

# Inland Fisheries Service

## Steppes Tench Distribution and Management Report



May 2024

# Inland Fisheries Service

## *Steppes Tench Distribution and Management Report*

Author:

Jonah Yick, Senior Fisheries Management Officer and Brock Cuthbertson, Technical Officer

Approved by:

Dr Ryan Wilkinson, Director- Inland Fisheries

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# Acknowledgements

Thanks to Ken Orr who reported the discovery of a tench skull at Herne Lagoon and assisted with the initial surveying logistics. Thanks to the landowners who allowed access to their property to undertake surveys and treatments. Acknowledgement to Hydro Tasmania for assisting with access to sections of Ripple Creek, coordinating the collection and analysis of water samples for eDNA and providing information on Hydro infrastructure.

# Timeline of Events

**Table 1.** Timeline of tench investigations and surveys conducted in the Steppes region

Date	Description
<b>21/1/2024</b>	An unidentified fish skull was found on the banks of Herne Lagoon (487761E, 5343070N), Steppes by an angler.
<b>23/1/2024</b>	Fish skull brought into Inland Fisheries Service head office and identified to be a tench.
<b>29/1/2024</b>	Herne lagoon is surveyed with a backpack electro fisher.
<b>15/2/2024</b>	Backpack electrofishing surveys commence in the Shannon River, Ripple Creek, and a dam close to Herne Lagoon. One tench measuring 75 mm is caught while backpack electrofishing Ripple Creek upstream of Herne Lagoon.
<b>26/2/2024</b>	Surveys continue in the Shannon River and Ripple Creek using a backpack electro fisher. One tench measuring 87 mm is caught while backpack electrofishing Ripple Creek downstream of Herne Lagoon.
<b>27/2/2024</b>	Surveys continue in the Shannon River using a backpack electro fisher.
<b>28/3/2024</b>	Herne Lagoon is surveyed using the electro boat. The upstream confluence of Ripple Creek and Herne Lagoon was also surveyed with a backpack electro fisher resulting in the capture of four tench: 105 mm, 21 mm, 32 mm, and 34 mm.
<b>9-10/4/2024</b>	Barrenton Dam located at the top of the Ripple Creek catchment is surveyed. Box traps and fine mesh fyke nets were set around the dam and left overnight. The gear was checked the following day and resulted in the capture of 73 tench.
<b>7/5/2024</b>	Barrenton Dam is deemed to be the source tench population. A risk assessment is undertaken to consider environmental values, including any potential threatened species within the water body. A decision is made to treat the dam with rotenone, with an aim to eradicate all tench from the dam.
<b>8/5/2024</b>	The release of water out of Barrenton Dam commenced via the riparian valve. Surveys continue in Ripple Creek using a backpack electro fisher resulting in the capture of three tench: 105 mm, 105 mm, and 200 mm.

<b>9/5/2024</b>	Surveys continue in Ripple Creek using a backpack electro fisher. A small dam close to Ripple Creek was surveyed resulting in the capture of two tench: 80 mm and 240 mm. Water continued to be released out of Barrenton Dam via the riparian valve.
<b>22/5/2024</b>	Water continued to be released out of Barrenton Dam via the riparian valve. Four-inch trailer water pump is hired from Coates Hire to assist with reducing the volume of water in the dam.
<b>22-24/5/2024</b>	Water continued to be released out of Barrenton Dam via the riparian valve and the trailer water pump.
<b>27/5/2024</b>	Water continued to be released out of Barrenton Dam via the riparian valve and the trailer water pump.
<b>28-29/5/2024</b>	Rotenone treatment of Barrenton Dam was completed. 206 tench were collected using dip nets as they succumbed to the treatment and came to the surface.
<b>30/5/2024</b>	An additional 151 tench were collected at the edge of the bank of Barrenton Dam.
<b>4/6/2024</b>	Rotenone treatment of two small dams directly downstream of Barrenton Dam was completed. 25 tench were collected using dip nets as they succumbed to the treatment and came to the surface.
<b>5/6/2024</b>	Another four dams in the vicinity of Ripple Creek were assessed for the suitability of rotenone treatment. However, as Ripple Creek had started to flow, none of the dams were treated. An additional 61 dead tench were collected from the two small dams using a dip net.
<b>23-24/1/2025</b>	Barrenton Dam and the two small dams directly downstream are re-surveyed to confirm eradication efforts after rotenone treatment. Box traps, fine mesh fyke nets, and backpack electrofishing were used, with no tench caught. Eradication appeared to be successful from these three water bodies.

# Introduction

On 21 January 2024 an unidentified fish skull was found on the banks of Herne Lagoon, Steppes by an angler (Figure 1). The skull was presented to the Inland Fisheries Service and confirmed to be a tench (*Tinca tinca*). Until this report, there had been no evidence of tench occurring in the Steppes region, apart from in Lagoon of Islands (LandT 2016; NVA 2024). However, it is likely this population no longer exists due to the lagoon drying up in 2016. This new incursion poses a risk to the nearby trout fisheries and numerous threatened native fish which are established in Penstock Lagoon, Arthurs Lake, Yingina / Great Lake, and Shannon Lagoon. As a result, an investigation into the potential distribution of tench in this area was undertaken.



**Figure 1.** Photograph of the fish skull found by an angler on the banks of Herne Lagoon

Tench is regarded as a pest fish in Tasmania and were first introduced from England by Captain Langdon in 1859 (Mollison 2020). After being released into the Tasmanian Royal Society's fishponds at Government House, they eventually bred and were then translocated into other Australian states as well as New Zealand (Mollison 2020). They were also stocked into many waters around Tasmania, including Lake Echo (Mollison 2020). Tench are now established in many areas of Tasmania, as well as in New South Wales, South Australia, and Victoria (McDowall

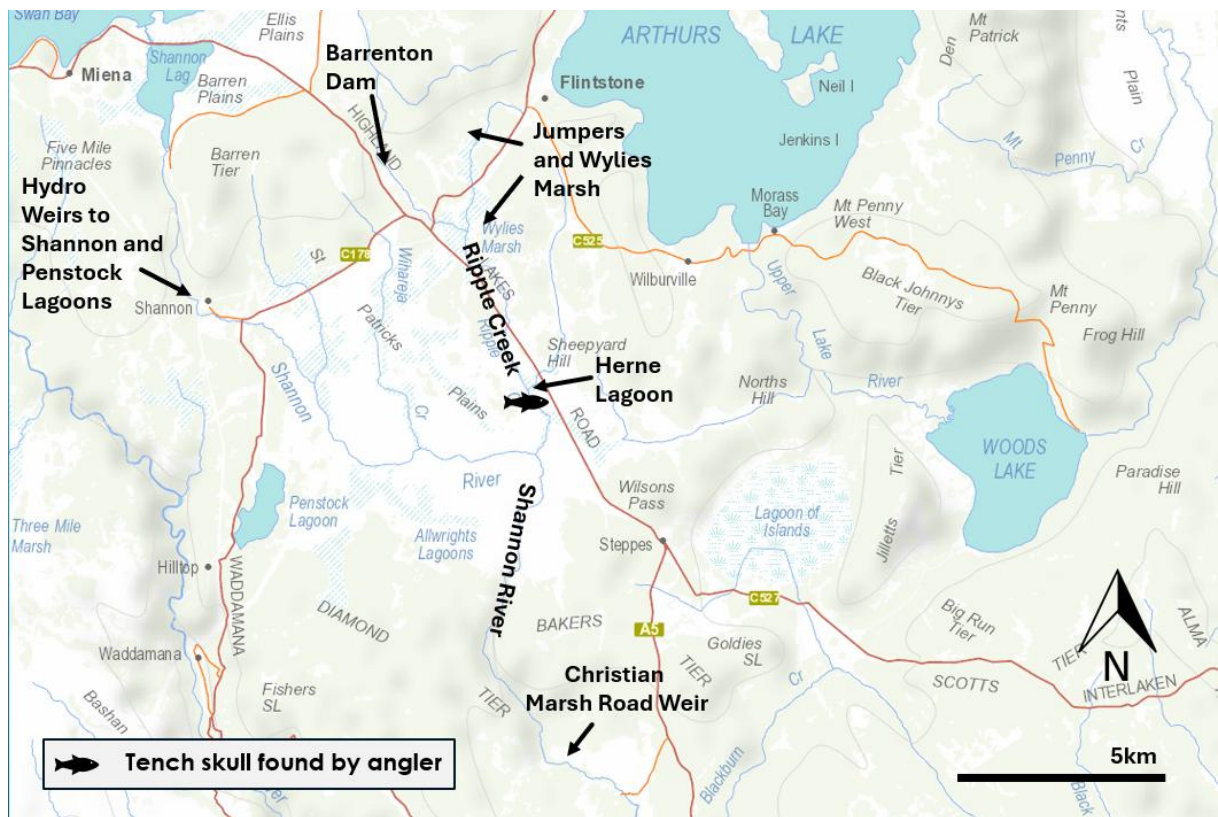
1996; Lintermans 2023). They prefer slow flowing and still water habitats combined with a muddy bottom and abundant aquatic plants (McDowall 1996; Lintermans 2023). They are found in lake and lagoon environments, however, they are also found in many riverine systems where there are off-channel habitats, backwaters, and sheltered holes.

The Inland Fisheries Service (IFS) has extensively highlighted the invasive nature of tench in interpretation material, signage, and on the IFS website. Anglers are encouraged to humanely dispatch and appropriately dispose of any tench caught. Legislation is also in place under the *Inland Fisheries Act 1995* that prohibits the translocation or transfer of any species of fish without the authority of the Director.

Herne Lagoon is located in the southern part of the Central Highlands, in an area called the Steppes (Figure 2). The lagoon is a dammed section of Ripple Creek, which starts upstream of Jumpers Marsh and stretches for approximately 10-12 km before flowing into the Shannon River. Ripple Creek has many slow flowing stretches of water which are suitable for tench, but it also contains several sections that dry out during summer. Numerous farm dams feed off Ripple Creek that are suitable for tench establishment. Ripple creek is also made up of extensive marshes, in particular Jumpers and Wylies Marsh, located approximately five kilometres upstream of Herne Lagoon (Figure 2). The Shannon River is the main catchment, which is the cause for the most concern, given its potential connectivity to some of the most popular brown and rainbow trout fisheries in the highlands, as well as many of these waters being inhabited by native (threatened and non-threatened) galaxias species (E.g. Shannon paragalaxias (*Paragalaxias dissimilis*), Great Lake paragalaxias (*Paragalaxias eleotroides*), saddled galaxias (*Galaxias tanycephalus*). However, the current Hydro Tasmania weirs in place should prevent access of tench into these waters, even if they became established in the upper section of the Shannon River (Figure 2). The Shannon River is approximately 68 km in length, and starts at the dam wall of Shannon Lagoon, before eventually flowing into the Ouse River downstream of Hermitage. Tench have been recorded in the lower catchment of the Shannon River below the weir at Christian Marsh Road, Steppes, however, they have never been found upstream of this location (Figure 2).

The objectives of this work were to:

- Determine whether tench are present and established in Herne Lagoon.
- Determine the overall distribution and presence of tench in the Steppes area, which includes Ripple Creek, upper Shannon River and any associated dams or waterbodies.
- Determine whether it is possible to aim for eradication in any areas where tench are detected.
- Assess the success of any attempted eradication efforts.



**Figure 2.** Map of the Steppes area and associated creeks, rivers and waterbodies which were investigated for the presence of tench.

# Methods

Tench distribution surveys were first undertaken in various rivers, creeks and dams to determine the extent of their range. Once the source population was detected, the dam was treated with rotenone. All tench collected during the distribution surveys and rotenone treatment were counted and the fork lengths (FL mm) recorded. The total weight (g) of fish were also recorded, apart from 216 individuals measuring <90 mm, and two individuals measuring 100 and 155 mm. Sex was unable to be determined reliably due to early-stage development of gonads.

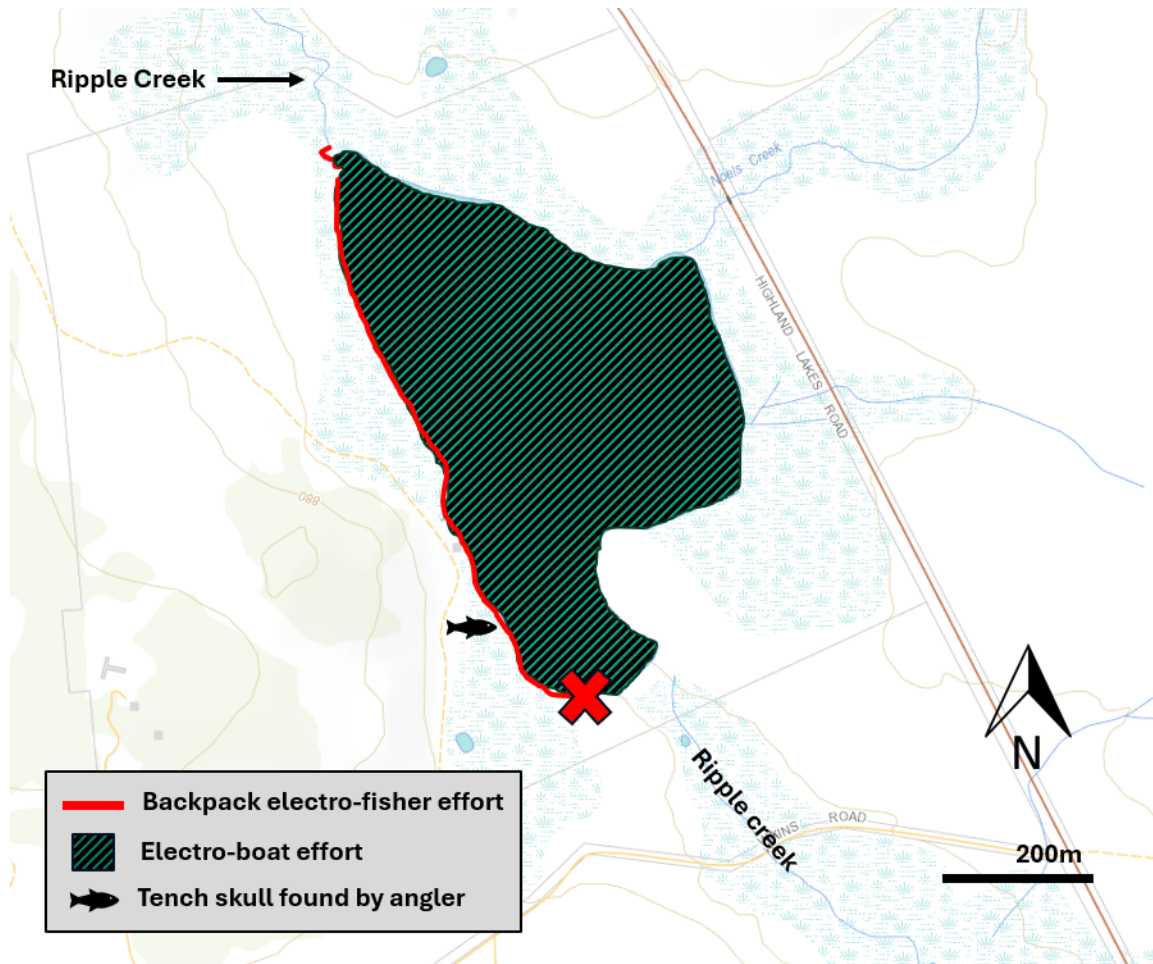
## Distribution surveys

From 29 January 2024 to 9 May 2024, IFS staff conducted surveys in Ripple Creek, Shannon River, and dams/marshes associated with these systems to investigate the distribution and presence/absence of tench. A range of techniques were used which included backpack electrofishing, boat electrofishing, box traps and fine mesh fyke nets.

### Herne Lagoon

On 29 January 2024, IFS staff surveyed Herne lagoon (487764E, 5343040N) with a backpack electro fisher. Electrofishing was undertaken from the southwest corner of the lagoon for approximately 900 m to the northwest corner (Figure 3). Different habitats were targeted, in particular mud substrate and aquatic plants.

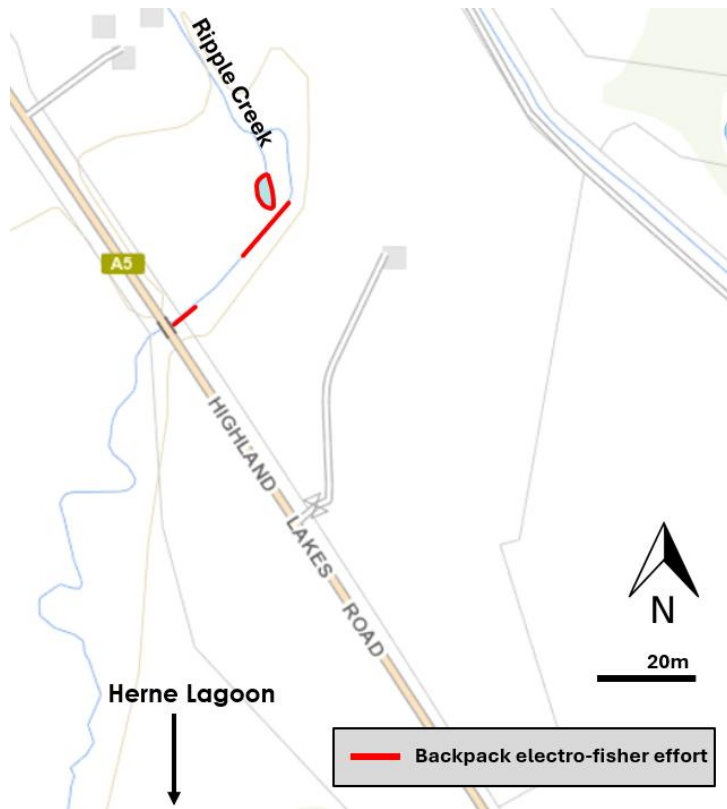
On 28 March 2024, the electrofishing boat was used to survey the entire lagoon (Figure 3). A backpack electro fisher was used to survey the shallow area where Ripple Creek meets the lagoon and for a distance of 50 m upstream.(Figure 3). This area had extensive weeds and macrophytes.



**Figure 3.** Map of Herne Lagoon showing backpack and electro-boat effort.  
*\*Note X- location where electro-boat was launched.*

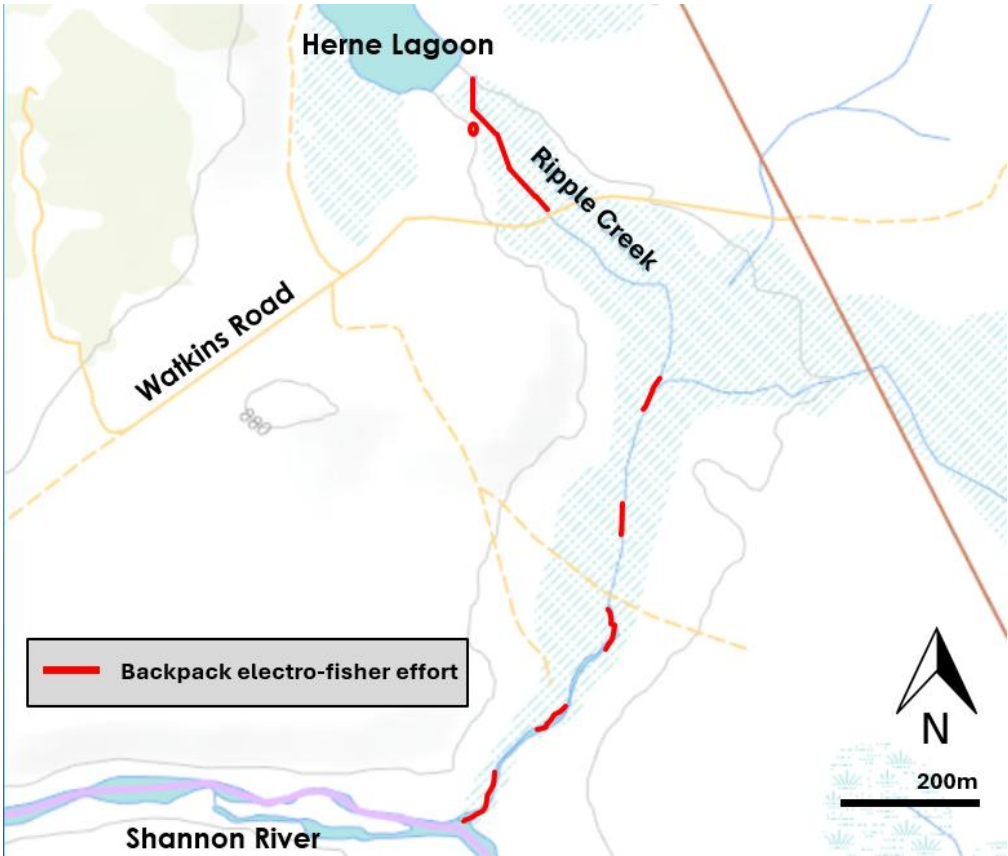
## Ripple Creek

On 15 February 2024, Ripple Creek upstream of Highland Lakes Road (487188E, 5344609N) was electro fished using a backpack electro-fisher (Figure 4). The creek was mostly dry with only a few small pools. On the western side of the creek adjacent to this stretch was a small dam, with soft substrate and weedy habitat. The perimeter of the dam was electro fished.



**Figure 4.** Map detailing backpack electrofishing effort on Ripple Creek upstream of Herne Lagoon, in the vicinity of Highland Lakes Road.

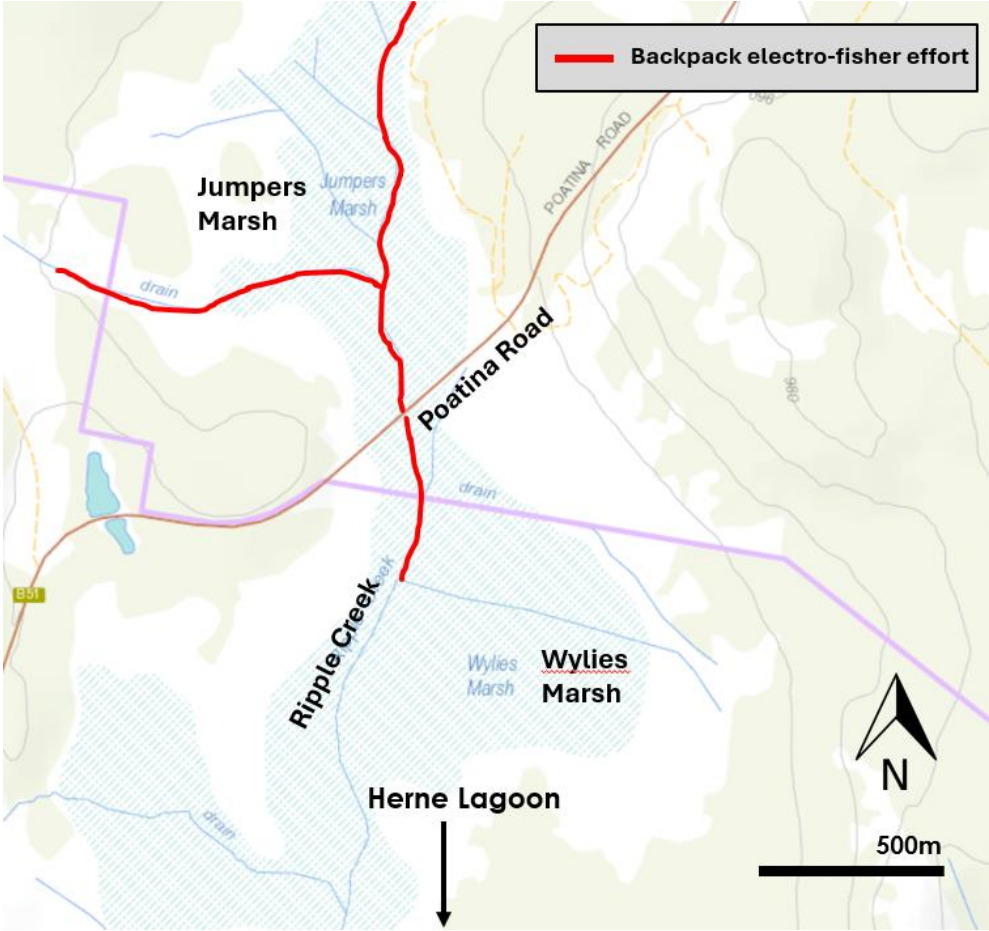
On 26 February 2024, the section of Ripple Creek downstream of Herne Lagoon to the Shannon River was electro fished. Most of the creek was dry with several pools present. The first section sampled directly below Herne Lagoon dam commenced approximately 40 m downstream of the lagoon (487945E, 5342643N), and continued for approximately 300 m to Watkins Road (Figure 5). This stretch of the creek was approximately three metres wide and less than one metre deep. The base was soft, muddy and was abundant with weed and macrophyte. There was a small dam (48795E, 5342550N) on the western side of the creek which had similar habitat and was also electro fished (Figure 5). Backpack electrofishing continued downstream of Watkins Road, in any pools that were deep enough for fish to inhabit. An additional five stretches/pools were surveyed until the Shannon River was reached (Figure 5).



**Figure 5.** Map detailing backpack electrofishing effort on Ripple Creek between Herne Lagoon and Shannon River.

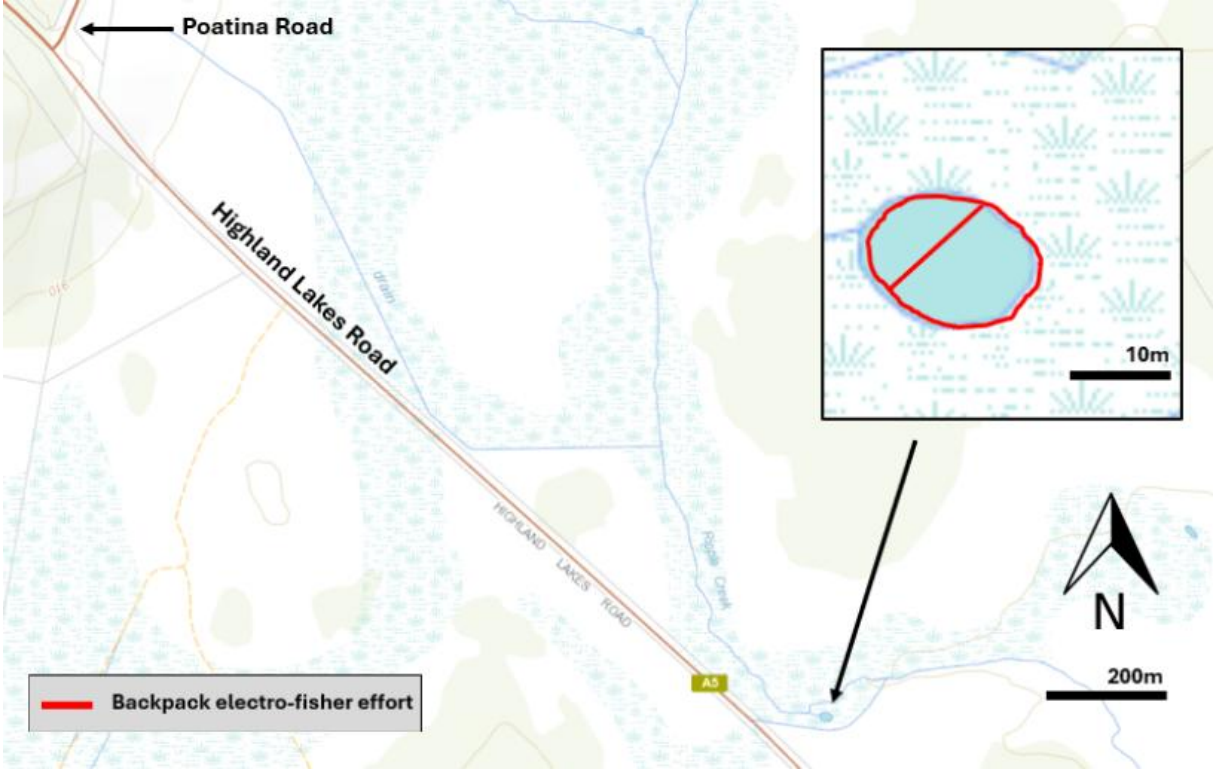
On 8 May 2024, Jumpers and Wylies Marsh were electro fished, located at the top of the Ripple Creek catchment. Jumpers Marsh is north of Poatina Road and forked into two separate areas. The first stretch electro fished commenced at Poatina Road (486270E, 5348211N) and continued upstream for a distance of approximately 1.4 km (Figure 6). The second stretch surveyed commenced at this location (486226E, 5348523N) and continued in a westerly direction upstream for approximately 800 m (Figure 6). This marsh had a firm gravelly base with low to no flow.

Wylies Marsh was located south of Poatina Road, and electrofishing commenced from the road (486277E, 5348201N) downstream for approximately 420 m (Figure 6). This area had a mostly soft base with an abundance of aquatic plants and macrophytes.



**Figure 6.** Map detailing backpack electrofishing effort on Ripple Creek in Jumpers and Wylies Marsh, upstream of Herne Lagoon.

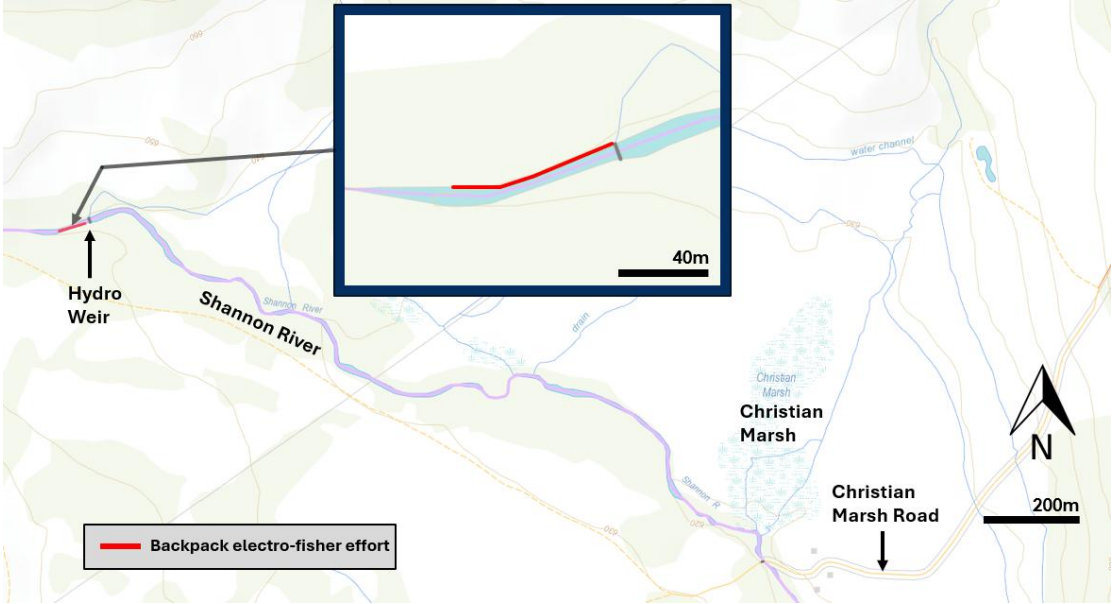
On 9 May 2024, a dam (486355E, 5346050N) located approximately 1.5 km southeast of the Highland Lakes Road and Poatina Road intersection was electro fished (Figure 7). The dam is east of Highland Lakes Road and connects with Ripple Creek once it begins to flow. It predominantly consisted of a soft, muddy substrate with an abundance of aquatic weed beds and macrophytes.



**Figure 7.** Map detailing backpack electrofishing effort on a small dam adjacent to Highland Lakes Road.

# Shannon River

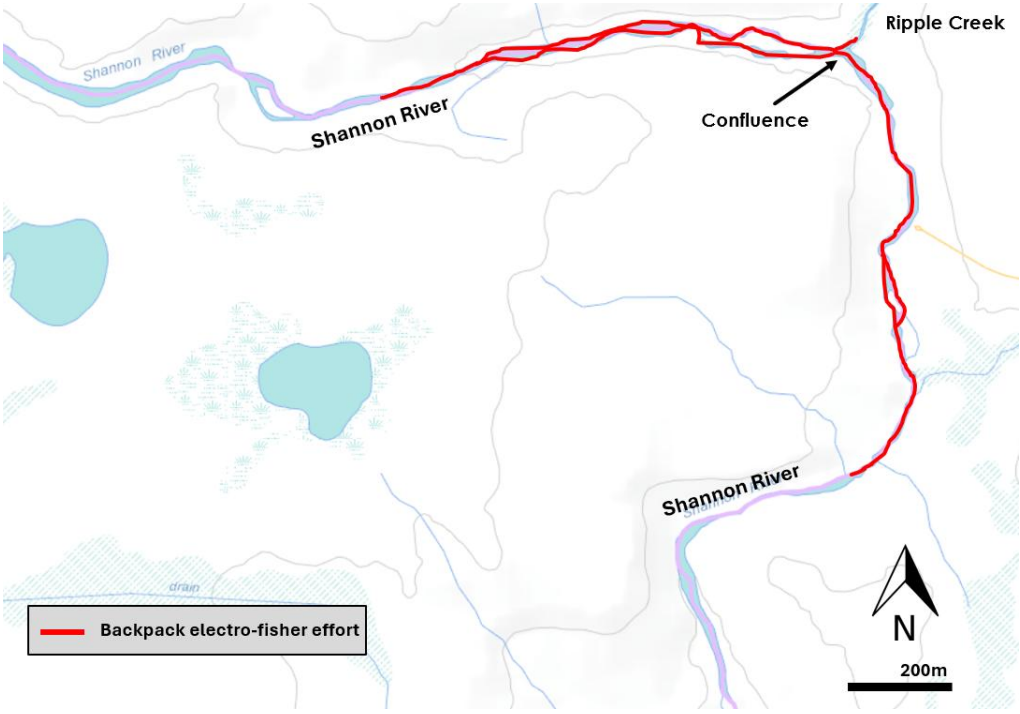
On 15 February 2024, an 80 m stretch of Shannon River was electro fished, directly upstream of a Hydro Weir (Figure 8). Electrofishing commenced at the weir (488673E, 5333280N) on the northern side of the riverbank, with the weir being situated approximately 1.7 km upstream of where Christian Marsh Road crosses over the Shannon River. The river had a medium flow in this stretch. The northern edge of the river had some small back waters with some aquatic weed.



**Figure 8.** Map detailing backpack electrofishing effort directly upstream of Christian Marsh Road Hydro Weir, on the Shannon River

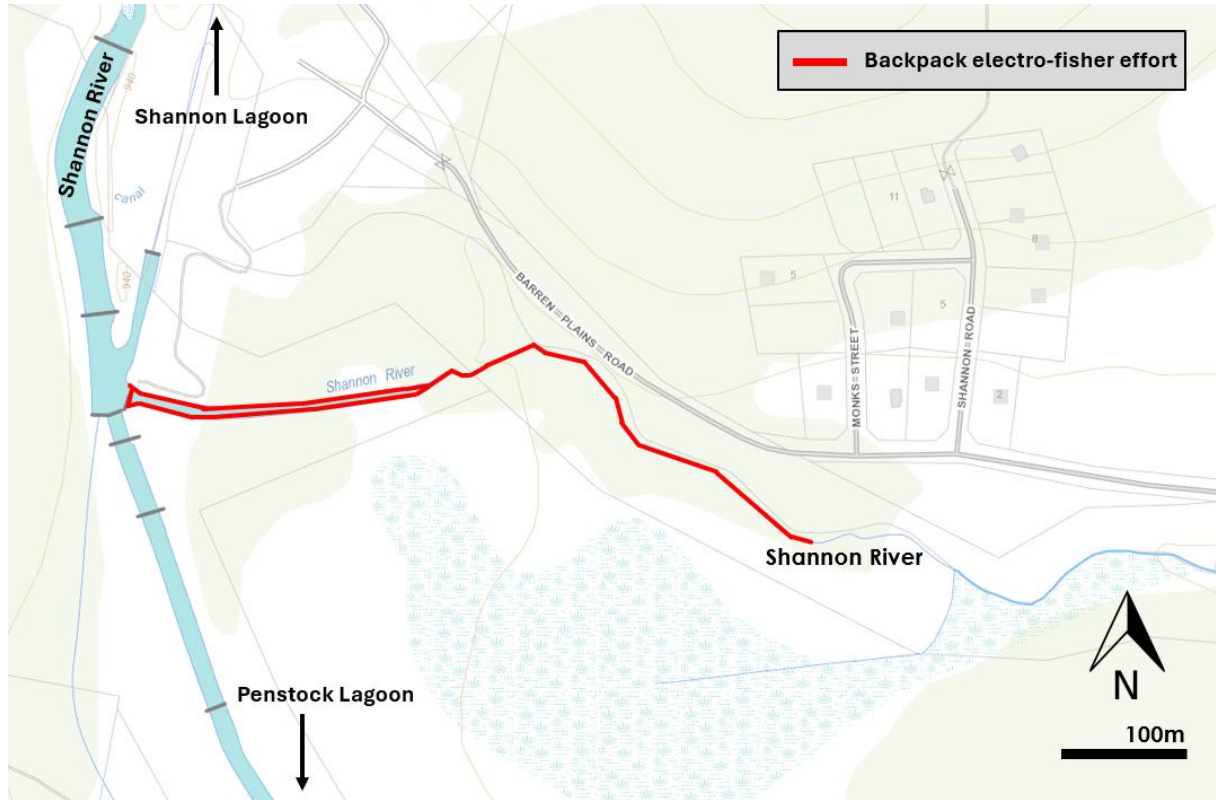
On 15 February 2024, electrofishing was undertaken approximately 500 m upstream and downstream of the Ripple Creek and Shannon River confluence (487914E, 5341267N) in the Shannon River (Figure 9). The river flow was strong in this area and was not ideal habitat for tench. The area upstream of the confluence into Ripple Creek had slower moving water and good habitat, therefore a short 70 m stretch was prioritised for electrofishing.

On 26 February 2024, the stretches of the Shannon River upstream and downstream of the Ripple Creek and Shannon River confluence were resurveyed (Figure 9). Electrofishing was undertaken approximately 1.5 km downstream of the confluence (487918E, 5341268N) on both sides of the Shannon River. The river in this stretch was shallow and had a medium flow, and the riverbed was rocky with aquatic weed on the edges. The habitat was not suitable for tench. Electro fishing effort was concentrated in various back waters. Electro fishing was also undertaken 1.5 km upstream of the confluence in the Shannon River (Figure 9), with both sides of the river surveyed. A small section of Ripple Creek 70 m upstream of the confluence was also surveyed (487945E, 5341238N). The confluence was out of the Shannon flow with no flow from Ripple Creek.



**Figure 9.** Map of the Shannon River showing electro-fishing effort upstream and downstream of the Ripple Creek confluence.

On 27 February 2024, the Shannon River was electro fished in the township of Shannon. Electro fishing commenced from the Hydro weir (479154E, 5344836N) downstream for approximately 700 m (Figure 10) for 40 minutes. This weir controls water flowing out of Shannon Lagoon, to either continue flowing down the Shannon River or into Penstock Lagoon. Both sides of the Shannon River were sampled concentrating on back waters and around aquatic weeds.



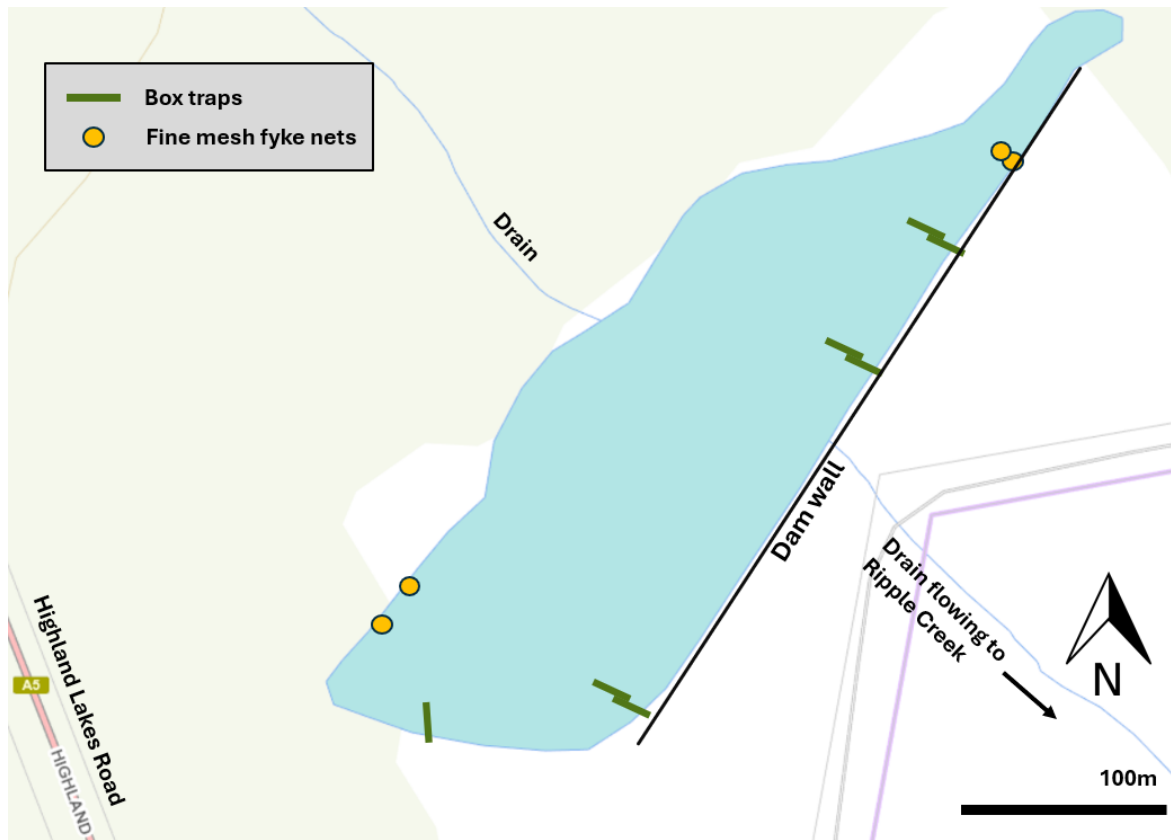
**Figure 10.** Map showing electro-fishing effort on the Shannon River around the Hydro weirs which divert water between Shannon River and Penstock Lagoon.

## Barrenton Dam

Barrenton Dam is a private dam (483986E, 5348691N) situated 4 km east of Barren Tier, in the Steppes region of the Central Highlands. It has an average depth of 3.5 m, an approximate area of 400 m x 90 m, and a holding capacity of approximately 80 ML. During high rainfall events, this dam spills into Ripple Creek. At the time of the survey, the dam was full but not spilling. The dam has extensive aquatic weeds around the margins, with a small marshy wetland on the northeastern corner.

On 9 April 2024, four fine mesh fyke nets and seven box traps were set in various locations around the dam (Figure 11). The nets were set in various locations around the dam focusing on aquatic weed and macrophytes. Two fine mesh fyke nets were set in a string of two, on the edge of the marshy wetland. The two remaining fyke

nets were set at right angles to the shore in the southwestern corner. Box traps were set on the dam wall (eastern shore) consisting of three strings of two traps, at right angles to the shore (Figure 11). One box trap was set on the southern corner of the dam. All gear was set overnight and retrieved the following day.



**Figure 11.** Map of Barrenton Dam showing fine mesh fyke net and box trap effort.

## Rotenone treatments

After the completion of the distribution surveys a few water bodies were selected for rotenone treatment. Barrenton Dam was a priority as it was the source population of tench in the Ripple Creek catchment. Two small dams approximately 120 m downstream of Barrenton Dam were also treated. It was likely that both of these dams had established populations of tench given Barrenton Dam floods directly into them. Given the smaller size of these two dams, it was assessed that treatment would be a relatively easy process without the need to drain them down further.

## Barrenton Dam

Prior to considering treating the dam with rotenone, a search was conducted on the Natural Values Atlas (NVA) to check for the presence of any threatened species, of which none were recorded for the area. The next step was to reduce the level of the dam by allowing water to flow out of the riparian valve (484054E, 5348676N). On 8 May 2024, the valve was opened up, and the outflow was screened using a large fine mesh net to prevent tench from spreading downstream. The valve was left open through until 27 May 2024. On 22 May 2024, a four inch trailer water pump was hired from Coates Hire to assist with pumping out the water. The outflow of the pump was also screened with a fine mesh net. This was mainly used during working hours and turned off at night or over the weekend when staff were not working. This pump was also used through until 27 May 2024. All water flowing out of the dam ran into the overflow drain and eventually into Ripple Creek.

The use of rotenone was checked to adhere to the permit "Permit to allow supply and emergency use of an unregistered AGVET chemical - product for management of exotic or pest fish in waterways (Permit Number: PER13011)". Confirmation that the permit was valid and in date. Rotenone powder was obtained from the Consolidated Chemicals Company, with 75 kg of rotenone powder purchased, with a dosage of 3 mg/L used.

Rotenone treatment of the dam commenced on 28 – 29 May 2024. IFS staff were issued with the required safety equipment and PPE as described in the Job Risk Assessment prepared for this activity. Initial mixing of rotenone powder and water was done in a high sided 500 L bin, with a surfactant/dissolving agent used called "Deluge Low Foam" to assist with the mixing process. Once the rotenone powder was sufficiently mixed in the bin, a three inch water pump with layflat hose was used to distribute the solution around the dam. As the intake pipe would draw down the level of solution in the bin, buckets of dam water were continuously tipped in to maintain the water level in the bin. This was repeated until the solution begun to be too dilute, or the area was sufficiently treated, whichever came first. The water pump was positioned on top of a level wooden pallet to prevented it from vibrating into the substrate.

Once the dam was drained to a suitable level, numerous pools of water remained. Treatment was undertaken pool by pool with the water pump manually moved around the perimeter of the pool ensuring the solution was distributed evenly. Once the bin of rotenone solution was drained completely and a sufficient amount had been applied, the inlet and outlet of the pump were put into the pool and left to circulate the water. The four inch trailer water pump was also used to circulate the solution through the pools. After treatment was complete, all pools were observed for affected fish. Any observed dead or affected fish were removed using a long handled dip net. All fish were collected and bagged for processing at a later date. On the following day (29 May 2024), IFS staff returned to the pools to remove any other dead or affected fish. This process was repeated whenever staff were passing by the dam over the next week.

## Other dams

Two small dams (484095E, 5348537N and 484073E, 5348515N) approximately 120 m downstream of Barrenton Dam were treated with rotenone on 4 June 2024. Given the small size of the dams, no adjustment in water level was required. The rotenone treatment process was followed as above, using a three inch water pump. After treatment was complete, both dams were observed for affected fish. Any dead or affected fish were removed using a long handled dip net. All fish were collected and bagged for processing at a later date. On the following day (5 June 2024), IFS staff returned to the pools to remove any other dead or affected fish.

## Re-survey of rotenone treated dams

### Barrenton Dam

On 23 January 2025, (approximately eight months after rotenone treatment), Barrenton Dam was resurveyed. Five box traps and four fine mesh fyke nets were set around the dam, focusing on aquatic weed and macrophytes. All four fyke nets and a string of two box traps were set in the northeast corner of the dam as this area accounted for most tench captured during the initial distribution survey. One box trap was set at approximately right angles on the middle of the dam wall (eastern shore), and the final two box traps were set in a string of two in the southern corner of the dam. All gear was set overnight and retrieved the following day.

Backpack electro fishing around the margin of the dam was also undertaken for 45 minutes on the following day, focussing on areas of structure, weed, and favourable habitat for tench.

### Other dams

On 23 January 2025, (approximately eight months after rotenone treatment), the two small dams approximately 120 m downstream of Barrenton Dam were resurveyed to confirm whether the treatment had been effective in removing all tench. One box trap was set overnight in the middle of each of the two dams and retrieved the following day.

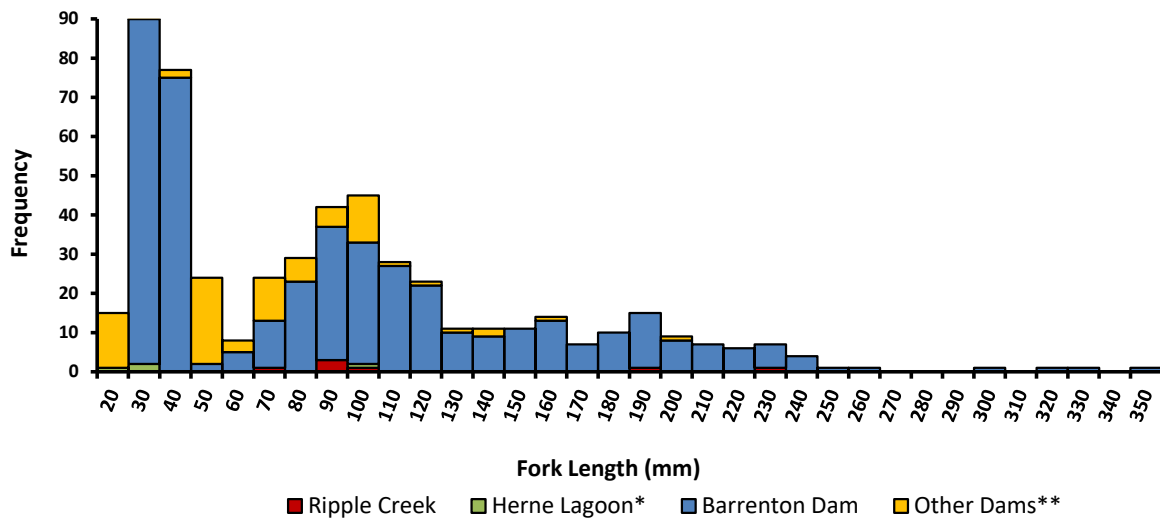
Backpack electro fishing around the margin and middle of the dams was also undertaken on the following day, focussing on areas of structure, weed, and favourable habitat for tench. Electro fishing was undertaken for 15 minutes in each of the dams.

# Results

A total of 527 tench were collected from all locations (Ripple Creek, Herne Lagoon, Barrenton Dam, and the two small dams downstream of Barrenton Dam) from all methods of capture (fyke nets, box traps, rotenone, and backpack electrofishing).

Across all the locations, the size of tench ranged from 15 mm to 345 mm, with an average length of 90 mm (Figure 12). Numerous year classes of fish were present, from individuals likely to be three to six months old, young of the year, and older cohorts (Figure 12 and 13). It is probable that there are four to five separate year classes established throughout the Steppes areas surveyed.

The widest size range of fish was found in Barrenton Dam, which is likely to be due to the largest sample size. The two small dams directly below Barrenton Dam accounted for smaller fish, in particular the < 20 mm size class (Figure 12). The few fish caught in Herne Lagoon were also small. As a gear type, the rotenone treatment was most effective at sampling fish of all sizes, compared to backpack electrofishing, and fyke nets/box traps (Figure 14).

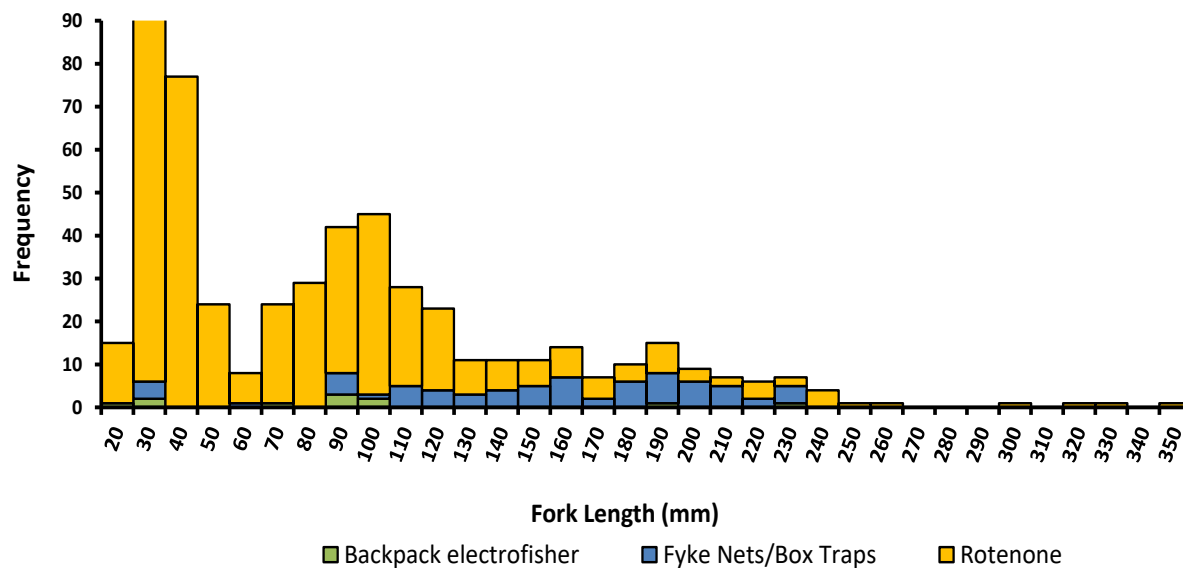


**Figure 12.** Length frequency distribution of all tench collected from all locations using all methods in the Steppes area (n = 527).

Note: \*Tench caught in Ripple Creek in the vicinity of Herne Lagoon. \*\*Two small dams directly downstream of Barrenton Dam.



**Figure 13.** Numerous young cohorts of tench caught after the rotenone treatment of Barrenton Dam and the two smaller dams downstream.



**Figure 14.** Length frequency distribution of all tench collected from the Steppes area comparing all gear types (n = 527).

# Distribution Surveys

## Herne Lagoon

Over two days (29 January and 28 March 2024), a total of 246 electro fishing minutes was undertaken, which includes 166 minutes in the electro boat and 80 minutes with the backpack electro fisher. Four tench were caught while backpack electro fishing Ripple Creek from the Ripple Creek confluence (487439E, 5343402N) to 30 m further upstream. The tench caught measured 24, 29, 34, and 102 mm. No tench were caught in the actual Herne Lagoon basin. A total of 123 brown trout (*Salmo trutta*) and 45 short finned eels (*Anguilla australis*) were also caught as bycatch.

## Ripple Creek

Backpack electro fishing was undertaken in numerous locations in Ripple Creek from the confluence of the Shannon River (487921E, 5341269N) to the top of the catchment at Jumpers Marsh (486378E, 5349344N). Total electro fishing effort across all sites was 98 minutes. Sites were selected based on favorable tench habitat and proximity to Herne Lagoon. Some sites included the small dams that were connected to Ripple Creek.

In total, seven tench were caught from Ripple Creek measuring 75, 87, 106, 105, 205, 107, and 240 mm (Table 2). In addition, 47 brown trout and five short finned eels were caught as bycatch (Table 2).

**Table 2.** Surveyed locations of Ripple Creek showing date, location, shock time, and catch of each site.

Date	Location	Eastings and Northings	Gear type	Shock Time (minutes)	Tench	Bycatch
15/2/2024	Upstream of Highland Lakes Road Bridge	487188E, 5344609N	x1 backpack electro fisher	30	1	15 BT 3 SE
26/2/2024	Downstream of Herne Lagoon	487945E, 5342643N	x1 backpack electro fisher	10	1	3 BT
8/5/2024	Upstream of Poatina Road	486270E, 5348211N	x1 backpack electro fisher	10	1	2 BT
8/5/2024	Downstream of Poatina Road	486277E, 5348201N	x1 backpack electro fisher	16	2	5 BT 1 SE
8/5/2024	Jumpers Marsh	486245E, 5348790N	x1 backpack electro fisher	22	0	22 BT
9/5/2024	Dam adjacent to Highland Lakes Road	486355E, 5346050N	x1 backpack electro fisher	10	2	1 SE

Note: Bycatch- BT- brown trout, SE- short finned eel.

## Shannon River

Backpack electro fishing was undertaken in numerous locations on the Shannon River for a total of 178 minutes. Of the five locations surveyed no tench were caught, while a total of 24 short finned eels and 20 brown trout were caught as bycatch (Table 3).

**Table 3.** Surveyed locations of Shannon River showing date, location, shock time, and catch of each site.

Date	Location	Eastings and Northings	Gear type	Shock Time (minutes)	Tench	Bycatch
15/2/2024	Christian Marsh Road Weir	488673E, 5333280N	x1 backpack electro fisher	16	0	2 SE
15/2/2024	Downstream from Ripple Creek confluence	487914E, 5341268N	x1 backpack electro fisher	57	0	2 BT 7 SE
15/2/2024	Upstream from Ripple Creek confluence	487914E, 5341268N	x1 backpack electro fisher	25	0	1 SE
26/2/2024	Upstream and downstream from Ripple Creek confluence	487914E, 5341268N	x1 backpack electro fisher	40	0	4 BT 10 SE
27/2/2024	Shannon Weir	479154E, 5344836N	x1 backpack electro fisher	40	0	10 BT 3 SE

*Note: Bycatch- BT- brown trout, SE- short finned eel.*

## Barrenton Dam

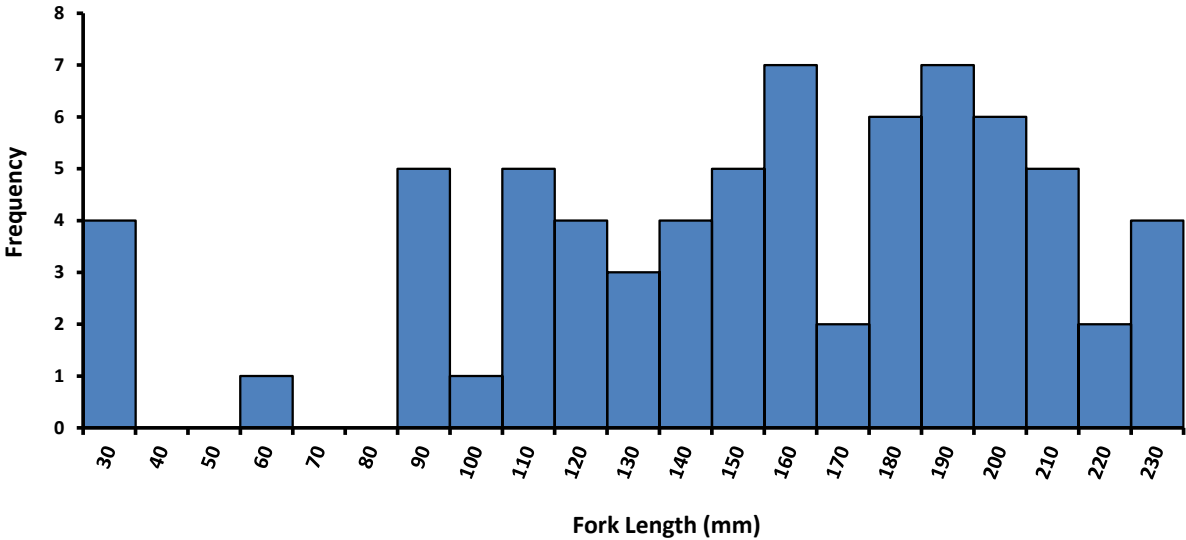
In total, 71 tench were caught over two days (overnight) of sampling (Table 4). Three brown trout and 14 short finned eels were also caught as bycatch. Both box traps and fyke nets caught similar numbers of tench, 40 (56 per cent) and 31 (44 per cent) respectively. The box traps had a total effort of 168 hours, while the fyke nets had a total effort of 96 hours (Table 4).

**Table 4.** Fishing effort for each gear type and the number of tench captured.

Technique	Effort (hrs)	Unit of Effort	No. of Tench	Bycatch
<b>Box Trap</b>	168	Trap net hours	40 (56%)	3 BT, 7 SE
<b>Fyke Net</b>	96	Fyke net hours	31 (44%)	7 SE

*Note: Bycatch- BT- brown trout, SE- short finned eel.*

The tench caught ranged in size from 27 mm to 231 mm, with an average length of 154 mm (Figure 15). Based on this initial catch, it appears there are at least two cohorts, one young of the year approx. 30 mm in length, and another from 90 to 230 mm. It is likely that the fish ranging from 90 to 230 mm consist of two separate cohorts. While tench were caught in all locations around the dam, the two box traps and fyke nets set in the northeast corner (Figure 11) accounted for the majority of the total catch.



**Figure 15.** Length frequency distribution of all tench caught in Barrenton Dam during distribution surveys (n = 71).

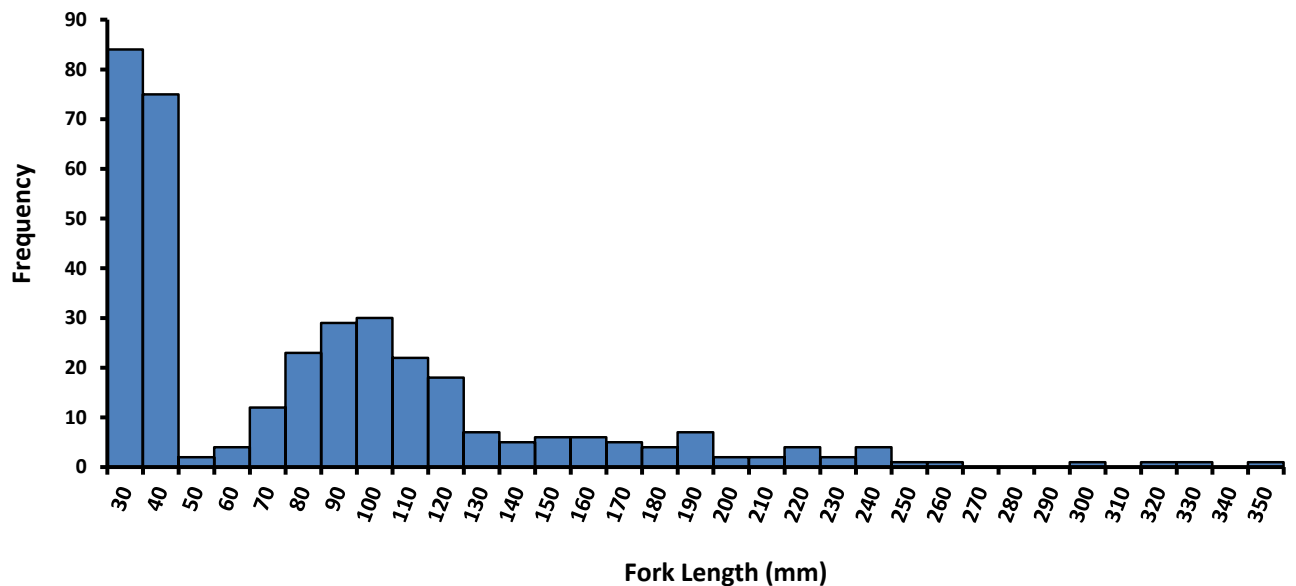
## Rotenone treatments

During and after the dams were treated with rotenone, affected and dead fish were collected with fine mesh dip nets where possible.

### Barrenton Dam

In total, 359 tench were collected from Barrenton Dam over three days, with many more observed dead but not able to be collected. Three brown trout, two saddled galaxias (*Galaxias tanycephalus*), and 22 short finned eels were also collected.

The larger individuals were caught using the rotenone treatment, rather than the box traps and fyke nets. The tench collected after rotenone treatment of the dam ranged in size from 27 mm to 345 mm, with an average length of 83 mm (Figure 16). With the larger sample size of tench collected, there is a clear young of the year cohort around 30 to 40 mm length, another cohort in the 50 to 140 mm length range, and potentially a further two cohorts making up the fish in the 150 mm to 350 mm length range (Figure 16).



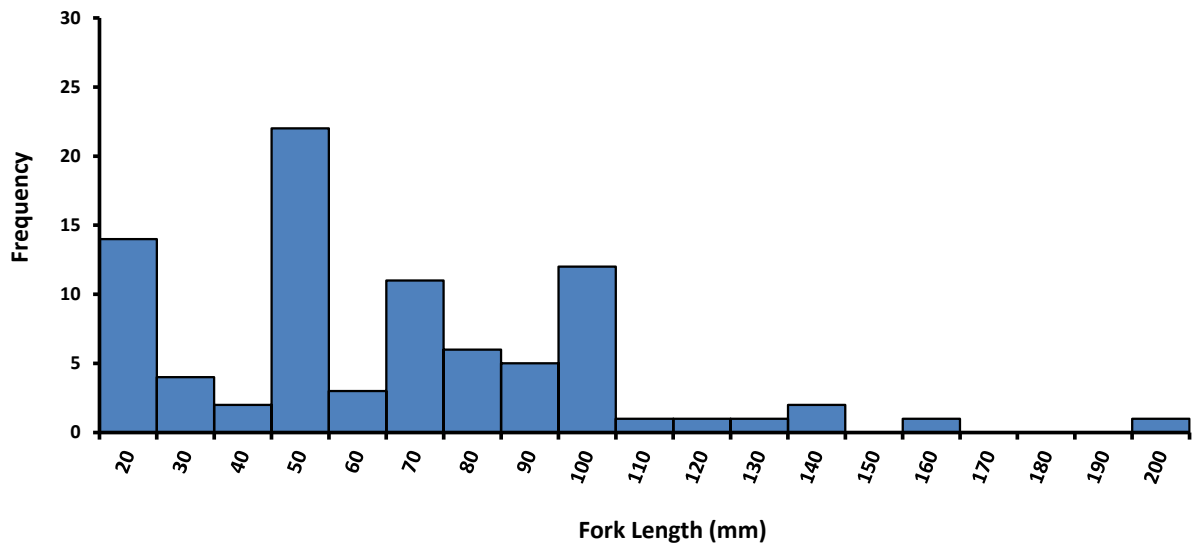
**Figure 16.** Length frequency distribution of all tench collected after rotenone treatment of Barrenton Dam (n = 359).

## Other dams

In total, 86 tench were collected from the two small dams over two days, with all dead fish able to be collected. Therefore, these 86 fish are likely to be representative of the total population in these dams.

The size range of tench in these two small dams was similar to the size of the fish caught in Barrenton Dam, although there were smaller fish in the 20 mm size class (15 to 24 mm length) which were not observed in Barrenton Dam (Figure 17).

The tench collected after rotenone treatment of the dams ranged in size from 15 to 196 mm, with an average length of 65 mm (Figure 17). Based on the length frequency graph (Figure 17) it is unclear how many cohorts are present, but it is likely there are at least three year classes.



**Figure 17.** Length frequency distribution of all tench collected after rotenone treatment of the two small dams downstream of Barrenton Dam (n = 86).

## Re-survey of rotenone treated dams

### Barrenton Dam

After retrieving all box traps and fine mesh fyke nets, a total of five small short finned eels and numerous tadpoles and freshwater shrimps were caught. Backpack electrofishing effort resulted in additional tadpoles and freshwater shrimps, with no tench of any size observed.

### Other dams

The box traps were retrieved with nothing caught, while backpack electro fishing effort resulted in numerous tadpoles and freshwater shrimps, with no tench of any size observed.

# Discussion

The discovery of a population of tench in Barrenton Dam is likely to be the source population in the Steppes region, given it is situated at the top of the Ripple Creek catchment. Although none of the tench collected were aged, it appeared there were four to five cohorts present. This included young of the year, young mature fish, as well as older mature individuals over 300 mm in length, indicating tench have been established at this location for numerous years.

Barrenton Dam is spring fed allowing it to fill quickly and maintain a regularly high level. Immediately after the rotenone treatment of Barrenton Dam, heavy rain occurred resulting in the water level rising from below 20 per cent capacity back to full, over seven days. The steady rise in water level directly after treatment facilitated the overall efficacy, as this event evenly distributed the treated water around the dam from pool to pool. The rotenone treatment of Barrenton Dam and the two smaller dams directly downstream appears to have eradicated tench from these waters, with no sign of any tench found during the re-survey eight months later.

When full, Barrenton Dam spills from the northern corner, and tench were able to disperse downstream into Ripple Creek, Herne Lagoon, and likely into the Shannon River. They also have access to Wylies Marsh and Jumpers Marsh on either side of Poatina Road, where a few tench were caught. However, sections of Ripple Creek from Barrenton Dam to the Shannon River dry up regularly. There are numerous small dams present that draw from Ripple Creek, as well as small residual pools. These were assessed, and many have suitable habitat which would be appropriate for tench to establish populations, however, some were also observed to dry up on occasions.

Despite extensive electro fishing in Herne Lagoon with both the backpack electro fisher and electro fishing boat, no tench were found in the actual basin. However, four small individuals were backpack electro fished in the confluence of Ripple Creek and the lagoon. Three of the four fish were likely to be young of the year. Given the proximity of where these fish were caught to the lagoon, it can be assumed there are tench within Herne Lagoon, but in low numbers. This assumption was supported by eDNA sampling undertaken by Hydro Tasmania / EnviroDNA during 2024, where 15 sites were sampled in Ripple Creek (above and below Herne Lagoon) and in Herne Lagoon (Webster 2024). All sites returned negative readings for the presence of tench, apart from one site in Herne Lagoon that returned an inconclusive result, indicating the possible low abundance of tench in the lagoon.

The Shannon River was also extensively electro fished at various locations with no tench found. Given one tench was caught in Ripple Creek just upstream of the confluence of the Shannon River, it is likely that small numbers of tench are in this upper section of the river. This result is also supported by eDNA sampling work

undertaken by Hydro Tasmania / EnviroDNA during 2024, where seven sites sampled in the Shannon River returned negative results for the presence of tench, as well as three sites in Ripple Creek downstream of Herne Lagoon (including the pool where the one tench was caught) (Webster 2024). The majority of the locations electro fished in the Shannon River were found to be fast flowing and generally not ideal habitat for tench. Although there were some sites that had slow moving backwaters and extensive aquatic macrophytes, it is likely the majority of tench would not be able to establish successfully in this area and are likely to be pushed further downstream.

An area of concern that was surveyed was in the township of Shannon, where the Hydro Tasmania weir diverts water flowing out Shannon Lagoon, to either travel into the Shannon River or into Penstock Lagoon. This area was carefully assessed to determine if tench became established in this area of the Shannon River, whether they would be able to access Shannon or Penstock Lagoon. Given the absence of tench caught, unsuitable habitat in this area, and the presence of high weirs/barriers, the risk of tench being able to access these waters is very low.

Tench are known to be present in the lower catchment of the Shannon River below the weir at Christian Marsh Road, Steppes, however, they have never been found upstream of this location. eDNA sampling for the presence of tench was undertaken by Hydro Tasmania / EnviroDNA in the Shannon River during 2021 and 2023 both upstream and downstream of the Christian Marsh Road Weir (Griffiths et al. 2021; Webster and Griffiths 2023). An additional site was also sampled further downstream in the Shannon River at the Hermitage Bridge in 2021 (Griffiths et al. 2021). All samples returned negative results. In addition to the eDNA sampling, backpack electro fishing was undertaken at numerous sites on the Shannon River during 2019, as far upstream as the Hydro Weir/radial gates in Shannon, down to the Hermitage Bridge (Lervasi and Lervasi 2019). The results of the eDNA sampling and the absence of tench during electrofishing surveys, suggests tench are either not established in these sections of the Shannon River, or are in very low numbers.

Tench are classed as a pest species in Tasmania and anglers are encouraged not to release them after capture. They are currently distributed and established throughout the River Derwent, South Esk, and Macquarie River systems, and parts of the midlands and highlands (IFS 2024). Although tench are part of the Cyprinid (carp) family, they are generally regarded as less invasive and pose a low risk to the environment and native fish species (Lintermans 2023). Bronte Lagoon in the Central Highlands is popular trout fishery for both brown and rainbow trout and the presence of tench has not affected the quality or condition of trout. However, given the diet of tench consists of aquatic insects, microcrustaceans, molluscs, and worms, it is likely they would compete for food with trout and galaxias species.

# Summary

The source population of tench in the Steppes region was located in Barrenton Dam, and after treatment with rotenone it appears they have been eradicated. Two smaller dams directly below Barrenton Dam were also successfully treated. However, it is likely that small numbers of tench are currently established and distributed in pools and dams throughout Ripple Creek and Herne Lagoon. Ripple Creek regularly stops flowing and dries out during the warmer months, therefore this is likely to limit the tench population here. However, it still means small numbers of tench can access the upper reaches of the Shannon River. Most of this section is fast flowing and generally unsuitable for tench, therefore they are unlikely to establish a significant population. Without further intervention, tench may continue to occur in Ripple Creek in low numbers. Although numbers are currently low in Herne Lagoon, it is possible this population could increase over time. A considerable amount of effort and resources would be required to attempt to eradicate tench from the Ripple Creek catchment and Herne Lagoon. Given tench have been documented to have minimal impact on native and coexisting fish, further control measures may not be required.

# Recommendations

- Consider re-surveying Herne Lagoon with either electrofishing and/or box traps.
- Consider re assessing the pools/dams on Ripple Creek in summer when the creek stops flowing.

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**Inland Fisheries Service**

**Phone:**  
1300 463 474

**Email:**  
[infish@ifs.tas.gov.au](mailto:infish@ifs.tas.gov.au)

**[www.ifs.tas.gov.au](http://www.ifs.tas.gov.au)**