

Inland Fisheries Service

Four Springs Lake Redfin Perch Report



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Inland Fisheries Service

Four Springs Lake Redfin Perch Report

Author:

Jonah Yick, Senior Fisheries Management Officer

Approved by:

Dr Ryan Wilkinson, Acting Director- Inland Fisheries

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Timeline of Events

Table 1. *Timeline of redbfin perch investigations and surveys conducted in Four Springs Lake*

Date	Description
27/4/2025	A photo of an angler holding a large redbfin perch at Four Springs Lake is sent in to the IFS.
7/5/2025	Redfin perch is delivered to IFS Head Office New Norfolk.
8/5/2025	Redfin perch is processed for biological information: length- 410mm, weight- 1353g, female (Stage 3- mature, vascularized but not running), and gonad weight- 95g (7% GSI).
12/5/2025	Results of otolith sectioning received; redbfin perch found to be 9 years old.
12-13/5/2025	Survey in Four Springs Lake undertaken involving box traps, fine mesh fyke nets, and electrofishing with the electroboat. Box traps and fyke nets set overnight. Brown trout, rainbow trout, Tasmanian smelt, and short finned eels were caught. No redbfin perch encountered.

Introduction

On 27 April 2025 the IFS received a photograph of a large redbfin perch (*Perca fluviatilis*) caught from Four Springs Lake. The fish was retained and given to an IFS staff member for subsequent inspection and processing. It was found to be a large adult female weighing 1.4 kg and 410 mm fork length, with 95 g of intact eggs. After removal and processing of the fish's otoliths, it was found to be nine years old.

This discovery was of concern given redbfin perch are not known to inhabit Four Springs Lake. They have been sighted downstream of the dam wall in a small creek which the lake spills into, however they are unable to access the lake due to the steepness of the dam wall.

In late April 2018, an angler reported hooking a redbfin perch in the lake but was unable to land it. A subsequent electrofishing survey conducted by the IFS did not result in any perch, with 4.5 hours of electrofishing undertaken. There was also an unsubstantiated report of half a dozen dead redbfin perch found at the Four Springs Lake boat ramp approximately five to seven years ago.



Figure 1. The large redbfin perch caught out of Four Springs Lake in April 2025.

Four Springs Lake is situated 14 km north of Westbury. It was formed in 1997 following the construction of a 10-metre-high, 260- metre-long clay core dam on Sandy Creek. The lake was created to establish a passive aquatic recreation centre at Four Springs to service residents of northern Tasmania. Since the establishment of Four Springs Lake as a trout fishery, it has fast become one of the most popular

fisheries in the state. The lake is managed with regular stockings of both wild brown trout and domestic rainbow trout, and there has been some limited evidence of natural brown trout recruitment in the lake.

Redfin perch are regarded as a pest fish in Tasmania and were introduced from England by Morton Allport in 1862 (Mollison 2020). Given their ability to breed prolifically, they were able to overpopulate waters. They have spread throughout mainland Tasmania and are also established in New South Wales, ACT, South Australia, Victoria, and south-western Western Australia. The IFS has extensively highlighted the invasive nature of redfin perch in interpretation material, signage, and on the IFS website. Anglers are encouraged to humanely dispatch and appropriately dispose of any redfin perch caught. Legislation is also in place under the *Inland Fisheries Act 1995* which prohibits the translocation or transfer of any species of fish without the authority of the Director, where significant penalties can apply.

Redfin perch prefer to inhabit still and slow flowing waters, in particular areas with aquatic vegetation and other structure (McDowall 1996). Four Springs Lake would be an ideal habitat for redfin perch establishment, with plentiful food availability including good numbers of aquatic invertebrates, small fish species, and the mainland yabby (*Cherax destructor*).

The objectives of the survey were to:

- Confirm the possible presence of additional redfin perch in Four Springs Lake
- Determine the population dynamics of redfin perch in Four Springs Lake, if found.
- Determine whether it is possible to eradicate redfin perch from Four Springs Lake, if found.

Methods

Retained redbfin perch

The redbfin perch caught by the angler and donated to the IFS was processed accordingly. Total weight (g), fork length (FL mm), sex, gonad weight (GW g), macroscopic reproductive stage, and stomach contents were recorded. Gonadosomatic Indices (GSI) were calculated as follows; $GSI = (\text{Gonad weight}/\text{total weight}) \times 100$. Stomach contents were identified to the lowest taxonomic classification possible.

The pair of sagittal otoliths were removed, cleaned, and dried for later age determination. One of the otoliths was embedded in epoxy resin and transversely sectioned (250 – 300 μm) using a Buehler IsoMet low speed saw. The section was mounted on a glass slide and viewed using transmitted light on an Olympus BX51 compound microscope fitted with an Olympus DP70 camera. A microphotograph of the otolith section was taken and counts of opaque zones were made on the dorsal side of the otolith (Figure 1). The otolith was read once by one reader, by counting the number of opaque zones and classifying the otolith margin as opaque, narrow or wide.

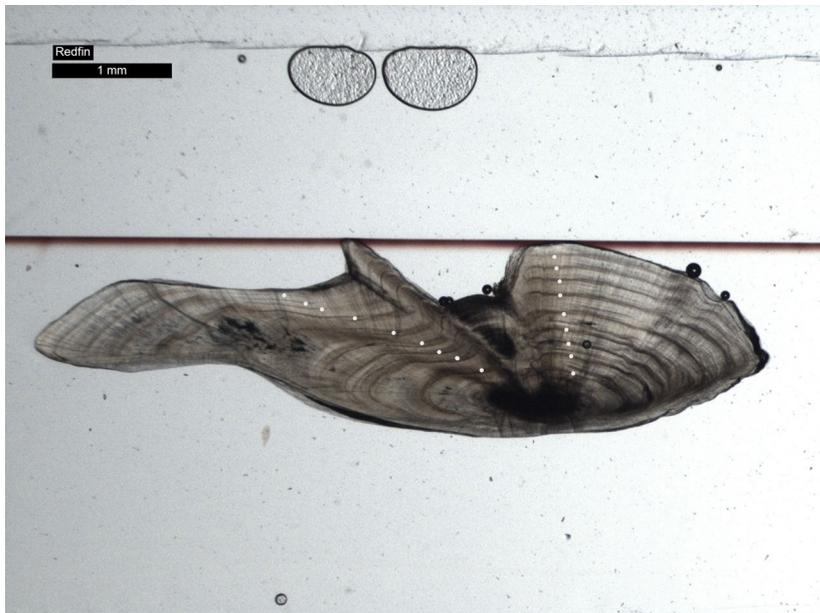


Figure 1. Image of the sectioned otolith of the nine-year-old redbfin perch from Four Springs Lake (opaque zone counts are marked with a white circle).

Electrofishing survey

The IFS Smith-Root electrofishing boat was launched at the boat ramp on the eastern side of Four Springs Lake on 12 May 2025. With three staff on board, the electrofishing boat was driven around various shorelines around the lake (Figure 2). The boat was driven parallel and close to the shore, and also targeting areas of structure where redbfin perch could be inhabiting. Additional time was spent covering the shoreline on the western side of Four Springs Lake in the vicinity of a jetty structure, which is where the original redbfin perch was caught. The generator was activated intermittently when working around structure. The shock time and the number of fish captured were recorded for each electrofishing run. Each electrofishing run was recorded by noting the start and end locations, with the track of the boat plotted on a map (Figure 2). Three runs were undertaken in total.

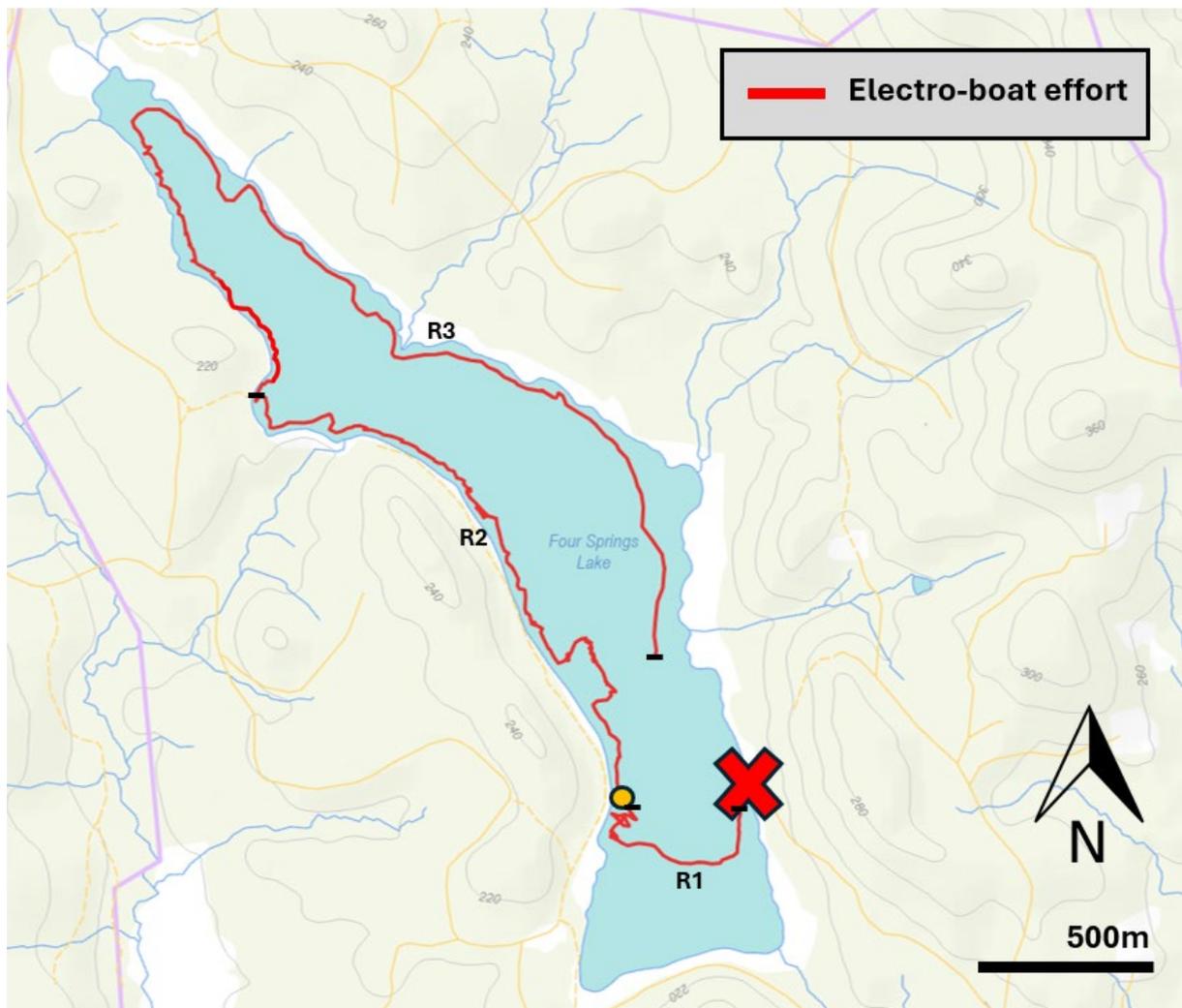


Figure 2. Map of Four Springs Lake illustrating the areas electrofished using the electroboat. Note: X- location where boat was launched, circle- area where the redbfin perch was caught. R represent Run.

Box trap and fyke net survey

From 12-13 May 2025, 30 box traps and 12 fine mesh fyke nets were set over one night in Four Springs Lake. A 5.7 m catamaran was launched from the main boat ramp and used to set gear around the lake (Figure 3). Box traps and fine mesh fyke nets were set in strings of three at right angles to the shoreline, with a focus on macrophytes and potential redbfin perch structure where possible. Box traps and fine mesh fyke nets were spread around the perimeter of the lagoon.

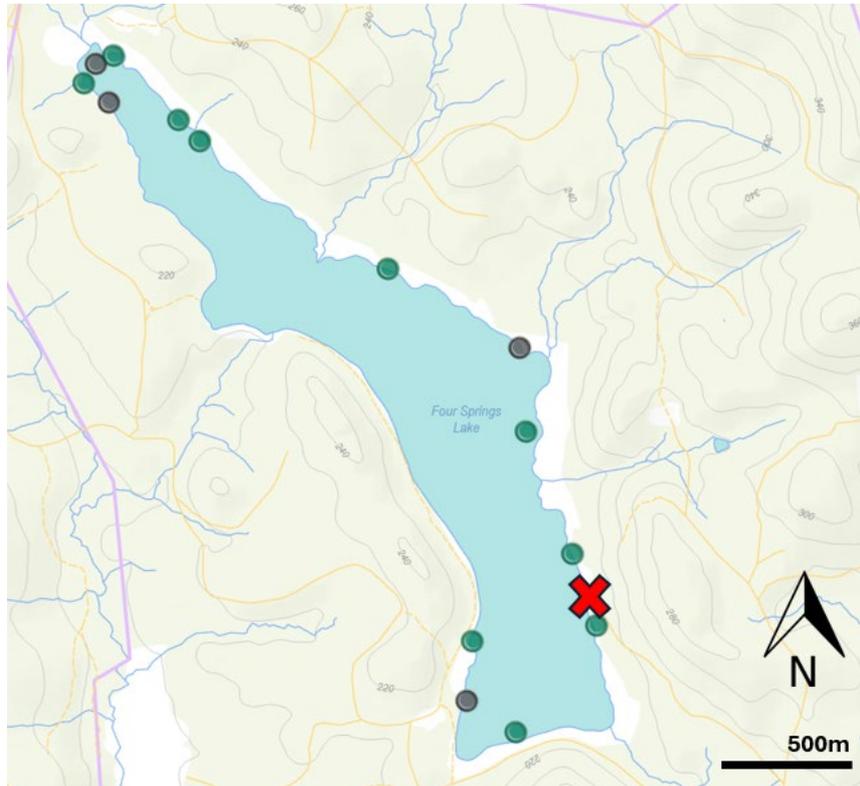


Figure 3. Map of Four Springs lake illustrating box trap and fyke net effort. Note: Box traps and fine mesh fyke nets were set in strings of three. Box trap sites- Green circles, fyke net sites- black circles.

Collection of trout and bycatch data

Any trout caught were opportunistically processed as supplementary information to existing fisheries performance assessment surveys conducted in Four Springs Lake. All trout were counted, measured to fork length (mm), weighed (g), and their sex determined by external observation (male, female or indeterminate). A fish is classed as indeterminate if it is unable to be identified as either a male or female (usually due to early development). Condition factor of the fish was calculated using the formula: $k = (10^5 \times \text{weight}) / \text{length}^3$. The categories of k are poor ≤ 0.9 , fair > 0.9 and ≤ 1.2 , good > 1.2 and ≤ 1.6 , excellent > 1.6 . All trout were processed alive and released soon after.

All native species caught in the fyke nets and box traps were counted and released.

Results

Retained redfin perch

The redfin perch caught by an angler on 27 April 2025 was a mature female measuring 410 mm and 1,353 g, and a gonad weight of 95 g (GSI 7%). It appeared to have an intact egg sac which was vascularized but not running. Stomach contents were examined for any presence of juvenile redfin perch which would suggest an established and recruiting population present. No redfin perch were found, but large numbers of partially digested aquatic invertebrates were found which include chironomids, zygoptera, and atyidae. The redfin perch was found to be over nine years in age from counts of the number of opaque zones on the dorsal section of the otolith (Figure 1).

Electrofishing survey

The electroboat was used to survey Four Springs Lake for any sign of redfin perch. The boat covered approximately 6.6 km with a total shock time of 204 minutes (the time the electrofishing unit is active) for 31 brown trout (*Salmo trutta*) and two rainbow trout (*Oncorhynchus mykiss*) (Table 1). Of the brown trout caught, there were 19 females, 11 males, and one indeterminate fish, while both rainbow trout were females. No redfin perch were observed, with clear water and still conditions favourable for seeing fish even if they weren't in the electric field of the electrodes.

The catch per unit effort (CPUE) of trout catch rates was measured in the number of trout caught per hour of shock time. The average CPUE for the three runs was 13 fish per hour, with first run resulting in the highest CPUE of 25 fish per hour across an approximately 1 km stretch (Table 1; Figure 2).

Table 1. Fishing effort, trout catch, shock time, and distance covered during the electrofishing survey for redfin perch undertaken in Four Springs Lake. *Average CPUE

Date	Run no.	Shock time (mins)	Distance covered (km)	Trout caught	CPUE trout/hour
12/05/2025	1	24	1	10	25
12/05/2025	2	78	1.9	9	8
12/05/2025	3	102	3.7	14	6
Total		204	6.6	33	13*

Box trap and fyke net survey

Forty three brown trout and one short finned eel (*Anguilla australis*) were caught from 30 box traps set over one night, with a total soak time of 319 box trap hours. Of the brown trout caught, there were 23 females and 20 males. Over 1,000 Tasmanian smelt (*Retropinna tasmanica*) were caught from 12 fine mesh fyke nets set over one night, with a total soak time of 90 fyke net hours. No redfin perch were encountered in any of the nets/traps.

The catch of 43 brown trout captured resulted in a catch per unit effort (CPUE) of 1.4 brown trout per box trap.

Combined trout information

All trout caught during the electrofishing and box trap/fyke net surveys were pooled together before general descriptive statistics and analysis of the data was undertaken. The total number of trout caught consisted of 74 brown trout and two rainbow trout.

The mean weight and length of all brown trout caught was 1,264 g and 490 mm respectively (Table 2). Both males and females had a similar average length, weight, and condition factor (fair). The brown trout captured ranged in size from a minimum and maximum length of 286 mm and 595 mm respectively, and a minimum and maximum weight of 330 to 1,910 g (Table 2; Figures 4, 5). Only two rainbow trout were caught during the survey (Table 2).

Table 2. Descriptive statistics for all trout caught during the survey for redfin perch in Four Springs Lake - length, weight and condition factor separated by sex.

Grouping	Measurement	Mean	Minimum	Maximum
All brown trout (n=73)	Length (mm)	490	286	595
	Weight (g)	1,264	330	1,910
	Condition Factor (k)	1.05	0.61	1.41
Female (n=42)	Length (mm)	487	296	553
	Weight (g)	1,285	340	1,860
	Condition Factor (k)	1.10	0.83	1.36
Male (n=31)	Length (mm)	503	286	595
	Weight (g)	1,274	330	1,910
	Condition Factor (k)	0.99	0.61	1.41
Rainbow trout (n=2)	Length (mm)	423	422	423
	Weight (g)	925	920	930
	Condition Factor (k)	1.23	1.22	1.24

Note: Indeterminate brown trout not included (n=1)

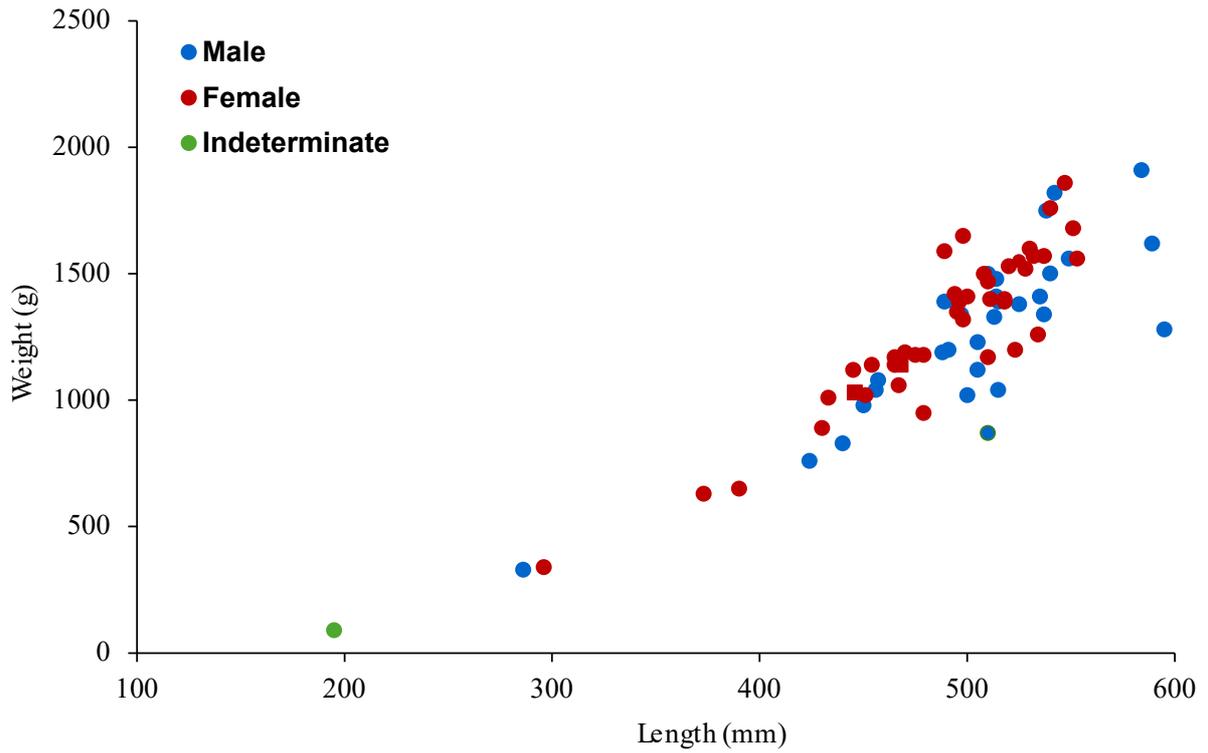


Figure 4. Length-weight relationship for brown trout caught during the survey for redbfin perch in Four Springs Lake ($n=74$). Note: Rainbow trout not included ($n=2$).

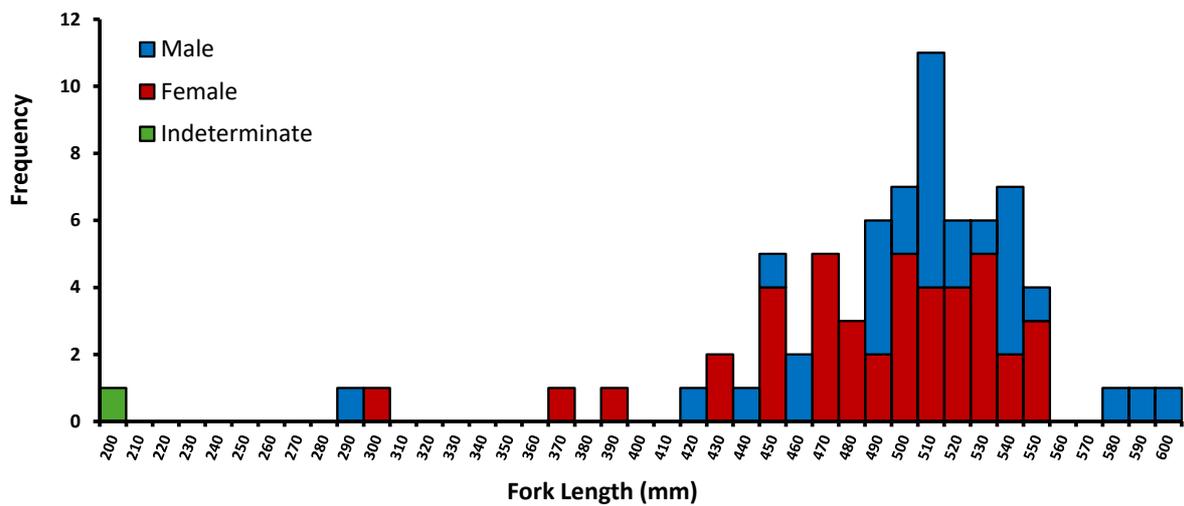


Figure 5. Length frequency for all brown trout caught during the survey for redbfin perch in Four Springs Lake, separated by sex ($n=74$). Note: Rainbow trout not included ($n=2$).

The average condition of brown trout encountered during this survey was 1.05 k (fair) (Table 2). Fifteen per cent of brown trout were categorised in poor condition, 73 per cent in fair condition, 12 per cent in good condition, and none in excellent condition (Figure 6).

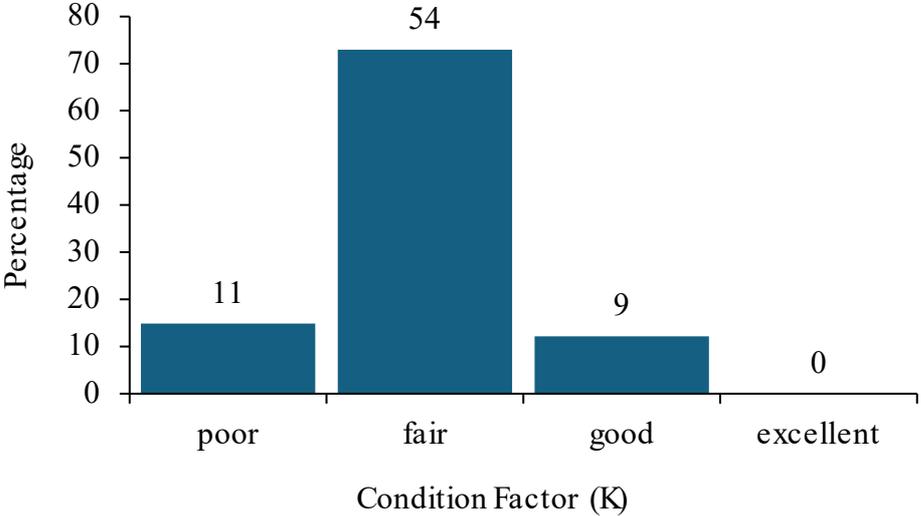


Figure 6. Condition factor category for all brown trout caught during the survey for redfin perch in Four Springs Lake (n=74). Note: Numbers on top of columns refer to actual number of fish. Rainbow trout not included (n=2).

Discussion

Despite extensive box trap, fine mesh fyke net, and electrofishing effort undertaken in Four Springs Lake, no redfin perch were encountered. The survey was undertaken in May where water temperature was sufficient for redfin perch movement around the lake. Four Springs Lake has extensive aquatic plants and structure which is ideal for redfin perch for spawning, rearing of juveniles, as well as general habitat. In addition, it supports large populations of aquatic invertebrates, mainland yabbies (*Cherax destructor*), and Tasmanian smelt, all of which would be ideal prey items. Therefore, the absence of redfin perch caught during these surveys suggests that they are either not present in the lagoon or are in very low numbers and have been unable to establish a population. This was further supported during the electroboat survey where the calm, bright conditions combined with clear water were ideal for seeing schools of juvenile redfin perch.

Four Springs Lake is one of the most popular trout fishing waters in Tasmania, with consistent angler visitation throughout the season, as well as numerous club competitions held there. Therefore, the absence of redfin perch reports from other anglers also suggests that they are not established in the lake.

Although there was a report of a redfin perch hooked in Four Springs Lake in 2018, as well as an unsubstantiated report of half a dozen dead redfin perch at the boat ramp approximately five to seven years ago, subsequent surveys failed to detect any sign of them. It is likely that the redfin perch caught from the lake in 2025 was a unique and solitary individual, and the result of an unauthorised translocation some time ago. Given the large size and relatively old age of nine years, it is unlikely that this fish was transferred recently to the lake as a sole individual. It is plausible that it may have been translocated as a juvenile either by accident or illegally, and/or may have been the last surviving individual if a small number of fish were introduced. Therefore, it is likely this individual has had many seasons and opportunities to spawn and establish a population if there were other mature males present in the lake.

During this survey the area below the dam wall was also inspected, where redfin perch have been sighted in a small creek. However, given the steepness of the spillway area leading to the creek, and the fact it remains dry unless the lake rises above full supply, this is unlikely to be the source of the redfin perch.

Summary

No redbfin perch were encountered in Four Springs Lake despite an extensive box trap, fine mesh fyke net, and boat electrofishing survey. The absence of reports from other anglers and lack of redbfin perch seen during visual inspections while electrofishing all suggests that a population has not established in this water. The IFS will still stay vigilant and will respond to any potential redbfin perch reports from anglers and the general public.

Recommendations

- An educational campaign to be undertaken to educate the public/fishers of the negative effects of translocating redbfin perch to new locations
- Maintain assistance from the public/anglers to report any redbfin perch sightings in Four Springs Lake to the IFS.

References

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Inland Fisheries Service

Phone:
1300 463 474

Email:
infish@ifs.tas.gov.au

www.ifs.tas.gov.au