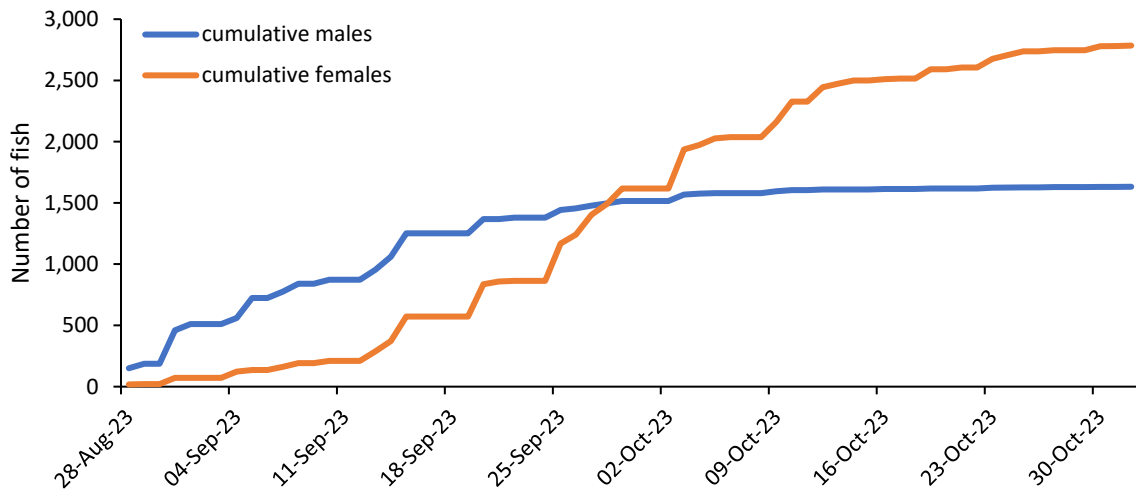


Figure 3. Number of male and female rainbow trout captured in the Liawenee Canal fish trap (counted when they were removed from the trap), accumulated over the 2023 spawning run.

Liawenee Canal spawning run 2023

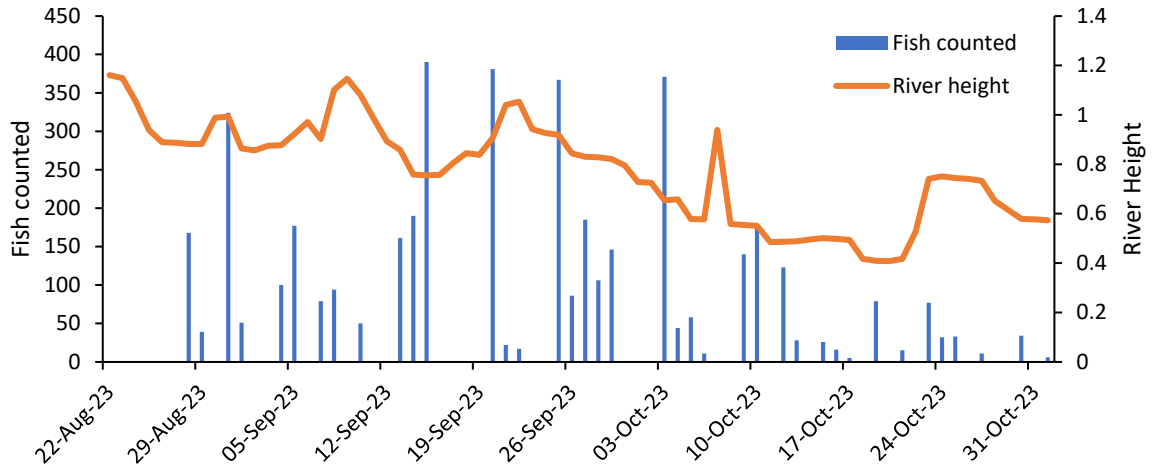


Figure 4. Number of rainbow trout captured in the Liawenee Canal trap (counted when they were removed from the trap), and river height for Liawenee Canal, August to November 2023.

Liawenee Canal spawning run 2023

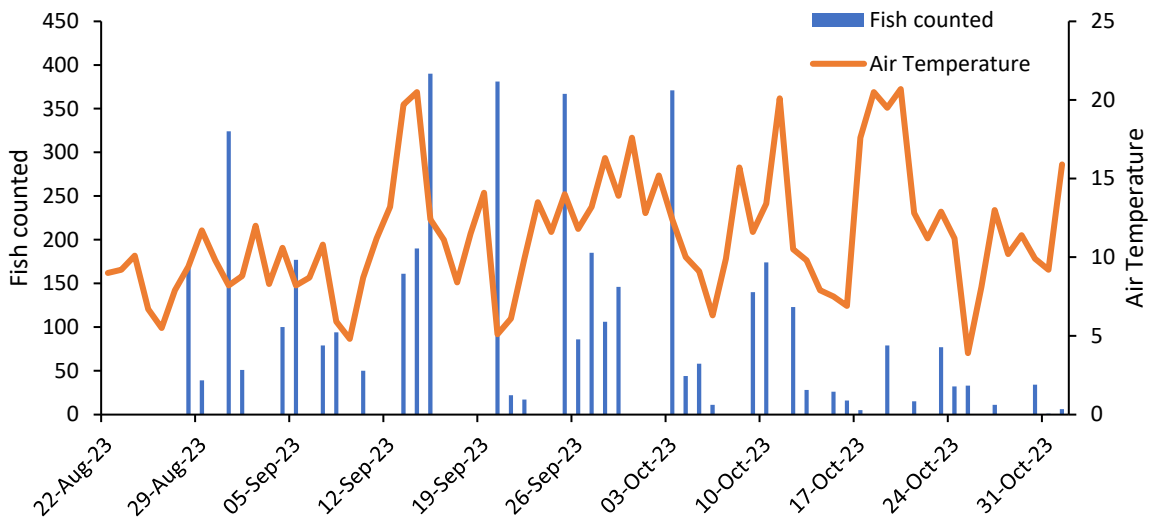


Figure 5. Number of rainbow trout captured in the Liawenee Canal fish trap (counted when they were removed from the trap), and air temperature for Liawenee Canal trap, August to November 2023.

Weigh and measure information

Table 2 and Figures 6 and 7 show the summary data for all rainbow trout weighed and measured at the Liawenee Canal fish trap.

yingina / Great Lake – Liawenee Canal weigh and measure results

Table 2. Summary of measurements for rainbow trout from the Liawenee trap, 20 September 2023.

Grouping	Measurement	Mean	Minimum	Maximum
All Trout n=200	Length (mm)	447	350	552
	Weight (g)	844	510	1320
	Condition factor	0.95	0.45	1.24
Male n=100	Length (mm)	457	375	552
	Weight (g)	853	550	1320
	Condition factor	0.9	0.4	1.1
Female n=100	Length (mm)	436	350	502
	Weight (g)	836	510	1150
	Condition factor	1.01	0.83	1.24

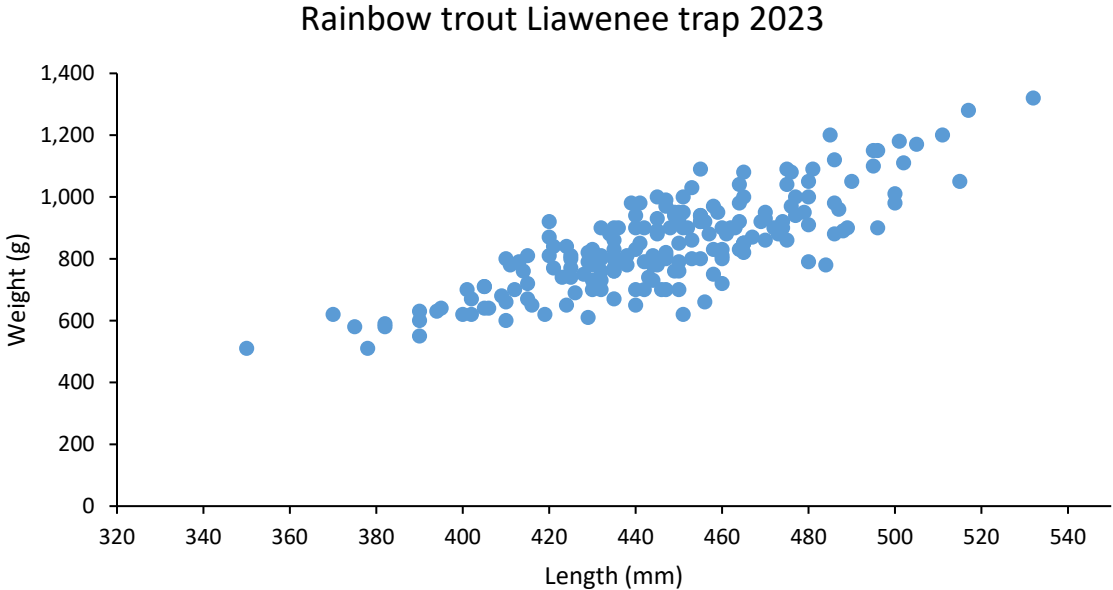


Figure 6. Length vs weight plot for rainbow trout from Liawenee Canal trap, 20 September 2023.

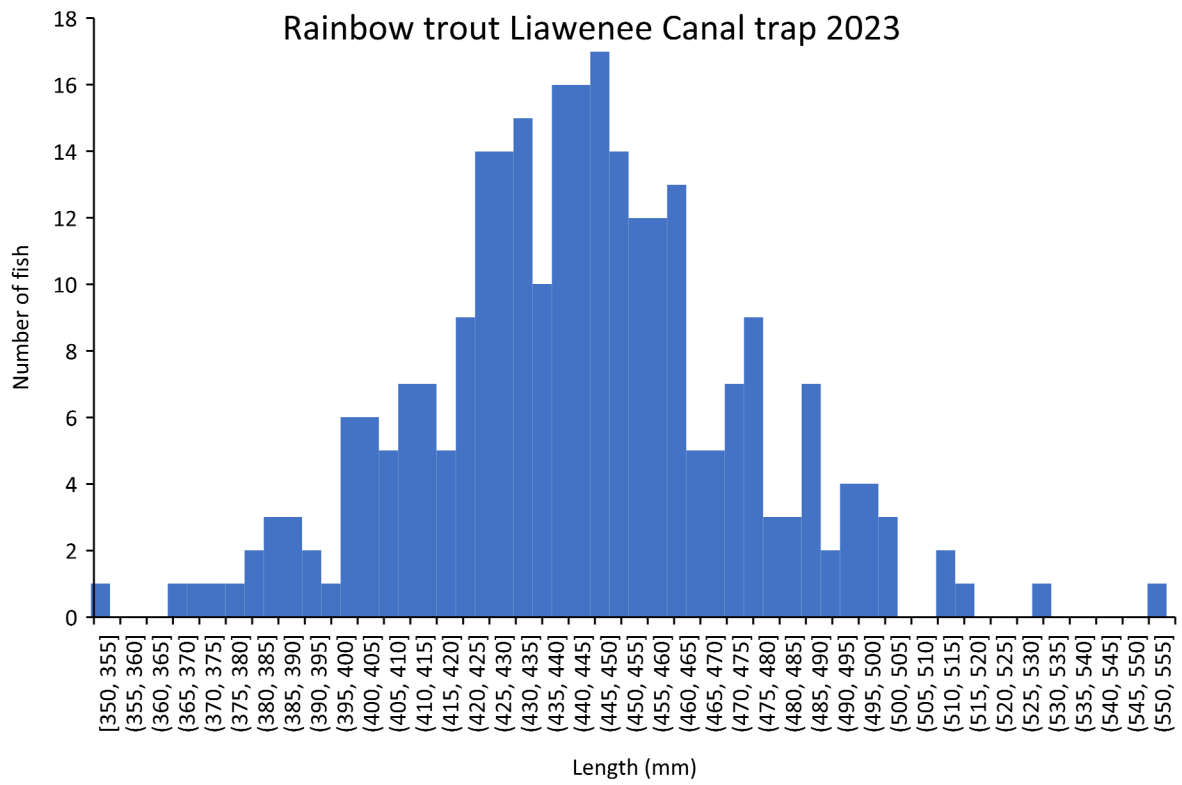


Figure 7. Length frequency histogram for rainbow trout measured from the Liawenee Canal trap, 20 September 2023.

Improvements in 2023

- New spawning gravel added to the middle of the southern Zig Zags
- New gravel spawning added to the entire northern Zig Zags
- Removable Screen installed at the top of the northern Zig Zags
- Refinements were made including concrete stairs and work area at the southern Zig Zag fry trap.
- A Standard Operating Procedure was produced for rainbow trout spawning management at Liawenee.

Discussion

It is important to monitor the water level in Lake Augusta, particularly in low rainfall years. Water flows need to be adequate during the rainbow trout spawning and the hatching and drop out period for the fry. Hydro Tasmania and Inland Fisheries Service Memorandum of Understanding – Water Level Arrangement 2023-28 (MOU) have agreed on a minimum of 0.5 cumec flow in Liawenee Canal for the rainbow trout spawning run. It is worthwhile checking with Hydro Tasmania staff to ensure this occurs. Ideally a minimum flow of 1.5 cumec flow should be maintained in Liawenee Canal during the adult spawning period and 0.5 cumec flow during the hatching and drop out of rainbow trout fry. The aim should be to match the outflow from Lake Augusta with inflows while maintaining water in the canal for as long as possible into summer.

Due to low water levels in Lake Augusta and a dry forecast for 2023, contact was made with Hydro Tasmania staff in November to ensure flows in Liawenee Canal, as per the MOU. Despite the dry forecast there were several rainfall events during December 2023 that pulsed the flows in Liawenee Canal and the Zig Zag channels. This may have pushed the fry from the spawning grounds earlier than occurred during 2022. This resulted in a lower catch than expected number of advanced fry in the first week of January 2023. Only 100 fry at 0.53g average weight were trapped over the period 2-5 January despite a target of 1,000 being required for stocking Penstock Lagoon.

Recommendations

- Monitor flows in Liawenee Canal during rainbow trout spawning period and liaise with Hydro Tasmania to ensure the MOU is met.
- Monitor flows in Liawenee Canal and consider collecting fry, for stocking in mid to late December.
- Use yearling rainbow trout collected by electrofishing the spawning channels in August for stocking waters identified in the *Stocking Plan*.
- The anti-jump structure at the bottom of the northern Zig Zag Channel should be replaced due to its poor condition. A new structure should be designed to allow additional fry trapping.
- Sample fry in December 2024 at Mountain Creek, Lake Sorell using electrofishing equipment to ascertain if the rainbow trout were present and that seeding of Lake Sorell has been successful.
- A review of the rainbow trout fishery of yingina / Great Lake is being undertaken during 2023/24.

Operational details

- Higher numbers of small rainbow trout fry are available for stocking from the last week of November until the end of the first week in December.
- Larger rainbow trout fry that have grown to 0.5g, are available for stocking after 20 December.
- During the transport of fry for stocking, 100 grams of fry should be carried with three litres of water within a fry bag.

Appendix

Appendix 1. Total allocation of spawning adult rainbow trout in the Liawenee spawning channels 2023.

Location	Number	Sub-total Males	Sub-total Females
Bottom Long Channel	515	221	294
Top Long Channel	515	221	294
Bottom Zig Zag Channel	420	180	240
Middle Zig Zag Channel	420	180	240
Top Zig Zag	231	99	132
Northern Zig Zag Channel	666	380	286
Liawenee Canal (green shack)	784	227	557
Liawenee Canal (above long channel)	766	168	598
Total	4,417	1,632	2,785

Appendix 2. Date and location of adult rainbow trout movements from the Liawenee trap 2023.

Destination	Number	Sex	Date
Bottom Zig Zag Channel	150	M	28/08/2023
Bottom Zig Zag Channel	18	F	28/08/2023
Bottom Zig Zag Channel	30	M	29/08/2023
Bottom Zig Zag Channel	2	F	29/08/2023
Middle Zig Zag Channel	7	M	29/08/2023
Middle Zig Zag Channel	173	M	31/08/2023
Top Zig Zag Channel	99	M	31/08/2023
Bottom Zig Zag Channel	52	F	31/08/2023
Northern Zig Zag Channel	51	M	1/09/2023
Lake Sorell	50	M	4/09/2023
Lake Sorell	50	F	4/09/2023
Northern Zig Zag Channel	163	M	5/09/2023
Bottom Zig Zag Channel	14	F	5/09/2023
Bottom Zig Zag Channel	26	F	7/09/2023
Northern Zig Zag Channel	53	M	7/09/2023

Destination	Number	Sex	Date
Northern Zig Zag Channel	19	M	8/09/2023
Top Long Channel	45	M	8/09/2023
Bottom Zig Zag Channel	30	F	8/09/2023
Bottom Zig Zag Channel	18	F	10/09/2023
Top Long Channel	32	M	10/09/2023
Top Long Channel	83	M	13/09/2023
Bottom Zig Zag Channel	78	F	13/09/2023
Top Long Channel	61	M	14/09/2023
Bottom Zig Zag Channel	2	F	14/09/2023
Middle Zig Zag Channel	82	F	14/09/2023
Bottom Long Channel	45	M	14/09/2023
Middle Zig Zag Channel	158	F	15/09/2023
Top Zig Zag Channel	42	F	15/09/2023
Bottom Long Channel	176	M	15/09/2023
Liawenee Canal (Top Long Channel)	14	M	15/09/2023
Liawenee Canal (Green Shack)	117	M	20/09/2023
Top Zig Zag Channel	90	F	20/09/2023
Northern Zig Zag Channel	174	F	20/09/2023
Northern Zig Zag Channel	22	F	21/09/2023
Northern Zig Zag Channel	6	F	22/09/2023
Liawenee Canal (Top Long Channel)	11	M	22/09/2023
Northern Zig Zag Channel	178	F	25/09/2023
Top Long Channel	126	F	25/09/2023
Liawenee Canal (Green Shack)	63	M	25/09/2023
Top Long Channel	73	F	26/09/2023
Liawenee Canal (Top Long Channel)	13	M	26/09/2023
Top Long Channel	95	F	27/09/2023
Bottom Long Channel	67	F	27/09/2023
Liawenee Canal (Green Shack)	23	M	27/09/2023
Bottom Long Channel	88	F	28/09/2023
Liawenee Canal (Top Long Channel)	18	M	28/09/2023
Bottom Long Channel	127	F	29/09/2023
Liawenee Canal (Top Long Channel)	19	M	29/09/2023

Destination	Number	Sex	Date
Bottom Long Channel	12	F	3/10/2023
Liawenee Canal (Green Shack)	267	F	3/10/2023
Liawenee Canal (Top Long Channel)	39	F	3/10/2023
Liawenee Canal (Top Long Channel)	53	M	3/10/2023
Liawenee Canal (Top Long Channel)	37	F	4/10/2023
Liawenee Canal (Top Long Channel)	7	M	4/10/2023
Liawenee Canal (Top Long Channel)	53	F	5/10/2023
Liawenee Canal (Top Long Channel)	5	M	5/10/2023
Liawenee Canal (Top Long Channel)	11	F	6/10/2023
Liawenee Canal (Green Shack)	125	F	9/10/2023
Liawenee Canal (Green Shack)	15	M	9/10/2023
Liawenee Canal (Green Shack)	165	F	10/10/2023
Liawenee Canal (Green Shack)	9	M	10/10/2023
Liawenee Canal (Top Long Channel)	118	F	12/10/2023
Liawenee Canal (Top Long Channel)	5	M	12/10/2023
Liawenee Canal (Top Long Channel)	28	F	13/10/2023
Liawenee Canal (Top Long Channel)	26	F	15/10/2023
Liawenee Canal (Top Long Channel)	11	F	16/10/2023
Liawenee Canal (Top Long Channel)	5	M	16/10/2023
Liawenee Canal (Top Long Channel)	5	F	17/10/2023
Liawenee Canal (Top Long Channel)	3	M	19/10/2023
Liawenee Canal (Top Long Channel)	76	F	19/10/2023
Liawenee Canal (Top Long Channel)	15	F	21/10/2023
Liawenee Canal (Top Long Channel)	70	F	23/10/2023
Liawenee Canal (Top Long Channel)	7	M	23/10/2023
Liawenee Canal (Top Long Channel)	31	F	24/10/2023
Liawenee Canal (Top Long Channel)	1	M	24/10/2023
Liawenee Canal (Top Long Channel)	31	F	25/10/2023
Liawenee Canal (Top Long Channel)	2	M	25/10/2023
Liawenee Canal (Top Long Channel)	9	F	27/10/2023
Liawenee Canal (Top Long Channel)	2	M	27/10/2023
Liawenee Canal (Top Long Channel)	32	F	30/10/2023
Liawenee Canal (Top Long Channel)	2	M	30/10/2023

Destination	Number	Sex	Date
Liawenee Canal (Top Long Channel)	1	F	31/10/2023
Liawenee Canal (Top Long Channel)	5	F	1/11/2023
Liawenee Canal (Top Long Channel)	1	M	1/11/2023



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