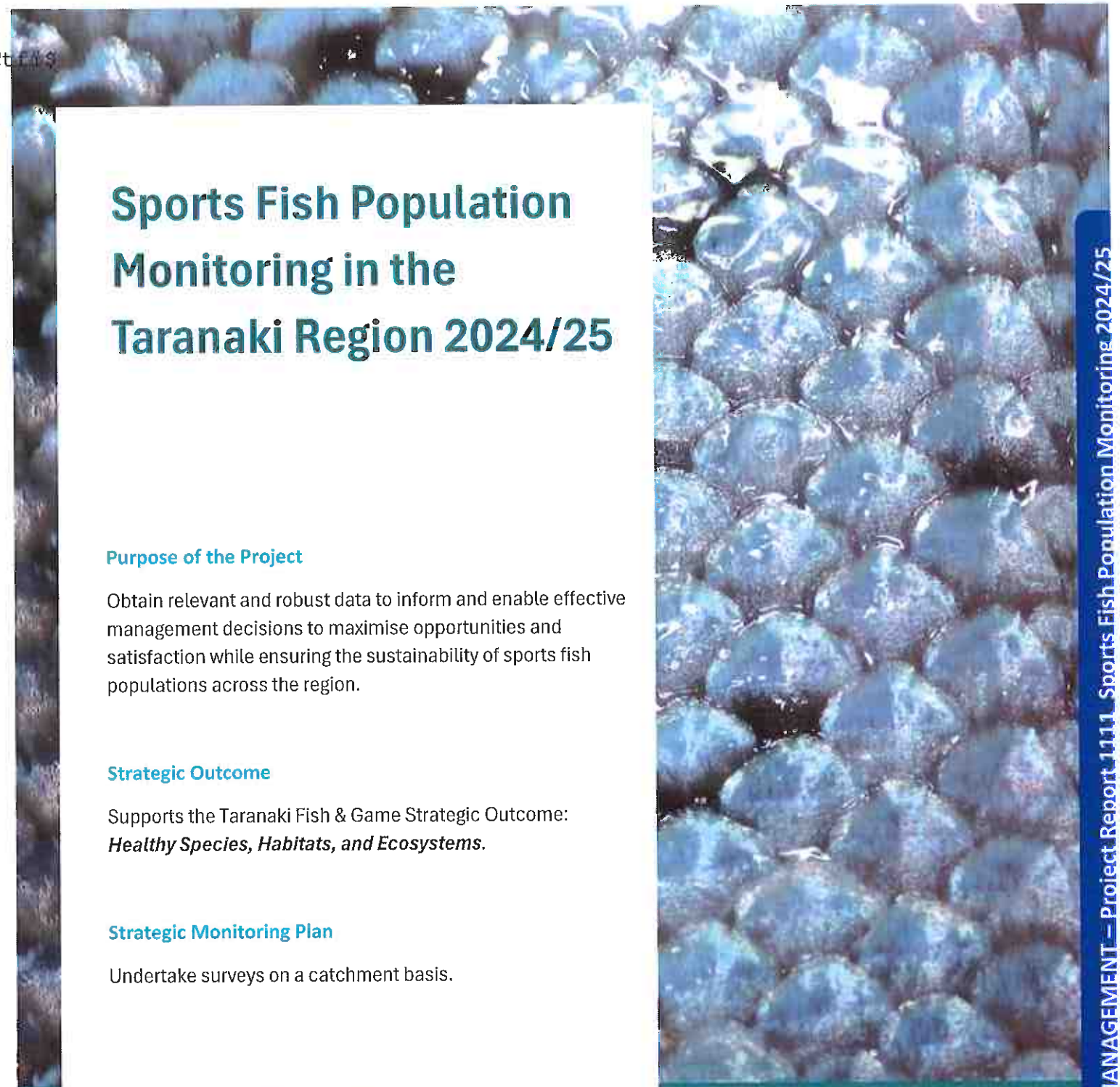
Taranaki Fish & Game Council

2024/2025 Project Reports



Sports Fish Population Monitoring in the Taranaki Region 2024/25

SPECIES MANAGEMENT – Project Report 1111 Sports Fish Population Monitoring 2024/25

Purpose of the Project

Obtain relevant and robust data to inform and enable effective management decisions to maximise opportunities and satisfaction while ensuring the sustainability of sports fish populations across the region.

Strategic Outcome

Supports the Taranaki Fish & Game Strategic Outcome: ***Healthy Species, Habitats, and Ecosystems.***

Strategic Monitoring Plan

Undertake surveys on a catchment basis.

Allen Stancliff / Jack Harland

Taranaki Fish and Game Council

August 2025

Fish & Game NEW ZEALAND

Executive Summary – 1111 Sports Fish Population Monitoring (2024/25)

Overview of Results

- Carried out electric fishing at 22 sites in the Manganui River in December 2024 with a report prepared for Council's 18th October 2025 meeting;
- Information collated for a Manganui River catchment resource inventory report (yr 1 of 2);
- Carried out electric fishing at 10 sites in Kapuni Stream on behalf of Ballance Agri-Nutrients Kapuni Ltd. and Todd Petroleum Mining Company Ltd.
- Carried out electric fishing at four sites in the Wāhianoa River within Karioi Forest for Ernslaw One Ltd;
- Carried out electric fishing at one site in Mākahikatoa Stream and 12 sites in Tokiāhuru Stream within Karioi Forest;
- Angler diaries sent to 26 anglers for the start of the 2024/25 season with 11 returned and information collated;
- Trout spawning surveys conducted in Lake Mangamahoe tributaries.

Key Catchment Findings

- Young of the year juvenile brown trout were widespread in the mainstem of the Manganui River but absent from several sites in tributary headwaters. Average densities were similar to those found in previous surveys of the Waingongoro River and Kaupokonui Stream;
- Densities of rainbow trout fry found in Kapuni Stream in late October 2024 were some of the highest found so far in ringplain streams, indicating a year of good recruitment;
- Headwater tributaries of the Whangaehu River within Karioi Forest support abundant populations of stunted brown and (mainly) rainbow trout;
- Angling diarists reported good catch rates in the Manganuioteao and Hangatahua (Stony) rivers, but there was insufficient information to draw conclusions about other waters.

Statement of Service Performance

Planned Result:

1. Assess juvenile trout recruitment in the Manganui River and tributaries to compare with baseline information from other catchment surveys (yr 1 of 2).
2. Undertake a resource inventory of the Manganui River catchment to determine current status of the trout fishery and identify threats and opportunities (yr 1 of 2).
3. Monitor and report information on the status of the region's trout fisheries sufficient to measure overall angler success (through a diary scheme), set effective regulations and inform management directions.

Performance Measures:

Reports produced on the status of the region's trout fisheries and including;

- Angler catch rates across the region;
- Juvenile recruitment in the Manganui River catchment;
- Manganui River resource inventory (draft report).

Actual Result:

- Angling diarists reported good catch rates in the Manganuioteao and Hangatahua (Stony) rivers, but there was insufficient information to draw conclusions about other waters.
- Juvenile recruitment was assessed at 22 sites in the Manganui River catchment and a report prepared for Council (project completed in one year instead of the two that were planned).
- Information was assembled for the Manganui River resource inventory report.
- An unbudgeted Kapuni Stream electric fishing survey was undertaken and report prepared for Ballance Agri-Nutrients Kapuni Ltd. and Todd Petroleum Mining Company Ltd.
- An unbudgeted Wāhianoa River electric fishing survey was undertaken and report prepared for Ernslaw One Ltd.
- Additional electric fishing surveys were conducted in Mākahikatoa and Tokiāhuru streams;
- A trout spawning survey was conducted in Lake Mangamahoe tributaries.
- A summary of fieldwork results was reported to Council on 18 October 2025 – Stancliff, A. and J. Harland. 2025. ***Project Report 1111 Sports Fish Population Monitoring 2024/25.***

Budget Variance

	Budget ($)		**Actual ($)**	
External	500		??	
Internal	20,013	200 hours	??	hours
Income	200		8,000	
Total	20,313		???	

Comments:

- Additional unbudgeted work resulted in additional hours spent.

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

2024/25 Fishery Monitoring Report

Angler diary scheme

The Species Management section of the Council's 2024/25 Annual Plan has a planned result to "Monitor and report information on the status of the region's trout fisheries sufficient to measure overall angler success (through a diary scheme), set effective regulations and inform management directions.".

The 2024/25 season was the eighth season (since 2017/18) that a voluntary angler diary scheme has been used across the Taranaki Fish & Game region.

Similar to last season, 12 anglers returned data in 2024/25, compared with 9 anglers in 2023/24, 19 anglers in 2022/23, 21 anglers in 2021/22 and 2020/2021, 22 in 2019/2020, 16 in 2018/2019 and 23 in 2017/18. The data provided a record of 117 angling trips greater than 15 minutes duration, compared to 115, 139, 227, 207, 249 and 188 angling trips in the preceding six years.

In the following analysis, the average catch rate was calculated by first determining the catch rate for each individual angler trip (number of fish caught / divided by how long the angler spent fishing) then averaging all these catch rates for the particular river or lake. This ensures each trip received equal weighting and therefore the average catch rate is a more appropriate measure of what an angler experienced on average. In this way the catch rate can also be used as one measure of angler satisfaction.

However, with this approach it is necessary to limit the analysis to trips longer than 15 minutes, otherwise unrealistic individual catch rates may be obtained which in turn skew the overall average calculated. The catch rates (cpue) listed in Tables 1 & 2 below represent the catch of trout larger than 30cm in length per hour of fishing effort. For example, a cpue of 0.5 equals half a trout per hour or one trout for every two hours fishing.

Table 1 highlights that, like previous seasons, most effort (90.2% of the total) was recorded on rivers in the region. The average catch rate for rivers (0.32 fish/hr) was the lowest recorded over the eight seasons and to some extent may reflect the relatively low number of angling trips in the analysis.

The average catch rate for lakes (0.18 fish/hr, Table 1) was also the lowest recorded and the data largely reflects one angler's visits to Lake Mangamahoe.

Catch rate data for some of the larger, more popular river fisheries is presented in Table 2. Data has not been presented for some of the smaller streams in accordance with an undertaking not to identify diarist's favourite small stream fisheries which can be vulnerable to overharvest.

With small sample sizes, the average catch rate can be strongly influenced by the results of one or two trips, and this can be misleading.

Three diarists recorded 22 trips to the Waingongoro River, with one of them recording 18 trips to the middle reaches where he landed 11 large rainbows, plus an additional 25 small rainbows that were not included in the analysis. This resulted in a rebound in the catch rate for the river (Table 2) and indicated that the Waingongoro fishery is still in good heart.

Catch rates look to have rebounded in the **Manganui o Te Ao River**, (0.91 fish/hr cf. 0.45 fish/hr in 2022), with 25 large rainbows and eight large browns caught in 37 hours of fishing effort.

No diary data was available for the **Waiaua River** at Opunake this year. But we know from other angler reports and photos that the river is recovering well from the July 2021 flood that caused headwater erosion and decimated the habitat and the fishery. An electric fishing survey to assess juvenile trout recruitment is scheduled for spring / summer 2025/26. With little water inflow from the Waiaua River, **Opunake Lake** remains in a poor state with frequent algal blooms and until the hydro scheme is back up and running it will not be worthwhile releasing trout there.

The **Hangatahua/Stony River** remained stable over the season until a major flood on 3rd July 2025. But even then, the river settled down quickly and anglers reported seeing and catching several large rainbows that had survived the flood. In 11 trips, diarists reported catching 14 large hatchery rainbows in 24.5 hours of fishing effort. No brown trout were caught by diarists and the success (or otherwise) of the 261 hatchery brown trout released into the river this year remains uncertain. While the river continues to experience periodic erosion events, in between times it receives a significant amount of angling use, with the National Angler survey estimating around 500 angler visits during the 2021/22 season. Given the 'here today - gone tomorrow' nature of the fishery, staff consider it is still appropriate to have the river open to angling all year and to continue with annual releases of 17-month brown and rainbow trout to bolster the fishery when habitat conditions are suitable.

No trips to the upper or lower **Patea River** were recorded by diarists this season, even though we know that a significant rainbow trout population is becoming established in the upper river. The **Waiwhakaiho River** has also seen a drop in use by diarists in the last three seasons. Diarists landed three large brown trout in seven hours of fishing, to give an average catch rate of 0.38 fish per hour. **Kaupokonui Stream** fished fairly consistently for both rainbow and brown trout, but diarists recorded only seven trips and 11.7 hours of angling effort.

The ongoing small number of diary returns have had an impact on the accuracy of the information and how it can be interpreted. It is common for diary schemes to start off with high returns and then decline over time as anglers get tired of recording their effort or reduce their fishing activity and it becomes hard to find new anglers to take their place. Diaries were sent to 26 anglers for the start of the 2024/25 season and less than half were returned – an email reminder sent to 12 anglers received only one response. The diaries that are returned do provide valuable information on a range of fisheries and on that basis, it is worthwhile continuing.

Table 1: *Hours of angling effort and average catch rate (trout > 30cm/hr) by water type for Taranaki F&G Region as recorded by diarists during the 2020 – 2024 seasons.*

	Trips recorded					Total hours					% of total angling effort					Average trip length (hrs)					Average catch rate				
Season	**2024**	2023	2022	2021	2020	**2024**	2023	2022	2021	2020	**2024**	2023	2022	2021	2020	**2024**	2023	2022	2021	2020	**2024**	2023	2022	2021	2020
Lakes	**22**	17	24	52	26	**24.5**	22	31	94	85	**9.8**	10.9	17.3	16.1	15.4	**1.11**	1.28	1.30	1.81	2.36	**0.18**	0.46	0.64	0.32	0.28
Rivers	**95**	98	115	175	171	**224.6**	179	239	490	468	**90.2**	89.1	82.7	83.9	84.6	**2.24**	1.82	2.08	2.8	2.73	**0.32**	0.43	0.55	0.52	0.60

Table 2: *Number of trips recorded and average catch rate (trout per hour) of large (> 30cm) rainbow, brown and all trout combined by water for the 2019 – 2024 seasons.*

Water	Trips recorded						CPUE large rainbow trout						CPUE large brown trout						CPUE large trout					
	2024	2023	2022	2021	2020	2019	**2024**	2023	2022	2021	2020	2019	**2024**	2023	2022	2021	2020	2019	**2024**	2023	2022	2021	2020	2019
Kaupokonui Stream	7	12	11	6	3	8	**0.36**	0.53	0.53	0.25	0.24	0.32	**0.14**	0.21	0.21	0.13	0.00	0.24	**0.50**	0.74	0.75	0.38	0.24	0.56
Patea River Upper		4	7	24	36	24		0	0.54	0.13	0.15	0.09		0.18	0.46	0.20	0.45	0.43		0.18	1	0.33	0.60	0.52
Patea River Lower		1	1	7				0	0.50	0.29				0	0	0.17				0	0.50	0.47		
Stony River	11	6	3	17	30	14	**0.72**	0.63	1.2	0.75	0.56	0.95	**0**	0	0	0	0	0	**0.72**	0.63	1.2	0.75	0.56	0.95
Waiaua River		2	6	0	7	17		0	0	0	0.04	0.13		0	0	0	0.23	0.28		0	0	0	0.27	0.41
Waingongoro River	22	6	7	9	9	17	**0.64**	0	0	0.70	0.31	0.30	**0.04**	0.35	0.33	0.15	0.05	0.15	**0.68**	0.35	0.33	0.85	0.36	0.45
Waiwhakaiho River	4	10	10	25	32	17	**0**	0	0	0.02	0	0	**0.38**	0.40	0.17	0.16	0.35	0.91	**0.38**	0.40	0.17	0.17	0.35	0.91
Manganui o Te ao River	7	3	9	27	14	12	**0.71**	0.87	0.45	0.58	1.49	0.59	**0.20**	0.10	0	0.08	0.11	0.36	**0.91**	0.97	0.45	0.67	1.60	0.95
Mangawhero River	2	0	0	2			**0**	0	0	0			**0**	0	0	0.50			**0**	0	0	0.50		
Manganui River	6	4	13	4	7	7	**0**	0	0	0	0	0	**0.10**	0	0.39	0.22	0.23	0.38	**0.10**	0	0.39	0.22	0.23	0.38
Lake Mangamahoe	16	13	19	51	32	87	**0**	0.15	0.51	0.30	0.15	0.47	**0**	0.21	0.17	0.04	0.07	0.1	**0**	0.37	0.68	0.34	0.22	0.57

Manganui River Catchment Fishery Investigation

The Species Management section of the Council's 2024/25 Annual Plan has a planned result to "Assess juvenile trout recruitment in the Manganui River and tributaries to compare with baseline information from other catchment surveys (yr 1 of 2)" and also to "Undertake a resource inventory of the Manganui River catchment to determine current status of the trout fishery and identify threats and opportunities (yr 1 of 2)".

To achieve the first stage of this planned result, an electric fishing survey of twenty-two sites in the Manganui River catchment (Figure 1) was undertaken during a summer low flow period from 11th-18th December 2024.

Of the 22 sites surveyed, young of the year juvenile brown trout (0+) were found at eight sites and older yearling (1+) brown trout were found at three sites, including in the fish pass at Manawa Energy's Motukawa hydro scheme's intake weir (Table 3).

No trout were found at 11 sites, which included nine sites in the upper reaches of streams upstream of SH3 (Figure 1) which had excellent water quality, a high-quality macroinvertebrate fauna and a relative lack of anthropogenic influence. Even when brown trout juveniles were found at upper catchment sites, they were at low density, which was unusual as highest densities of juvenile trout are often found in the upper reaches of streams.

Denser populations of juvenile brown trout were found further downstream in the Manganui River mainstem and in the lower reaches of tributary streams. For example, Piakau Stream (Site 18) had high conductivity, relatively poor habitat and macroinvertebrate quality, and yet it had the highest density of juvenile trout in the survey at 0.811 trout-per-minute of electric fishing time.

Trout moving up the Manganui mainstem to spawn from as far afield as the lower Waitara River may find adequate spawning locations in its lower and middle reaches and therefore don't head higher into its headwaters. Or perhaps adult trout descend the catchment to spawn and return to the headwaters afterwards.

At a site-specific level, some sites had unique characteristics that may have resulted in the absence of trout. For example, the residual flow reach at Site 21 was significantly sedimented and lacked invertebrates due to the diversion of water into Lake Ratapiko. Other examples include the presence of a black shag colony at the Te Popo Stream survey site, and perhaps the influence of pollution in the Mangamawhete Stream at Bedford Road South.

In summary, juvenile brown trout were widespread in the Manganui catchment but at lower-than-expected densities in the headwaters of tributary streams. Average densities were lower than that found in surveys of other Taranaki ringplain rivers (Table 4), but the Manganui River and tributaries still support a productive and highly valued fishery and current levels of recruitment must therefore be sufficient. Given that much of the juvenile production appears to occur in the river mainstem, initiatives which maintain and enhance water quality and reduce sedimentation, both in the tributaries and the mainstem, will be beneficial.

Aside from trout, eels (mainly longfin), koura and bully spp. were also caught (Table 3) and recorded alongside environmental data such as macroinvertebrate quality, water temperature, and conductivity

measurements at each site. All survey results were uploaded into the NIWA Freshwater Fisheries Database.

Figure 1. Brown trout presence/absence at 22 sites surveyed within the Manganui River Catchment in December 2024. Green dots denote sites where juvenile brown trout were found (11 sites), and red dots denote sites where no brown trout were found (11 sites).

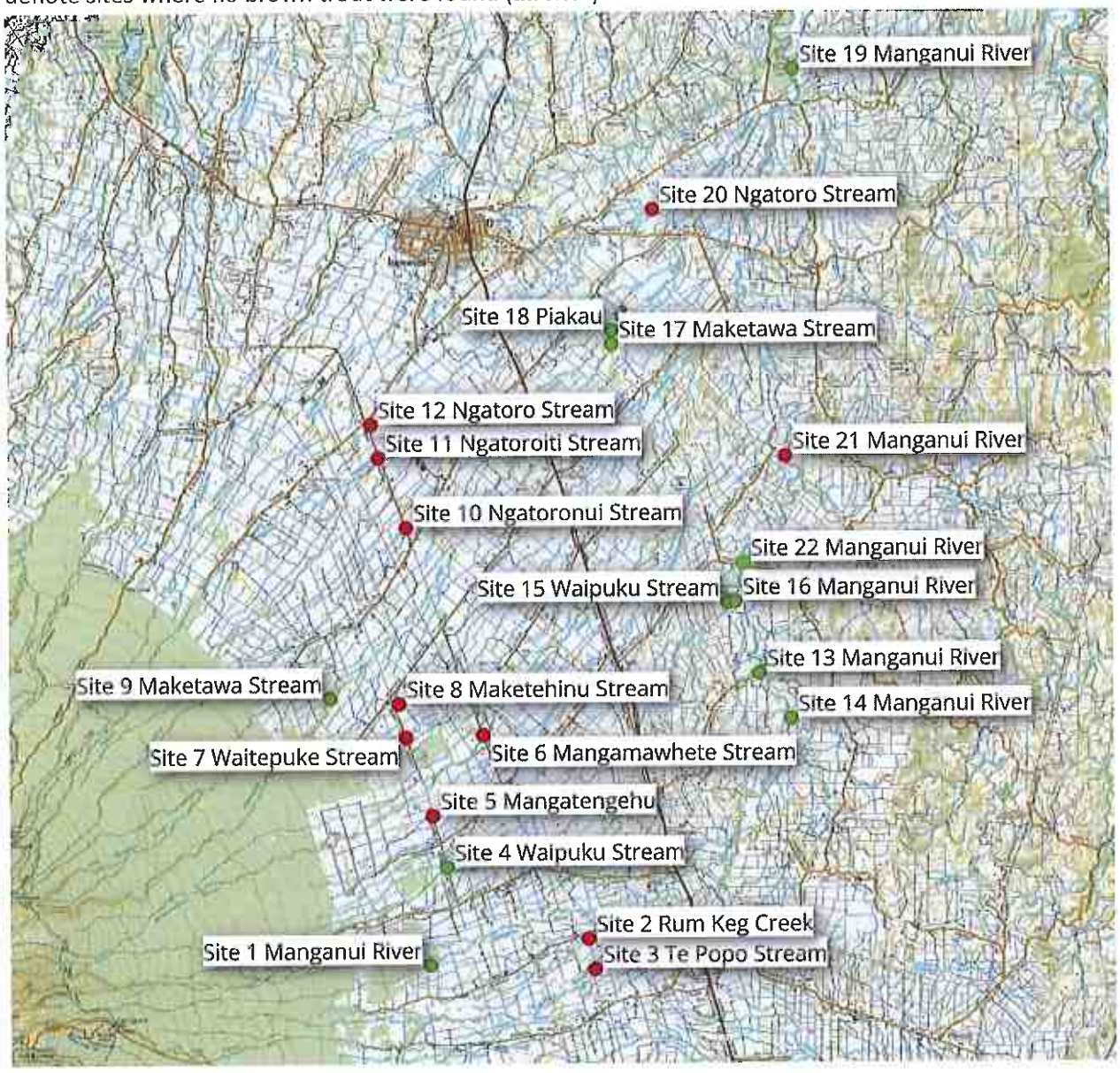


Table 3. The total numbers of each species found at each site during the Manganui River catchment electric fishing survey, 11 – 18 December 2024.

Survey Site	Species				
	Brown Trout	Eel (incl. Elver)	Redfin Bully	Bully unid	Koura
Site 1 – Manganui River (Denbigh Road)	1	1			2
Site 2 – Rumkeg Creek		8		6	7
Site 3 – Te Popo Stream		1		1	1
Site 4 – Waipuku at Derby Road South	1	1			1
Site 5 – Mangatengehu Derby Road Bridge		7	7		1
Site 6 -Mangamawhete at Bedford Road South		4	1	5	
Site 7 – Waitepuke at Derby Road		4			5
Site 8 – Maketehinu at Derby Road		7			20
Site 9 – Maketawa	3	2			
Site 10 – Ngatoronui at Bedford Road		5			1
Site 11 – Ngatoroiti at Bedford Road		17		1	1
Site 12 – Ngatoro at Bedford Road		10			1
Site 13 – Manganui at Croydon Road Bridge	4	12		1	
Site 14 – Manganui River end of Manganui Road	3			2	
Site 15 – Waipuku at Manganui River confluence	1	9	1		3
Site 16 – Manganui above Waipuku confluence	3	10			
Site 17 – Maketawa at Durham Road Lower	1	4	1	3	
Site 18 – Piakau at Durham Road Lower	5	1		4	4
Site 19 – Manganui River at Everett Park	1	5		26	
Site 20 - Ngatoro above Maketawa confluence		14		7	1
Site 21 – Manganui Residual flow reach (Ngaro Road)		9		5	
Site 22 – Ratapiko Inlet fish pass	1	12		6	2
Totals	24	143	10	67	50

Table 4. Comparison of maximum and average brown trout densities recorded (fish caught per minute of electric fishing machine time) in the current Manganui River survey with those of previous surveys.

Catchment	Survey Dates	No. of sites	Maximum density (fish per minute)	Average density (fish per minute)
Mangawhero River	2-3 December 2015	9	7.0	2.40
Kaupokonui Stream	6-7 December 2016	9	1.1	0.36
Manganuioteao River	4-6 December 2017	11	2.7*	1.39*
Waiwhakaiho River	17-19 December 2018	9	1.50	0.63
Retaruke River	7 December 2020, 2nd January 2021	4	1.80	1.68
Waingongoro River	5 – 8 December 2022	13	1.68*	0.30*
Waiongana/Mangaoraka	11-12th December 2023	11	1.53	0.515
Kapuni	24th October 2024	10	2.20*	0.996*
Manganui River	11-18 December 2024	22	0.811	0.137
Tokiāhuru Stream headwaters	5th December 2024	8	16.29*	5.97*

* Includes both brown & rainbow trout

Kapuni Stream Electric Fishing Survey

An electric fishing survey of 10 sites in Kapuni Stream was carried out on 24th October 2024 for Ballance Agri-Nutrients Kapuni Ltd. and Todd Petroleum Mining Company Ltd.

Running since 1982, the electric fishing programme is a voluntary initiative by these companies to assess whether habitat in Kapuni Stream remains satisfactory for fish and to enable detection of catastrophic declines in fish abundance.

Seventy-one fish (39 trout fry, 14 eels, 11 koura, four redfin bullies, two lamprey and one koaro) were recorded with a density of 6.97 fish per 100 m^2 (which was about 77% of the median density since records began in 1996; Figure 2). Fish were recorded at all ten sites in Kapuni Stream.

Trout fry were caught at eight of the 10 sites fished, with a density of 1 fry per minute of machine time (which is the highest density recorded of any river surveyed so far on the ringplain). Of the 39 trout fry caught, 36 were rainbow and three brown.

Commencing in 1984, an influx of sand from headwater erosion was judged to have adversely affected habitat quality in Kapuni Stream, including a reduction in trout spawning success. However, since 2015 good numbers of trout fry (mainly rainbow fry) have been recorded in October by electric fishing (Figure 3), which suggests that conditions are improving.

There is nothing to indicate that the activities of the petrochemical industry at Kapuni have had significant adverse impacts on fish communities in Kapuni Stream.

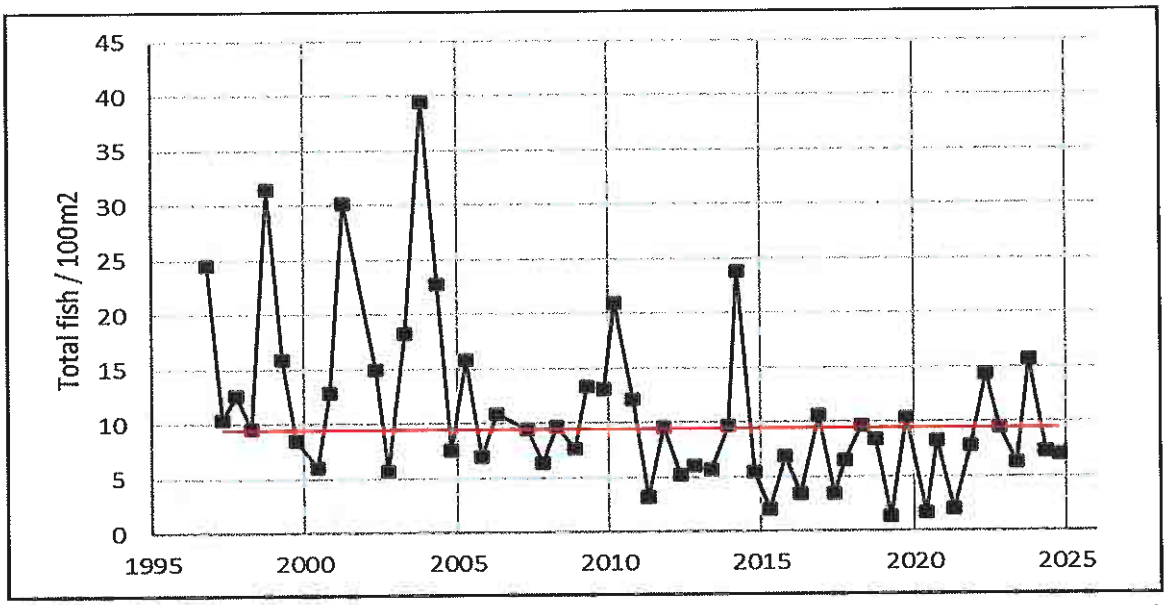


Figure 2. Total numbers of fish per 100 m^2 electric-fishing in the Kapuni catchment (1996 – 2025). The red line denotes the median density.

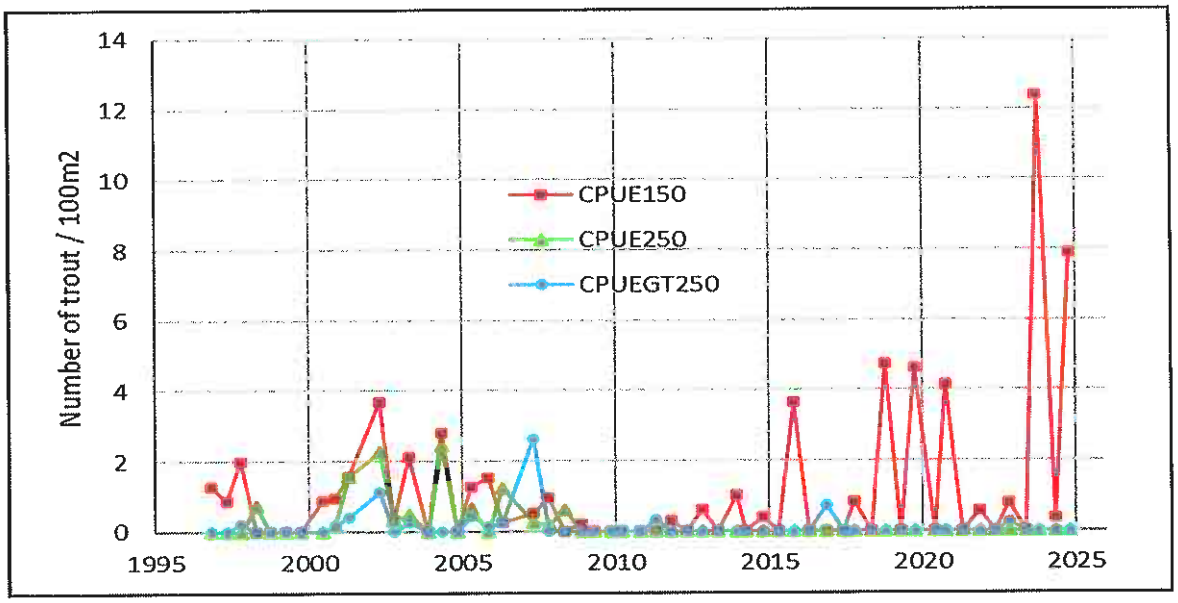


Figure 3. Number of trout in three size classes per 100 m^2 electric-fished in the Kapuni catchment. "CPUE150" refers to trout fry.

Wāhianoa River / Mākāhikatoa Stream / Tokiāhuru Stream electric fishing surveys

Wāhianoa River

The Wāhianoa River has its source high on the slopes of Mount Ruapehu and is a headwater tributary of the Whangaehu River, which drains the crater lake (Te Wai-ā-Moe). The Wāhianoa supports a population of small rainbow trout that is essentially landlocked by the acidic nature of the Whangaehu River. Much of the catchment runs through the Karioi pine forest (Figure 4), which is managed by Ernslaw One Ltd.

On 4th December 2024, Taranaki and Wellington Fish & Game staff and volunteers from the Ngā Waihua o Paerangi Trust (Ngāti Rangi) electro-fished four sites in the Wāhianoa River catchment to survey fish populations upstream and downstream of two existing concrete fords owned by Ernslaw One Limited to assess the need to improve fish passage upstream past these fords.

Only one rainbow trout was found in the vicinity of the Main Road ford (W2; Figure 1) in the upper Wāhianoa River, which doesn't provide strong evidence for the need to upgrade fish passage at this ford. However, there was also an absence of pollution sensitive mayflies and stoneflies at this site and low pH conditions in the upper river may be implicated. The current survey results for rainbow trout may therefore not be representative of the population present there at other times of the year and repeat surveys were recommended.

It does appear that the upper Wāhianoa River is subject to low pH conditions originating from inflows of volcanic origin, but the extent and duration of low pH has not been well documented. Further investigation of pH conditions along the Wāhianoa River, how this varies through the year, and the impacts on trout and macroinvertebrates was also recommended.

The density of rainbow trout caught immediately downstream of the Lower Wāhianoa River ford (W1) was 5.3 times higher than that found upstream, which suggests there is a need to improve fish passage at this ford. There is a potential fish pathway along the true left bank of the ford that could be enhanced to improve upstream fish passage. It is recommended that further information is gathered prior to expiry of consents in 2029 to enable design of a fish pass that is robust and resilient, given the unstable, high-flow nature of the Wāhianoa River.

In this survey, no native fish were seen or caught at any of the sites in the Wāhianoa River catchment. The results of eDNA samples taken upstream and downstream of fords W2 and W1 some two weeks after the current survey also did not indicate the presence of native fish and this is consistent with the results of previous surveys. The acidic nature of the Whangaehu River likely prevents migratory native fish from reaching this catchment. Therefore, in accordance with Condition 8 of Consent ATH-2019203145.01 for the fords, there was no requirement to install modifications to provide for fish within the next twelve months.

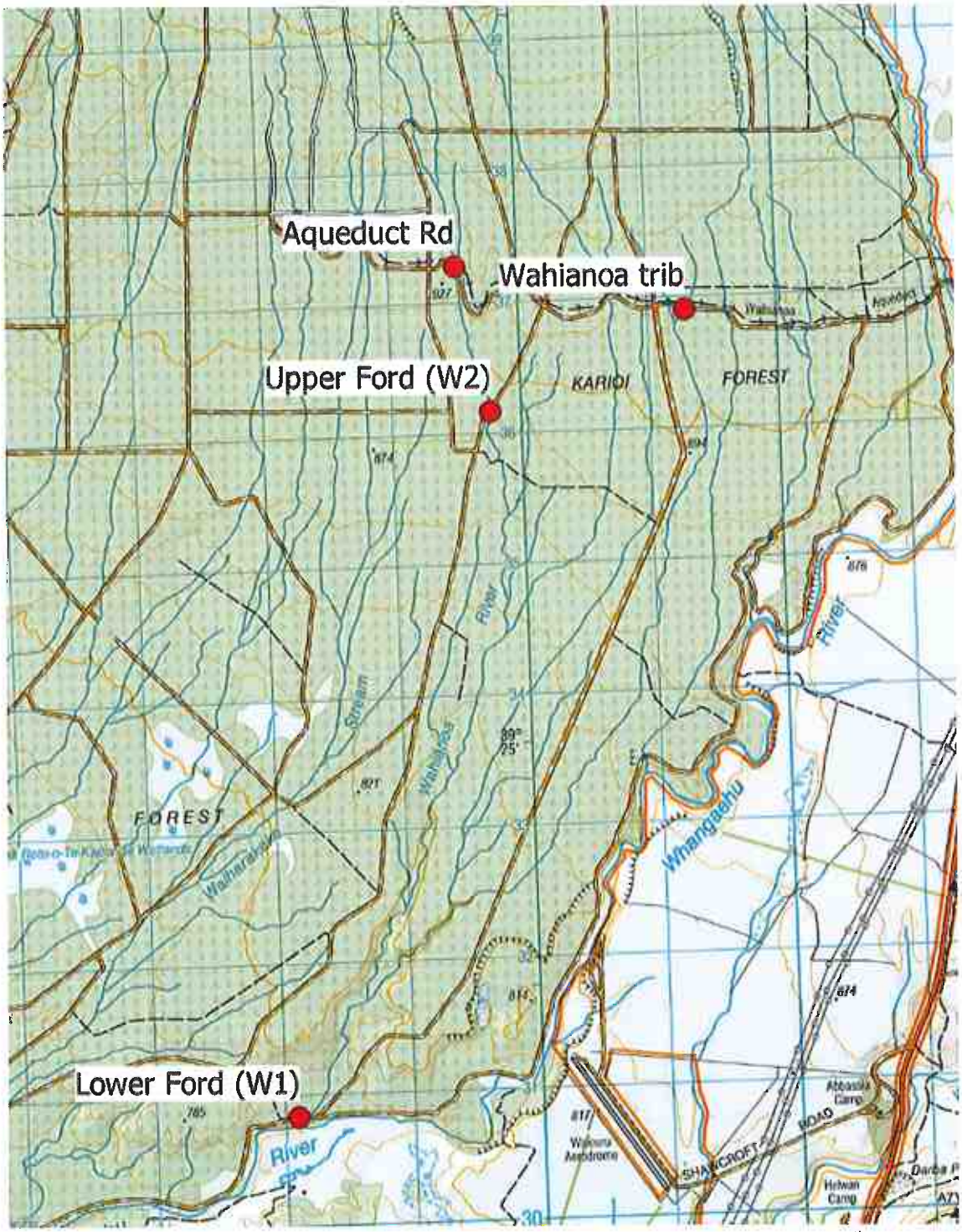


Figure 4. Map of the Wāhianoa River catchment showing the four sites electro fished on 4th December 2024.

Mākāhikatoa Stream

In conjunction with an electrofishing survey of sites in the Wāhianoa River catchment in Karioi Forest for Ernslaw One Limited, one site in the adjacent Mākahikatoa Stream catchment was also electric fished on 4th December 2024. Mākāhikatoa Stream is a small catchment immediately to the east of the Wāhianoa River which rises high on the south-eastern slopes of Mt. Ruapehu and joins the Whangaehu River upstream from the Wāhianoa River confluence (Figure 5).

The site was located immediately downstream of an aqueduct intake diverting water for the eastern diversion of the Tongariro hydro-electric power scheme and the Aqueduct Road ford (Photos 1&2). The Mākahikātoa upstream of the intake was too deep to electric fish and so was not sampled.

Seven rainbow trout between 80mm and 130mm were caught (Table 5) indicating that like the Wāhianoa, a stunted self-sustaining population of rainbow trout also exists in Mākahikatoa Stream. A single common bully was also caught. This species can form landlocked populations and is not reliant on access to and from the sea.

Photos 1 and 2 below, show the Mākahikatoa Eastern Diversion intake with the downstream residual flow and the Aqueduct Road ford. While some rainbow trout may be able to move downstream of the intake (those that aren't entrained into the Eastern Diversion), there is little possibility of trout moving upstream.

Table 5. Survey results for the Mākahikatoa Stream Aqueduct Road intake, 4th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Not fished				
Downstream	Rainbow trout	7	Not recorded		80-130mm
	Common bully	1			

Photo 1. Tongariro HEPS Eastern Diversion structure on Mākahikatoa Stream showing downstream residual flow, 4th December 2024.

Photo 2. Wellington F&G staff Hamish Carnachan and Matt Kavermann electric fishing Mākahikatoa Stream downstream of the eastern diversion and the Aqueduct Road ford in Karioi Forest, 4th December 2024.

Tokiāhuru Stream

Tokiāhuru Stream and its major headwater tributary, Te Unuunuakapua Te Ariki Stream, rise high on the south-western slopes of Mt. Ruapehu at 1760 – 1980m (Figure 5). Te Unuunuakapua Te Ariki Stream runs through the Tongariro National Park and part of the Karioi Forest before joining Tokiāhuru Stream downstream of SH49. Tokiāhuru Stream is then joined by another major tributary, Waitaiki Stream, and then the Mangaehuehu Stream, before discharging into the Whangaehu River. Both the middle and lower reaches of the Tokiāhuru and Waitaiki streams support productive fast-water fisheries for brown and rainbow trout, although the lower Tokiāhuru runs through a gorge with difficult access.

In conjunction with an electric fishing survey of four sites in the Wāhianoa River catchment within Karioi Forest for Ernslaw One Limited, Taranaki and Wellington Fish & Game staff and volunteers from the Ngā Waihua o Paerangi Trust (Ngāti Rangi) also electro-fished nine sites in the Tokiāhuru Stream catchment within Karioi Forest and upstream from SH49 on 5th December 2024. At sites 1, 3 & 8 (Table 6), electric fishing was undertaken in stream sections both upstream and downstream of road crossings, bringing the total number of sites fished to 12.

Rainbow trout were found at all sites fished and at a higher average density than found in other rivers and streams sampled to date (Table 4). Brown trout were found at three sites, with highest densities in Tokiāhuru Stream at Site 8 (Link Road box culvert, Table 6).

The presence of newly emerged trout fry (25 – 30 mm) in Te Unuunuakapua Te Ariki Stream (Sites 1 & 3; Table 5) and Tokiāhuru Stream (Sites 2, 4 & 8) indicate that there had been successful spawning over winter / spring 2024. While examination of otoliths will be necessary to confirm the age of larger trout, the fact that most larger fish were small (80 – 180 mm) with the largest fish just 280 mm, is in line with the conclusions of earlier studies that these headwater populations consist of stunted resident trout.

However, as occurs with the stunted rainbow trout population in Ahukawakawa Swamp in the headwaters of the Hangatahua (Stony) River on Taranaki Maunga, it's likely that trout moving downstream to the main angling waters of the Tokiahuru (and Waitaiki) grow normally and these headwater areas are likely to be important sources of recruitment for the downstream fishery. Sites further downstream in the Tokiāhuru and Waitaiki Streams are scheduled for survey in December 2025.

Table 6. The total numbers of each species and the density and size if trout found at each site during a Tokiāhuru Stream catchment electric fishing survey in Karioi Forest, 5th December 2024.

Survey Site	Species						
	Brown Trout	Rainbow trout	Eel	Koura	Shock time	Trout density (per min)	Trout length (mm)
Site 1: Te Unuunuakapua te Ariki Stream (upstream)		13	5	1	5m10s	2.52	25 - 130
Site 1: Te Unuunuakapua te Ariki Stream (downstream)		22			6m50s	3.22	25 - 150
Site 2: Tokiāhuru Stream (wooden bridge)		4			1m47s	2.24	30 - 80
Site 3: Te Unuunuakapua te Ariki Stream (Otahatekapua Rd upstream)		26		1	Not recorded		14 fry, 12 fingerlings
Site 3: Te Unuunuakapua te Ariki Stream (Otahatekapua Rd downstream)		57			3m30s	16.29	50 fry, 80 - 280
Site 4: Tokiāhuru trib. (Rock Rd.)	3	24			2m46	9.76	30 - 120
Site 5: Tokiāhuru mainstem (Swamp Rd.)		1			1m2s	0.97	100
Site 6: Tokiahuru trib. (Terrace Rd.)		2			Not recorded		75
Site 7: Tokiahuru trib. (Terrace Rd.)		15			Not recorded		80 - 180
Site 8: Tokiahuru mainstem Link Rd box culvert (upstream).	13	15 + 12unid			7m27s	5.36	80 - 180
Site 8: Tokiahuru mainstem Link Rd box culvert (downstream).	2	14 + 4 unid			2m42s	7.41	28 - 150
Site 9: Tokiahuru Stream at Terrace Road ford.		4			Not recorded		

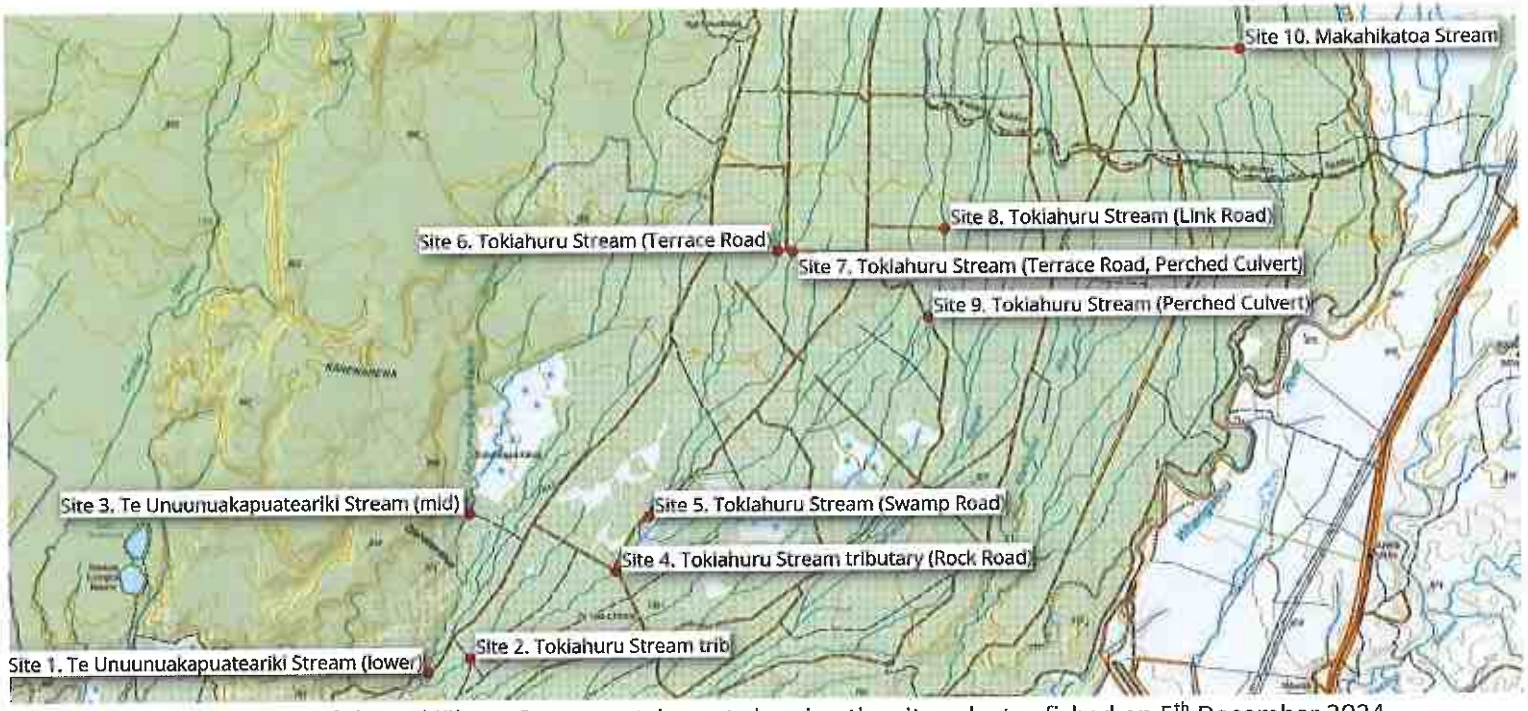


Figure 5. Map of the Tokiāhuru Stream catchment showing the sites electro fished on 5th December 2024 and the site in Mākahikatoa Stream fished on 4th December 2024, all within Karioi Forest.

Photo 3. Rainbow trout from Site 1 in Te Unuunuakapua te Ariki Stream.

Photo 4. Te Unuunuakapua te Ariki Stream at Site 3.

Lake Mangamahoe Trout Spawning Survey

Lake Mangamahoe is a 24ha hydro reservoir located near New Plymouth. It supports a fishery based on wild brown trout, supplemented with the annual release of around 300 hatchery rainbows. Brown trout recruitment most likely stems from spawning in Mangamahoe Stream and from juveniles entrained in water diverted from the Waiwhakaiho River via the lake inlet tunnel. The fishery is restricted to fly fishing only and is one of the most popular in the region.

Spawning surveys of Mangamahoe Stream have been carried out since 1990 (Figure 7) in a 1.5km section between SH3 and a waterfall. The reach is mainly used by brown trout, with numbers of fish and spawning redds fluctuating over time. In 2025, an initial survey was undertaken on 8th May to enhance known and potential spawning sites. A total of four sites were enhanced, with no trout observed.

A repeat survey on 23rd July following two major floods (Figure 6) occurred after the spawning peak. No trout were seen and bed movement occurring during the floods had destroyed what had previously been suitable areas for trout spawning. Some new areas of gravel had appeared, but they were unstable and would take some time to consolidate. It was assumed that the timing and size of the floods would result in poor recruitment to the 2025 year-class, although this will need to be confirmed with an electric fishing survey.

At least three large spawning redds, but no trout, were seen in lake inlet downstream of the Waiwhakaiho River diversion tunnel outlet on 23rd July. However, spawning and fry production in the inlet is unlikely to contribute significantly to the Lake Mangamahoe fishery, as the flow is swift and deep and there is little rearing habitat for fry.

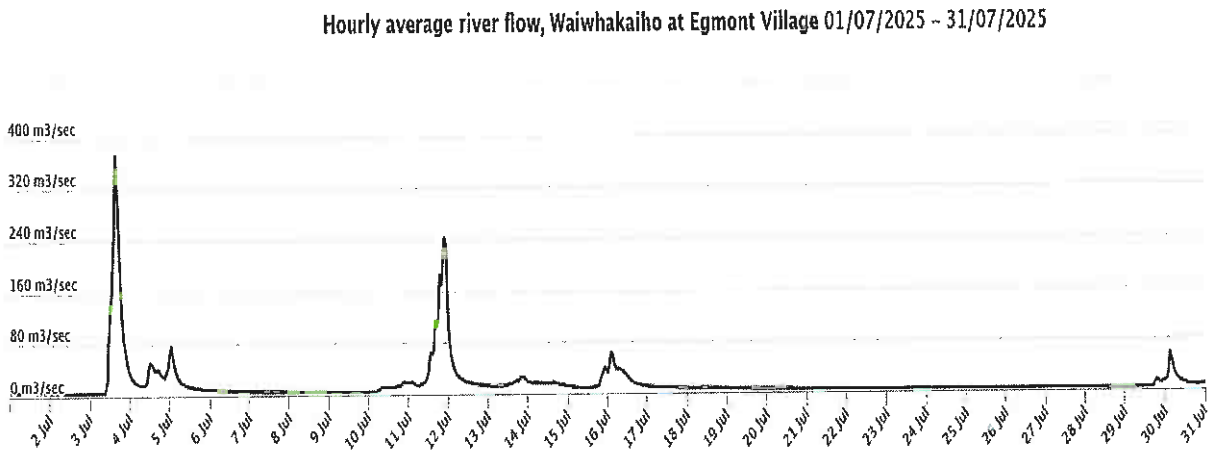


Figure 6. Hourly average flow in the Waiwhakaiho River at Egmont Village, 1 – 31 July 2025 (Data courtesy of Taranaki Regional Council).

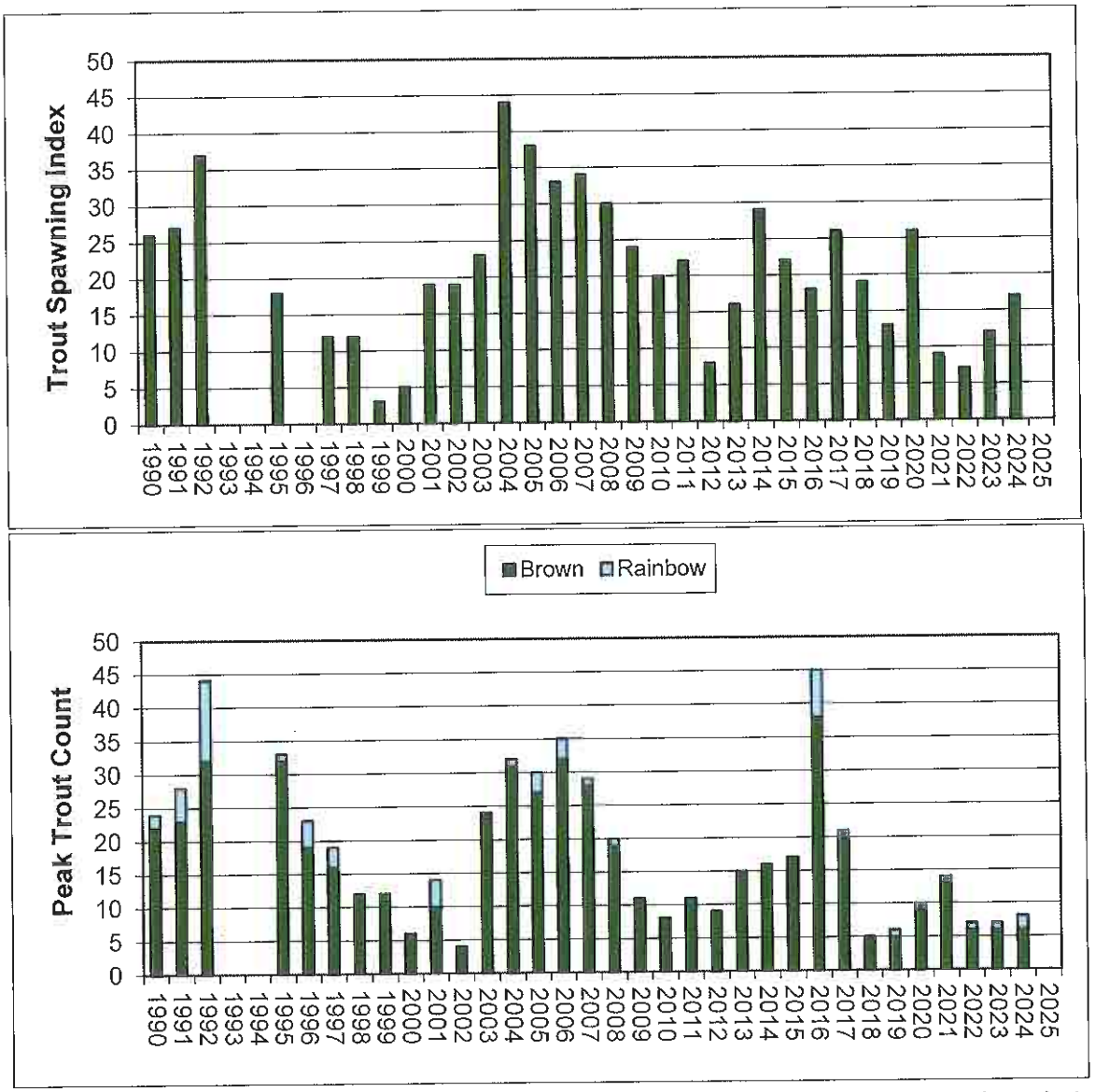


Figure 7. Peak counts of spawning trout in Mangamahoe Stream (top) and spawning indices derived from the number and size of spawning redds seen (bottom).

RECOMMENDATION:

- THAT THE 2024/25 FISHERY MONITORING REPORT BE RECEIVED.

Jack Harland & Allen Stancliff

22nd September 2025

Manganui Catchment Juvenile Trout Survey – December 2024.

Purpose of the Project

To strengthen understanding of juvenile trout recruitment and distribution across the Manganui catchment by recording presence, absence, relative abundance and environmental data.

Strategic Outcome

Healthy Species, Habitats and Ecosystems, as part of planned result 1. and 2. under the Species Management output class within Taranaki Fish and Game's 2024/25 annual work plan.

Strategic Monitoring Plan

Undertake surveys on a catchment basis.

Allen Stancliff / Jack Harland

Taranaki Fish and Game Council

August 2025

Fish & Game NEW ZEALAND

Juvenile Trout Survey of the Manganui River, December 2024

Jack Harland & Allen Stancliff

December 2024

Juvenile Trout Survey of the Manganui River, December 2024

Jack Harland & Allen Stancliff

An Internal Report prepared for Taranaki Fish & Game Council

August 2025

Taranaki Fish & Game

PO Box 4152

Whanganui 4541

Cover: Manganui River near Denbigh Road

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Objective

A requirement for the Species Management output class in the Council's 2024/2025 Annual Plan is to:

1. *"Assess juvenile trout recruitment in the Manganui River and tributaries to compare with baseline information from other catchment surveys"*

This report presents a summary of data gathered from an electric-fishing survey that was conducted from the 12th-18th December 2024, where 22 sites in the Manganui River catchment were surveyed for the presence of young of the year (0+) juvenile trout. A second report is being prepared that incorporates these results into a wider review of the Manganui catchment.

Methodology

Twenty-two sites along the Manganui River and its tributaries (Figure 1) were selected for survey by electric fishing. At each site, two field staff fished using a Smith-Root LR-24 Electrofisher machine, fishing the range of habitats available at each site for a total of approximately 6 minutes machine time per site. Water temperature and conductivity were recorded at each site using a calibrated YSI Pro2030 meter.

The electric field created by the electrofishing machine causes fish to be stunned and drift with the water flow into a stop net or hand net, or to be forced to swim towards the hand-held anode. The voltage, pulse-width and frequency of the electrofisher was set at 400 volts, 60Hz, with a duty cycle of 25%.

The machine operator held a dip net and a hand-held anode pole and used a single pass methodology to fish downstream towards a stop net and/or a hand net held by a second observer. Staff targetted likely trout habitat within the streams and rivers, aside from where the water was too deep or swift for safe, effective fishing.

Attempts were made to capture all fish seen, with captured fish held in a plastic bucket and then carefully identified, measured to the nearest millimetre, and released. The electrofishing machine time was recorded in minutes and the density of fish caught expressed as "fish per minute of machine time". Eels were identified to species where possible but were not measured and were instead categorized by size. Other fish observed but not captured were also recorded.

The electric field also causes pollution sensitive, behaviourally drifting mayflies and stoneflies to let go of the substrate and drift into the downstream stop net with the water flow. The number and species composition of macroinvertebrates caught in the stop net was noted at each site as this provides a good indication of the quality and abundance of the invertebrate fauna at each site fished.

The survey was undertaken by Allen Stancliff and Jack Harland of Taranaki Fish and Game.

Study Sites

Twenty-two sites were surveyed throughout the Manganui catchment.

To achieve a broader understanding of juvenile trout distribution throughout the catchment, effort was made to select sites throughout its length, from the border of the national park Te Papa-Kura-o-Taranaki to the lower reaches of the mainstem prior to its confluence with the Waitara River.

The Manganui River mainstem was surveyed at 7 different locations, enabling a comparison of the river's fauna, temperature and conductivity at different sections.

Survey locations along the Manganui River were also selected based on the location of tributary inflows, to enable site-by-site comparison. For example, the Manganui was surveyed above the confluence with the Waipuku stream tributary, and below. Another example is the surveying of the Manganui above and within the residual flow section at Ngaro Road, downstream of Manawa Energy's Motukawa hydro scheme intake weir.

All key tributary streams of the Manganui River were surveyed, with 12 sites upstream of State Highway 3, and 10 below (Figure 1).

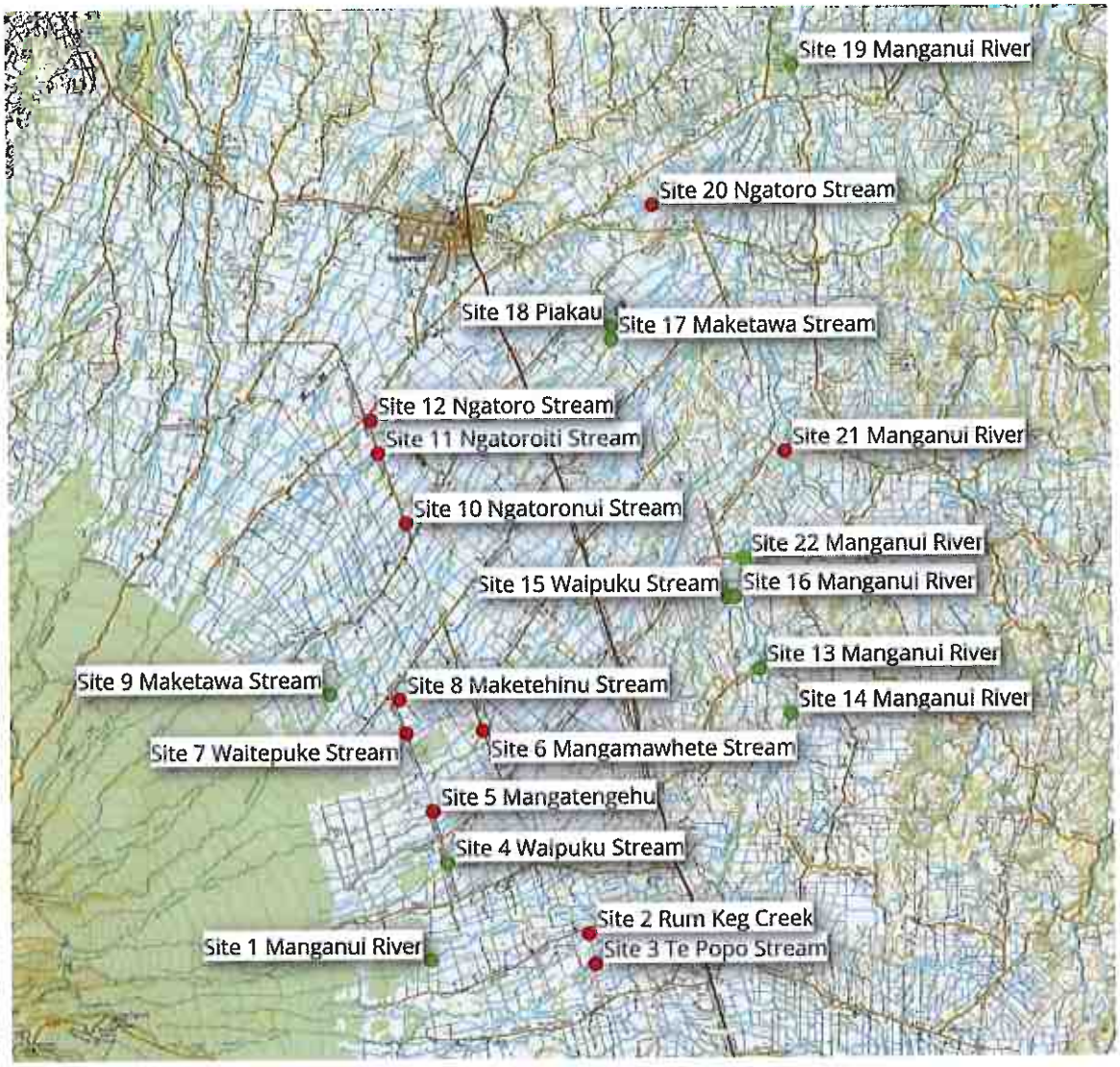

Figure 1. Manganui River survey sites (green dots show sites where trout were found and red dots where no trout were seen or caught).

Table 1. Location of Manganui River catchment survey sites (NZTM 2000)

Site	Survey Date	Start	Altitude /Distance inland	Comment
Site 1 – Manganui River	11 December 2024	E 1703431 N 5649941	543m asl 58.92km	Near national park, Denbeigh Road
Site 2 - Rum Keg Creek	11 December 2024	E 1706773 N 5650472	419m asl 56.5km	Off Denbigh Road
Site 3 – Te Popo Stream	11 December 2024	E 1706910 N 5649841	416m asl 56.49km	Between Denbigh and Radnor Road
Site 4 – Waipuku Stream	11 December 2024	E 1703795 N 5651971	423m asl 52.65km	Derby Road bridge
Site 5 – Mangatengehu Stream	11 December 2024	E 1703504 N 5653043	412m asl 46.15km	Derby Road bridge, below ford
Site 6 – Mangamawhete Stream	11 December 2024	E 1704567 N 5654726	372m asl 45.45km	Bedford Road South Bridge
Site 7 – Waitepuke Stream	16 December 2024	E 1702953 N 5654676	405m asl 46.34km	Derby Road North
Site 8 – Maketehinu Stream	16 December 2024	E 1702807 N 5655378	374m asl 44.47km	Derby Road North
Site 9 – Maketawa Stream	16 December 2024	E 1701347 N 5655497	400m asl 45.18km	Norfolk Road
Site 10 – Ngatoronui Stream	16 December 2024	E 1702978 N 5659056	313m asl 41.63km	Bedford Road North
Site 11 – Ngatoroiti Stream	16 December 2024	E 1702398 N 5660514	294m asl 40.99km	Bedford Road North
Site 12 – Ngatoro Stream	16 December 2024	E 1702244 N 5661205	278m asl 39.95km	Bedford Road North
Site 13 – Manganui River	17 December 2024	E 1710407 N 5655993	251m asl 45.26km	Croydon Road Bridge
Site 14 – Manganui River	17 December 2024	E 1711065 N 5655044	268m asl 48km	Manganui Road end
Site 15 – Waipuku Stream	17 December 2024	E 1709750 N 5657476	227m asl 43.1km	At Manganui River confluence
Site 16 – Manganui River	17 December 2024	E 1709907 N 5657492	230m asl 43.01km	Above Waipuku confluence
Site 17 – Maketawa Stream	18 December 2024	E 1707328 N 5662868	203m asl 34.79km	Lower Durham Road
Site 18 – Piakau Stream	18 December 2024	E 1707331 N 5663155	207m asl 34.78km	Lower Durham Road
Site 19 – Manganui River	18 December 2024	E 1711183 N 5668592	101m asl 26.43km	At Everett Park
Site 20 – Ngatoro Stream	18 December 2024	E 1708218 N 5665676	143m asl 30.32km	Above Maketawa confluence
Site 21 – Manganui River	18 December 2024	E 1710977 N 5660525	196m asl 37.09km	Residual flow section at Ngaro Road
Site 22 – Manganui River	18 December 2024	E 1710081 N 5658303	220m asl 41.79km	Motukawa weir fish pass

Results

Fieldwork was conducted on the 11th and 16th - 18th December 2024. During this period, flows were sitting near their summer low flow levels, following a minor fresh on 9th December.

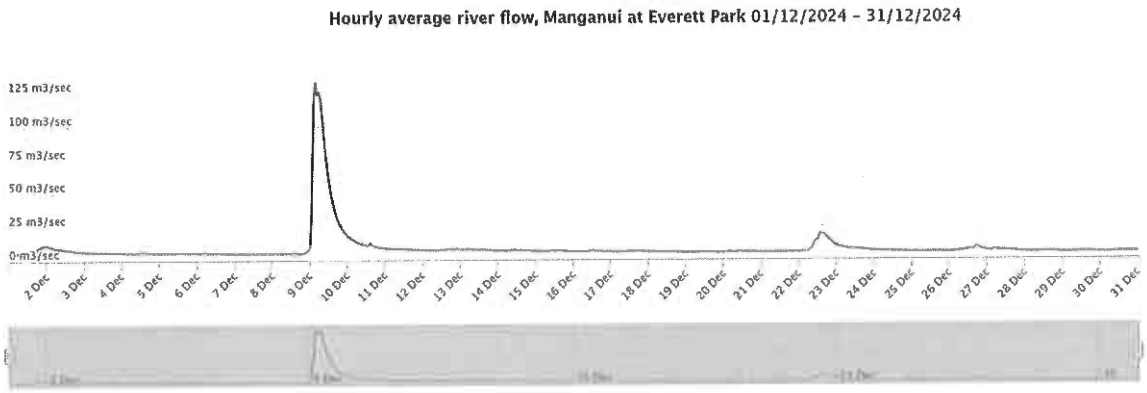

Figure 2. Hourly average flows in the Manganui River at Everett Park in December 2024. The Everett Park monitoring site is located downstream of the most downstream survey site (data courtesy of the Taranaki Regional Council).

Water conductivity measurements, which can be taken as a measure of nutrient enrichment, generally increased with distance down the Manganui River catchment from the headwaters in Te Papa-Kura-o-Taranaki, where conductivity was in the 50 – 60 uS/cm range (Sites 1,3,4,7,8,9,10, Table 2), to lower catchment sites where conductivity was in the low 90's (e.g. Sites 18,19, Table 2).

Table 2. Conductivity (uS/cm), specific conductance (at 25°C) and water temperature (°C) for the Manganui catchment sites surveyed from 11th – 18 th December 2024.

Site	Conductivity (uS/cm)	SPC (25°C)	Water Temperature (°C)
Site 1 – Manganui River (Denbigh Road)	51.1	67.2	12.4
Site 2 – Rumkeg Creek	85.1	108.4	13.8
Site 3 – Te Popo Stream	55.5	71	13.6
Site 4 – Waipuku at Derby Road South	50.7	64.7	13.7
Site 5 – Mangatengehu Derby Road Bridge	68.3	81.8	16.4
Site 6 -Mangamawhete at Bedford Road South	81.9	98.6	16.1
Site 7 – Waitepuke at Derby Road	60.2	78.3	12.8
Site 8 – Maketehinu at Derby Road	55.0	70.6	13.4
Site 9 – Maketawa Norfolk Road	63.9	79.6	14.6
Site 10 – Ngatoronui at Bedford Road	64.1	79.4	14.9
Site 11 – Ngatoroiti at Bedford Road	81.9	100.8	15.2
Site 12 – Ngatoro at Bedford Road	80.6	93.8	17.6
Site 13 – Manganui at Croydon Road Bridge	73.9	89.2	16.0
Site 14 – Manganui River end of Manganui Road	68.5	83.4	15.7
Site 15 – Waipuku at Manganui River confluence	76.5	93.6	15.4
Site 16 – Manganui above Waipuku confluence	78.3	90.8	17.8
Site 17 – Maketawa at Durham Road Lower	61.6	83.1	11.4
Site 18 – Piakau at Durham Road Lower	94.0	122.9	12.8
Site 19 – Manganui River at Everett Park	92.0	108.3	17.1
Site 20 - Ngatoro above Maketawa confluence	88.7	110.4	14.7
Site 21 – Manganui Residual flow reach (Ngaro Road)	94.2	110.6	17.3
Site 22 – Motukawa hydro fish pass	75.1	89.7	16.5

Site 1: Manganui River at Denbigh Road

On the day of survey, this site had water of great clarity alongside well-established native riparian margins, and the second-lowest water temperature recorded in the survey at 12.4°C. There were some deeper water sections that were more challenging to electro-fish, with staff noting these areas as suitable adult trout habitat.

One young-of-the-year brown trout was observed but not captured. Locating trout here shows that juvenile recruitment is occurring in the headwaters of the Manganui catchment upstream from SH3.

This site had thin periphyton films and a high-quality macroinvertebrate fauna.

Table 3. Survey results for Site 1 - Manganui River at Denbigh Road in the Manganui catchment, 11th December 2024 (shock time = 6min.44s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1 - S				
Brown trout	1	0.148			
Koura	2			37	

(S= Small, M= Medium, L= Large)

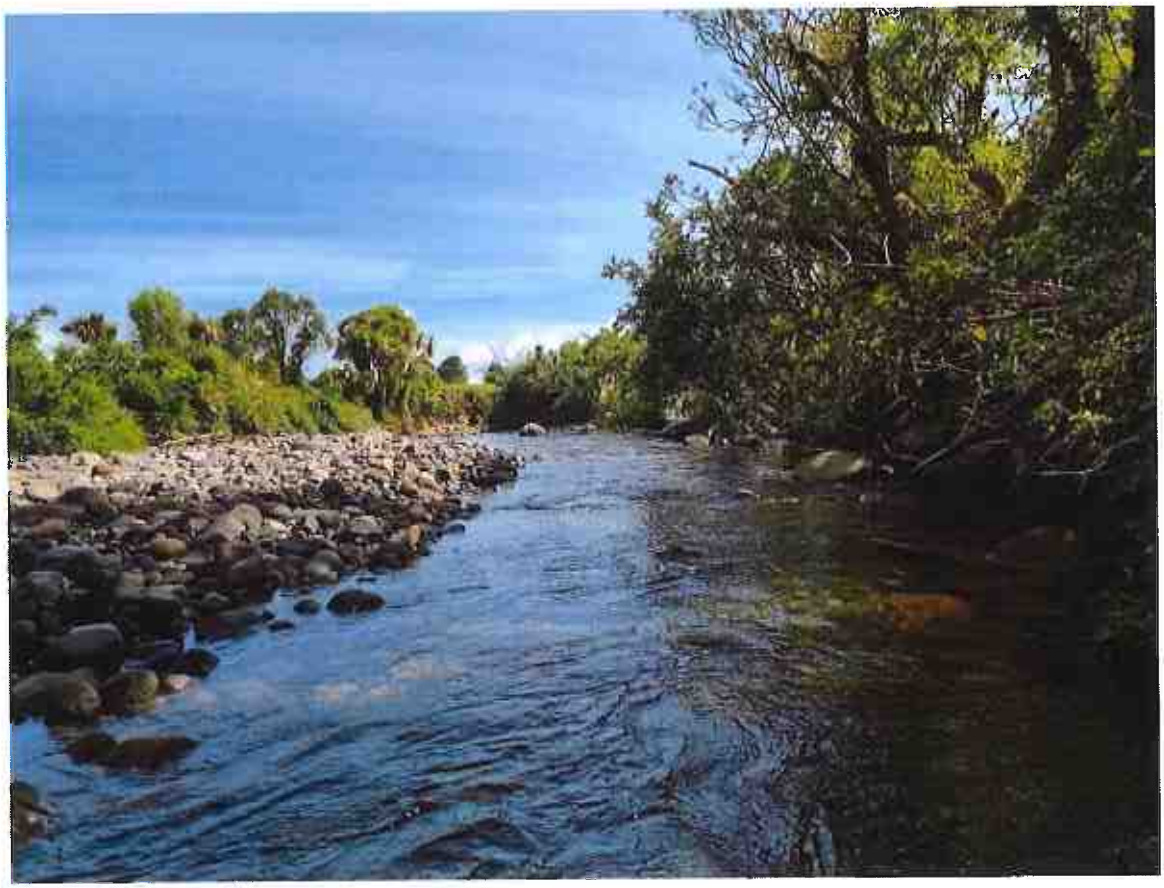

Photo 1. Manganui River at Denbigh Road (Site 1).

Site 2: Rumkeg Creek at Denbigh Road

This site was located at a farm race ford. There was fine sediment covering most of the bed, significant periphyton growth, and slow flowing water. Eight longfin eels were caught here (Table 4), but no trout. A sparse invertebrate fauna of moderate quality was noted.

Table 4. Survey results for Site 2 – Rumkeg Creek in the Manganui catchment, 11th December 2024 (shock time = 4min.58s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	4 -L, 2-M, 1-S, 1-E				
Koura	7			37	
Crans Bully	6		40	74	

Photo 2. Rumkeg Creek (Site 2).

Site 3: Te Popo Stream

This site offered a large, shallow section of stream that looked very suitable as juvenile trout habitat. Surprisingly, none were seen or captured here despite a 6 minute 40 second shock time. A black shag colony was located in mature pine trees directly above the surveyed reach. Abundant, high-quality invertebrates were found here alongside minimal algal films.

Table 5. Survey results for Site 3 – Te Popo Stream in the Manganui catchment, 11th December 2024 (shock time = 6min, 40s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)		Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-M					
Koura	1				37	
Unidentified Bully	1		20		40	30

Photo 3. Te Popo Stream (Site 3).

Site 4: Waipuku Stream at Derby Road South

This site had a channelised and entrenched bed structure, hazy water clarity, with 10-20m-wide riparian margins giving way to agricultural pasture. One young-of-the-year brown trout was recorded here (Table 6). Conductivity was particularly low at 50.7 µS/cm.

Table 6. Survey results for Site 4 – Waipuku Stream (Derby Road South Bridge) in the Manganui catchment, 11th December 2024 (shock time = 6min, 44s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-S				
Brown Trout	1	0.148		37	
Koura	3		30	60	45

Photo 4. Waipuku Stream at Derby Road South.

Site 5. Mangatengehu Stream at Derby Road

This survey site was located below a perched, 6-barrel concrete ford, which is becoming more perched as water is channelised through the barrels. Wetted margins existed for the passage of climbing native fish, alongside old mussel spat rope, but fish passage could be improved.

There were exotic riparian margins giving way to pasture, with minimal native species. The stream itself was narrow, averaging about 4 metres width, bank to bank, with slightly discoloured water.

No trout were located here, but a strong population of longfin eel and bully species was present (Table 7), along with a dense, high-quality invertebrate fauna.

Table 7. Survey results for Site 5 – Mangatengehu Stream (below ford, Derby Road) in the Manganui catchment, 11th December 2024 (shock time = 4min.51s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	2-L, 3-M, 2-E				
Koura	1				
Unidentified Bully	7		18	50	41

Photo 5. Mangatengehu Stream at Derby Road (Site 5)

Site 6. Mangamawhete Stream at Bedford Road South

At this site the discolouration of the water, foam levels, and odour were noted and reported to the Taranaki Regional Council as some form of pollution.

There were dense, overhanging native riparian margins, with a wide, shallow stream bed mainly consisting of boulders and riffles. There were good numbers and diversity of macro invertebrates present, but no trout (Table 8).

Table 8. Survey results for Site 6 – Mangamawhete Stream (at Bridge, Bedford Road South) in the Manganui catchment, 11th December 2024 (shock time = 5min.26s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	2-M, 2-S				
Redfin Bully	1		95		
Unidentified Bully	5		85	90	87.5

Photo 6. Mangamawhete Stream at Bedford Road South (Site 6).

Site 7. Waitepuke Stream at Derby Road

This site had overhanging mixed native/exotic riparian plants (80% native), and a shallow, rock and riffle streambed composition with some instream debris such as farm irrigation pipes and concrete. Survey of this site found good numbers of longfin eel and koura (Table 9), abundant high-quality invertebrates, but no trout. This site had the third coolest water of the survey, at 12.8 degrees Celsius.

Table 9. Survey results for Site 7 – Waitepuke Stream (at Derby Road) in the Manganui catchment, 16th December 2024 (shock time = 6min.41s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	2-L, 1-M, 1-S				
Koura	5				

Photo 7. Waitepuke Stream at Derby Road (Site 7).

Site 8. Maketehinu Stream at Derby Road

This site had one of the narrowest channels of all sites surveyed along Derby Road. There was a mixture of native and exotic riparian vegetation down to the waterline. The densest population of koura of all sites was found here, alongside longfin eels in a variety of age classes (Table 10).

Slight water discolouration was noted here alongside particularly low conductivity at 55.0 µS/cm. Thin algal films, a high-quality invertebrate fauna and an iron mineral deposit leaching into stream (Photo 8) were also recorded.

Table 10. Survey results for Site 8 – Maketehinu Stream (at Derby Road) in the Manganui catchment, 16th December 2024 (shock time = 4min.39s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	2-L, 2-M, 2-S, 1-E				
Koura	20		30	60	45

Photo 8. Maketehinu Stream at Derby Road (Site 8).

Site 9. Maketawa Stream at Norfolk Road

This site had excellent water clarity, with minimal algal films, and a mixture of bouldery run, riffle and back-eddy habitat suitable for trout. Three juvenile brown trout were located here (Table 11) and staff observed larger trout in deeper sections of the stream.

In similar fashion to Site 1, locating trout at Site 9 shows that juvenile trout recruitment Is occurring in Manganui headwater streams.

Table 11. Survey results for Site 9 – Maketawa Stream, in the Manganui catchment, 16th December 2024 (shock time = 6min, 57s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-M, 1-E				
Brown Trout	3	0.431	20	62	46.6

Photo 9. Maketawa Stream at Norfolk Road (Site 9).

Site 10. Ngatoro-nui Stream at Bedford Road

This site had dense native riparian margins and good water clarity, along with an abundant and diverse invertebrate fauna. Koura and longfin eel were recorded here (Table 12), but no trout.

Table 12. Survey results for Site 10 – Ngatoro-nui Stream (at Bedford Road) in the Manganui catchment, 16th December 2024 (shock time = 6min.12s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-L, 2-M, 2-E				
Koura	1				

Photo 10. Ngatoro-nui Stream at Bedford Road (Site 10).

Site 11. Ngatoro-iti Stream at Bedford Road

The Ngatoro-iti Steam site had notably poorer water clarity than nearby sites, even though this site is situated between the Ngatoro Stream (about 650 metres away) and the Ngatoro-nui Stream sites, which both had notably good water clarity.

A strong population of longfin eel was located here, alongside the presence of bully species and koura (Table 13), and a moderate to good macroinvertebrate population. No trout were seen or caught.

Table 13. Survey results for Site 11 – Ngatoroiti Stream (at Bedford Road) in the Manganui catchment, 16th December 2024 (shock time = 6min, 41s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	6-M, 6-S, 5-E				
Koura	1				
Unidentified Bully	1		74		

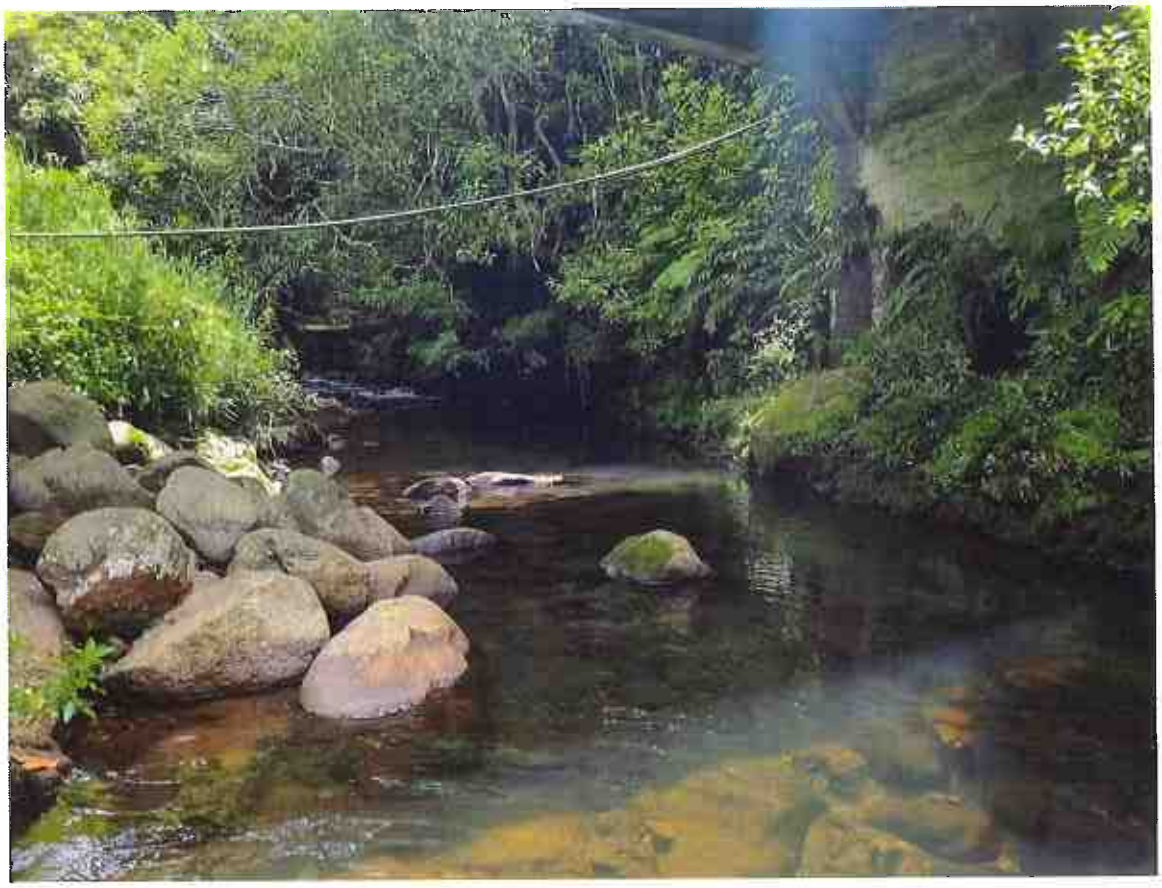

Photo 11. Ngatoroiti Stream at Bedford Road (Site 11).

Site 12. Ngatoro Stream at Bedford Road

The Ngatoro Stream site had good water clarity, with an abundant moderate to high quality invertebrate fauna. Longfin eel and koura was present (Table 14), but no trout were caught.

Table 14. Survey results for Site 12 – Ngatoro Stream (at Bedford Road) in the Manganui catchment, 16th December 2024 (shock time = 6min, 42s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	4-M, 4-S, 2-E				
Koura	1				

Photo 12. Ngatoro Stream at Bedford Road (Site 12).

Site 13. Manganui River at Croydon Road Bridge

The Croydon Road site offered suitable habitat for a variety of trout age-classes. There were shallower, mixed gravel and bouldery sections towards the banks covered by mature overhanging riparian vegetation where juvenile brown trout were captured (Table 15), and deeper runs and pools where three adult brown trout were seen. Particularly clear water with thin algal films were noted at this site, which may have contributed to the presence of higher concentrations of trout.

Table 15. Survey results for Site 13 – Manganui River (at Croydon Road Bridge) in the Manganui catchment, 17th December 2024 (shock time = 7min.33s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	4-M, 3-S, 5-E				
Brown Trout	4	0.529	60	84	72
Unidentified Bully	1		42		

Photo 13. Manganui River at Croydon Road Bridge (Site 13).

Site 14. Manganui River at Manganui Road

This site had clear water, minimal algal films, with populations of bully species and juvenile brown trout (Table 16). The conductivity at this site was low, at 68.5 µS/cm, and there were large areas of deeper pools and runs offering potential adult trout habitat.

Table 16. Survey results for Site 14 – Manganui River (end of Manganui Road) in the Manganui catchment, 17th December 2024 (shock time = 7min.42s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Brown Trout	3	0.389	62	70	66
Unidentified Bully	2		67	90	78.5

Photo 14. Manganui River at the end of Manganui Road (Site 14).

Site 15. Waipuku Stream at Manganui River confluence

This site consisted of shallower bouldery and riffle habitat moving into deeper pool areas, with a diverse number of species noted (Table 17), including brown trout, longfin eel, koura, redfin bully, and the observation of inanga (not caught).

Filamentous green, and brown algae were noted in the main flow, alongside a sparse but high-quality invertebrate fauna.

Table 17. Survey results for Site 15 – Waipuku Stream (at Manganui River confluence) in the Manganui catchment, 17th December 2024 (shock time = 5min.2s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-M, 2-S, 6-E				
Brown Trout	1	0.198	200		
Koura	3				
Red Fin Bully	1		85		
Unidentified Bully	1		38		
Inanga	observed				

Photo 15. Waipuku Stream at the Manganui River confluence (Site 15).

Site 16. Manganui River above Waipuku Stream confluence

This site offered the largest and most open stream bed of all sites in this survey. The area fished comprised of shallow riffle and a backwater that sat upon a finer gravel substrate.

Longfin eel and juvenile brown trout, all of a similar size (and therefore age class) were recorded here (Table 18).

Table 18. Survey results for Site 16 – Manganui River (above the Waipuku Stream confluence) in the Manganui catchment, 17th December 2024 (shock time = 7min, 16s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-M, 1-S,8-E				
Brown Trout	3	0.413	70	85	78.3

Photo 16. Manganui River above the Waipuku stream confluence (Site 16).

Site 17. Maketawa Stream at Lower Durham Road

In similar fashion to Site 15, this site also had filamentous green algae present. A yearling brown trout and a redfin bully were observed, alongside longfin eel and bully species (Table 19). This site had a conductivity of 61.6 µS/cm, and a water temperature of 11.4°C – the coldest water recorded in the survey.

Table 19. Survey results for Site 17 – Maketawa Stream (at Durham Road Lower) in the Manganui catchment, 18th December 2024 (shock time = 6min.48s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-M, 2-S, 1-E				
Brown Trout	1 observed	0.147	250		
Redfin Bully	1 observed				
Unidentified Bully	3		50	80	66.6

Photo 17. Maketawa Stream at Lower Durham Road (Site 17).

Site 18. Piakau Stream at Lower Durham Road

Moderate algal growth was recorded here, with slightly more filamentous green algae than at Site 17, and a much higher conductivity at 94.0 µS/cm. Interestingly, five juvenile brown trout were found here - the highest density in the survey. Bully species, koura, and eel elver were also noted (Table 20).

Table 20. Survey results for Site 18 – Piakau Stream (at Durham Road Lower) in the Manganui catchment, 18th December 2024 (shock time = 6min, 10s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-E				
Brown Trout	5	0.811	66	80	76
Unidentified Bully	4		50	110	82.5
Koura	4				

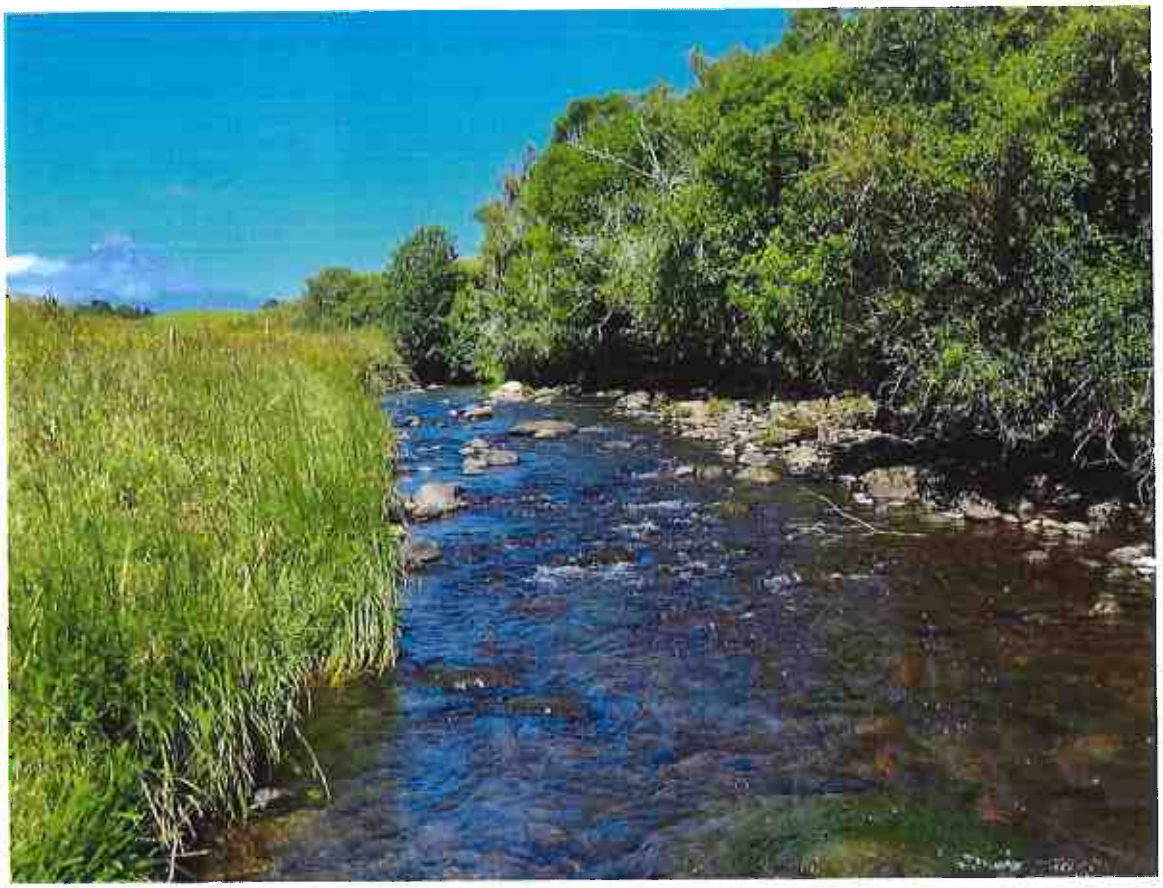

Photo 18. Piakau Stream at Durham Road Lower (Site 18).

Site 19. Manganui River at Everett Park

The Manganui River is a large river by the time it reaches Everett Park Reserve. One juvenile brown trout was located here, alongside a longfin eel and eel elvers (Table 21). Twenty-six bullies were recorded here in a variety of sizes. These were likely redfin bully. A sparse invertebrate fauna and moderate algal growth was noted.

Table 21. Survey results for Site 19 – Manganui River (at Everett Park) in the Manganui catchment, 18th December 2024 (shock time = 6min.29s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-S, 4-E				
Brown Trout	1	0.154	70		
Unidentified Bully	26		50	100	65

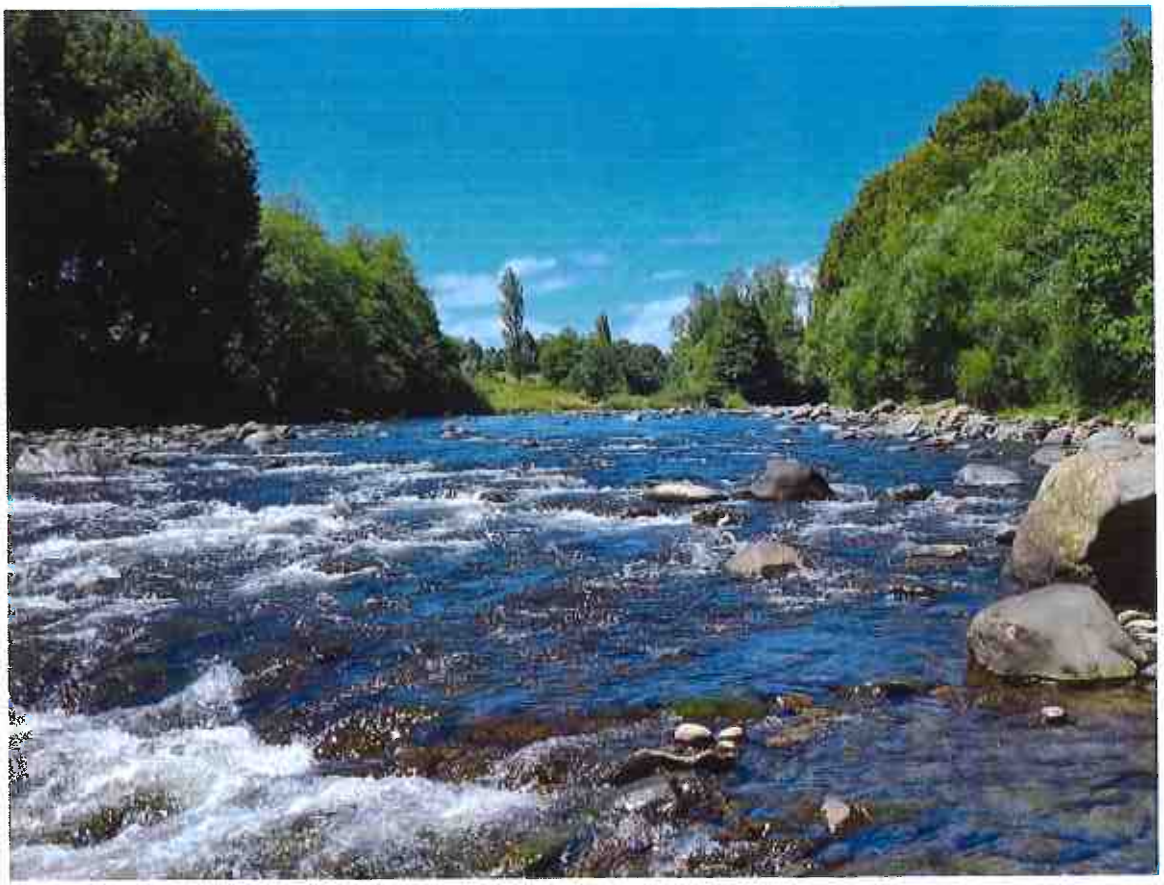

Photo 19. Manganui River at Everett Park (Site 19).

Site 20. Ngatoro Stream above Maketawa confluence

This survey site was situated within a mixture of native and exotic riparian vegetation. Longfin eel, koura and bully species were located here (Table 22), but no trout. A sparse but high-quality invertebrate fauna and moderate algal films and green filamentous algae were present. Unfortunately, no photo was taken of this site.

Table 22. Survey results for Site 20 – Ngatoro (above Maketawa confluence) in the Manganui catchment, 18th December 2024 (shock time = 6min.24s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	5-S, 9-E				
Koura	1				
Unidentified Bully	7				

Site 21. Manganui River Residual Flow Reach

The residual flow reach is located downstream of Manawa Energy's diversion weir for the Motukawa hydro scheme and for approximately 50% of the time the flow in this section is just 400 l/s. This survey location had significantly slower and deeper flows (Photo 20) than other survey sites, alongside discoloured water and large sediment deposits covering most of the riverbed. Longfin eel and bully species were found (Table 23), but no trout. No invertebrates were found, which was unusual. This site also had the highest conductivity of the survey, at 94.2 µS/cm.

Table 23. Survey results for Site 21 – Manganui River residual flow section (Ngaro Road) in the Manganui catchment, 18th December 2024 (shock time = 4min.49s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	5-S, 1-M, 3-E				
Unidentified Bully	5		30		

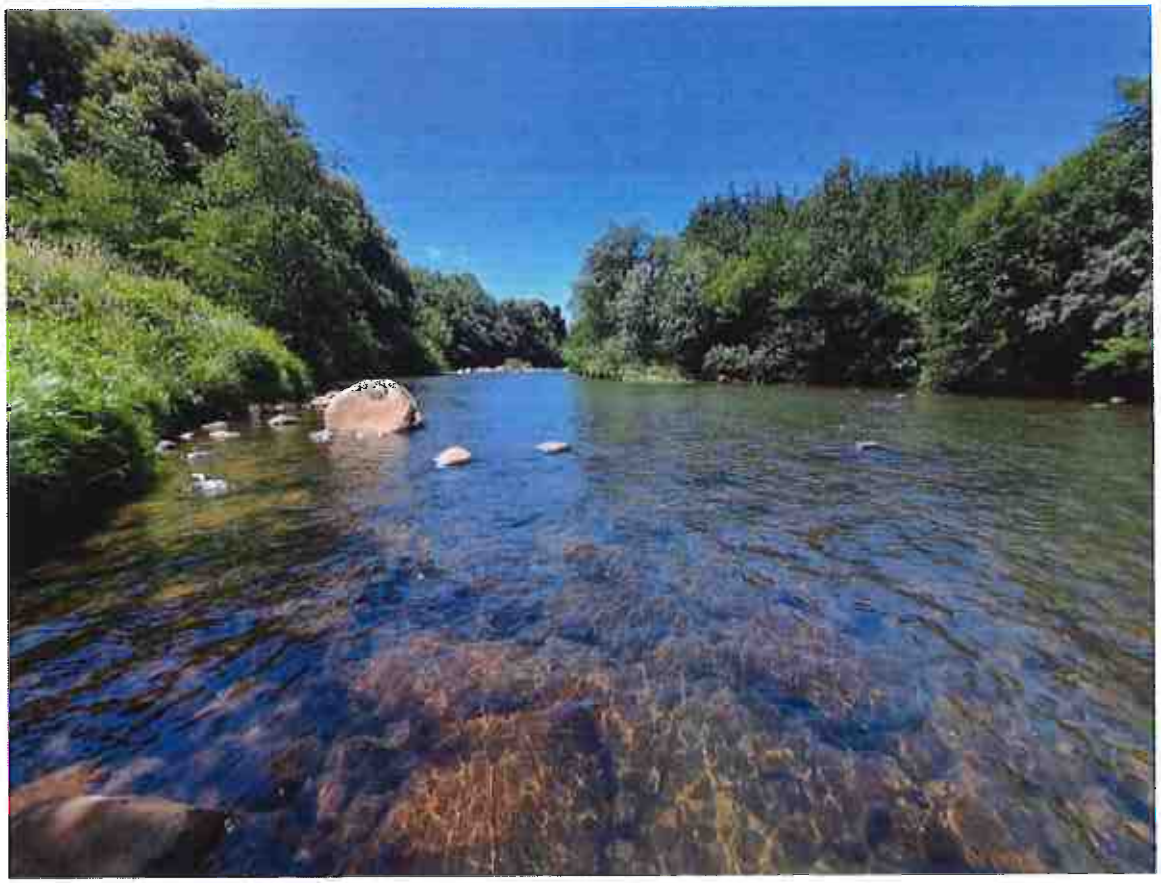

Photo 20. Manganui River residual flow reach (Site 21).

Site 22. Motukawa Diversion Weir Fish Pass

To enable fish to travel upstream past the Motukawa hydro scheme diversion weir, a U-shaped fish pass exists on the true right-hand side of the weir. The fish pass was surveyed as part of this investigation, with 11 longfin elver caught there, alongside koura of different age classes, and bully species (Table 24). A brown trout estimated to be 250mm in length (1+) was caught mid-way up the fish pass.

Table 24. Survey results for Site 22 – Lake Ratapiko inlet fish pass, in the Manganui catchment, 18th December 2024 (shock time = 3min.24s @ 400 volts, 60pps, 25% pulse width).

Species	Number	Density (per minute)	Minimum length (mm)	Maximum length (mm)	Average length (no. measured)
Longfin Eel	1-M, 11-E				
Brown Trout	1	.294	250		
Koura	2				
Unidentified Bully	6		30	50	40

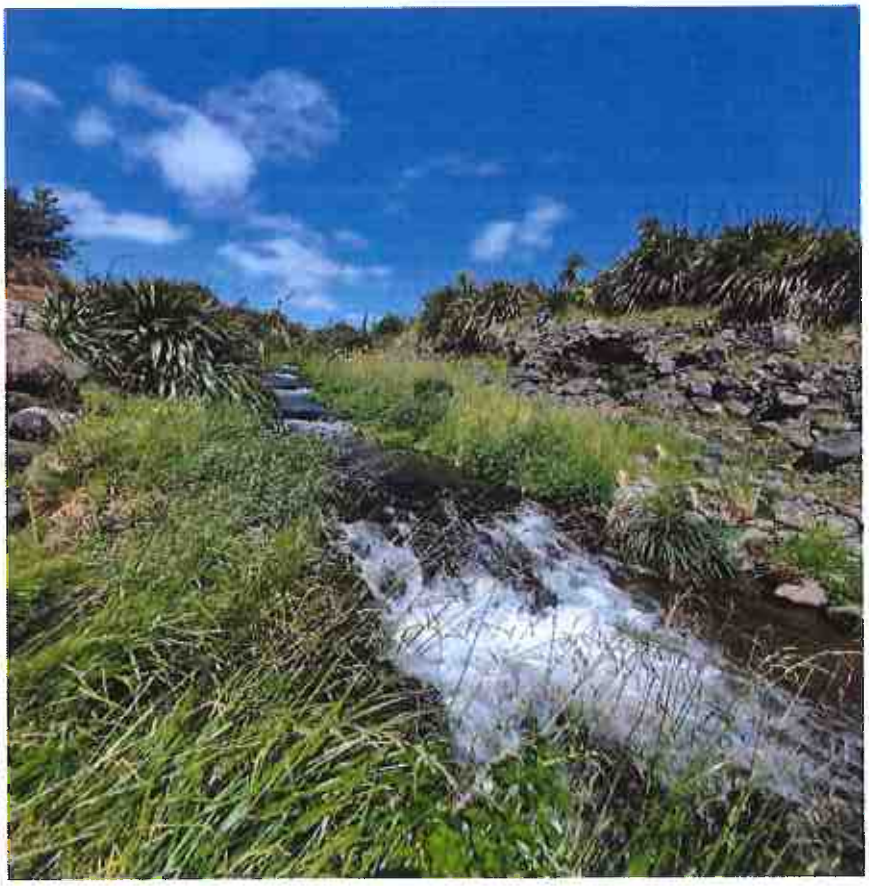

Photo 21. Motukawa hydro diversion weir fish pass (Site 22).

Discussion

Juvenile trout

Of the 22 sites surveyed in the Manganui River catchment, brown trout were found at 11 sites (Figure 3, Table 25). Young of the year (0+) brown trout juveniles (Photo 22) were found at eight of those sites and yearling (1+) brown trout were found at three sites (Table 25).

The most striking result was the relative absence of juvenile brown trout at upper catchment sites. While juveniles were caught at the Manganui River (Site 1), Waipuku Stream (Site 4) and Maketawa Stream (site 9) headwater sites, no juvenile trout were found at nine other headwater sites upstream from SH3 (Figure 3), despite the presence of good water quality and a high-quality macroinvertebrate fauna.

This contrasts with results from the nearby Waiwhakaiho River catchment where an electric fishing survey in 2019 (Stancliff & McLean, 2019), found highest densities of juvenile trout in the upper reaches of the river. Perhaps a lack of suitable spawning habitat in the headwaters of the Manganui River and tributaries is implicated.

In this survey, juvenile brown trout were found most consistently in the Manganui River mainstem, where they were widespread but at low density in suitable habitat from the headwaters to at least as far downstream as Everett Park (Figure 3, Site 19).

The average density of juvenile brown trout over the 22 sites was 0.137 fish per minute of machine time, which is lower than that found in other surveys of ringplain trout fisheries, such as the Waiwhakaiho and Waiongana rivers and Kapuni Stream (Table 26). At a site-specific level, Piakau Stream (Site 18) had highest juvenile trout density in the survey, at 0.811 trout-per-minute.

The lower average juvenile trout density in the Manganui catchment could be related to the larger number of sites (22 compared with 9 to 11 in other surveys) and the fact that some sites were unlikely to hold trout, such as the residual flow reach (Site 21) and Rumkeg Creek (site 2). Te Popo Stream (Site 3) had excellent juvenile rearing habitat with good water clarity, thin periphyton films and a dense high-quality invertebrate fauna, but no trout were seen or caught. This was surprising but possibly related to the large black shag colony in the trees above the surveyed reach.

The average size of juvenile brown trout increased with distance downstream of the national park Te Papa-Kura-o-Taranaki, with average lengths of 47-60mm in the headwaters (Sites 1, 4 & 9, Table 25) and 66-78mm further downstream (Sites 13,14,16,18 & 19, Table 25). A similar trend was found in the Waiwhakaiho River, where Stancliff & McLean (2019) suggested there may be a downstream movement of young trout as they grow, or alternatively that warmer water temperatures in the lower reaches mean that fish residing there grow faster. However, the two explanations may be linked in that it is thought that warmer water temperatures, greater food resources and more space are often the drivers for downstream juvenile migration.

Notwithstanding the low average densities of juvenile brown trout found in this survey, the Manganui River and tributaries such as Maketawa and Ngatoro streams support a productive trout fishery, and the current levels of recruitment must therefore be sufficient. Given that much of the juvenile production appears to occur in the river mainstem, initiatives which maintain and enhance water quality and reduce sedimentation, both in the tributaries and the mainstem, will be beneficial.

Table 25. Brown trout densities (fish caught per minute of electric fishing machine time) and average size of the young of the year (0+) captured. Note that yearling brown trout were caught at three sites (Sites 15, 17 and 22).

Survey Site	Species	Density (Fish per minute)	Average Length (mm)
Site 1 – Manganui River (near National Park, Denbigh Road)	Brown Trout	0.148	~60
Site 4 – Waipuku Stream (Derby Road Bridge)	Brown Trout	0.148	58
Site 9 – Maketawa Stream (Norfolk Road)	Brown Trout	0.431	46.6
Site 13 – Manganui River (Croydon Road Bridge)	Brown Trout	0.529	72
Site 14 – Manganui River (Manganui Road end)	Brown Trout	0.389	66
Site 15 – Waipuku Stream (Manganui confluence)	Brown Trout	0.198	**200**
Site 16 – Manganui River (above Waipuku confl.)	Brown Trout	0.413	78.3
Site 17 – Maketawa Stream (Lwr Durham Rd.)	Brown Trout	0.147	**250**
Site 18 – Piakau Stream (Lower Durham Road)	Brown Trout	0.811	76
Site 19 – Manganui River (at Everett Park)	Brown Trout	0.154	70
Site 22 – Manganui River (Motukawa weir fish pass)	Brown Trout	0.294	**250**

Photo 22. Juvenile brown trout from Maketawa Stream (Site 9).

Table 26. Comparison of maximum and average juvenile brown trout densities recorded (fish caught per minute of electric fishing machine time) in the current Manganui River survey with those of previous surveys.

Catchment	Survey Dates	No. of sites	Maximum density (fish per minute)	Average density (fish per minute)
Mangawhero River	2-3 December 2015	9	7.0	2.40
Kaupokonui Stream	6-7 December 2016	9	1.1	0.36
Manganuioteao River	4-6 December 2017	11	2.7*	1.39*
Waiwhakaiho River	17-19 December 2018	9	1.50	0.63
Retaruke River	7 December 2020, 2nd January 2021	4	1.80	1.68
Waingongoro River	5 – 8 December 2022	13	1.68*	0.30*
Waiongana/Mangaoraka	11-12th December 2023	11	1.53	0.515
Kapuni	24th October 2024	10	2.20	0.996
Manganui River	11-18 December 2024	22	0.811	0.137

* Includes both brown & rainbow trout

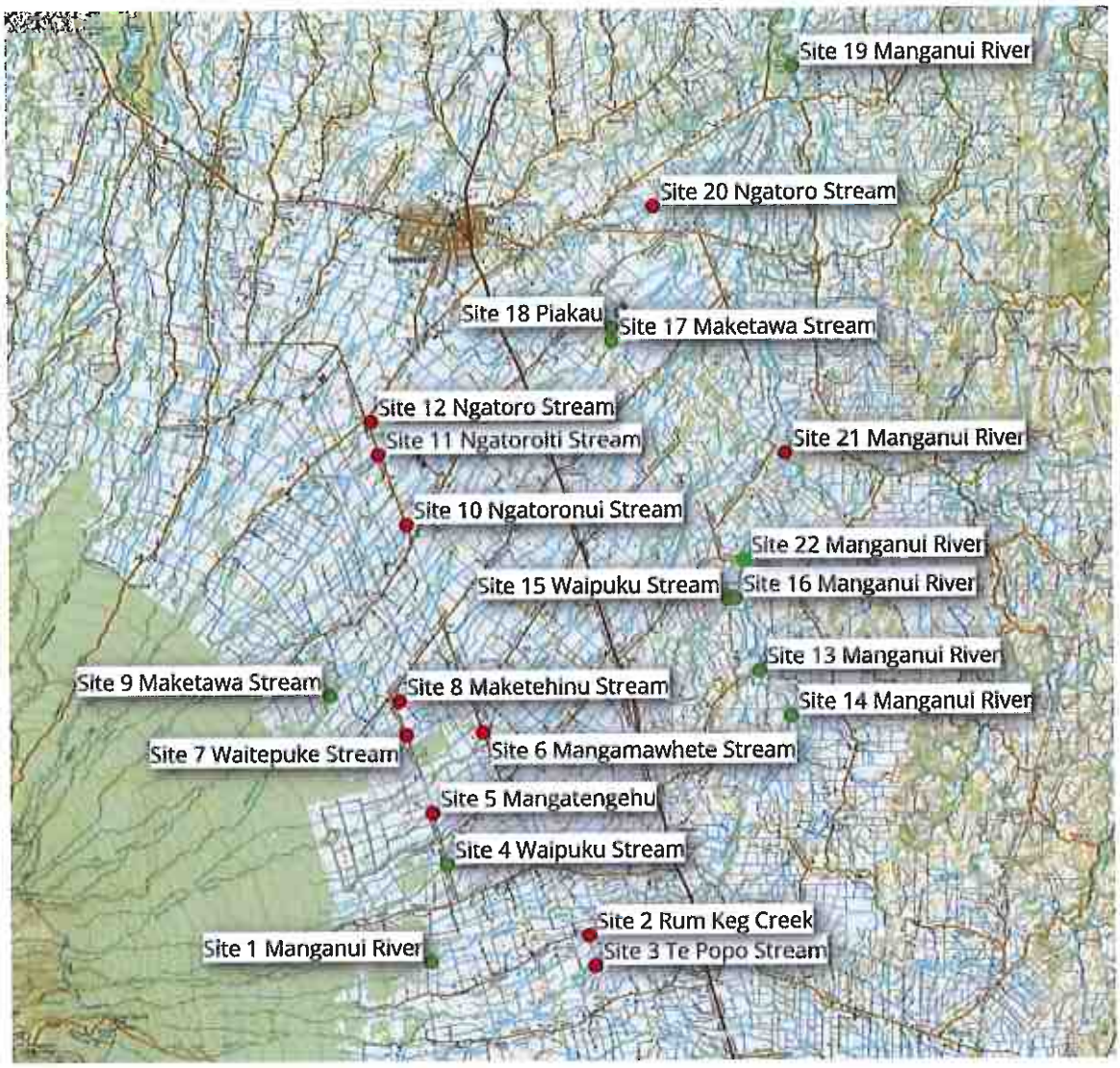

Figure 3. Manganui Survey Sites (green dots show sites where trout were found and red dots where no trout were seen or caught).

Water Quality

The general increase in water conductivity readings down the catchment (Table 2) is indicative of an increase in nutrient enrichment from adjacent farmland. Hotspots identified by an increase in conductivity included Rumkeg Creek (Site 2), which is a small stream draining intensively farmed land that is obviously impacted by farm runoff and sedimentation.

Mangamawhete Stream at Bedford Road South (Site 6) was another outlier with high conductivity and poorer than expected water clarity given its upper catchment location. Despite a visit by the regional council, no source of pollution could be identified. The Ngatoro and Ngatoro-iti streams at Bedford Road (Sites 11 & 12, Table 2) also had higher than expected conductivity given their upper catchment location and good riparian vegetation.

While observations were subjective, there was also a decline in the quality of the macroinvertebrate fauna towards the lower end of the Manganui catchment. However, this was not a linear trend, as a high-quality invertebrate fauna was recorded in the lower reaches of

Ngatoro Stream (Site 20) whereas upstream at Site 11 (Ngatoro-iti Stream at Bedford Road), the quality of invertebrates was considered only moderate to good.

The Manganui residual flow reach downstream of Manawa Energy's diversion weir for its Motukawa hydro scheme showed a distinct lack of invertebrates. The survey at this site (Site 21) noted very slow flowing, discoloured water, with large sediment deposits along the riverbed. This site also had the highest conductivity measurement of all sites in the survey (Table 2).

The Motukawa diversion weir is the largest instream structure in the Manganui catchment, and the pool and step fish pass was electro-fished as part of the survey (Site 22). The pass is constructed in a large, curved 'U' shape, which decreases the gradient and having multiple channel 'steps' in the form of rock rip rap also helps to reduce water velocity. One yearling brown trout was captured mid-way up the fish pass.

Photo 23. An approx. 250mm brown trout caught in the Motukawa hydro scheme weir fish pass.

Native fish

This survey found a healthy population of longfin eel (*Anguilla dieffendachii*) present throughout the Manganui River catchment, with eels caught at 21 of the 22 sites surveyed, in a range of sizes from elvers to mature adults.

Koura (*Paranephrops planifrons*) were found at 13 of the 22 sites, also in a range of size classes, often at the same site. The highest density of koura was recorded in Maketehinu Stream at Derby Road (Site 8) with a count of 20 small to medium specimens (Photo 24). The second-highest density of koura was found in Rumkeg Creek (Site 2), with a count of seven.

Photo 24. Koura at the Maketehinu Stream at Derby Road (Site 8).

A single observation of inanga (*Galaxias maculatus*) was made in Waipuku Stream just upstream from the Manganui River confluence (Site 15). This site is located upstream of Manawa Energy's diversion weir, and the inanga must therefore have successfully negotiated the fish pass.

Bully species (either Crans or Redfin bully) were noted at 14 sites, with highest numbers recorded at the most downstream site - the Manganui River at Everett Park (Site 19).

Photo 25. Bully species, brown trout and elver at the Manganui River at Everett Park (Site 19).

Two instream structures were identified during the survey that have the potential to adversely affect the passage of both native fish and trout. A six-barrel concrete ford on Mangatengehu Stream at Derby Road (Site 5, Photo 26) had old mussel spate rope present in some of the barrels, but the downstream concrete lip and high water velocities through the barrels are likely to impede fish passage. Additional modifications are needed to improve fish passage at this ford, which is likely the responsibility of New Plymouth District Council.

Photo 26. A six-barrel concrete ford in Mangatengehu Stream at Derby Road (Site 5).

A disused concrete multi-barrel ford (Photo 27) was also noted in the Manganui River mainstem just upstream from the Waipuku Stream confluence. This ford was previously used for vehicle access across the river from Tariki Road when land on both sides was in the same ownership. The farm properties are now separately owned, and the ford has become an orphan structure. Most of the barrels are blocked with bedload and the ford will likely impede the upstream migration of fish during periods of low river flow. There is no good reason to retain this ford, and it should be demolished.

Photo 27. Disused concrete ford in the Manganui River mainstem just upstream from the Waipuku Stream confluence.

Summary

The survey was completed over a summer low flow period from the 11th-18th December 2024.

Headwater tributary streams upstream from SH3 generally had excellent riparian vegetation, dense high-quality macroinvertebrate faunas, good water clarity and a lack of anthropogenic influence, but juvenile brown trout were found at only three of the 12 sites sampled.

Denser populations of juvenile brown trout were found in the mainstem of the Manganui River and in the lower reaches of some tributary streams, such as Piakau Stream, which had the highest density of trout in the survey, at 0.811 trout-per-minute of fishing time.

Trout that are moving up the Manganui River from as far afield as the lower Waitara River may find adequate spawning locations in the river mainstem and may not migrate higher into the headwaters. Or perhaps adult fish may descend the catchment to spawn and return to the headwaters afterwards. Additional work is needed on this, including sampling sites not included in the current survey and using additional methods, such as night spotting in headwater streams.

Macroinvertebrate fauna quality and abundance declined down the catchment, but this trend was not absolute with some lower sites having better quality invertebrates than upstream ones.

Although the average density of juvenile trout was lower in this survey than in surveys of other Taranaki ringplain catchments (Table 26), some sites had characteristics that may have adversely affected trout abundance. For example, the residual flow reach site was significantly sedimented and lacked invertebrates due to diversion of flow into the Motukawa hydro scheme. Other examples include the shag colony at Te Popo Stream, or perhaps the pollution noted when surveying Mangamawhete Stream at Bedford Road South.

Notwithstanding the low average densities of juvenile brown trout found in this survey, the Manganui River catchment supports a productive and highly valued trout fishery. Given that 85.4% of the river and its tributaries run through intensively farmed dairying land and there are 63 discharge consents in the catchment (TRC, 2016), initiatives which maintain and enhance water quality and reduce sedimentation, both in the tributaries and the mainstem, will be beneficial in maintaining fishery values.

Recommendations

- That further electric fishing and/or night spotting surveys are conducted in the Manganui River catchment to expand juvenile trout presence/absence maps, with a focus on tributaries and reaches not yet surveyed.

- That there is liaison with New Plymouth District Council about improving fish passage at the Mangatengehu Stream Derby Road ford and with Taranaki Regional Council about removal of the disused ford in the Manganui River mainstem upstream from the Waipuku Stream confluence.

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Kapuni Biomonitoring Electric-Fishing Survey

(24 October 2024)

Taranaki Fish and Game Report No. 2025-01 February 2025

Cover Photograph: Kapuni Stream at Kokiri Road. Jack Harland 24 October 2024.

Kapuni Biomonitoring Electric-Fishing Survey

(24 October 2024)

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Prepared for

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INTRODUCTION

The Kapuni biological monitoring programme, undertaken on behalf of Ballance Agri-Nutrients Kapuni Ltd and Todd Petroleum Mining Company Ltd (previously Vector Ltd), has included electric-fishing in or around April and October each year. These surveys indicate whether habitat remains satisfactory for fish and they enable detection of catastrophic declines in fish abundance.

Running since 1982, the electric-fishing programme has been a voluntary initiative and not one required by Taranaki Regional Council (TRC) water consents for the operation of Ballance Agri-Nutrient Kapuni Ltd's Ammonia-Urea Plant and Todd Petroleum Mining Company Ltd's Gas Treatment Plant. Following a review of the programme in 2024, it was decided to retain the survey but reduce its frequency to once a year in spring. A spring (October) survey was chosen because there are generally more fish caught in spring than in autumn. In conjunction with the macroinvertebrate biomonitoring programme (which is required by TRC consent conditions), the survey has provided valuable information on habitat quality and fish populations in Kapuni Stream, changes over time, and whether there are any significant adverse effects from the operation of the Ammonia-Urea Plant and the Gas Treatment Plant in the Kapuni catchment.

The surveys were previously undertaken by the Cawthron Institute (1981 – 2007), Stark Environmental Limited (2007 – 2021) and Riverwise Consulting (2021 – 2024). Fish & Game NZ (Taranaki Region) has agreed to carry out surveys in October 2024 and 2025.

Single-pass electric fishing is a relatively quick procedure but seldom captures all fish present in the area fished and does not provide accurate fish density estimates. Therefore, the data should be interpreted bearing the following in mind:

- Fish species recorded only as one or two individuals at any site can be termed 'rarely encountered'.
- If a fish species is not recorded at a site, it does not necessarily mean that it was not present.
- Approximate relative abundance estimates might need to differ by a factor of 10 or more to suggest real changes in abundance at sites over time.

More intensive sampling, such as triple-pass electric fishing with large stop nets, or fishing 150m of stream at each site in accordance with the NZ Freshwater Fish Sampling Protocols (Joy *et. al*, 2013) would provide more accurate estimates of fish presence-absence and numbers. However, it would also be considerably more time-consuming to undertake. Since TRC does not require fish monitoring to be undertaken (although it is specified in the respective management plans for the Ammonia-Urea Plant and the Gas Treatment Plant), there is no requirement to undertake it in a more rigorous (and costly) manner.

This report presents the results of electric fishing undertaken on Thursday 24th October 2024 by Allen Stancliff and Jack Harland of Taranaki Fish & Game.

METHODS

Sampling sites and methods

Table 1 and Figure 1 show the locations of the monitoring sites in the Kapuni Stream catchment. On Thursday 24th October 2024, 10 sites between Opunake Road and Normanby Road were electric fished. Electric fishing was undertaken using a Smith-Root battery-powered backpack machine, with a single pass at each site. Fish were caught after being stunned and swept downstream into a hand-held stop net. They were then identified, counted, measured and released. The area of streambed sampled at each site was recorded (Appendix 1).

Table 1 Location of monitoring sites in the Kapuni Stream mainstem, 24th October 2024.

Site name	NZTM Coordinates
Kapuni mainstem sites (upstream to downstream order)	
Opunake Road	1699395E 5640390N
Upper Palmer Road	1700755E 5637740N
Eltham Road	1701300E 5635250N
Site 9 (upstream "control" site for regular monitoring)	1701435E 5630740N
Site 11	1701045E 5629620N
Site 12	1700865E 5629395N
Site 10 (Skeet Road)	1700805E 5628945N
Site 6	1700540E 5627370N
Kokiri Road	1699446E 5625860N
Normanby Road	1699105E 5623650N

RESULTS AND DISCUSSION

Kapuni Stream had a stable flow of approximately 1.27 m^3/s during the survey on Thursday 24th October 2024. A significant fresh of 25 m^3/s occurred three weeks earlier on 3rd October and a smaller fresh of 4.9 m^3/s on 14th October 2024.

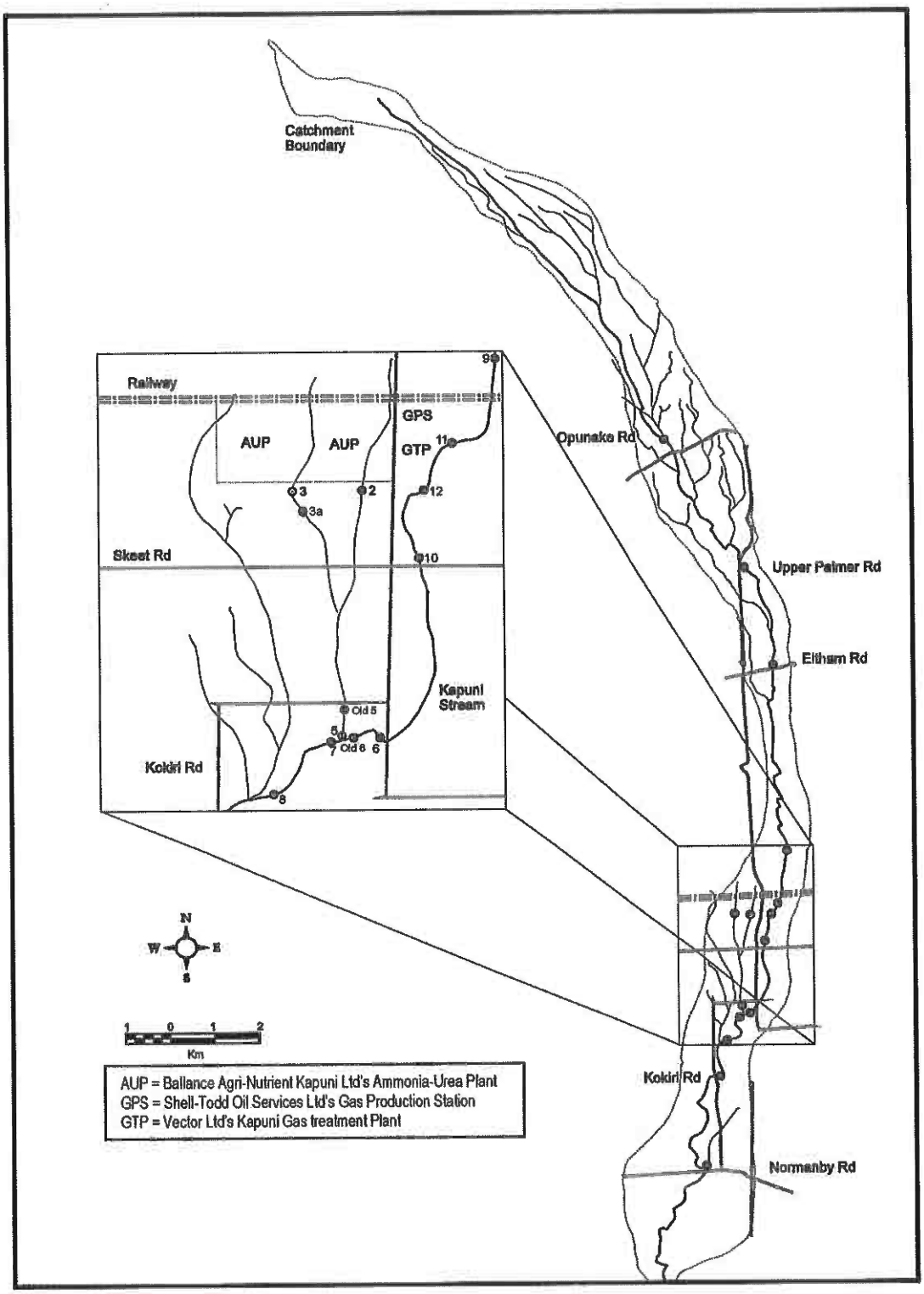

Figure 1 Locations of sampling sites in the Kapuni Stream catchment.

Table 2 Total numbers of fish and koura recorded from the Kapuni Stream in autumn (-A: April – May) and spring (-S: September – November) 1982 – 2025. A = Abundant (>20), C = Common (5-19), R = Rare (1-5). + indicates under-estimate of counts due to relative abundances being recorded at some sites/times.

Year	No. of sites	Trout	Redfin bully	Goldfish	Bluegill bully	Common bully	Koaro	Inanga	Torrentfish	Eels	Lamprey	Koura	Individuals	No. of taxa
2024-S	**10**	**39**	**4**	**-**	**-**	**-**	**1**	**-**	**-**	**14**	**2**	**11**	**71**	**6**
2024-A	7	1	6	-	-	-	-	-	1	6	-	6	20	5
2023-S	11	49	1	-	-	-	-	-	-	2	5	5	62	6
2023-A	7	-	2	-	-	-	-	-	-	8	-	2	12	3
2022-S	11	4	1	-	-	-	2	-	-	23	-	6	36	5
2022-A	7	-	10	-	-	-	1	-	-	21	-	7	39	4
2021-S	11	2	-	-	-	-	4	-	-	20	-	1	27	4
2021-A	7	-	3	-	-	-	1	-	-	1	-	-	5	3
2020-S	11	16	5	-	-	-	3	-	-	2	-	5	32[1]	5
2020-A	7	-	1	-	-	-	-	-	-	1	-	2	4	3
2019-S	11	16	11	-	-	-	-	-	1	8	-	-	36	4
2019-A	7	-	1	-	-	-	-	-	-	1	-	1	3	3
2018-S	11	17	-	-	-	-	2	-	-	7	-	4	30	4
2018-A	7	-	7	-	-	-	-	-	-	6	-	-	15[2]	2
2017-S	11	3	11	-	-	-	1	-	-	7	-	1	23	5
2017-A	7	-	5	-	-	-	-	-	-	4	-	2	11	3
2016-S	9	3	5	-	-	-	4	-	-	25	-	6	43	5
2016-A	7	-	-	-	-	-	-	-	-	11	-	1	12	2
2015-S	11	18	2	-	-	-	4	-	1	9	-	-	34	5
2015-A	7	-	5	-	-	-	1	-	-	1	-	-	7	3
2014-S	11	2	3	-	-	-	3	-	3	14	-	2	27	6
2014-A	7	-	5	-	-	-	-	-	21	48	-	1	75	4
2013-S	11	5	5	-	-	-	9	-	2	23	-	4	48	6
2013-A	7	-	9	-	-	-	-	-	2	5	-	2	18	4
2012-S	11	3	7	-	-	-	4	-	7	9	-	-	30	5
2012-A	7	-	6	-	-	-	1	-	3	8	-	-	18	4
2011-S	11	1	6	-	-	-	5	-	3	19	-	-	34	5
2011-A	7	1	5	-	-	-	-	-	2	2	-	-	10	4
2010-S	11	-	16	-	1	-	6	-	4	32	-	4	63	6
2010-A	7	-	6	-	-	-	8	-	10	42	-	-	66	4
2009-S	11	-	8	-	-	-	14	-	5	38	-	-	65	4
2009-A	7	-	5	-	-	-	2	-	7	28	-	-	42	4
2008-S	11	1	5	-	-	-	6	-	2	23	-	1	38	6
2008-A	8	2	3	-	-	-	2	-	8	16	-	1	32	6
2007-S	12	6	3	-	-	-	3	-	6	13	-	3	34	6
2007-A	8	14	1	-	-	-	1	-	4	16	-	-	36	6
2006-A	8	7	3	-	-	-	1	-	2	27	-	4	44	6
2005-S	12	11	3	-	-	-	3	-	3	26	-	-	46	5
2005-A	8	12	5	-	-	-	3	-	19	30	-	5	74	7
2004-S	11	-	2	-	-	-	3	-	4	27	-	2	38	5
2004-A	8	15	8	-	-	-	8	-	13	17	-	4	65	6
2003-S	8	-	15	-	-	-	-	1	1	54	-	3	74	5
2003-A	8	12	2	-	-	-	4	-	25	32	-	2	77	6
2002-S	12	4	4	-	-	-	3	-	4	20	-	2	37	6
2002-A	8	25	4	-	-	-	-	-	2	19	-	3	53	5
2001-A	7	9	7	-	-	-	-	-	17	43	-	1	77	5
2000-S	12	7	13	-	-	-	1	-	12	32	-	3	68	6
2000-A	9	3	4	-	-	-	-	-	8	6	-	-	21	4
1999-S	12	-	3	-	-	-	2	-	6	18	-	3	32	5
1999-A	8	-	4	-	-	-	-	-	17	22	-	1	44	4
1998-S	12	-	39	-	-	-	12	-	1	61	-	7	120	5
1998-A	8	2	4	-	-	-	-	-	2	10	-	1	19	6

[1] Total includes one unidentified bully.
[2] Total includes one unidentified fish and one unidentified bully.

Table 2 continued.

Year	No. of sites	Trout	Redfin bully	Goldfish	Bluegill bully	Common bully	Koaro	Inanga	Torrentfish	Eels	Lamprey	Koura	Individuals	No. of taxa
1997-S	12	10	10	-	-	-	1	-	1	25	3	6	56	7
1997-A	8	2	6	-	-	-	1	-	1	13	-	1	24	6
1996-S	9	3	6	1	-	-	1	-	2	42	3	3	61	8
1996-A	7	3	7	-	-	-	-	-	10	9	2	-	31	5
1995-S	12	4	6	1	-	-	4	-	1	43	1	33	93	8
1995-A	6	-	2	-	-	-	-	-	1	6	-	-	9	3
1994-S	12	4	2	-	-	-	-	-	1	30	-	17	54	5
1994-A	7	1	-	-	-	-	-	-	2	25	6	2	36	5
1993-S	8	3	-	-	-	-	-	-	1	6	-	-	10	3
1993-A	7	13	13	-	-	-	-	-	8	32+	10+	17	93+	6
1992-S	12	23	11	-	-	-	-	-	1	71	-	15	121	5
1992-A	7	-	3	-	-	-	-	-	3	12	-	-	18	3
1991-S	11	1	2	-	-	-	-	-	-	18+	-	4	25+	4
1991-A	6	-	2	-	-	-	-	-	-	43+	3	1	49+	4
1990-S	11	4	4	-	-	-	-	-	-	34+	-	18	60+	4
1990-A	6	2	4	-	-	2	-	-	3	38+	-	4	53+	6
1989-S	11	1	6	-	-	-	-	-	-	62+	-	2+	71+	4
1989-A	6	3	9	-	-	-	-	-	2	63+	15	9	101+	6
1988-S	7	2	14	-	-	-	-	-	-	92	-	3+	111+	4
1988-A	6	3	13	-	-	-	-	-	8	38	9	8	79	6
1987-S	7	5	3	-	-	-	-	-	5	41+	-	15	69+	5
1987-A	6	1	6	-	-	-	-	-	1	49	16	9	82	6
1986-S	6	-	R+	-	-	-	-	-	R	5+	-	R	8+	4
1985-S	6	5	17	-	-	-	-	-	-	68	3	13	106	5
1984-S	6	37	26	-	-	-	-	-	-	114	14	30	221	5
1983-S	5	15	22	-	-	-	-	-	-	97	13	2	149	5
1982-S	5	14	1	-	-	-	-	-	-	19	-	5+	39+	4
1982-A	5	35	C	-	-	-	-	-	-	A+	-	-	60+	3
Total		**474**	**498+**	**2**	**1**	**3**	**122**	**1**	**253+**	**2002+**	**112+**	**324+**	**3687+**	

The results from electric fishing at 10 sites in the Kapuni catchment on 24th October 2024 are presented in Appendix 2, together with all electric fishing data collected from the Kapuni Stream since monitoring began in 1982. Table 2 above summarises the data.

Brown and Rainbow Trout (*Salmo trutta & Oncorhynchus mykiss*)

Trout appear irregularly and in variable abundance in the Kapuni Stream. They have been recorded on 55 of the 81 sampling occasions but mostly in spring surveys and particularly since 2011 (Table 2, Appendix 2). Over the years, most trout recorded from the Kapuni Stream are likely to have been brown trout. However, rainbow trout fry (0^+ young of the year) comprised most of the catch in the October 2023 and October 2024 surveys and when comments from anglers are included it appears that rainbow trout have become the dominant salmonid species in Kapuni Stream in recent years. Of the 39 trout fry caught in Kapuni Stream on 24th October 2024, only three were brown trout. It could be that large early spring floods (e.g. 195 m^3/s on 18th August 2022) damaged spawning redds laid down by brown trout and allowed later spawning rainbows to thrive. Rainbow trout fry averaged 34.6 mm in length (23 – 42 mm; n=27), while brown trout fry were larger at 45.3 mm (38 – 50 mm; n=3).

Redfin bullies (*Gobiomorphus huttoni*)

Redfin bullies are common in lowland reaches of most New Zealand streams. They have seldom been found in high numbers in the Kapuni Stream, but usually have been found at three or more sites, and on all but five of the 81 sampling occasions. On 24th October 2024, redfin bullies were recorded at Sites 9 (1), 6 (2) and Normanby Road (1) (Appendix 2). Redfin bullies prefer quieter water towards the edge of stony streams where there is cover between and under the cobbles. Unfortunately, the sand in the bed of the stream has degraded their preferred habitat.

Common bullies (*Gobiomorphus cotidianus*)

Despite their name, common bullies are not the most common bullies in New Zealand streams, and this certainly is true of the Kapuni Stream. They have been recorded on only two of 80 occasions: at Site 10 on 6 April 1990 and at Site 9 on 12 May 1986 (Appendix 2).

Bluegill bullies (*Gobiomorphus hubbsi*)

A bluegill bully was recorded from the Kapuni Stream only once (22 October 2010) in 42 years of monitoring. A single individual was recorded from Site 12 (Table 2, Appendix 2). Bluegill bullies are widespread in New Zealand especially in the west, but the NZ Freshwater Fisheries Database holds records only for the Hangatahua (Stony), Maketawa, Te Henui, and Waiwhakaiho rivers on the Taranaki ringplain.

Goldfish (*Carassius auratus*)

In the Kapuni catchment, goldfish were present in the stormwater catch basins when Vector owned the Gas Treatment Plant, which was the most likely source of fish found in the wild. Single goldfish were recorded when electric-fishing the Kapuni Stream on two occasions: 13 October 1995 at Site 12 and 24 October 1996 at Site 7 (Appendix 2). Both of these sites were downstream of the discharge of the stormwater catch basins. Brightly-coloured goldfish would not last long in the wild with large eels and trout around!

Koaro (*Galaxias brevipinnis*)

The koaro is one of New Zealand's native whitebait species, and the one most able to overcome steep waterfalls and penetrate far inland. They have been recorded in Kapuni Stream on 34 of 52 occasions since (and including) October 1995 (but not prior to that date) during this biomonitoring programme. In the Kapuni catchment koaro normally would be expected to occur in swift riffle habitat within Te Papa-Kura-o-Taranaki (Egmont National Park) where the stream flows through forest and also at sites on the upper ringplain near the park boundary. Their presence at sites nearer the coast is most likely due to displacement from their usual habitats by floods, elevated flows, or habitat degradation due to sand in the riverbed. A single koaro was recorded on 24th October 2024 at the Opunake Road site (Appendix 2).

Torrentfish (*Cheimarrichthys fosteri*)

During the day torrentfish are found most commonly among cobble and boulder substrates in swift riffles and rapids. Unrestricted access from the sea is essential for their distribution. In Kapuni Stream, torrentfish have only been found previously as far upstream as Site 11, but most commonly at Kokiri Road. Torrentfish have quite specific habitat requirements – very swift riffles/rapids – that are not always present at the monitoring sites or they can be too swift and difficult to sample at higher flows. The riffle at Kokiri Road is not such good torrentfish habitat as it was some years back because it has reduced in swiftness as the stream channel has altered. A better picture of torrentfish distribution throughout the Kapuni catchment, including assessment of the effectiveness of weir removal, would be obtained by targeting torrentfish habitat at selected locations along the length of the river, rather than confining electric-fishing to the established monitoring sites. No torrentfish were recorded in the 24th October 2024 survey (Appendix 2).

Lamprey (*Geotria australis*)

In the Kapuni Stream, only the juvenile form (ammocoetes) of these migratory fish has been recorded in the past during biomonitoring surveys, usually during the autumn monitoring surveys at Sites 6 and 7. They occur in organic-rich silt/sand habitat at river margins. Monitoring data suggest that lamprey ammocoetes may have been adversely affected by the influx of sand into the streambed, which first occurred in late 1984 with the impact still evident today. However, five lamprey ammocoetes were recorded from suitable habitat at the Normanby Road site in the October 2023 survey and two were found there in the same habitat on 24th October 2024 (Appendix 2). This confirms that lamprey spawning is occurring in the Kapuni Stream catchment and that more ammocoetes are likely to be found if suitable habitat is targeted.

Eels (*Anguilla australis* and *A. dieffenbachii*)

The eels recorded in these monitoring surveys include both shortfin (*A. australis*) and longfin (*A. dieffenbachii*) eels, with the latter being predominant. Most have been small (<300 mm) including a large proportion of elvers (juvenile eels in the process of migrating up the river from the ocean). Eels have broad habitat preferences and are widespread in the Kapuni catchment. Eels have been recorded on every sampling occasion and comprise 54% of the fish recorded from the Kapuni stream by electric fishing. On 24th October 2024, 14 eels were recorded (Table 2), of which 12 were longfin, one was shortfin and one was unidentified. One large longfin was present at the upper Palmer Road site, six smaller longfins were found at Site 6, five at Normanby Road and one small shortfin eel and an unidentified eel at Eltham Road (Appendix 2).

Koura (*Paranephrops planifrons*)

Koura have been recorded on 59 of the 81 monitoring occasions but the numbers have varied considerably. Representation of koura at different sampling sites has also been inconsistent

(Appendix 2). Koura inhabit crevices under banks and around logs, large cobbles, and aquatic vegetation. They are likely to have been adversely affected by sedimentation of the streambed. On 24th October 2024, koura were recorded at Upper Palmer Road (2), Eltham Road (1), Site 11 (1), Site 10 (1) and Normanby Road (6), where a grassy undercut bank provided good habitat.

Inanga (*Galaxias maculatus*)

New Zealand's most common galaxiid (whitebait) species has only been recorded from the Kapuni catchment twice during this monitoring programme. A single adult male inanga was captured in a hand net on 13 April 2000 when collecting the macroinvertebrate sample from Site 5 in the gully within 3 m of the confluence with the Kapuni Stream, and another individual (115 mm long) was recorded at Site 11 on 12 November 2003. Inanga inhabit coastal or lowland streams and may be more common in the lower reaches of the Kapuni Stream downstream of Normanby Road. The Normanby Road site is the most downstream of all of the monitoring sites but is still nearly 6 km from the sea in a straight line, and considerably further along the meandering lower reaches of the Kapuni Stream.

Catch per unit effort (CPUE)

On 24th October 2024, a total of 495 m^2 of streambed was fished at 10 different sites (*cf.* 185 – 649 m^2 on previous occasions: Appendix 1).

A total of 71 fish (including koura) were recorded, with a mean density of 6.97 fish per 100m^2. This fish density ranks 37th of 55 occasions since measurements of fishing effort commenced in 1996 (Figure 2). The lowest was 1.30 fish per 100 m^2 in autumn 2019 and the highest was 39.46 fish per 100 m^2 in spring 2003.

The catch of trout per unit effort since October 1996 is summarised in Figure 3. Trout have been assigned to three size classes corresponding to fingerlings or young-of-the-year (<150 mm standard length), yearlings (150–250 mm), and adults (>250 mm). Of the 39 young-of-the-year trout recorded on 24th October 2024, 36 were rainbow trout and three were brown trout.

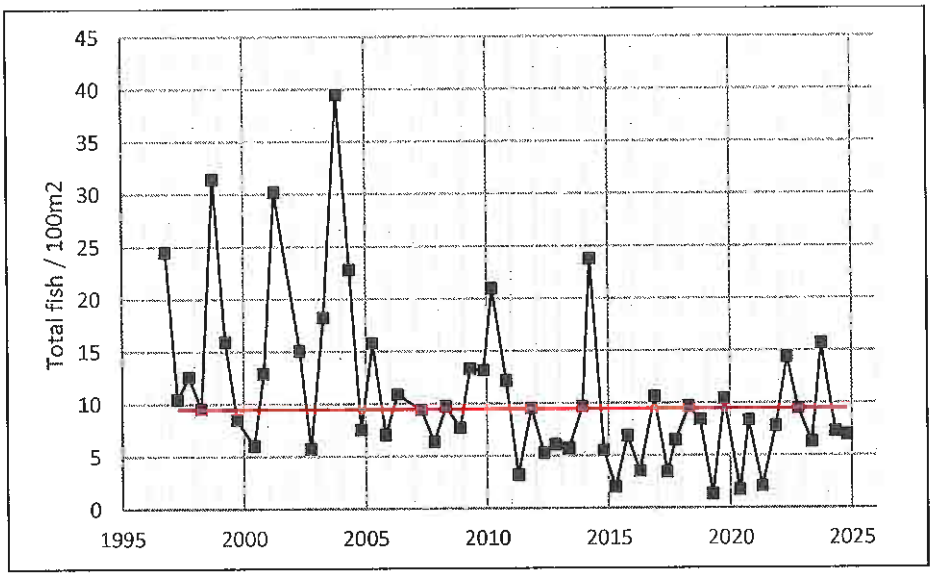

Figure 2 Total numbers of fish per 100 m^2 electric-fishing in the Kapuni catchment (1996 – 2025), the red line denotes the median.

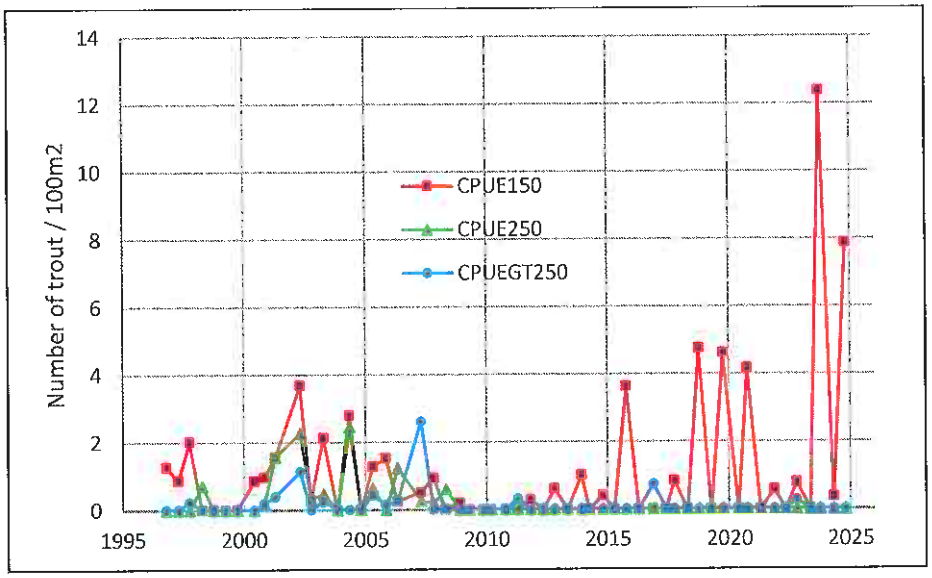

Figure 3 Number of trout in three size classes per 100 m^2 electric-fished in the Kapuni catchment.

SUMMARY AND CONCLUSIONS

Electric fishing was undertaken in the Kapuni Stream on Thursday 24th October 2024 when the river flow was about 1.27 cumecs. Significant freshes (> 3.864 m^3/s) within the month prior to sampling occurred on 3rd October (25 m^3/s) with a smaller fresh of 4.9 m^3/s on 14th October 2024.

Seventy-one fish (*i.e.*, 39 trout, 14 eels, 11 koura, four redfin bullies, two lamprey and one koaro) were recorded with a density of 6.97 fish per 100 m^2 (which is about 77% of the median density since records began in 1996). Fish were recorded at all ten sites in the Kapuni Stream that were electric-fished.

It is impossible to compare the catch per unit effort of trout over the entire period of monitoring because the area fished has been recorded consistently only since October 1996. Furthermore, the assessment is complicated by changes in method (from mains-powered to battery-powered electric fishing machines), numbers, and locations of sampling sites, and variation in the area of streambed fished at each site over the years. However, in 1982 – 1983 when only five sites were electric-fished on three occasions (*i.e.*, 15 site-times) an average of 4.27 (range 2.8 – 7.0) brown trout per site was recorded. Following the sand influx, which commenced in 1984, the numbers of brown trout recorded per site has been only 0.57 (*i.e.*, 382 trout/666 site-times). Although this analysis is rather simplistic, a reduction of this magnitude (*i.e.*, 7-fold) is likely to be significant and almost certainly indicative of a decline in habitat quality. This decline is most likely due to the inundation of the streambed by sand and is unrelated to the activities of the industries at Kapuni. However, since 2015 good numbers of trout fry (mainly rainbow trout fry) have been recorded in October by electric fishing, which suggests that conditions may be improving.

Sand remains a prominent feature of the bed of the Kapuni Stream and has degraded the quality of the stream habitat for fish (and invertebrates). Since the removal of Vector's weir in April 2008 single torrentfish have been recorded from Site 11 (upstream of the former weir location) on five occasions (April 2009, October 2011, May & October 2012, October 2015). On only one other occasion (April 2007) prior to the weir removal had torrentfish been recorded upstream of the weir location since monitoring commenced 43 years ago. This suggests that weir removal may have improved access for torrentfish, although their presence further upstream would best be assessed by targeted electric-fishing of their preferred torrential riffle habitat rather than simply fishing the established monitoring sites.

There is nothing to suggest that the activities of the petrochemical industry at Kapuni have had significant adverse impacts on fish communities.

The next electric-fishing survey of the Kapuni Stream is due in October 2025.

APPENDICES

Appendix 1. Area of streambed electric-fished at monitoring sites in the Kapuni Stream[3]. The area fished was not recorded prior to October 1996.

Sampling Date	Site													Total Area (m^2)
	O	P	E	9	11	12	10	6	7	8/K	N	2	5	
24-Oct-24	40	52	55	40	38	50	50	50		60	60			495
1-May-24				40	38	42	38	39	38	39				274
11-Oct-23	36	38	34	38	32	38	36	34	34	36	40			396
15-May-23				30	27	15	30	30	30	30				192
25-Oct-22	32	36	32	32	38	36	32	36	32	40	34			380
12-May-22				37	36	40	42	45	36	36				272
17-Nov-21	30	34	32	32	30	32	32	34	32	30	30			348
28-Apr-21				38	34	36	35	34	32		36			245
6&7-Oct-20	39	44	38	40	30	32	32	30	30	33	36			384
27-May20				33	30	33	33	34	35	34				232
8-Oct-19	30	30	30	30	32	32	30	30	30	32	40			346
15-Apr-19				35	32	30	31	33	31	38				230
9-Oct-18	36	36	33	32	32	33	30	32	30	33	30			357
24-Apr-18				30	31	30	32	32	30	30				155
4-Oct-17	33	30	30	30	30	30	33	33	33	33	39			356
1-Jun-17				48	45	45	45	45	45	51				324
23-Nov-16	45	45	45	45			45	45	45	45	45			405
19-Apr-16				45	45	45	45	45	45	45				315
14&15-Oct-15	45	45	45	45	45	45	45	45	45	45	45			495
16-Apr-15				48	48	45	60	48	48	48				345
22&23-Oct-14	45	45	45	45	45	45	45	45	45	45	45			495
3-Apr-14				45	45	45	45	45	45	45				315
3-Dec-13	45	45	45	45	45	45	45	45	45	45	45			495
11-May-13				45	48	45	45	45	45	45				318
26-Oct-12	45	45	45	45	45	45	45	45	45	45	45			495
7-May-12				54	54	48	45	45	51	45				342
31-Oct/1-Nov-11	30	36	30	30	45	36	30	30	30	30	30			357
21-Apr-11				45	45	45	45	45	45	45				315
21&22-Oct-10	54	51	45	51	45	45	45	48	45	45	45			519
21-Mar-10				45	45	45	45	45	45	45				315
13-Nov-09	45	45	45	45	45	45	45	45	45	45	45			495
22&23-Apr-09				45	45	45	45	45	45	45				315
22-Nov-08	45	45	45	45	45	45	45	45	45	45	45			495
24-Apr-08				45	45	48	45	48	48	48			2	329
30&31-Oct-07	48	54	51	51	45	51	45	42	51	48	45		5	536
23-Apr-07				50	50	50	60	50	60	60			3	383
27-Apr-06				60	70	50	60	60	60	70			4	444
3-Nov- 05	50	60	70	60	60	50	60	60	60	60	60		4	654
19-Apr-05				70	70	60	70	60	60	75			4	469
27&28-Oct-04	45	45	45	45	51	45	45	45	45	48	45			504
11-May-04				40	40	40	40	40	40	40			5	285
12-Nov-03					25	25	25	30	25	25	25		5	185
17-Apr-03				60	60	60	60	60	60	60			2	422
10&11-Oct-02	63	63	63	63	60	33	48	60	60	63	63		10	649
30-Apr-02				50	50	50	50	50	50	50			3	353
17-Apr-01				42	33	36	39	36	36	33				255
1-Nov-00	60	60	60	54	48	42	48	39	39	39	39			528
11-May-00				51	54	48	51	33	36	54		20	3	350
28-Sep-99	30	30	45	36	30	33	36	33	36	33	30		5	377
6-Apr-99				48	45	36	42	36	36	30			4	277
3-Oct-98	30	40	36	40	30	30	30	26	30	40	40		10	382
15-Apr-98				36	54	36	39	36	42	40				283
6&7-Oct-97	30	40	50	40	50	40	40	20	25	45	50		15	445
22-Apr-97				48	45	30	30	24	15	33			5	230
24-Oct-96				30	24	30	32	16	30	35	30		10	237

[3] Shaded cells denote 'Not sampled'

Appendix 2. Fish and koura recorded from monitoring sites in the Kapuni catchment[4].

Trout	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-24	-	-	2	5	6	7	9	5		2	3	
	1-May-24				-	-	-	-	1	-	-		
	11-Oct-23	-	2	4	10	3	7	16	2	1	2	2	
	25-Oct-22	-	-	1	2	1	-	-	-	-	-	-	
	17-Nov-21	-	-	1	-	1	-	-	-	-	-	-	
	6&7-Oct-20	-	-	1	5	5	1	1	-	2	-	1	
	8-Oct-19	-	-	3	3	4	1	-	-	-	1	4	
	9-Oct-18	-	-	-	3	5	2	2	-	-	-	4	
	4-Oct-17	-	-	-	-	-	-	1	-	-	2	-	
	23-Nov-16	1	-	-	-	-	-	2	-	-	-	-	
	14&15-Oct-15	-	-	-	-	5	1	-	1	-	1	10	
	22&23-Oct-14	-	-	1	1	-	-	-	-	-	-	-	
	3-Dec-13	-	-	1	1	1	1	1	-	-	-	-	
	26-Oct-12	-	-	-	-	1	-	-	1	-	-	1	
	31-Oct/1-Nov-11	-	-	-	-	1	-	-	-	-	-	-	
	21-Apr-11				-	-	1	-	-	-	-		
	22-Nov-08	-	-	-	-	1	-	-	-	-	-	-	
	24-Apr-08				-	-	-	-	-	1	1		-
	30&31-Oct-07	1	-	-	-	2	2	1	-	-	-	-	-
	23-Apr-07				4	1	1	2	5	-	-		1
	27-Apr-06				2	2	2	-	1	-	-		-
	3-Nov-05	-	2	-	1	6	1	-	1	-	-	-	1
	19-Apr-05				2	2	1	2	3	-	1		-
	11-May-04				1	2	1	6	1	4	-		-
	17-Apr-03				4	2	3	2	-	1	-		-
	10&11-Oct-02	-	-	-	1	1	-	2	-	-	-	-	-
	30-Apr-02				10	9	5	1	-	-	-		-
	17-Apr-01				2	3	2	1	-	-	1		
	1-Nov-00	1	-	-	2	-	-	1	2	1	-	-	-
	11-May-00				-	1	1	-	-	-	-		1
	15-Apr-98				2	-	-	-	-	-	-		
	6&7-Oct-97	-	-	-	-	-	-	1	-	-	-	8	1
	22-Apr-97				-	-	-	1	-	-	-		1
	24-Oct-96				-	-	-	-	-	-	3	-	-
	25-Apr-96				-	2		-	-	1	-		-
	13-Oct-95	2	1	1	-	-	-	-	-	-	-	-	-
	17-Apr-95				-			-	-	-	-		-
	28-Oct-94	-	-	-	3	-	-	-	-	-	1	-	-
	1-Apr-94				1	-		-	-	-	-		-
	1-Oct-93				-			1	1	1	-	-	-
	23-Apr-93				2	-		2	-	2	7		-
	14&19-Oct-92	-	2	-	-	-		-	9	2	4	2	4
	21-Apr-92				-	-		-	-	-	-		-
	26-Sep-91	-	-	-	-			-	-	-	1	-	-
	4-Apr-91				-			-	-	-	-		-
	28-Sep-90	-	-	-	-			-	-	-	4	-	-
	6-Apr-90				-			1	-	1	-		-
	2-Oct-89	1	-	-	-			-	-	-	-	-	-
	26-Apr-89				-			-	-	3	-		-
	27-Oct-88				-			-	-	-	2		-
	6-May-88				2			1	-	-	-		-
	2-Oct-87				-			-	2	-	-		3
	9-Apr-87				-			-	-	1	-		-
	20-Oct-86				-			-	-	-	-		-
	12-May-86				-			-	-	-	-		-
	14-Nov-85				1			2	2	-	-		-
	28-Oct-84				11			8	12	4	2		-
	3-Oct-83				10			3	-	2			-
	26-Oct-82								2	8	-	4	-
	4-May-82				33				-	1			1

[4] Shaded cells denote 'Not sampled'. VA = very abundant, A = abundant, C = common, R = rare, P = present. Only dates when fish were recorded are listed in the appendix tables for each species.

Redfin bully	Sampling Date	Site											
		O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-24	-	-	-	1	-	-	-	2		-	1	
	1-May-24				1	-	1	-	1	-	3		
	11-Oct-23	-	-	-	-	-	-	-	-	-	1	-	
	15-May-23				2	-	-	-	-	-	-		
	25-Oct-22	-	-	-	-	-	1	-	-	-	-	-	
	12-May22				-	-	1	1	4	-	4		
	28-Apr-21				-	-	-	-	1	1		1	
	6&7-Oct-20	-	-	-	1	-	1	1	-	1	-	1	
	27-May-20				1	-	-	-	-	-	-		
	8-Oct-19	-	-	-	-	1	3	-	3	2	-	2	
	15-Apr-19				-	-	-	-	-	-	1		
	24-Apr-18				1	-	3	-	-	2	1		
	4-Oct-17	-	-	-	2	1	3	-	1	1	2	1	
	1-Jun-17				1	-	1	-	1	-	2		
	23-Nov-16	-	-	-	-			2	1	2	-	-	
	14&15-Oct-15	-	-	-	-	-	-	1	-	1	-	-	
	16-Apr-15				-	1	-	-	1	1	2		
	22&23-Oct-14	-	-	-	-	2	-	-	-	1	-	-	
	3-Apr-14				-	2	2	-	1	-	-		
	3-Dec-13	-	-	-	-	-	1	1	3	-	-	-	
	11-May-13				-	-	3	-	4	1	1		
	26-Oct-12	-	-	-	-	-	4	-	1	1	-	1	
	7-May-12				-	-	-	-	5	-	1		
	31-Oct/1-Nov-11	-	-	-	1	2	-	-	2	-	-	1	
	21-Apr-11				-	2	1	1	-	1	-		
	21&22-Oct-10	-	-	-	-	3	2	-	4	5	1	1	
	21-Mar-10				1	4	1	-	-	-	-		
	13-Nov-09	-	-	-	-	2	-	-	-	-	3	3	
	22&23-Apr-09				1	2	1	-	1	-	-		
	22-Nov-08	-	-	-	-	-	1	1	-	1	-	2	
	24-Apr-08				-	2	1	-	-	-	-		-
	30&31-Oct-07	-	-	-	-	-	-	-	-	1	-	2	-
	23-Apr-07				-	-	-	-	-	-	1		
	27-Apr-06				-	1	-	-	-	-	2		-
	3-Nov-05	-	-	-	-	-	-	-	-	-	3	-	-
	19-Apr-05				-	1	-	1	1	2	-		-
	27&28-Oct-04	-	-	-	-	-	-	-	-	1	-	1	
	11-May-04				4	-	2	1	-	-	1		-
	12-Nov-03					10	-	-	2	-	-	3	-
	17-Apr-03				-	-	-	-	2	-	-		-
	10&11-Oct-02	-	-	-	-	-	-	-	-	-	2	2	-
	30-Apr-02				-	-	-	2	-	-	2		-
	17-Apr-01				-	2	1	1	1	1	1		
	1-Nov-00	-	-	-	-	3	5	-	2	-	1	2	-
	11-May-00				-	2	2	-	-	-	-		-
	28-Sep-99	-	-	-	-	-	-	-	-	-	3	-	-
	6-Apr-99				-	-	1	1	-	2	-		-
	3-Oct-98	-	-	-	-	6	1	4	1	6	17	4	-
	15-Apr-98				-	1	1	-	-	1	1		
	6&7-Oct-97	-	-	-	1	6	-	-	-	-	-	3	-
	22-Apr-97				-	2	-	-	-	-	4		-
	24-Oct-96				-	-	-	-	-	2	1	3	-
	25-Apr-96				-	3		-	1	-	3		-
	13-Oct-95	-	-	-	1	-	2	-	-	2	-	1	-
	17-Apr-95				2			-	-	-	-		-
	28-Oct-94	-	-	-	-	1	-	-	-	-	1	-	-
	23-Apr-93				-	7		3	2	1	-		-
	14&19-Oct-92	-	-	-	1	7		-	-	-	1	2	-
	21-Apr-92				2	-		1	-	-	-		-
	26-Sep-91	-	-	-	1			-	-	-	-	1	-
	4-Apr-91				1			-	-	1	-		-
	28-Sep-90	-	-	-	-			2	-	1	-	1	-
	6-Apr-90				2			1	-	1	-		-
	2-Oct-89	-	-	-	1			-	-	1	2	2	-
	26-Apr-89				2			1	4	2	-		-
	27-Oct-88				4			4	1	4	1		-
	6-May-88				2			2	2	7	-		-
	2-Oct-87				1			-	1	1	-		-
	9-Apr-87				5			1	-	-	-		-
	20-Oct-86				R			-	R	R	-		-
	14-Nov-85				-			6	8	2	1		-
	28-Oct-84				4			3	15	4	-		-
	3-Oct-83				8			7	4	3			-
	26-Oct-82								-	-	1	-	-
	4-May-82				C				R	R			-

Common bully	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	6-Apr-90				-			2	-	-	-		-
	12-May-86				1			-	-	-	-		-

Bluegill bully	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	21&22-Oct-10	-	-	-	-	-	1	-	-	-	-	-	

Goldfish	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-96				-	-	-	-	-	1	-	-	-
	13-Oct-95	-	-	-	-	-	1	-	-	-	-	-	-

Koaro	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-24	1	-	-	-	-	-	-	-		-	-	
	25-Oct-22	1	1	-	-	-	-	-	-	-	-	-	
	12-May-22				1	-	-	-	-	-	-		
	17-Nov-21	1	1	1	-	-	-	-	-	-	-	1	
	28-Apr-21				-	1	-	-	-	-		-	
	6&7-Oct-20	3	-	-	-	-	-	-	-	-	-	-	
	9-Oct-18	2	-	-	-	-	-	-	-	-	-	-	
	4-Oct-17	1	-	-	-	-	-	-	-	-	-	-	
	23-Nov-16	1	3	-	-			-	-	-	-	-	
	14&15-Oct-15	3	1	-	-	-	-	-	-	-	-	-	
	16-Apr-15				1	-	-	-	-	-	-		
	22&23-Oct-14	2	1	-	-	-	-	-	-	-	-	-	
	3-Dec-13	4	3	-	1	1	-	-	-	-	-	-	
	26-Oct-12	3	-	-	-	1	-	-	-	-	-	-	
	7-May-12				-	-	-	-	1	-	-		
	31-Oct/1-Nov-11	4	1	-	-	-	-	-	-	-	-	-	
	21&22-Oct-10	4	1	-	-	1	-	-	-	-	-	-	
	21-Mar-10				5	3	-	-	-	-	-		
	13-Nov-09	2	8	2	1	-	-	-	1	-	-	-	
	22&23-Apr-09				1	-	-	-	-	1	-		
	22-Nov-08	1	4	-	1	-	-	-	-	-	-	-	
	24-Apr-08				-	2	-	-	-	-	-		-
	30&31-Oct-07	3	-	-	-	-	-	-	-	-	-	-	-
	23-Apr-07				1	-	-	-	-	-	-		-
	27-Apr-06				-	-	-	-	1	-	-		-
	3-Nov-05	2	-	-	1	-	-	-	-	-	-	-	-
	19-Apr-05				3	-	-	-	-	-	-		-
	27&28-Oct-04	3	-	-	-	-	-	-	-	-	-	-	
	11-May-04				8	-	-	-	-	-	-		-
	17-Apr-03				4	-	-	-	-	-	-		-
	10&11-Oct-02	1	-	-	1	1	-	-	-	-	-	-	-
	1-Nov-00	1	-	-	-	-	-	-	-	-	-	-	-
	28-Sep-99	2	-	-	-	-	-	-	-	-	-	-	-
	3-Oct-98	10	1	-	-	1	-	-	-	-	-	-	-
	6&7-Oct-97	1	-	-	-	-	-	-	-	-	-	-	-
	22-Apr-97				1	-	-	-	-	-	-		-
	24-Oct-96				-	-	-	-	-	1	-	-	-
	13-Oct-95	3	-	-	-	-	-	-	-	-	1	-	-

Inanga	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	12-Nov-03					1	-	-	-	-	-	-	-
	13-Apr-00					-	-	-	-	-	-		1

Lamprey	Sampling Date	Site											
		O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-24	-	-	-	-	-	-	-	-	-	-	2	
	11-Oct-23	-	-	-	-	-	-	-	-	-	-	5	
	6&7-Oct-97	-	-	-	-	-	-	-	-	-	-	3	-
	24-Oct-96				-	-	-	-	-	3	-	-	-
	25-Apr-96				-	-		-	-	2	-		-
	13-Oct-95	-	-	-	-	-	-	-	-	-	-	1	-
	1-Apr-94				-	-		-	-	6	-		-
	23-Apr-93				-	-		-	A	10	-		-
	4-Apr-91				-			-	-	3	-		-
	26-Apr-89				-			3	7	5	-		-
	6-May-88				4			1	2	2	-		-
	9-Apr-87				3			2	-	3	8		-
	12-May-86				1			-	1	10	-		-
	14-Nov-85				-			-	-	3	-		-
	28-Oct-84				2			1	1	10	-		-
	3-Oct-83				-			-	3	10			-

Torrentfish	Sampling Date	Site											
		O	P	E	9	11	12	10	6	7	8/K	N	5
	1-May-24				-	-	-	-	-	1	-		
	8-Oct-19	-	-	-	-	-	-	-	-	-	1	-	
	14&15-Oct-15	-	-	-	-	1	-	-	-	-	-	-	
	22&23-Oct-14	-	-	-	-	-	-	-	1	1	1	-	
	3-Apr-14				-	-	-	2	7	11	1		
	3-Dec-13	-	-	-	-	-	-	-	-	-	2	-	
	26-Oct-12	-	-	-	-	1	-	1	3	1	1	-	
	7-May-12				-	1	-	-	-	-	2		
	31-Oct/1-Nov-11	-	-	-	-	1	-	-	-	-	2	-	
	21-Apr-11				-	-	-	2	-	-	-		
	21&22-Oct-10	-	-	-	-	-	-	-	2	-	-	2	
	21-Mar-10				-	-	2	-	-	2	6		
	13-Nov-09	-	-	-	-	-	-	-	2	-	2	1	
	22&23-Apr-09				-	1	-	-	4	1	1		
	22-Nov-08	-	-	-	-	-	-	-	1	-	1	-	
	24-Apr-08				-	-	-	4	2	-	2		-
	30&31-Oct-07	-	-	-	-	-	-	2	-	-	1	3	-
	23-Apr-07				-	1	1	1	-	-	1		-
	27-Apr-06				-	-	-	-	-	-	2		-
	3-Nov-05	-	-	-	-	-	-	-	2	-	-	1	-
	19-Apr-05				-	-	2	4	5	4	4		-
	27&28-Oct-04	-	-	-	-	-	1	-	-	-	2	1	
	11-May-04				-	-	-	-	5	2	6		-
	12-Nov-03				-	-	-	-	-	-	1	-	-
	17-Apr-03				-	-	-	6	6	7	6		-
	10&11-Oct-02	-	-	-	-	-	-	-	2	-	1	1	-
	30-Apr-02				-	-	-	-	1	1	-		-
	17-Apr-01				-	-	-	4	5	4	4		
	1-Nov-00	-	-	-	-	-	-	1	1	8	1	1	-
	11-May-00				-	-	-	2	2	2	2		-
	28-Sep-99	-	-	-	-	-	-	1	-	-	4	1	-
	6-Apr-99				-	-	3	3	1	5	5		-
	3-Oct-98	-	-	-	-	-	-	-	-	-	-	1	-
	15-Apr-98				-	-	-	1	-	-	1		
	6&7-Oct-97	-	-	-	-	-	-	-	-	-	1	-	-
	22-Apr-97				-	-	-	-	-	-	1		-
	24-Oct-96				-	-	-	-	-	-	2	-	-
	25-Apr-96				-	-		-	-	-	10		-
	13-Oct-95	-	-	-	-	-	-	-	-	-	1	-	-
	17-Apr-95				-			-	-	-	1		-
	28-Oct-94	-	-	-	-	-	-	-	-	-	1	-	-
	1-Apr-94				-	-		-	-	-	2		-
	1-Oct-93				-			-	-	-	1	-	-
	23-Apr-93				-	-		-	-	3	5		-
	14&19-Oct-92	-	-	-	-	-		-	-	-	1	-	-
	21-Apr-92				-	-		2	1	-	-		-
	6-Apr-90				-			1	-	1	1		-
	26-Apr-89				-			1	-	1	-		-
	6-May-88				-			6	-	-	2		-
	2-Oct-87				-			2	-	1	2		-
	9-Apr-87				-			-	-	-	1		-
	20-Oct-86				-			-	-	-	R		-
	12-May-86										2		
	3-Oct-83				-			-	3	-	2		-

Eels	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-24	-	1	2	-	-	-	-	6		-	5	
	1-May-24						1	2	1	1	1		
	11-Oct-23	-	-	-	-	-	1	-	-	1	-	-	
	15-May-23				-	1	-	-	3	4	-		
	25-Oct-22	-	4	-	3	1	-	2	4	3	2	1	
	12-May-22				3	1	1	2	4	3	7		
	17-Nov-21	-	-	1	1	2		1	4	4	4	3	
	28-Apr-21				-	-	-	-	1	-		-	
	6&7-Oct-20	-	-	-	-	-	-	-	-	-	2	-	
	27-May-20				-	1	-	-	-	-	-		
	8-Oct-19	-	-	-	-	-	-	-	1	4	2	1	
	15-Apr-19				-	-	-	-	-	-	1		
	9-Oct-18	-	-	1	1	-	1	-	1	1	2	-	
	24-Apr-18				1	-	1	-	1	-	3		
	4-Oct-17	-	1	1	-	-	-	-	1	-	1	3	
	1-Jun-17				-	-	-	-	-	-	4		
	23-Nov-16	-	-	2	2			2	6	2	11	-	
	19-Apr-16				5	1	1	2	2	-	-		
	14&15-Oct-15	-	1	-	2	2	1	-	1	-	1	1	
	16-Apr-15				-	1	-	-	-	-	-		
	22&23-Oct-14	-	1	2	3	2	1	1	1	1	1	1	
	3-Apr-14				1	4	4	7	13	4	15		
	3-Dec-13	-	1	1	1	4	1	3	5	-	7	-	
	11-May-13				-	1	-	-	2	-	2		
	26-Oct-12	-	1	-	-	-	1	1	2	-	2	2	
	7-May-12				-	-	1	-	5	1	1		
	31-Oct/1-Nov-11	1	-	2	3	2	-	-	1	3	4	3	
	21-Apr-11				-	-	-	-	1	-	1		
	21&22-Oct-10	-	-	1	2	1	2	1	9	5	3	8	
	21-Mar-10				6	7	7	2	5	7	8		
	13-Nov-09	-	4	2	4	2	2	-	15	4	3	2	
	22&23-Apr-09				8	3	1	1	7	6	2		
	22-Nov-08	-	-	3	-	4	-	2	3	6	3	2	
	24-Apr-08				1	2	1	-	9	-	3		-
	30&31-Oct-07	-	-	-	2	1	-	2	2	-	2	1	3
	23-Apr-07				2	7	2	-	2	-	1		2
	27-Apr-06				4	9	1	-	1	3	9		-
	3-Nov-05	-	1	1	4	1	1	-	3	5	4	2	3
	19-Apr-05				3	4	2	2	3	5	10		1
	27&28-Oct-04	-	-	-	5	-	1	-	-	2	3	16	
	11-May-04				-	-	1	-	7	5	3		1
	12-Nov-03					15	-	-	25	5	1	8	-
	17-Apr-03				16	2	-	-	5	3	4		-
	10&11-Oct-02	-	3	1	1	1	1	-	6	2	1	3	1
	30-Apr-02				-	4	2	1	4	-	6		2
	17-Apr-01				7	9	2	1	6	6	12		
	1-Nov-00	-	2	-	2	5	3	1	4	1	7	6	1
	11-May-00				1	1	-	1	-	-	-		-
	28-Sep-99	1	-	6	-	3	-	1	1	1	5	-	-
	6-Apr-99				1	2	2	1	4	3	9		-
	3-Oct-98	-	-	3	5	1	2	2	7	4	11	12	15
	15-Apr-98				-	2	-	1	2	1	4		
	6&7-Oct-97	1	-	-	5	-	7	-	-	-	2	2	8
	22-Apr-97				-	1	2	2	-	-	-		8
	24-Oct-96				1	4	6	3	2	5	7	6	8
	25-Apr-96				4	2		-	-	2	1		-
	13-Oct-95	-	1	1	2	10	4	5	-	4	8	7	1
	17-Apr-95				1			3	-	-	-		2
	28-Oct-94	-	3	4	1	2	1	1	5	4	1	6	2
	1-Apr-94				2	8		4	1	3	4		3
	1-Oct-93				-			-	-	-	4	2	-
	23-Apr-93				5	8		6	3	6	4		P
	14&19-Oct-92	-	1	5	13	10		4	-	6	13	11	8
	21-Apr-92				1	-		4	-	3	4		-
	26-Sep-91	-	-	-	1			5	-	-	3+	2	A
	4-Apr-91				8			7	6	10	12		A
	28-Sep-90	1	3	4	8			4	1	4	3	4	C
	6-Apr-90				4			5	3	18	8		A
	2-Oct-89	2	3	5	6			14	3	4	12	13	VA
	26-Apr-89				7			10	12	10	24		VA
	27-Oct-88				11			22	4	18	32		VA
	6-May-88				4			6	9	3	12		4
	2-Oct-87				8			7	2	8	11		5
	9-Apr-87				8			8	9	10	6		8
	20-Oct-86				5			C	R	-	R		R
	12-May-86				6			A	C	C	A		A
	14-Nov-85				11			15	2	26	10		4
	28-Oct-84				5			13	7	53	4		32
	3-Oct-83				14			14	24	45			-

Eels (continued)	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	26-Oct-82								1	11	3	4	-
	4-May-82				-				R	A			C

Koura	Sampling Date	Site O	P	E	9	11	12	10	6	7	8/K	N	5
	24-Oct-24	-	2	1	-	1	-	1	-		-	6	
	1-May-24				-	1	-	-	-	-	5		
	11-Oct-23	-	-	-	-	-	-	-	1	-	2	2	
	15-May-23				1	-	-	-	-	-	1		
	25-Oct-22	-	-	-	2	-	-	1	-	2	-	2	
	12-May-22				1	-	3	-	1	-	2		
	6&7-Oct-20	-	3	-	2	-	-	-	-	-	-	-	
	27-May-20				-	-	-	-	-	2	-		
	15-Apr-19				-	-	1	-	-	-	-		
	9-Oct-17	-	-	2	1	-	-	-	-	-	-	1	
	4-Oct-17	-	-	-	-	-	-	-	-	-	1	-	
	1-Jun-17				1	-	-	-	-	-	1		
	23-Nov-16	-	1	2	1			-	-	2	-	-	
	19-Apr-16				1	-	-	-	-	-	-		
	22&23-Oct-14	-	-	1	-	-	-	-	1	-	-	-	
	3-Apr-14				-	-	-	1	-	-	-		
	3-Dec-13	-	-	3	-	-	-	1	-	-	-	-	
	11-May-13				-	-	-	1	-	-	1		
	21&22-Oct-10	-	3	1	-	-	-	-	-	-	-	-	
	22-Nov-08	-	-	-	-	-	-	-	-	-	-	1	
	24-Apr-08				-	-	1	-	-	-	-		-
	30&31-Oct-07	-	-	-	-	2	-	-	-	1	-	-	-
	27-Apr-06				-	-	-	2	-	-	2		-
	19-Apr-05				-	-	1	-	-	3	1		-
	27&28-Oct-04	-	1	1	-	-	-	-	-	-	-	-	
	11-May-04				-	1	-	-	-	-	2		1
	12-Nov-03					-	-	-	1	-	-	2	-
	17-Apr-03				-	1	1	-	-	-	-		-
	10&11-Oct-02	-	1	-	-	-	-	-	-	-	-	1	-
	30-Apr-02				-	-	-	-	-	-	3		-
	17-Apr-01				-	-	1	-	-	-	-		
	1-Nov-00	-	-	2	-	-	-	-	-	-	-	1	-
	28-Sep-99	-	1	1	-	-	-	-	1	-	-	-	-
	6-Apr-99				-	-	-	-	-	1	-		-
	3-Oct-98	-	2	1	1	-	-	-	1	-	-	2	-
	15-Apr-98				-	1	-	-	-	-	-		
	6&7-Oct-97	-	1	-	3	-	-	1	-	-	1	-	-
	22-Apr-97				-	-	-	1	-	-	-		-
	24-Oct-96				-	-	-	-	2	1	-	-	-
	13-Oct-95	-	12	6	-	-	-	2	-	1	8	4	-
	28-Oct-94	-	1	2	2	2	1	-	2	2	-	5	-
	1-Apr-94				-	2		-	-	-	-		-
	23-Apr-93				5	1		5	-	1	5		-
	14&19-Oct-92	2	4	3	-	-		-	-	-	2	2	2
	26-Sep-91	1	2	-	1			-	-	-	-	-	-
	4-Apr-91				-			-	-	1	-		-
	28-Sep-90	-	3	-	3			1	1	7	3	-	-
	6-Apr-90				-			-	-	4	-		-
	2-Oct-89	2	C	-	-			-	-	-	-	-	-
	26-Apr-89				3			2	2	-	2		-
	27-Oct-88				C			-	1	2	C		-
	6-May-88				2			6	-	-	-		-
	2-Oct-87				-			1	1	1	12		-
	9-Apr-87				1			5	-	3	-		-
	20-Oct-86				-			-	-	-	R		-
	14-Nov-85				2			10	-	1	-		-
	28-Oct-84				-			15	-	-	10		5
	3-Oct-83				-			-	-	2			-
	26-Oct-82								-	-	5	C	-

Appendix 3. Photos.

Photo 1. Lamprey (piharau) ammocoete from the Normanby Road site.

Photo 2. Trout fry from Kapuni Stream

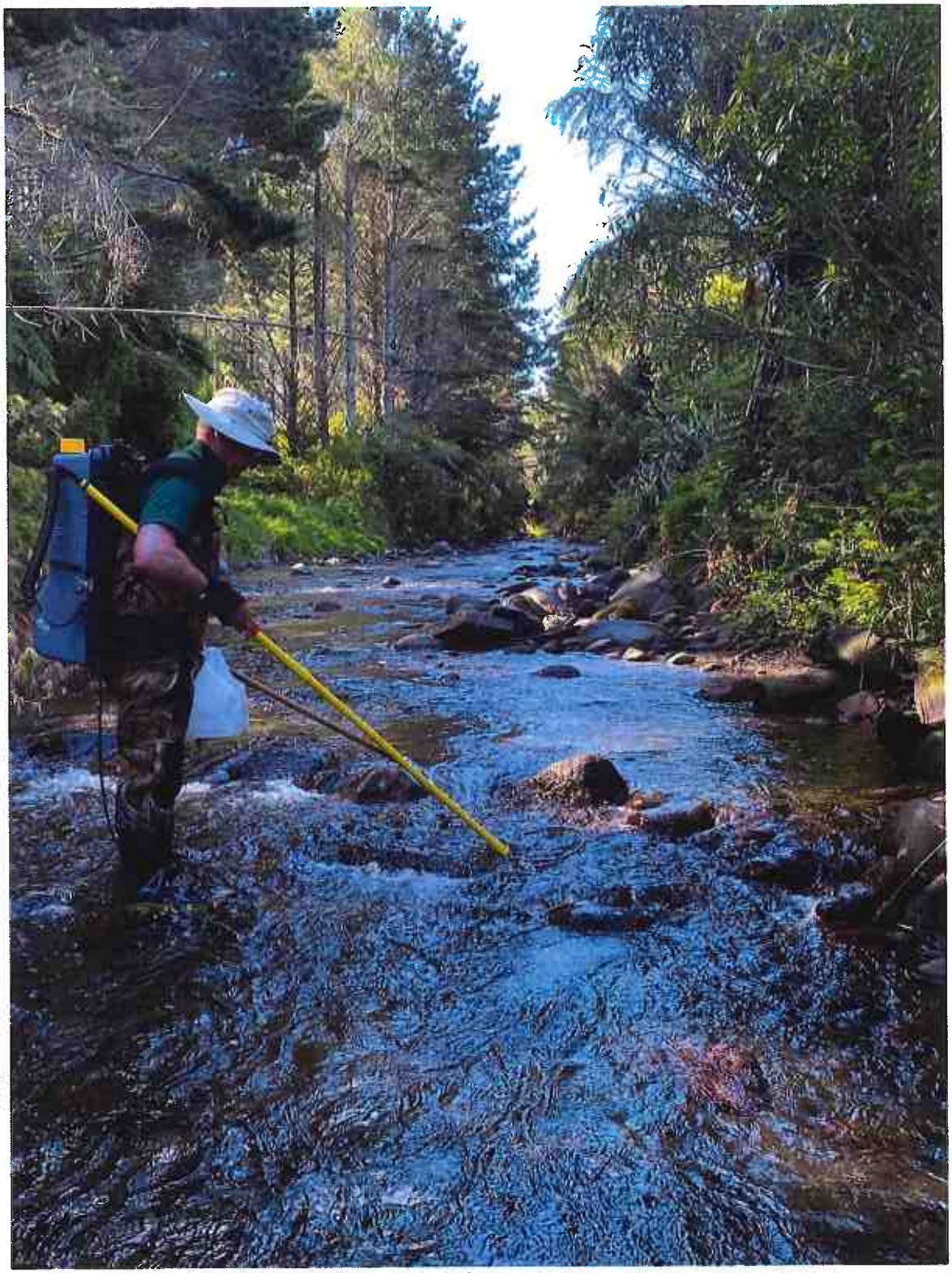

Photo 3. Electric fishing at the Eltham Road site.

Wāhianoa River electrofishing survey
4 December 2024

Report prepared by

Taranaki Fish and Game Council

for Ernslaw One limited

March 2025

Reviewed by:

Allen Stancliff

Approved for release by:

Phil Teal

CONTENTS

SUMMARY AND RECOMMENDATIONS

Four sites in the Wāhianoa River catchment were surveyed by electro-fishing on 4th December 2024 to survey fish populations upstream and downstream of two existing concrete fords owned by Ernslaw One Limited to assess the need to improve fish passage upstream past these fords.

Only one rainbow trout was found in the vicinity of the Main Road ford (W_2) in the upper Wāhianoa River, which does not provide strong evidence for the need to upgrade fish passage at this ford. However, there was also an absence of pollution sensitive mayflies and stoneflies at this site and low pH conditions in the upper river may be implicated. The current survey results for rainbow trout may therefore not be representative of the population present there at other times of the year and repeat surveys are recommended.

It does appear that the upper Wāhianoa River is subject to low pH conditions originating from inflows of volcanic origin, but the extent and duration of low pH has not been well documented. Further investigation of pH conditions along the Wāhianoa River, how this varies through the year, and the impacts on trout and macroinvertebrates is therefore recommended.

The density of rainbow trout caught immediately downstream of the Lower Wāhianoa River ford (W_1) was 5.3 times higher than that found upstream, which suggests there is a need to improve fish passage at this ford. There is a potential fish pathway along the true left bank of the ford that could be enhanced to improve upstream fish passage. It is recommended that further information is gathered prior to expiry of consents in 2029 to enable design of a fish pass that is robust and resilient, given the unstable, high-flow nature of the Wāhianoa River.

In this survey, no native fish were seen or caught at any of the sites in the Wāhianoa River catchment. The results of eDNA samples taken upstream and downstream of fords W_2 and W_1 some two weeks after the current survey also did not indicate the presence of native fish and this is consistent with the results of previous surveys. Therefore, in accordance with Condition 8 of Consent ATH-2019203145.01 for the fords, there is no requirement to install modifications to provide for fish within the next twelve months.

INTRODUCTION

On 30th October 2024, Horizons Regional Council granted an application for resource consent by Ernslaw One Limited to use two existing concrete fords (W_2 and W_1) in the Karioi Forest across the Wāhianoa River for the purpose of transporting logs for a period of five years through to 30th October 2029.

Following consultation with Taranaki Fish & Game Council and Ngā Waihua o Paerangi Trust, and in accordance with the Augier principle, the consent (ATH-2019203145.01) included the following conditions:

4. Commencing in December 2024, the Consent Holder must, in consultation with the stakeholders, undertake an investigation to determine environmental conditions, population dynamics and spawning/fry habitat and habitat impacting life supporting capacity for rainbow trout and native fish species in these reaches of the Wāhianoa River.

5. The Consent Holder must provide the outcome of the investigation undertaken under Condition 4 to the Consents Monitoring Team by 1 March 2025.

6. Annually, commencing December 2024, the Consent Holder must undertake eDNA sampling for migratory and taonga native species within the Wāhianoa River and share the results with stakeholders and the Manawatū-Whanganui Regional Council within five (5) days of receiving the results.

8. If following the December 2024 fish investigation required by Condition 4, eDNA sampling required by Condition 6, and subsequent engagement with Fish and Game Taranaki and Ngā Waihua o Paerangi Trust, it is determined that fish passage enhancements are required due to a confirmed presence of native species at one or both of the fords, then the Consent Holder must install modifications to provide for fish passage within twelve (12) months.

This report provides the results of an electric fishing survey of four sites in the Wāhianoa River catchment completed on 4 December 2024 - three sites in the Wāhianoa mainstem and one in an unnamed tributary (Figure 1). Surveys at the three Wāhianoa River mainstem sites involved electric fishing reaches immediately upstream and downstream of fords - the Aqueduct Road ford, the Main Road ford (W_2) and the Lower Wāhianoa River ford (W_1). The two lower fords (W_2 & W_1) are the subject of resource consent ATH-2019203145.01 and the Aqueduct Road ford is located further upstream.

Sites in the adjacent Mākahikatoa and Tokiāhuru Stream catchments were electrofished on 5th December 2024 for comparison, and these results are presented in a separate report.

METHODS

At each of the three Wāhianoa River mainstem fords, two teams comprising Taranaki and Wellington Fish and Game staff and Ngā Waihua o Paerangi Trust volunteers fished using Smith-Root LR-24 Electrofisher machines. One team surveyed a river section immediately upstream of each ford while the other fished the reach immediately downstream.

The electric field created by the electrofishing machine causes fish to be stunned and drift with the water flow into a stop net or hand net, or to be forced to swim towards a hand-held anode. The voltage, pulse-width and frequency of each electrofisher was set at 400 volts, 60Hz and 25% respectively.

Attempts were made to capture all fish seen, with captured fish held in a plastic bucket and then carefully identified, measured and released. The electrofishing machine time was recorded in minutes and the density of fish caught expressed as "fish per minute of machine time".

The machine operator held a dip net and a hand-held anode pole and used a single pass presence / absence assessment methodology to fish downstream towards a stop net and/or a hand net held by a second observer. Each team targeted likely trout habitat within the river, other than where the water was too deep or swift for safe, effective fishing.

The electric field also causes pollution sensitive, behaviourally drifting mayflies and stoneflies to let go of the substrate and drift into the downstream stop net with the water flow. The number and species composition of macroinvertebrates caught in the stop net gives a good indication of the quality and abundance of the invertebrate fauna at the site fished. However this was not thoroughly examined during the trout surveys..

Photo 1. Fish & Game staff and Ngā Waihua o Paerangi Trust volunteers electrofishing in the Wāhianoa River, 4 December 2024.

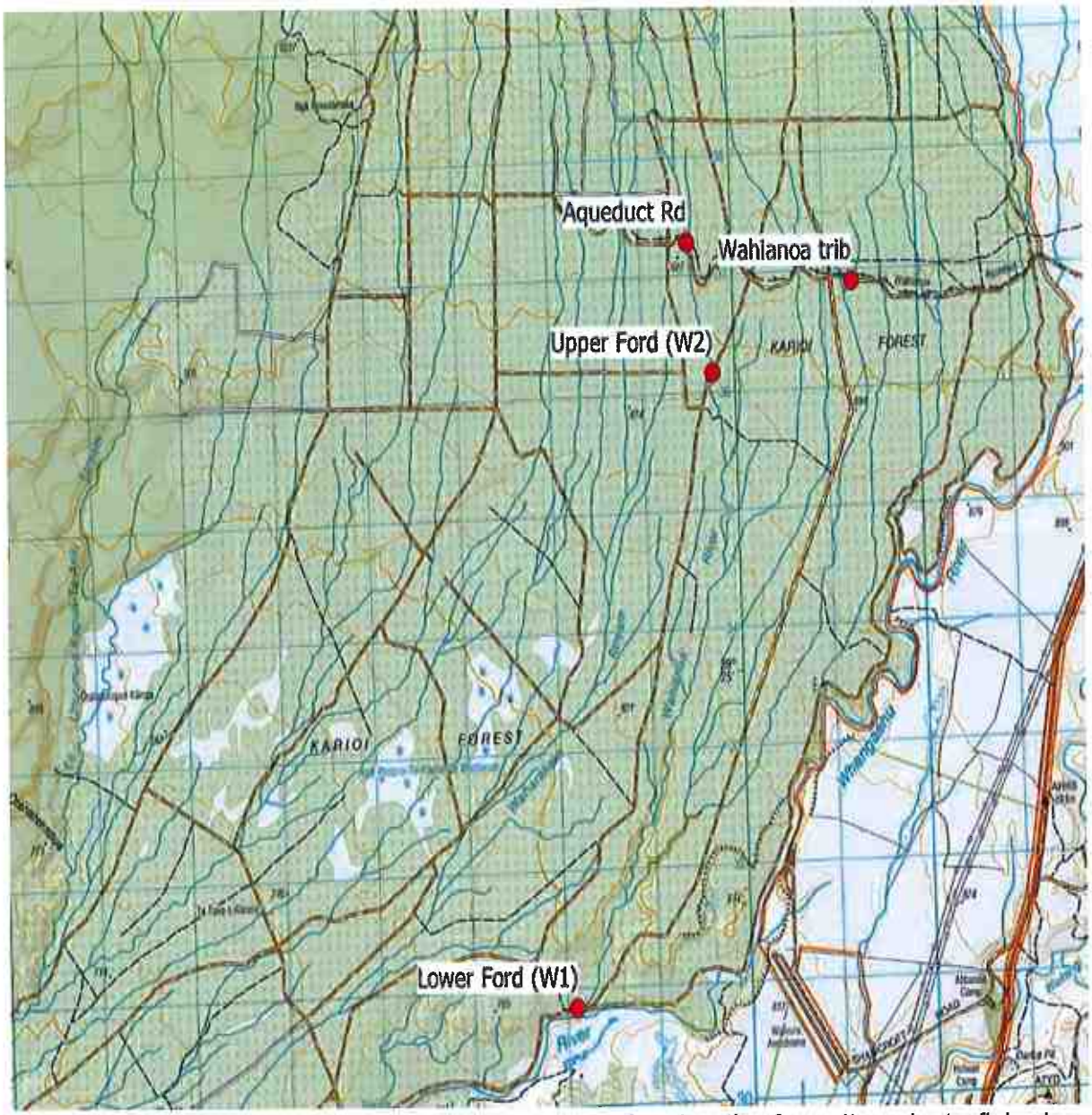

Figure 1. Map of the Wāhianoa River catchment showing the four sites electrofished on 4th December 2024.

RESULTS

Site 1: Wāhianoa River at Aqueduct Road crossing

No fish were seen or caught in the river sections immediately upstream and downstream of the Wāhianoa River Aqueduct Road ford (Table 1). Water clarity was good, but the river appeared devoid of aquatic macroinvertebrates at this location and a brown algae covered about 30% of the riverbed.

Table 1. Electrofishing survey results for the Wāhianoa River Aqueduct Road ford crossing, 4 December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Fish density (per minute)
Upstream	nil		7min5s	0.00
Downstream	nil		8min5s	0.00

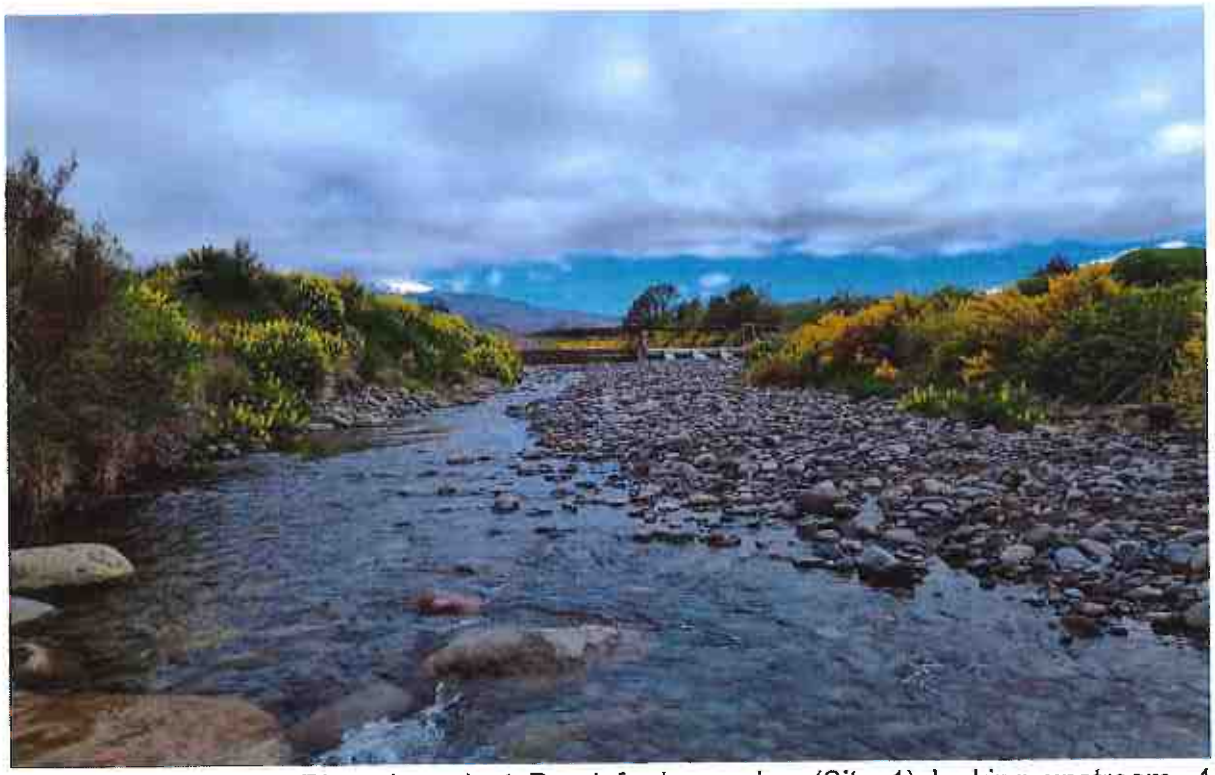

Photo 2. Wāhianoa River Aqueduct Road ford crossing (Site 1) looking upstream, 4 December 2024.

Photo 3. Wāhianoa River Aqueduct Road ford crossing (Site 1) looking downstream, 4 December 2024.

Photo 4. Wāhianoa River Aqueduct intake, 4 December 2024.

Site 2: Wāhianoa River W_2 Main Road ford crossing

No fish were seen or caught in the river section immediately downstream of the Wāhianoa River Main Road ford (Table 2). One rainbow trout was seen upstream of the ford, but not caught. This site had good water clarity, but very few macroinvertebrates were present. A brown algae covered approximately 60% of the streambed.

Table 2. Survey results for the Wāhianoa River W_2 Main Road Ford Crossing, 4 December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Fish density (per minute)
Upstream	Rainbow trout	1*	7min13s	0.14
Downstream	nil		7min12s	0.00

* seen but escaped capture

While the upstream riverbed was level with the ford (Photo 5), the downstream face of the ford dropped away steeply (Photos 6 & 7) and it was assessed that there was little prospect of upstream passage for trout during low flows.

Photo 5. Wāhianoa River Main Road ford (W_2) looking upstream, 4 December 2024.

Photo 6. Wāhianoa River Main Road ford (W_2) looking downstream, 4 December 2024.

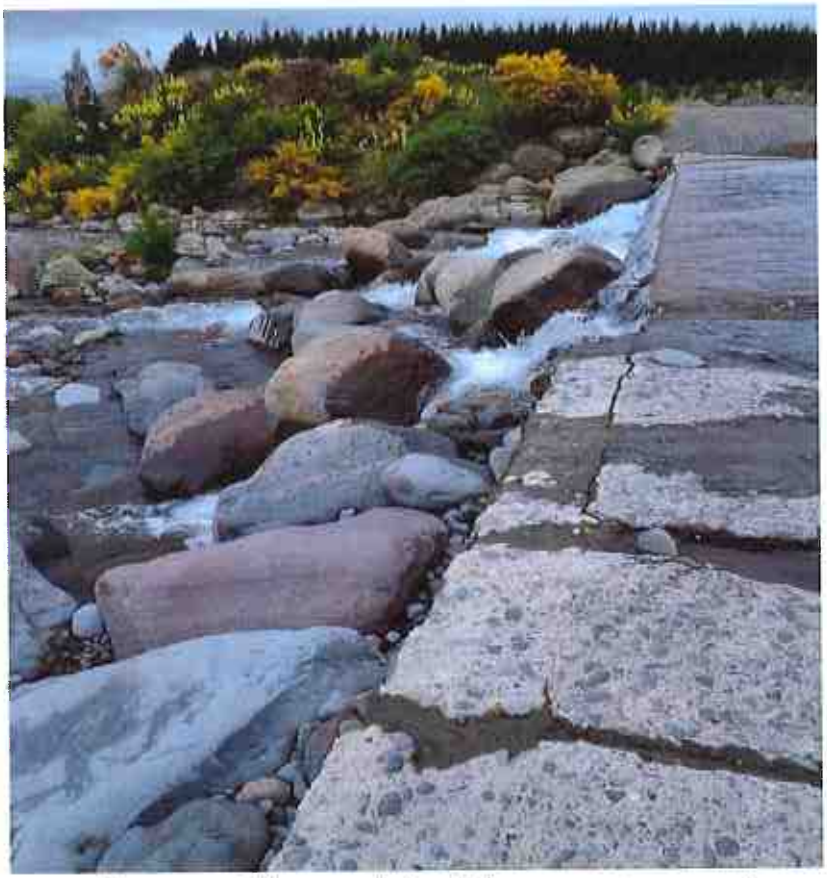

Photo 7. Wāhianoa River Main Road ford (W_2) showing downstream face, 4 December 2024.

Site 3: Wāhianoa River W_1 Whangaehu Road lower ford crossing

Three rainbow trout were caught in the river section immediately upstream of the ford, and 11 rainbow trout were caught in the downstream section (Table 3). Fish density was 0.39 fish per minute upstream and 2.06 fish per minute downstream. Fish length was 134 – 156mm upstream (mean length 145mm) and varied between 90mm and 250mm downstream (mean length 118mm;Table 3). No native fish were seen or captured. A moderately abundant, high quality, macroinvertebrate fauna was present both upstream and downstream of the ford (A. Stancliff pers obs.).

The concrete apron on the downstream face of the ford, while not ideal for fish passage, has reduced downstream bed degradation and there is potentially a pathway adjacent to the true left of the ford (Photo 9) which could be enhanced to provide for upstream fish passage.

Table 3. Survey results for the Wāhianoa River W_1 Lower Ford Crossing, 4 December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Fish density (per minute)	Size
Upstream	Rainbow trout	3	7min43s	0.39	156mm, 134mm
Downstream	Rainbow trout	11	5min20s	2.06	1x250mm 3x130-150mm 7x90mm

Photo 8. Wāhianoa River W_1 Lower Ford crossing (Site 3) looking upstream, 4 December 2024.

Photo 9. Wāhianoa River W_1 Lower Ford crossing (Site 3) looking downstream, 4 December 2024.

Photo 10. Wāhianoa River W_1 lower ford crossing (Site 3). Wellington Fish & Game's Dr Matt Kavermann with a rainbow trout caught downstream of the ford, 4 December 2024.

Site 4: Wāhianoa River unnamed tributary - Aqueduct Road intake

This Wāhianoa River unnamed tributary was sampled in its upper reaches, but downstream of where its flow is diverted into the Wāhianoa Aqueduct for the Tongariro Power Scheme's eastern diversion (Photo 11). The upstream section of this tributary was too deep to survey with an electric fishing machine and only the seepage flow immediately downstream of Aqueduct Road was fished (Photo 12). Two rainbow trout, one 90mm and another 130mm in length were captured (Photo 13). Unfortunately, the electrofishing machine time was not recorded.

Table 6. Survey results for the Wāhianoa River tributary at Aqueduct Road, 4th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Fish density (per minute)	Size
Upstream	Not fished				
Downstream	Rainbow trout	2	Not recorded		90mm, 130mm

Photo 11. Wāhianoa River tributary - Aqueduct Road intake, 4 December 2024.

Photo 12. Wāhianoa River tributary - Aqueduct Road intake, fishing the downstream seepage flow, 4 December 2024.

Photo 13. Rainbow trout caught in a Wāhianoa River tributary downstream of the Aqueduct Road intake, 4 December 2024.

DISCUSSION

Trout

Main Road Ford (W_2)

In the 4 December 2024 electric fishing survey, only one rainbow trout was observed in the Wāhianoa River immediately upstream of the Main Road ford (W_2) and none were observed or captured below. Similarly, no trout were observed further upstream at the Aqueduct Road ford.

These results indicate that there was a very low density population of rainbow trout present in the upper Wāhianoa River at the time of the survey. Information collated by Delich (2023) from NIWA freshwater fish database records (1969 – 2011) and eDNA sampling undertaken by Ernslaw One in 2021 and 2023, confirmed the ongoing presence of rainbow trout in the Wāhianoa River upstream of the Main Road ford. More recent eDNA sampling by Ernslaw One on 19th December 2024 also confirmed the presence of rainbow trout DNA upstream of the Main Road ford (Lynette Baish, Ernslaw One Ltd., pers comm).

The Wāhianoa River decends steeply downstream of the Main Road ford (Photos 6 & 7) and rainbow trout are unlikely to be able to move upstream past the ford at flows below fresh flow. Given the lack of rainbow trout found immediately downstream of the ford, results from the current survey do not provide strong evidence for upgrading fish passage prior to the consent expiring in 2029 (there is no requirement in any case). Providing a dished rock ramp along either margin downstream of the ford is an option, but given the flashy nature of floods in the catchment a concrete base would be needed to provide a lasting solution. Taranaki Fish and Game would welcome the opportunity to discuss options for providing fish passage at this ford.

The lack of pollution sensitive mayflies and stoneflies at the Main Road ford, and also upstream at the Aqueduct Road ford is unusual. Given the headwater location (880-900m), the surrounding forestry landuse and the apparent lack of anthropogenic pollution, an abundant, high quality fauna would be expected there. Possible reasons for the lack of invertebrates, such as recent de-watering or low pH water are discussed later in this report. If some environmental or chemical impact has occurred, then the current survey results for rainbow trout may not be representative of the population present there at other times of the year (e.g. autumn/winter) and more rigorous surveys encompassing the calendar cycle are recommended.

Lower Wāhianoa River Ford (W_1)

Rainbow trout were caught both upstream and downstream of the lower river ford. The density of trout below the ford (2.06 trout/min) was 5.3 times higher than that above (0.39 trout/min), which suggests there is a need to improve fish passage at this location.

Given the short length of the Wāhianoa River from the ford to the Whangaehu River confluence (c.160m) and the acidic nature of the Whangaehu River which likely limits trout migration (Delich 2023), a scenario which could explain the survey result is that trout are washed downstream over the ford in floods and are then unable to get back upstream.

There is a potential fish pathway along the true left bank of the ford that could be enhanced to improve upstream fish passage (Photo 14). This would involve sandbagging the area to temporarily isolate it from the river flow and constructing a concrete and rock channel with suitable water depths and velocities utilising the existing concrete wing-wall.

Rainbow trout upstream of the ford were 134 - 156mm in length (mean length 145mm) while those downstream were 90 – 250mm (mean length 118mm) with seven of the 11 fish measuring 90mm. Rainbow trout in open systems have the potential to grow to much larger sizes (NIWA website). However, previous studies by Oates 2018 and Delich 2023 have reported that adult trout within the Wāhianoa are stunted due to low growth rates in the cold waters, with fish seldom exceeding 220mm. A study of otoliths from trout of varying lengths would confirm if this is the case. Current evidence suggests that the population is stunted and largely land locked, carrying out its entire life cycle within the Wāhianoa River.

As well as rainbow trout DNA, brown trout DNA was also recorded in two of the three eDNA samples taken from the lower ford (both above and below) on 19th December 2024 (Lynette Baish, Ernslaw One Ltd., pers comm), which although not found in this survey, indicates that brown trout may also be present in the Wāhianoa. Further surveys would be required to confrim their presence and distribution.

The presence of a moderately abundant high-quality macroinvertebrate fauna upstream and downstream of the lower ford indicates good preceding water quality and that the effects seen in the headwaters are not present in the lower river, where there is dilution and augmentation of the mainstem flow by tributary streams.

The two rainbow trout found in a small seepage pool in an unnamed tributary downstream of the Aqueduct Road intake indicates that rainbow trout are widespread in tributaries of the Wāhianoa on either side of Wāhianoa Road and they could potentially help to replenish the mainstem population following adverse events (e.g. Ruapehu lahars). It also indicates that where there are no in-stream impediments to fish passage, trout will migrate throughout the catchment.

Photo 14. Potential fish passage pathway (in blue) that could be enhanced to provide for upstream fish passage at low flow.

Native fish

In this survey, no native fish were seen or caught at any of the sites in the Wāhianoa River catchment, including sections immediately upstream and downstream of the Main Road ford (W_2) and the Lower Wāhianoa River ford (W_1).

The results of eDNA samples taken upstream and downstream of both fords on 19th December 2024, some two weeks after the current survey, also did not indicate the presence of native fish (Lynette Baish, Ernslaw One Ltd., pers comm).

An absence of native fish in the catchment is consistent with a review of earlier information by Delich (2023), who found that NIWA freshwater fish database records, and eDNA sampling in 2021 and 2023 recorded only rainbow trout (*Oncorhynchus mykiss*) and kōura (*Paranephrops planifrons*) as being present. Kōura are rare, having been recorded from the catchment only twice.

The December 2024 electric fishing survey and eDNA investigations therefore indicate that in accordance with Condition 8 of Consent ATH-2019203145.01 there is no requirement to install modifications to provide for fish passage at the main road and lower river fords within the next twelve months.

Factors affecting macroinvertebrates in the upper Wāhianoa River

The apparent absence of pollution sensitive mayflies and stoneflies at the two upstream sites on the Wāhianoa River mainstem (Sites 1 & 2, Aqueduct Road and Main Road W2 fords) on 4 December 2024 was unexpected, but could be due to the effects of low pH water arising from snow-melt or the crater lake (Te Wai-ā-Moe). Unfortunately, this is unconfirmed as no pH measurements were taken during the survey.

Another possiblilty is that the section of the Wāhianoa River downstream of Genesis Energy's eastern diversion intake was temporarily and recently dewatered. Electric fishing a section of the Wāhianoa River upstream of the eastern diversion intake would have provided more information on this (i.e. if macroinvertebrates were present upstream then the downstream impact would likely be flow-related).

However, Genesis Energy's 2023/24 Tongariro Power Scheme resource consent compliance report (Genesis, 2024) states that while there are no consented minimum flow requirements downstream of the Wāhianoa Aqueduct intakes, Genesis has worked with Ngāti Rangi to establish connective flows on the four main waterways, including the Wāhianoa River. Further information provided by Genesis indicates that the downstream flow is now always over 120 l/s or the natural flow, which can be less than 80 l/s (Holly Molesworth, pers. com). The absence of EPT macroinvertebrates at the Aqueduct Road and Main Road ford sites is therefore unlikely to be flow-related.

Monitoring by the Ngā Waihua o Paerangi Trust (Hannah Rainforth, pers. com) has found that the Wāhianoa River is usually very low in macroinvertebrate numbers both upstream and downstream of the aqueduct intake until the tributary streams start coming in. The Trust had planned to do invertebrate surveys there for the past year, "but each time we checked there were never enough invertebrates present to warrant the lab processing costs".

The Wāhianoa River has its source high on the slopes of Mount Ruapehu and is partially glacier-fed (Genesis (2000) cited in Oates (2018)). In between eruptions, it's possible that the river may receive acidic water from the crater lake, the headwaters of the Whangaehu River, or from glacial snow melt, although the exact mechanism and extent is unclear.

There appears to be relatively little pH information available for the Wāhianoa River. Rowe, *et al.* (1989) reported in a presentation to the NZ Concrete Society Conference on the repair of the Wāhianoa aqueduct that the acidity of the Wāhianoa River was monitored for two years between 1976 and 1978, and at that time the pH varied between 4 and 7. Oates (2018) recorded a pH of 5 – 5.5 at the Wāhianoa Main Road and Whangaehu Road fords (W_2 & W_1) in spring 2018. The same pH was also recorded in the upper reaches of the Tokiahuru and Mākahikatoa streams, suggesting that many of the streams running through Karioi Forest may be naturally acidic.

O'Halloran, et al. (2008) investigated the response of NZ *Deleatidium* mayfly to acid mine drainage (AMD) and found that mayflies sourced from three naturally acidic streams (pH 5.7–6.5) had a distinctly higher tolerance to AMD and low pH (3.5–4.0) compared to

mayflies sourced from three circumneutral streams (pH 7.0–7.4). Their study found that mayflies from naturally acidic streams showed high survival to 96hrs in water of pH 4.

Winterbourn and Collier (1987), in their study of benthic invertebrates in acid, brown water streams in the South Island of NZ observed that "taxonomic richness was not correlated with pH and similar numbers of ephemeropteran, plecopteran and trichopteran (EPT) taxa were taken from acidobiontic (pH less than or equal to 5.5), acidophilic (pH 5.6-6.9) and moderately alkaline (pH more than or equal to 7.0) groups of streams. Many species occurred over a wide pH range and had a lower limit of about pH 4.5."

This suggests that the Wāhianoa River would need to get down to an acidity of at least pH 4 – 4.5 for an extended period to eliminate EPT taxa to the extent observed in this survey.

Genesis Energy monitors the pH of the discharge of the Wāhianoa aqueduct into Mangaio Stream at Gate 51, as their resource consents require that the discharge must cease if the pH is less than 5 (Genesis, 2024). In 2023/24, the pH was mostly around 6.5 (Appendix 1), but there was a period in April 2024 where pH dropped towards 5. Given that the Gate 51 flow includes the combined flow from 21 of the eastern diversion's 22 intakes, at that time the pH in the Wāhianoa River could have been much lower than 5.

The effect of low pH on trout

Trout appear less tolerant to low pH than EPT macroinvertebrate taxa. Raleigh et al. (1986) suggest the tolerable range of pH for brown trout is 5.0 to 9.5, with an optimal range of 6.7 to 7.8.

Molony (2001) reviewed the environmental tolerances of rainbow and brown trout and concluded that survival of trout is possible at pH values below 5.0. However, it appears that tolerance to low pH is not well developed in the early life stages (e.g. egg or fry stage). For example, Thomsen et al. (1988) concluded that low pH (pH: 4.5 - 5.5) resulted in low hatching success of rainbow trout eggs, while Daye (1980) recorded no survival of embryos and alevins of rainbow trout in waters of pH 4.3 and below. Similarly, Barlaup et al. (1996) recorded survivorship of less than 1.0 % of brown trout embryos in waters with pH 4.0-4.8.

Likewise, Weiner et al. (1986) studied the effects of low pH on the reproduction of rainbow trout. Among the progeny of unexposed adults, survival through 7d of development and hatching was lower during rearing at pH 4.5, 5.0, or 5.5 than at pH 6.5–7.1. No eggs exposed to pH 4.5 survived to the eyed stage. They concluded that reproduction of rainbow trout is likely to be adversely affected by environmental acidification to pH values below 5.5.

The possibility that low pH may adversely affect fish and macroinvertebrate populations in the Wāhianoa River (excluding periods affected by volcanic eruptions) is not specifically mentioned in studies of the catchment undertaken to date. Delich (2023) states that the rainbow trout population is limited by multiple factors, but low pH in the Wāhianoa itself was not one of them. Oates (2018, citing Genesis, 2000) states that "late summer snow melt causes spillage from the Crater Lake to descend through the Whangaehu River,

lowering the pH to levels un-inhabitable to macro-invertebrates" and that "water quality (in the Whangaehu) improves significantly with distance down stream as a result of tributary inputs with lower soluble salt concentrations and higher pH values". However, Oates doesn't refer to low pH being an issue in the Wāhianoa River itself.

Further investigation of pH conditions in the Wāhianoa River and the potential for adverse effects on rainbow trout and macroinvertebrate populations is therefore warranted.

ACKNOWLEDGMENTS

Our thanks to Lynette Baish, Environmental Planner Ernslaw One Limited, and Keith Wood, Senior Forester (Karioi), for forest access, help and advice. Also to Joseph McLeod, Pouro and Komaihana from Ngā Waihua o Paerangi Trust for their local knowledge and help with the survey.

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APPENDIX 1

From: Genesis Energy Ltd. 2024. Tongariro Power Scheme Resource Consent Compliance Report 1 July 2023 – 30 June 2024. Appendix A. Annual Hydrology Report, p9 - showing a significant decline in pH in the Mangaio Tunnel in April 2024.

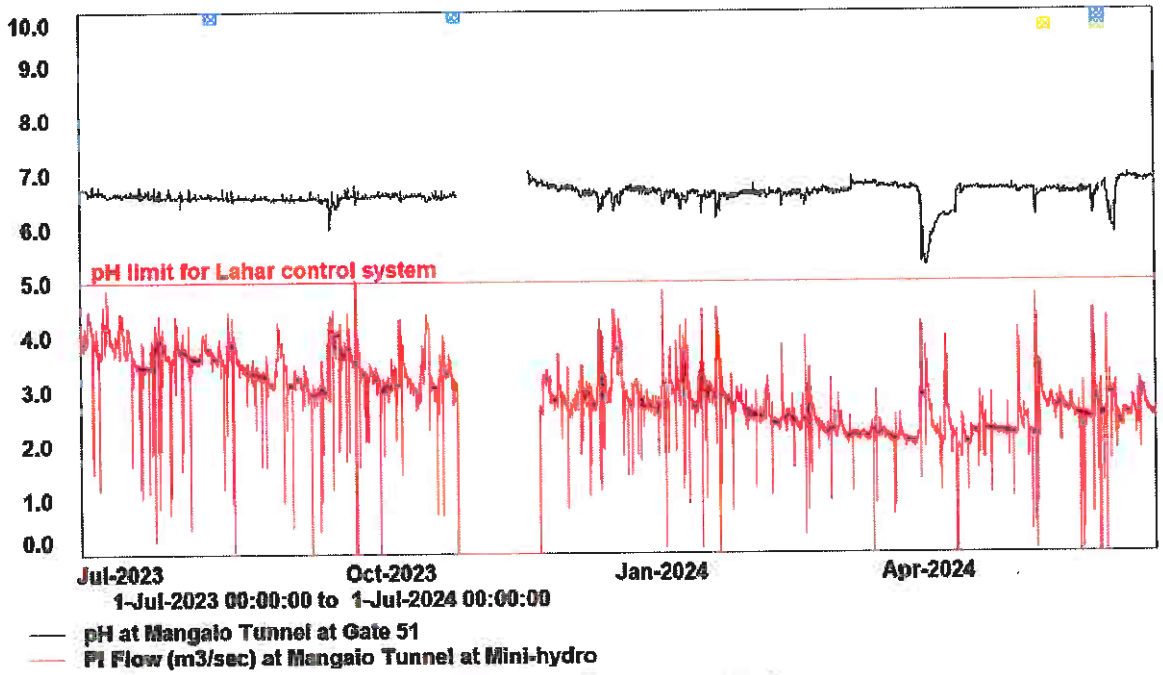

Figure 4.2 - Wahianoa Aqueduct annual hydrograph with Gate 51 pH.

Electrofishing survey of Mākahikatoa and Tokiāhuru streams in Karioi Forest 4 - 5 December 2024

Report prepared by

Taranaki Fish and Game Council

September 2025

Photo: Te Unuunuakapua te Ariki Stream upstream from the Otahatekapua Road crossing in Karioi Forest.

Reviewed by:

Allen Stancliff

Approved for release by:

Phil Teal

CONTENTS

SUMMARY AND RECOMMENDATIONS

In conjunction with an electric fishing survey of sites in the Wāhianoa River catchment within Karioi Forest for Ernslaw One Limited, Taranaki and Wellington Fish & Game staff and volunteers from the Ngā Waihua o Paerangi Trust (Ngāti Rangi) also electro-fished nine sites in the adjacent Tokiāhuru Stream catchment and one site in Mākahikātoa Stream on 4th and 5th December 2024.

Rainbow trout were found at all sites fished and at a higher average density than that found in other rivers and streams surveyed to date by Taranaki Fish & Game. Brown trout were also found at two sites.

The presence of newly emerged trout fry in the Te Unuunuakapua Te Ariki Stream tributary and at three other sites in the Tokiāhuru catchment confirms there had been successful spawning over winter / spring 2024. Most of the larger trout caught were small (80 – 180mm in length), with just one fish of 280 mm. This is in line with the conclusions of earlier studies that these headwater populations consist of stunted resident trout. However it's likely that juvenile trout moving downstream to the main angling waters of Tokiāhuru Stream will grow normally and these headwater areas may well be important sources of recruitment to the downstream fishery.

A tributary of Tokiāhuru Stream running through a recently harvested pine block had good numbers of rainbow and brown trout, but little shading, increased streambed periphyton growth and a sparse, poor-quality macroinvertebrate fauna. Replanting with a greater setback from the stream to allow restoration of riparian vegetation along the margins is recommended. This tributary also has most of its flow diverted into the Wāhianoa Aqueduct and liaison with Genesis Energy about increasing the permanent flow downstream of the intake is also recommended.

Further downstream at Terrace Road, this same tributary has a perched concrete ford which presents a significant barrier to upstream fish passage and it is recommended that concrete and rock ramps are installed on each side of the stream at this site, or ideally a full-width rock ramp fish pass.

Five adult eels (tuna) were observed in a low gradient section of the Te Unuunuakapua te Ariki Stream tributary and these fish must have migrated from the sea as elvers via the Whangaehu River to reach Tokiāhuru Stream during a period when rainfall or other factors reduced the acidity of the Wangaehu to levels that allowed upstream migration. A single common bully wascaught in Mākahikātoa Stream, but this species can form landlocked populations and is not reliant on access to and from the sea. Two koura were caught in Te Unuunuakapua te Ariki Stream, but not at any other site.

Sites further downstream in the Tokiāhuru Stream catchment, including Waitaiki Stream and Mangaehuehu Stream are scheduled for survey in December 2025.

INTRODUCTION

In conjunction with an electrofishing survey of four sites in the Wāhianoa River catchment in Karioi Forest for Ernslaw One Limited, one site in the adjacent Mākahikatoa Stream catchment and nine sites in the Tokiāhuru Stream catchment were also electric fished (Figure 1) on 4th and 5th December 2024.

Mākahikatoa Stream rises high on the south-eastern slopes of Mt. Ruapehu and joins the Whangaehu River upstream from the Wāhianoa River confluence (Figures 1 & 2). The larger, Tokiāhuru Stream catchment is located immediately west of the Wāhianoa River and has a number of tributary streams within Karioi Forest, including Te Unuunuakapua Te Ariki Stream (Figure 1).

Karioi Forest is a production plantation forest of approximately 11,000ha (Oates 2018) situated on the south-eastern slopes of Mount Ruapehu, an active volcano in the central North Island of New Zealand (Figure 2). Numerous small streams, including spring-fed, ephemeral, and glacial melt driven, drain the slopes of the mountain and flow through Karioi Forest. Most of these streams are secondary or tertiary tributaries of the Whangaehu River, which flows from the volcano's crater-lake and is acidic in nature (Figure 2).

Twenty-two of these streams are diverted for hydro-power generation. Water is diverted via a series of intakes into the underground Mangaio tunnel, and flows eastward to Lake Moawhango. The series of intake structures is known as the Wahianoa Aqueduct, and forms part of the Eastern Diversion of the Tongariro hydroelectric power scheme, operated by Genesis Energy.

METHODS

Two teams comprising Taranaki and Wellington Fish & Game staff and Ngā Waihua o Paerangi Trust volunteers fished using Smith-Root LR-24 Electrofisher machines. At sites 1, 3 and 8, one team surveyed a river section immediately upstream of a ford or road culvert, while the other team fished the reach immediately downstream. Other sites were fished by one of other of the teams.

The electric field created by the electrofishing machine causes fish to be stunned and drift with the water flow into a stop net or hand net, or to be forced to swim towards a hand-held anode. The voltage, pulse-width and frequency of each electrofisher was set at 400 volts, 60Hz and 25% respectively.

Attempts were made to capture all fish seen, with captured fish held in a plastic bucket and then carefully identified, measured and released. The electrofishing machine time was recorded in minutes and the density of fish caught expressed as "fish per minute of machine time".

The machine operator held a dip net and a hand-held anode pole and used a single pass presence / absence assessment methodology to fish downstream towards a stop net and/or a hand net held by a second observer. Each team targeted likely trout habitat within the river, other than where the water was too deep or swift for safe, effective fishing.

The electric field also causes pollution sensitive, behaviourally drifting mayflies and stoneflies to let go of the substrate and drift into the downstream stop net with the water flow. The number and species composition of macroinvertebrates caught in the stop net gives a good indication of the quality and abundance of the invertebrate fauna at the site fished. However this was not thoroughly examined during the trout surveys.

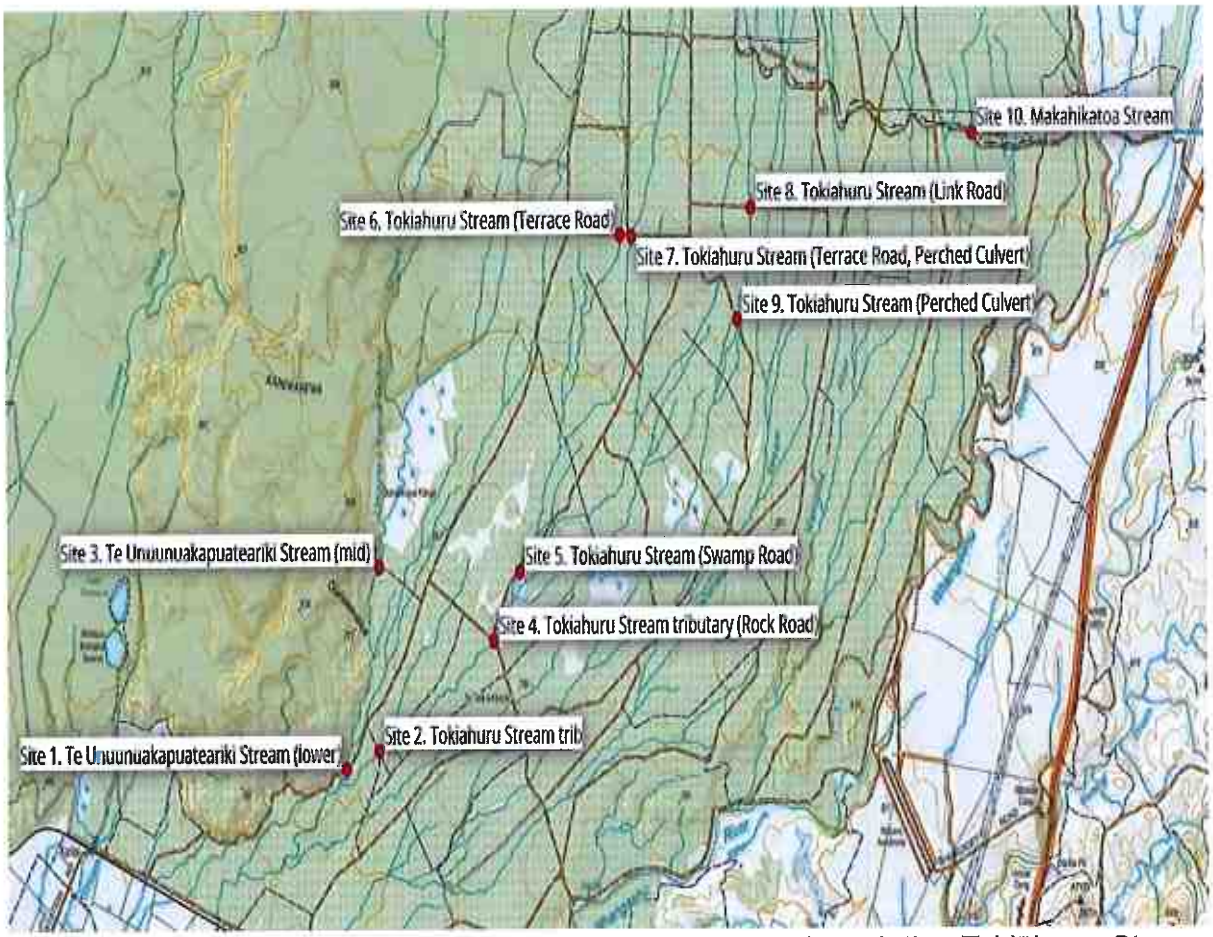

Figure 1. Survey sites in Mākahikatoa Stream (Site 10) and the Tokiāhuru Stream catchment (Sites 1 – 9) within Karioi Forest, that were electrofished on 4th and 5th December 2024.

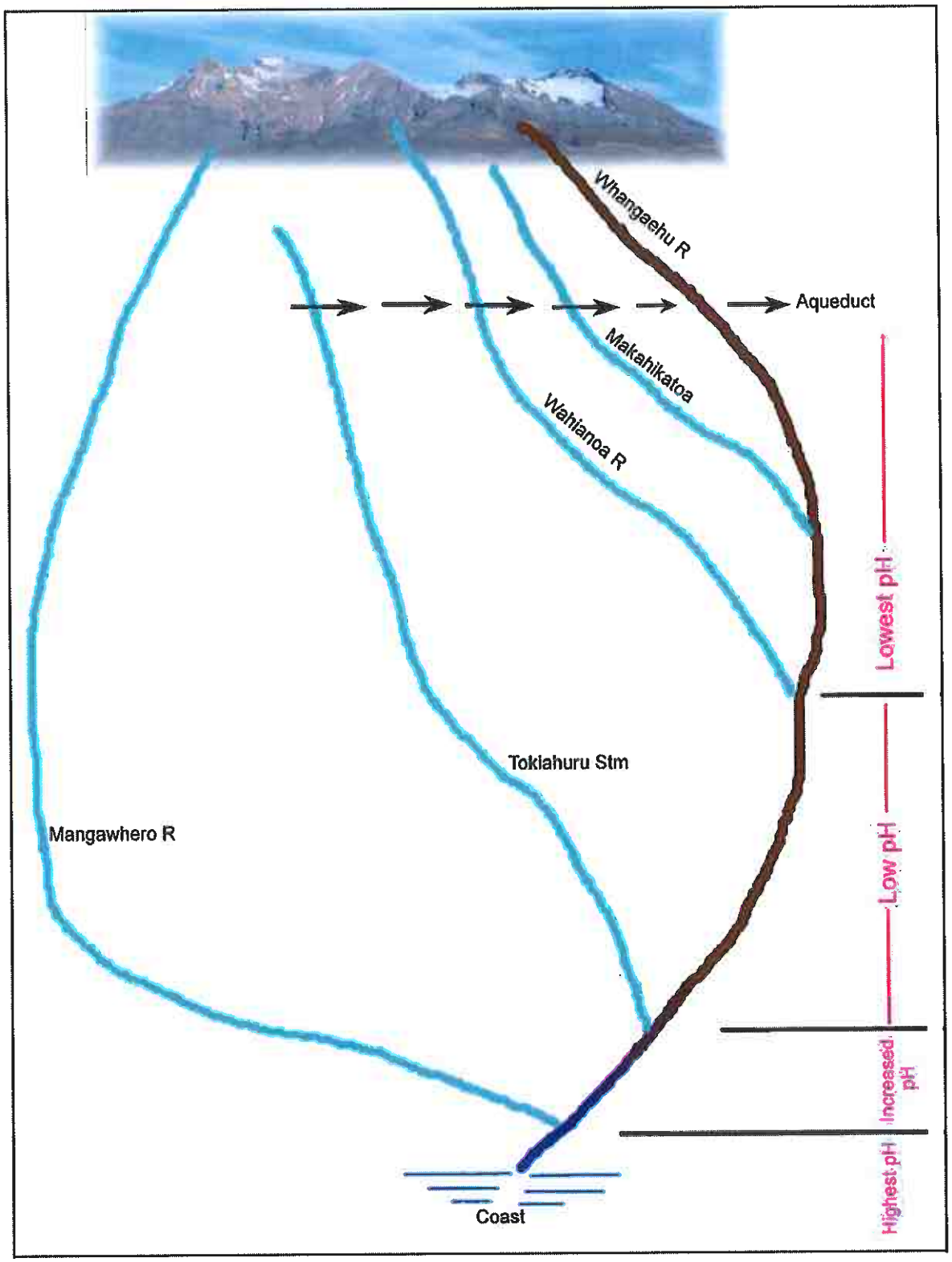

Figure 2. Schematic diagram of the Whangaehu River catchment showing tributary inputs and pH levels increasing in the Whangaehu River with distance downstream (from Oates, (2018).

RESULTS

Mākahikatoa Stream at Aqueduct Road (Site 10)

This site (Site 10, Figure 1) was located immediately downstream of an aqueduct intake diverting water for the eastern diversion of the Tongariro hydro-electric power scheme and the Aqueduct Road ford (Photos 1&2). Mākahikātoa Stream upstream from the intake was too deep to electric fish and was not sampled. A residual flow for the downstream reach was provided by a valve in the aqueduct intake (Photo 1).

Seven rainbow trout between 80mm and 130mm were caught (Table 1) indicating that, like the adjacent Wāhianoa River, a stunted self-sustaining population of rainbow trout exists in Mākahikatoa Stream. A single common bully was also caught. This species can form landlocked populations and is not reliant on access to and from the sea.

Photos 1 and 2 below, show the Mākahikatoa Eastern Diversion intake with the downstream residual flow and the Aqueduct Road ford. While some rainbow trout may be able to move downstream of the intake (i.e. those that aren't entrained into the Eastern Diversion), there is little possibility of trout moving upstream.

Table 1. Survey results for the Mākahikatoa Stream Aqueduct Road intake (, 4th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Not fished				
Downstream	Rainbow trout	7	Not recorded		80-130mm
	Common bully	1			

Photo 1. Tongariro HEPS Eastern Diversion structure on Mākahikatoa Stream showing downstream residual flow, 4th December 2024.

Photo 2. Wellington F&G staff Hamish Carnachan and Matt Kavermann electric fishing Mākahikatoa Stream downstream of the eastern diversion and the Aqueduct Road ford in Karioi Forest, 4th December 2024.

Tokiāhuru Stream catchment

Te Unuunuakapua te Ariki Stream (lower) – Site 1 Ninias Ford

An abundant population of rainbow trout, ranging from newly emerged fry 25mm in length to 150mm fish, was found at this site (Table 2). Five adult eel (tuna) were also found in the section upstream of the ford, along with one koura. A sparse but high-quality invertebrate fauna was present.

Table 2. Survey results for Te Unuunuakapua te Ariki Stream at Ninias Ford (Site 1), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	13	5min10s	2.52	25mm – 75mm; 1x130mm
	Eel (tuna)	5		0.97	
	Koura	1		0.19	25mm
Downstream	Rainbow trout	22	6min50s	3.22	25mm – 75mm; 1x150mm

Photo 3: Te Unuunuakapua te Ariki Stream at Ninias Ford (Site 1) looking upstream to where adult eel were found in the stream under bank vegetation, 5th December 2024.

Photo 4: Te Unuunuakapua te Ariki Stream at Ninias Ford looking downstream, 5th December 2024.

Photo 5: A rainbow trout caught in Te Unuunuakapua te Ariki Stream at Ninias Ford, 5th December 2024.

Tokiāhuru Stream (wooden bridge) – Site 2

This site had a swift flow and was only fished by one team. Four rainbow trout in the 30mm – 80mm range (Table 3) were caught. Unfortunately, no photo was taken of this site

Table 3. Survey results for Tokiāhuru Stream (wooden bridge upstream from Te Unuunuakapua te Ariki Stream confluence) Site 2, 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	4	1min47s	2.24	2 x 30mm 2 x 80mm

Te Unuunuakapua te Ariki Stream (middle reaches off Otahatekapua Road) - Site 3

Te Unuunuakapua te Ariki Stream was electric fished upstream and downstream of a ford on Otahatekapua Road (Figure 1). Newly emerged rainbow trout fry were abundant, along with fingerlings in a range of sizes (80 – 160mm, Photo 8) and a larger 280mm fish (Table 4). Water quality was excellent, and a high-quality macroinvertebrate fauna was present. Unfortunately, the shock-time was not recorded by the team fishing upstream of the ford (Table 4).

Table 4. Survey results for Te Unuunuakapua te Ariki Stream middle reaches off Otahatekapua Road (Site 3), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	26	Not recorded		14 fry, 12 fingerlings
	Koura	1			
Downstream	Rainbow trout	57	3min30s	16.29	50 x 25mm, 3 x 80mm, 2 x 120mm, 1 x 160mm, 1 x 280mm

Photo 6: Te Unuunuakapua te Ariki Stream at Otahatekapua Road crossing (Site 3) upstream site, 5th December 2024, showing deep pool habitat at the top of the reach.

Photo 7: Te Unuunuakapua te Ariki Stream at Otahatekapua Road crossing (Site 3) downstream site, 5th December 2024.

Photo 8: Rainbow trout fry, fingerlings and koura caught in the Te Unuunuakapua te Ariki Stream middle reaches at the Otahatekapua Road crossing site (Site 3), 5th December 2025.

Tokiāhuru Stream tributary upstream of Rock Road (Site 4)

A small tributary of Tokiāhuru Stream upstream of Rock Road (Site 4, Figure 1) was electric fished. Good numbers of rainbow trout fry were found, along with larger fish in the 50 – 100mm range (Table 5). Three 115 -120mm brown trout were also caught (Table 5, Photo 10). A moderate density, high-quality invertebrate fauna was present. However, there was a significant amount of streambed algae present, indicating that nutrient enrichment was occurring.

Table 5. Survey results for a Tokiāhuru Stream tributary upstream of Rock Road (Site 4), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	24	2min46s	8.67	15 x 30mm 6 x 50-80mm 2 x 100mm 1 x 100mm
	Brown trout	3		1.08	115mm, 120mm

Photo 10: Brown trout caught in the Tokiāhuru Stream tributary upstream of Rock Road (Site 4), 5th December 2024.

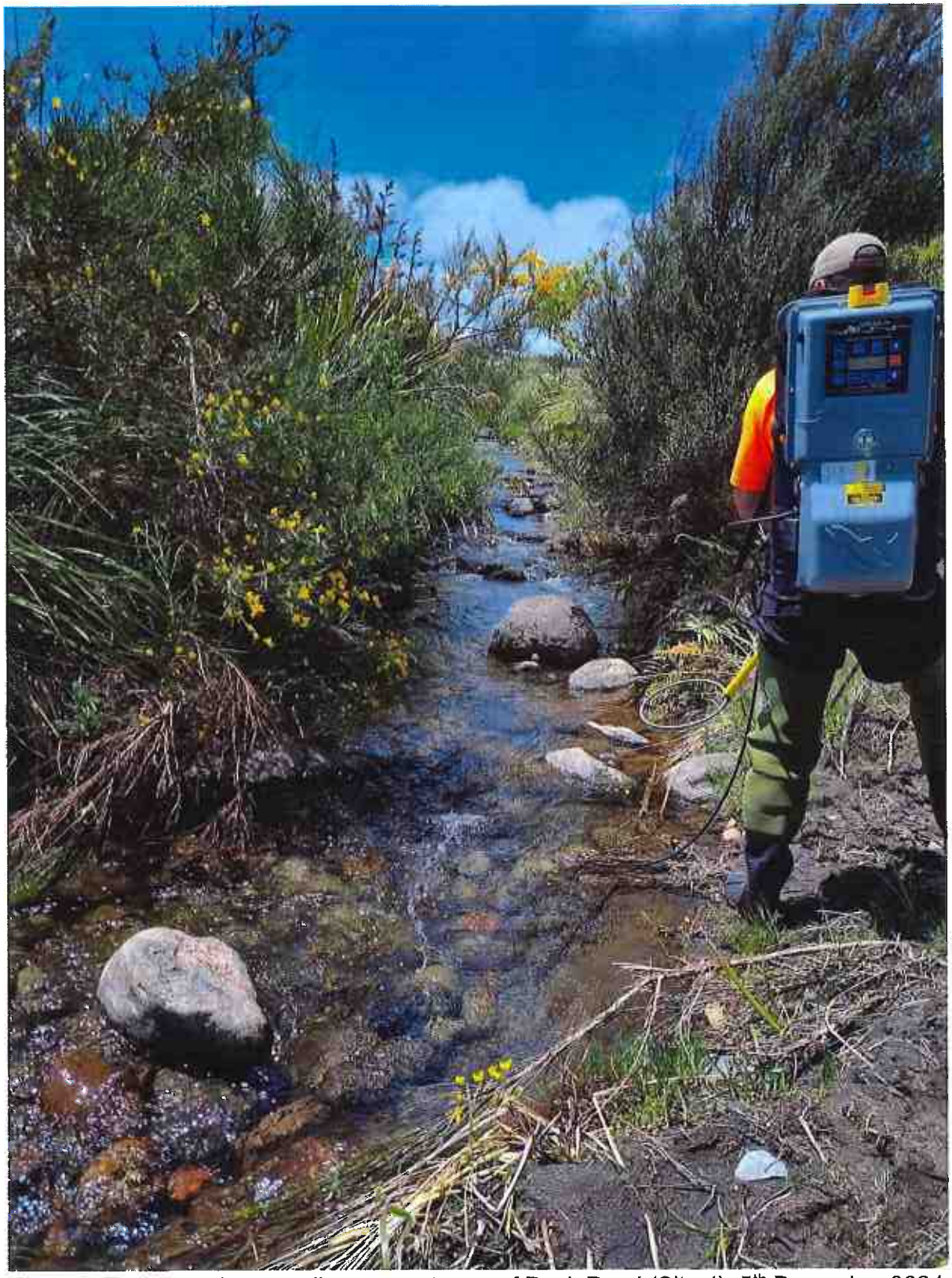

Photo 9: Tokiahuru Stream tributary upstream of Rock Road (Site 4), 5th December 2024.

Tokiāhuru Stream mainstem off Swamp Road (Site 5)

The Tokiāhuru mainstem off Swamp Road (Site 5, Figure 1) had a deep, swift flow and dense riparian vegetation that made electric fishing difficult. A single 100mm rainbow trout was caught. Unfortunatley, no photo was taken of this site.

Table 6. Survey results for the Tokiāhuru Stream mainstem off Swamp Road (Site 5), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	1	1min2s	0.97	100mm

Tokiāhuru Stream tributary downstream of Terrace Road (Site 6)

Two rainbow trout were caught in a small tributary off Terrace Road (Table 7, Photo 11). Unfortunately the shock time was not recorded for this site.

Table 7. Survey results for a small Tokiāhuru Stream tributary off Terrace Road (Site 6), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Downstream	Rainbow trout	2	Not recorded		75mm

Photo 11. Electric fishing a small tributary of Tokiāhuru Stream (Site 6), 5th December 2024.

Tokiāhuru Stream tributary downstream of Terrace Road (Site 7)

Fifteen rainbow trout between 80mm and 180mm were seen or caught in a section of a Tokiāhuru Stream tributary downstream of a perched culvert at Terrace Road within Karioi Forest (Table 8, Photo 12). Unfortunately the shock time was not recorded at this site.

Table 8. Survey results for small Tokiahuru Stream tributary off Terrace Road (Site 7), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Downstream	Rainbow trout	15	Not recorded		5 x 80mm 1 x 120mm 1 x 140mm 3 x 180mm 5 missed

Photo 12: Fishing up to a perched culvert in a Tokiāhuru Stream tributary downstream of Terrace Road (Site 7), 5th December 2024.

Tokiāhuru Stream tributary at Link Road box culvert (Site 8)

A Tokiāhuru Stream tributary was electric fished both upstream and downstream of a newly contructed box culvert on Link Road within Karioi Forest (Figure 1, Photos 13-15).

The stream ran through an area of recently harvested pine forest. It was very open with little mature riparian vegetation, lots of streambed algae present and a sparse poo-quality macroinvertebrate fauna. However, an abundant population of both rainbow and brown trout was found (Table 9, Photo 16), with trout ranging in size from 28mm fry up to 180mm fish that could've been adults.

Table 9. Survey results for the Tokiāhuru Stream at the Link Road box culvert (Site 8), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width).

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	15	7min27s	2.01	Ave 117mm (n=15) 80-180mm
	Brown trout	13		1.74	Ave 120mm (n=13) 80-180mm
	Unid trout	12		1.61	
	Total density			**5.36**	
Downstream	Rainbow trout	14	2min42s	5.19	Ave 82.8mm (n=14) 28-150mm
	Brown trout	2		0.74	Ave 107.5mm (n=2) 105 - 110mm
	Unid trout	4		1.48	
	Total density			**7.41**	

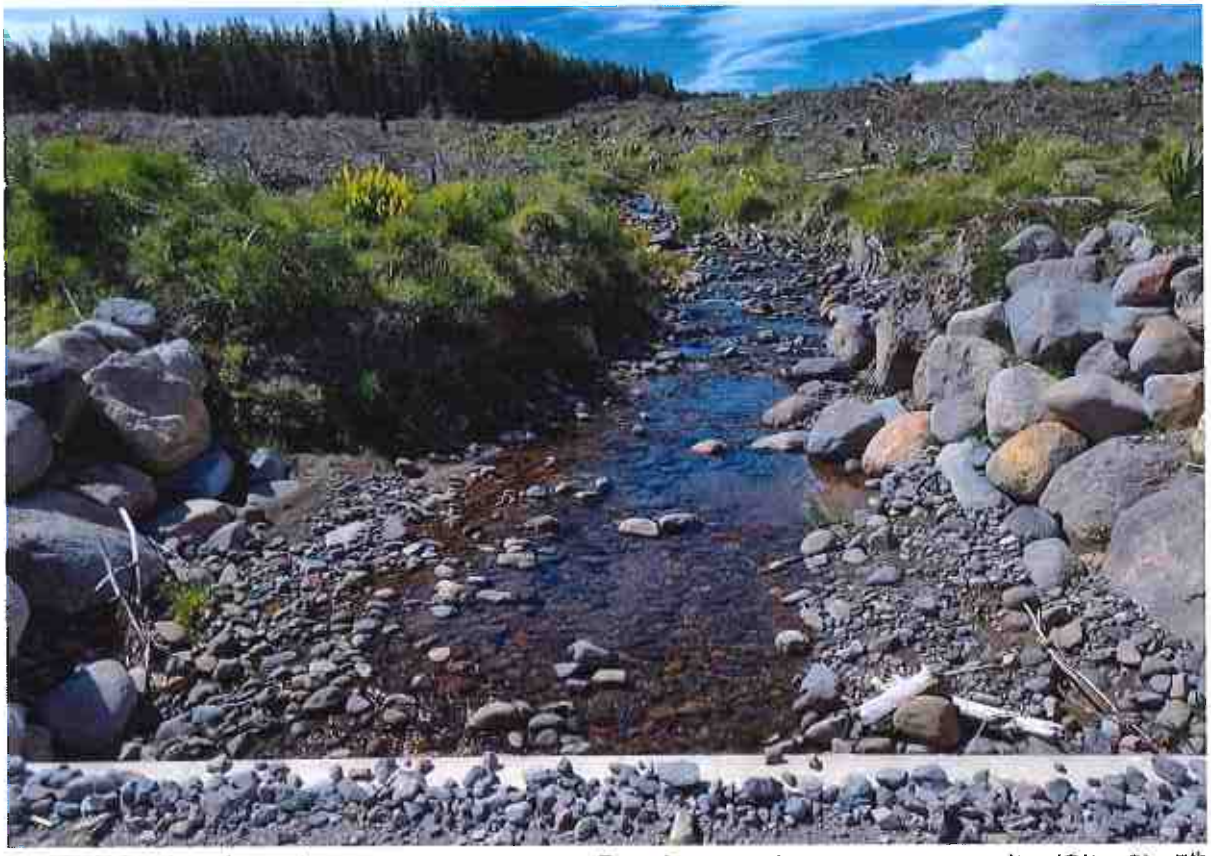

Photo 13: Tokiahuru Stream tributary Link Road box culvert, upstream site (Site 8), 5th December 2024.

Photo 14: Tokiāhuru Stream tributary Link Road box culvert, downstream site (Site 8), 5th December 2024.

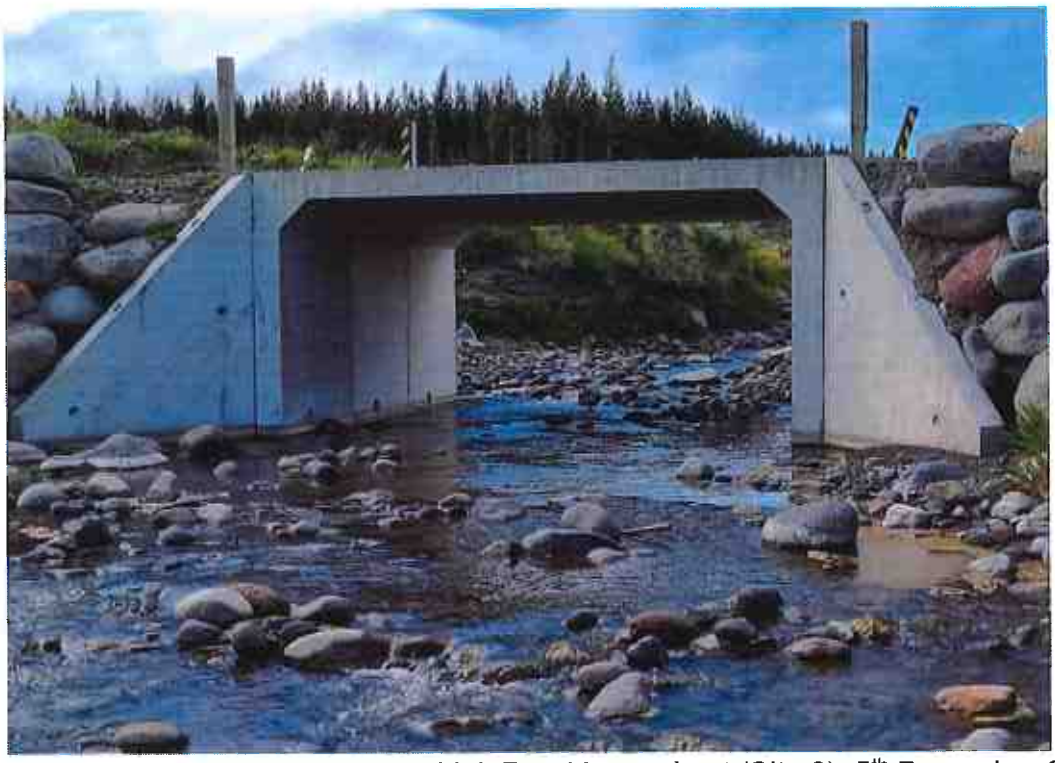

Photo 15: Tokiahuru Stream tributary Link Road box culvert (Site 8), 5th December 2024.

Photo 16: Rainbow trout (top) and brown trout (bottom) from the Link Road box culvert site (Site 8) in a Tokiāhuru Stream tributary.

Tokiāhuru Stream tributary at Terrace Road ford (Site 9)

The same tributary that was sampled at Site 8 was electric fished further downstream at a concrete ford on Terrace Road (Site 9, Figure 1). Rainbow trout were found both upstream and downstream of the ford (Table 10, Photos 17 & 18). However, the ford was perched at its downstream face (Photo 18) and presented a significant barrier to the upstream movement of trout except perhaps during flood flows.

Table 10. Survey results for Tokiāhuru Stream at Terrace Road ford (Site 9), 5th December 2024 (machine setting: 400 volts, 60pps, 25% pulse width). Shock time not recorded.

Location	Species	Number	Shock time	Density (per minute)	Size
Upstream	Rainbow trout	2	Not recorded		
Downstream	Rainbow trout	2	Not recorded		

Photo 17: Tokiahuru Stream tributary at the Terrace Road ford, (downstream Site 9), 5th December 2024.

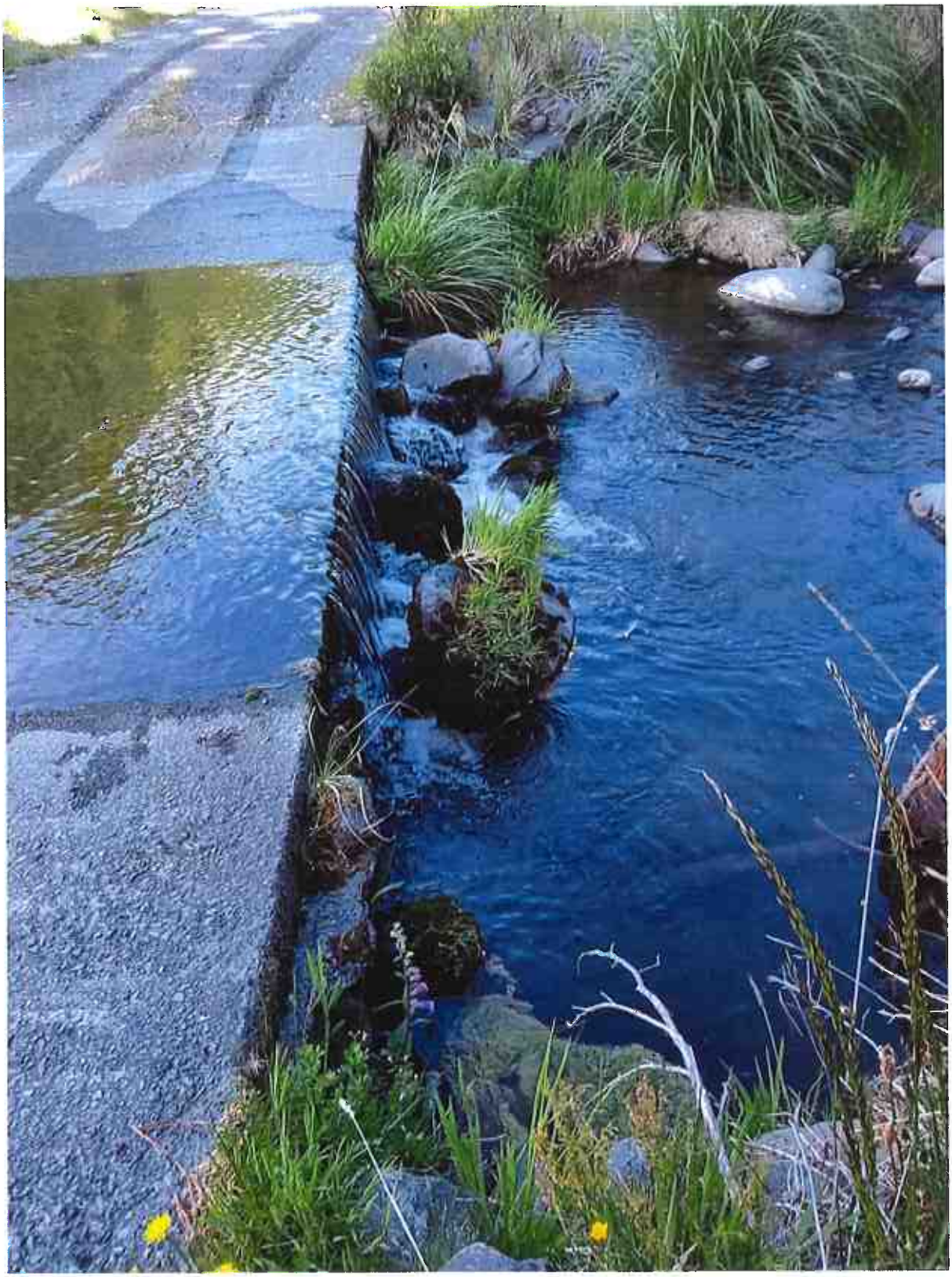

Photo 18: Tokiahuru Stream tributary at the Terrace Road ford (Site 9), showing the barrier to upstream fish passage, 5th December 2024.

DISCUSSION

Rainbow trout were present at every site surveyed in the Tokiāhuru Stream catchment and also at the site in Mākahikatoa Stream (Table 11). Rainbows were even present in very small streams that had nearly all their flow diverted into the Wāhianoa Aqueduct. Brown trout were found in two Tokiāhuru Stream tributaries (Rock Road and Link Road, Sites 4 and 8, Table 11), with highest densities at Link Road. The average trout density at sites where shock time was recorded was 5.97 fish per minute (Table 11) which is much higher than that found in other catchments surveyed to date by Taranaki Fish & Game (Table 12).

Newly emerged trout fry (25-30mm) were abundant at sites 1 & 3 in Te Unuunuakapua te Ariki Stream, indicating that this stream provides important trout spawning and juvenile rearing habitat. Te Unuunuakapua te Ariki Stream runs through bush within Tongariro National Park prior to entering Karioi Forest. It has excellent water quality, thin perphyton films, a high-quality macroinvertebrate fauna and is a relatively low gradient stream in the area sampled, with a stony bed suitable for trout spawning and deep pool habitat for large trout. The stream also has good riparian vegetation within Karioi Forest, which helps protect these values.

Trout fry were also found at Sites 2, 4 and 8 in Tokiāhuru Stream, indicating that recruitment is widespread in the catchment and that there had been successful spawning over winter / spring 2024.

Most of the larger trout caught in the survey were 80 – 180mm in length, with just one fish of 280mm caught. Kingett Mitchell (1999, cited in Oates 2018), in studies associated with the assessment of environmental effects for reconsenting of the Tongariro Power Scheme considered that trout in the Tokiāhuru catchment downstream of the Wāhianoa Aqueduct would carry out their entire life cycle in these streams with no input from adults migrating upstream. They also considered that these fish were stunted and likely to be much older than their lengths indicated. Oates (2018) also references a survey of the Tokiāhuru by the Cawthron Institute which concluded that small trout in the stream were in fact adult fish, considered stunted with low growth rates due to colder water temperatures. Oates (2018) carried out a spotlighting and trapping survey of streams in Karioi Forest and also found a trout population dominated by small fish, with only one of 45 trout caught being larger than 221mm.

While examination of otoliths will be necessary to confirm the age of larger trout in the current study, the fact that most larger fish were small (80 – 180 mm) with the largest fish just 280 mm, is in line with the conclusions of earlier studies that these headwater populations consist of stunted resident trout.

However, as occurs with the stunted rainbow trout population in Ahukawakawa Swamp in the headwaters of the Hangatahua (Stony) River on Taranaki Maunga, it's likely that juvenile trout moving downstream to the main angling waters of Tokiāhuru Stream will grow normally and these headwater areas are likely to be important sources of recruitment for the downstream fishery.

Conversely, provided there are no downstream barriers, there is nothing to prevent large adult trout present in the lower Tokiāhuru Stream from moving upstream to the headwaters to spawn, with Te Unuunuakapua te Ariki Stream likely to be a prime location.

While a significant population of both brown and rainbow trout was present at the Link Road box culvert survey section (Site 8), this site highlights the effects of forest harvest on streams where there is little or no protective riparian vegetation. Harvesting opens up the stream to all day sun (Photos 13 & 14) and, along with an increase in sedimentation and nutrient enrichment, this results in the observed increase in periphyton growth and reduction in the abundance and quality of the macroinvertebrate fauna.

Water temperatures are also likely to fluctuate over a larger range than previously, with potentially damaging high temperatures occurring in summer. The chronic thermal criteria for brown trout is just 19.6 °C, above which stress related impacts start to be felt, while the acute thermal criteria (the temperature at which fish start dying) is 24.6 °C (Todd *et. al.* 2008). Mayflies and stoneflies, a key component of the macroinvertebrate fauna, have incipient lethal temperatures in the 21 – 23 °C range (Olsen *et. al.* 2012). In this case, any effects will be exacerbated by diversion of much of the stream's flow into the Wāhianoa Aqueduct for much of the time, as the capacity of each intake is generally twice the mean flow of the stream (Genesis 2024. Re-planting pine trees further back from the stream to allow restoration of a protective riparian buffer is recommended, along with advocacy to Genesis Energy for an increase in residual flow, given the significant value of this tributary as trout habitat.

There are currently no consented minimum flow requirements downstream of the Wāhianoa Aqueduct intakes (Genesis, 2024). However, Genesis Energy has been working with the Ngā Waihua o Paerangi Trust (Ngāti Rangi) to establish connective flows on the four main waterways, Tokiāhuru, Wāhianoa, Mākahikatoa and Tomowai. A permanent downstream flow of 100 l/s was established in the Tokiāhuru in March 2016, and more recently in the Wāhianoa (120 l/s), Mākahikātoa (100 l/s) and Tomowai streams (200 l/s) (H. Molesworth, Genesis Energy, pers. comm). It is understood that the current consents for the eastern diversion do not expire until 2037, so any increase in downstream flows in other waterways prior to that will need to be negotiated.

Further downstream on the same tributary, there is a perched concrete ford on Terrace Road (Site 9, Figure 1, Photos 17 & 18) that presents a significant barrier to the upstream movement of trout and native fish. Given that the tributary looks to have stable flows, it is recommended that Ernslaw One remedies fish passage at this site, either through construction of concrete and rock ramps on either side of the stream, or a full-width rock ramp fish pass.

It doesn't seem feasable to improve fish passage at the Wāhianoa Aqueduct take sites observed during this survey, but there may be opportunities at other sites.

Table 11. Total numbers of each species found at each site during the Tokiāhuru and Mākahikatoa Stream catchment electric fishing survey, 4th & 5th December 2024.

Survey Site	Species							
	Brown Trout	Rainbow trout	Eel	Koura	Common bully	Shock time	Trout density (per min)	Trout length (mm)
Site 1: Te Unuunuakapua te Ariki Stream (upstream)		13	5	1		5m10s	2.52	25 - 130
Site 1: Te Unuunuakapua te Ariki Stream (downstream)		22				6m50s	3.22	25 - 150
Site 2: Tokiāhuru Stream (wooden bridge)		4				1m47s	2.24	30 - 80
Site 3: Te Unuunuakapua te Ariki Stream (Otahatekapua Rd upstream)		26		1		Not recorded		14 fry, 12 fingerlings
Site 3: Te Unuunuakapua te Ariki Stream (Otahatekapua Rd downstream)		57				3m30s	16.29	50 fry, 80 - 280
Site 4: Tokiāhuru trib. (Rock Rd.)	3	24				2m46	9.76	30 - 120
Site 5: Tokiāhuru mainstem (Swamp Rd.)		1				1m2s	0.97	100
Site 6: Tokiāhuru trib. (Terrace Rd.)		2				Not recorded		75
Site 7: Tokiāhuru trib. (Terrace Rd.)		15				Not recorded		80 - 180
Site 8: Tokiāhuru mainstem Link Rd box culvert (upstream).	13	15 + 12 unid				7m27s	5.36	80 - 180
Site 8: Tokiāhuru mainstem Link Rd box culvert (downstream).	2	14 + 4 unid				2m42s	7.41	28 - 150
Site 9: Tokiāhuru Stream at Terrace Road ford.		4				Not recorded		
Site 10: Mākahikatoa Stm. (Aqueduct Road)		7			1	Not recorded		
Average trout density							**5.97**	

Unid = unidentified

Table 12. Comparison of maximum and average trout densities recorded (fish caught per minute of electric fishing machine time) in the Tokiāhuru Stream survey with those of previous surveys by Taranaki Fish & Game.

Catchment	Survey Dates	No. of sites	Maximum density (trout per minute)	Average density (trout per minute)
Mangawhero River	2-3 December 2015	9	7.0	2.40
Kaupokonui Stream	6-7 December 2016	9	1.1	0.36
Manganuioteao River	4-6 December 2017	11	2.7*	1.39*
Waiwhakaiho River	17-19 December 2018	9	1.50	0.63
Retaruke River	7 December 2020, 2nd January 2021	4	1.80*	1.68*
Waingongoro River	5 – 8 December 2022	13	1.68*	0.30*
Waiongana/Mangaoraka Stream	11-12th December 2023	11	1.53	0.515
Kapuni Stream	24th October 2024	10	2.20*	0.996*
Manganui River	11-18 December 2024	22	0.811	0.137
Wāhianoa River	4th December 2024	6	2.06*	0.87*
Tokiāhuru Stream headwaters	5th December 2024	8	16.29*	5.97*

* Includes rainbow trout

Native fish and crustacea

Five adult eels (tuna), likely longfin eel, were observed at Site 1 in Te Unuunuakapua te Ariki Stream at Ninias Ford, in a low-gradient section with undercut banks and good riparian vegetation (Photo 3) that would be classed as "ideal habitat". These fish must have migrated from the sea as elvers via the Whangaehu River to reach Tokiāhuru Stream, likely during a period when rainfall or other factors reduced the acidity of the Wangaehu to levels that allowed upstream migration.

A single common bully was caught in Mākahikātoa Stream. This species can form landlocked populations and is not reliant on access to and from the sea. Otherwise, no other native fish were observed or caught.

Two koura were caught in Te Unuunuakapua te Ariki Stream (Sites 1 & 3, Table 11, Photo 8), but not at any of the other sites.

ACKNOWLEDGMENTS

Our thanks to Lynette Baish, Environmental Planner Ernslaw One Limited, and Keith Wood, Senior Forester (Karioi), for forest access, help and advice. Also to Joseph McLeod, Pouro and Komaihana from Ngā Waihua o Paerangi Trust for their local knowledge and help with the survey.

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Taranaki Angler Satisfaction Survey Report 2024/25

Purpose of the Project

Assess satisfaction and success of Taranaki Region anglers using an online satisfaction survey.

Strategic Outcome

Supports the Taranaki Fish & Game Strategic Outcomes:

Attract & Retain Licence Holders

Jack Harland and Allen Stancliff

Taranaki Fish and Game Council

September 2025

SPECIES MANAGEMENT: Project 1321 Angler Satisfaction Survey Report 2024/25

Fish & Game NEW ZEALAND

Executive Summary – Taranaki Angler Satisfaction Survey Report (2024/2025)

Overview of Results

- An electronic survey was sent to 619 2024/25 Taranaki resident and non-resident adult fishing licence holders with a valid email address. 166 surveys were partially or fully completed.
- The survey explores and summarises angler responses to a series of nine questions asked each season since 2019/20 (but excluding 2023/24), which enables trends to be tracked, and comparisons made across years.
- The survey report provides insights into the age and fishing experience of local anglers, along with key information on the fishery, including angler satisfaction, catch rates, fish size and condition, barriers to participation, and areas of concern.
- Fishing opportunities in the Taranaki region rated well in the 2024/25 season, with 14.1% of respondents stating they had an "excellent" fishing experience, which is the highest rating within this category since the 2019/2020 season.
- 48% of respondents stated they had "good" fishing experience in 2024/25, which sits near the 5-year average of 48.5%.

Statement of Service Performance

Planned Result:

Assess satisfaction and success of Taranaki Region anglers using an online satisfaction survey.

Actual Result:

An electronic survey was sent to 619 2024/25 Taranaki resident and non-resident adult fish licence holders with a valid email address. 166 surveys were partially or fully completed, which provided insights into the success and satisfaction of Taranaki anglers during the 2024/25 fishing season.

Budget Variance

	Budget ($)		Actual ($)	
External				
Internal	4,003	40 hours	876	8.75 hours
Total	4,003		876	

Comments: Survey analysis and report writeup carried over to 2025/26 financial year.

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

2024/25 TARANAKI ANGLER SATISFACTION SURVEY

On the 15th August 2025 an electronic survey was sent to 619 2024/25 Taranaki resident and non-resident adult fishing licence holders for whom a valid email address was held. The survey asked a series of nine questions regarding their success this season, as well as detractions. After 7 days, a reminder email was sent to 486 contacts who had not yet participated in the survey. The survey was the same as that used in the 2022/23, 2021/22 and 2020/21 and a shortened version of the one used in 2019/20. The survey was sent after many waters closed to angling on April 30, but before the end of the winter angling season.

Of the 619 email survey invites sent out, 409 (66%) were opened and 166 surveys partially or fully completed (26.82% of invites). This was lower than the 37.7% of surveys partially or fully completed in 2023, and 2021 (35.1%). The actual number of respondents was also lower than in the 2023, 2022, and 2021 surveys, which had 220, 259, and 263 respondents respectively.

Results

The questions were identical to those used in the last three seasons and these earlier results are included for comparison.

When interpreting these results, it is important to remember that surveys of this kind often attract responses from the more enthusiastic or experienced participants.

Q1. How many years have you fished for trout?

	2024/25	2022/23	2021/22	2020/21	2019/20
5 years or less	13.25%	16.5%	22.9%	26.4%	22.4%
6 to 10 years	13.25%	5.5%	7.4%	9.6%	12.6%
11 to 20 years	11.45%	15.1%	12.8%	12.6%	12.6%
More than 20 years	62.05%	62.8%	57.0%	51.3%	52.3%

Figure 1 Taranaki angler fishing experience (166 responses) 2024/25 season.

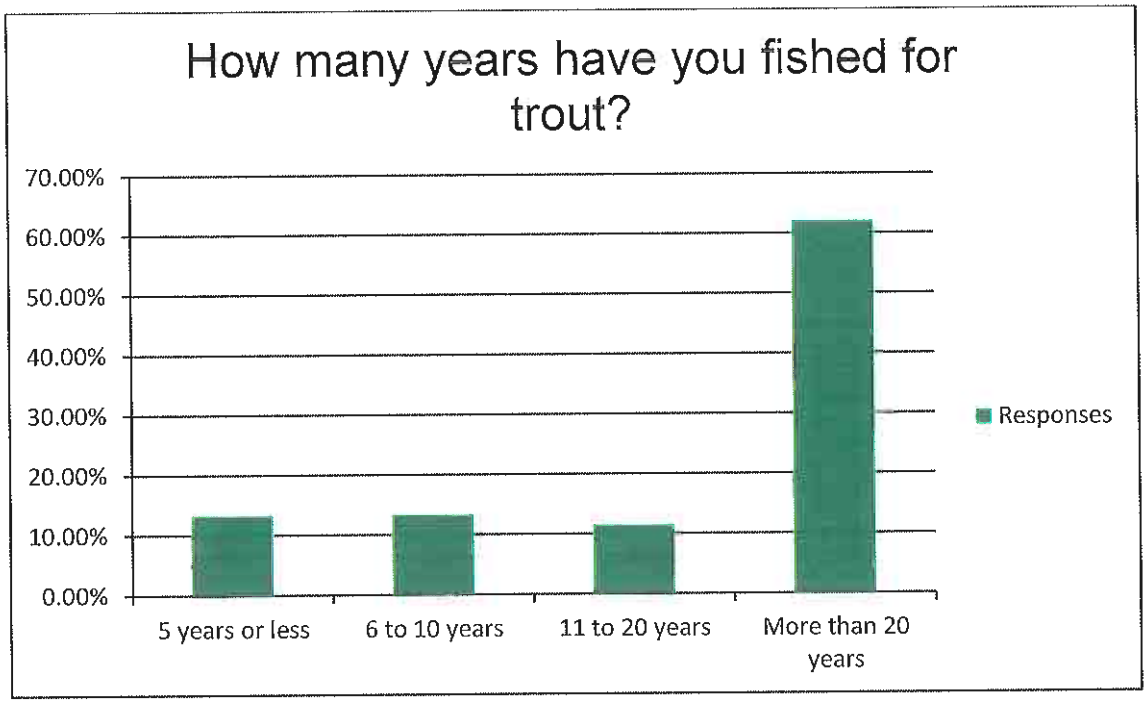


Figure 1 indicates that like the previous seasons, a significant number of anglers have been trout fishing for more than 20 years.

Q2. On how many days did you go trout fishing this season?

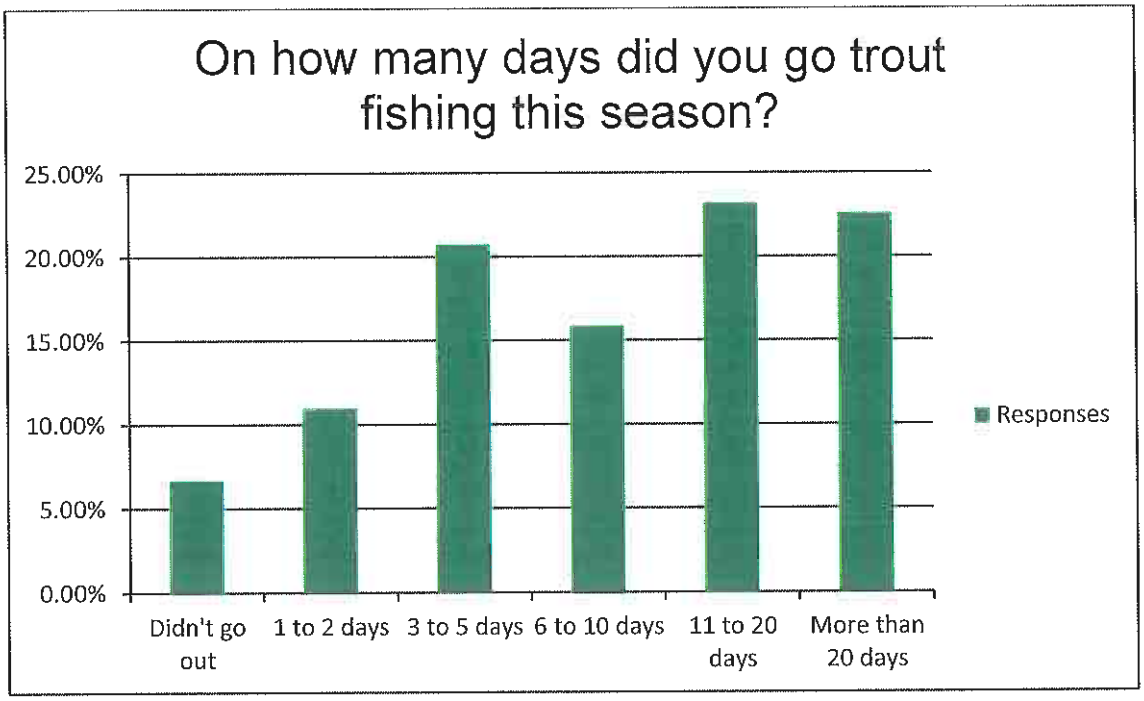
Of the 164 anglers who responded, 31.71% had fished for 5 days or less, similar to previous years (35.2% in 2022/23, and 32.7% in 2021/22).

For the 2024/25 fishing year, almost half of respondents (45.73%) indicated they had fished for 11 days or more, which is a significant increase compared to previous years' survey results (36.5% in 2022/23, and 37% in 2021/22).

In comparison to all previous survey results, the smallest proportion of respondents (6.71%) indicated they didn't go out fishing at all this season (11 respondents).

	2024/25	2022/23	2021/22	2020/21	2019/20
Didn't go out	6.71%	8.2%	6.8%	7.5%	7.5%
1 to 2 days	10.98%	11.0%	11.2%	13.8%	14.4%
3 to 5 days	20.73%	24.2%	21.5%	17.0%	21.8%
6 to 10 days	15.85%	20.1%	23.5%	28.5%	24.7%
11 to 20 days	23.17%	13.7%	17.9%	15.4%	17.2%
More than 20 days	22.56%	22.8%	19.1%	17.8%	14.4%

Figure 2. Number of days anglers fished during the 2024/25 season (164 responses).



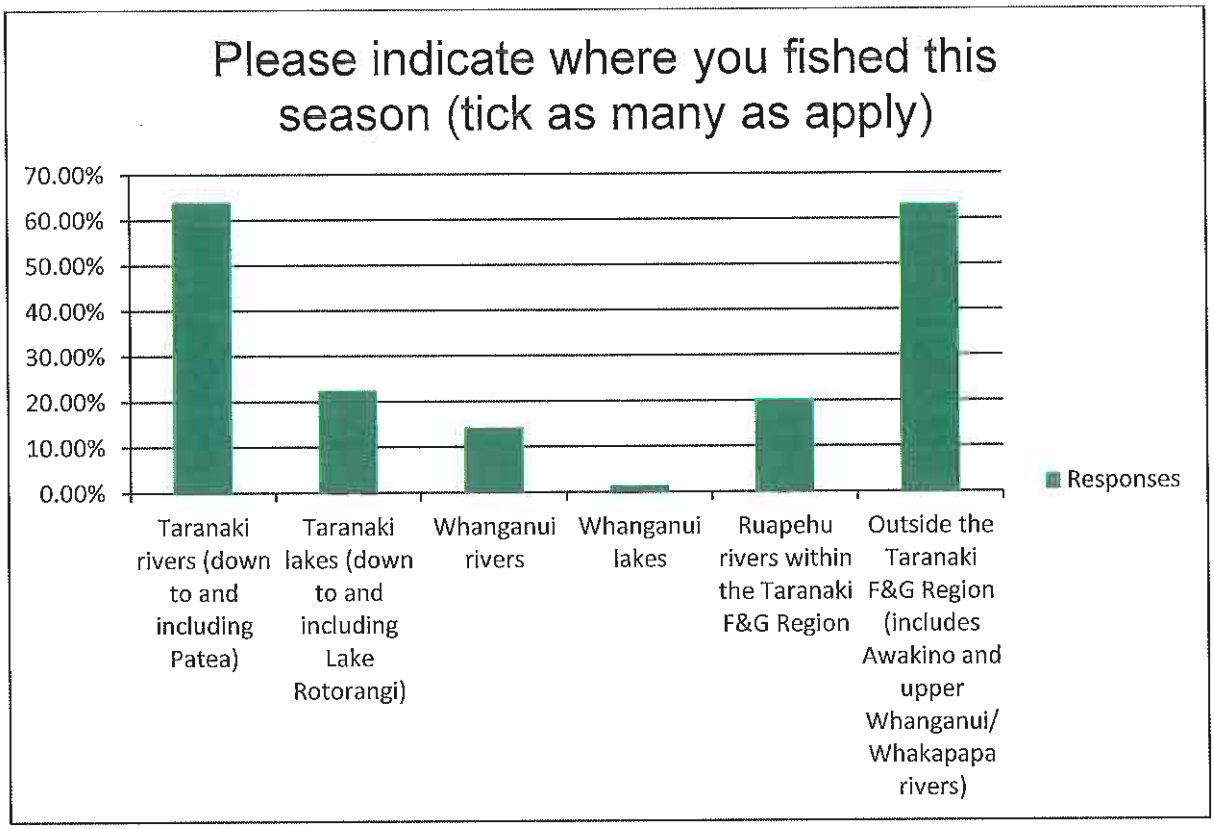
Q3. Where did you fish this season (tick as many as apply)?

The following table includes a breakdown of where the 147 anglers who answered this question fished over the 2024/25 season.

	2024/2025	2022/23	2021/22	2020/21	2019/20
Taranaki rivers (down to Patea)	63.95%	59.7%	54.5%	49.4%	58.3%
Taranaki lakes (down to and including Lake Rotorangi)	22.45%	19.9%	22.6%	21.9%	22.4%
Whanganui rivers	14.29%	15.8%	15.3%	18.1%	11.5%
Whanganui lakes	1.36%	2.0%	3.4%	3.0%	1.3%
Ruapehu rivers within the Taranaki F&G Region	20.41%	30.1%	30.2%	27.4%	24.4%
Outside the Taranaki F&G Region (includes Awakino and upper Whanganui/ Whakapapa rivers)	63.27%	66.3%	60.4%	57.8%	52.6%

While fishing outside of the Taranaki region remains popular, this survey recorded the highest proportion of anglers fishing Taranaki rivers in the 5 years of survey, at 63.95%.

Figure 3. Where anglers fished during the 2024/25 season (147 responses).



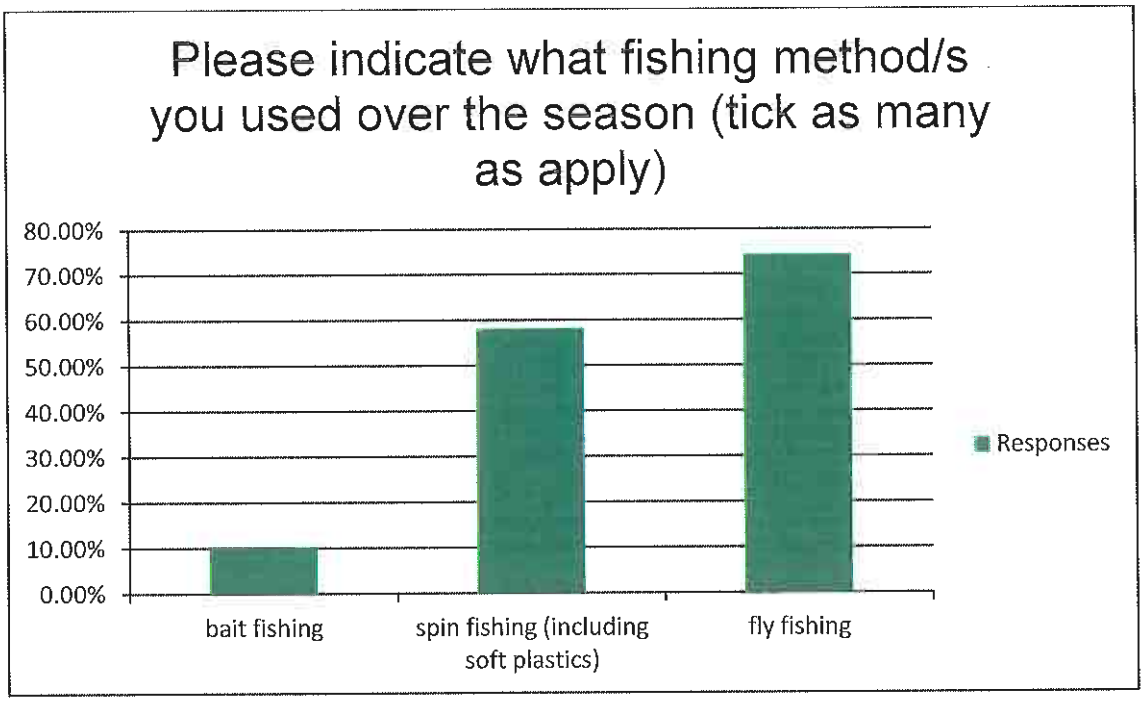
Q4. Please indicate what fishing method/s you used over the season (tick as many as apply)

This question was answered by 148 anglers.

	2024/25	2022/23	2021/22	2020/21	2019/20
bait fishing	10.14%	10.7%	11.9%	9.3%	14.7%
spin fishing (including soft plastics)	58.11%	48.0%	48.1%	52.7%	49.7%
fly fishing	74.32%	77.6%	75.7%	73.0%	75.8%

Despite bait fishing being legal in most Taranaki fisheries it's not a popular method, with fly fishing leading, followed by spin fishing.

Figure 4. Methods used by Taranaki anglers during the 2024/25 season (148 responses).

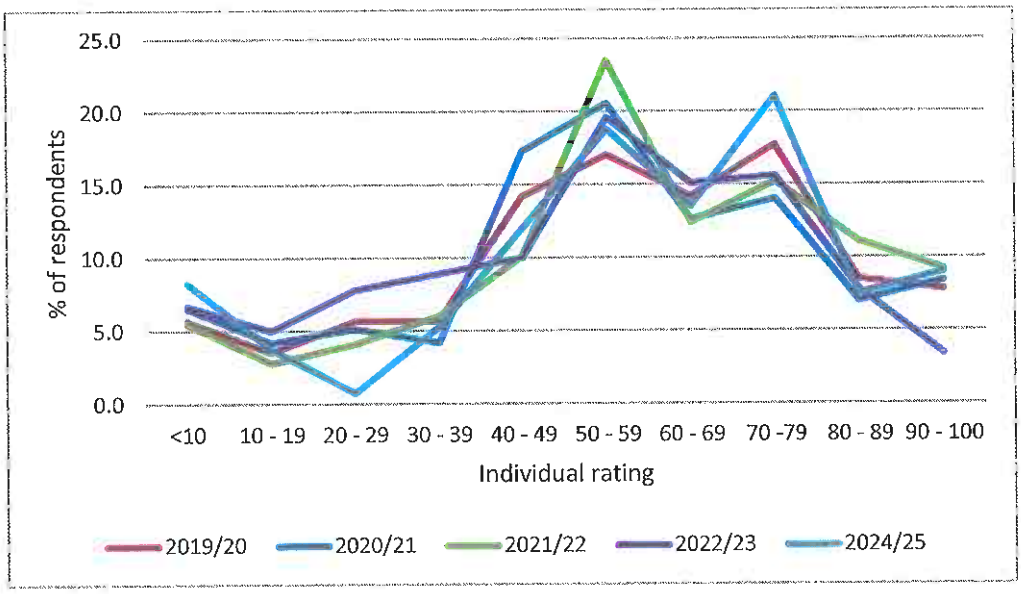


Q5. Overall how did you rate your catch rate this season? (click or slide the marker to the appropriate spot along the line)

Of the 145 respondents in the 2024/25 survey (those who scored it zero were removed and considered as non-answers), 50.3% rated their catch rate as at least a 60/100 individual rating. 37.2% of respondents rated their catch for the season as at least a 70/100 rating.

Notably on Figure 5 below, the percentage of responses with a satisfaction value between 20-29 decreased, with 1.4% of responses falling within this range, compared to 7.8% in 2022/23, and 4.1% in 2021/22. In contrast, 20% of respondents in 2024/25 survey provided a satisfaction rating between 70-79, which is a notable increase compared to 2022/23 and 2021/2022, where respective ratings of 15.6% and 15.2% were recorded.

Figure 5. Distribution of individual responses regarding how anglers rated their catch rate in the 2019/20, 2020/21, 2021/22, 2022/23 and 2024/25 seasons.

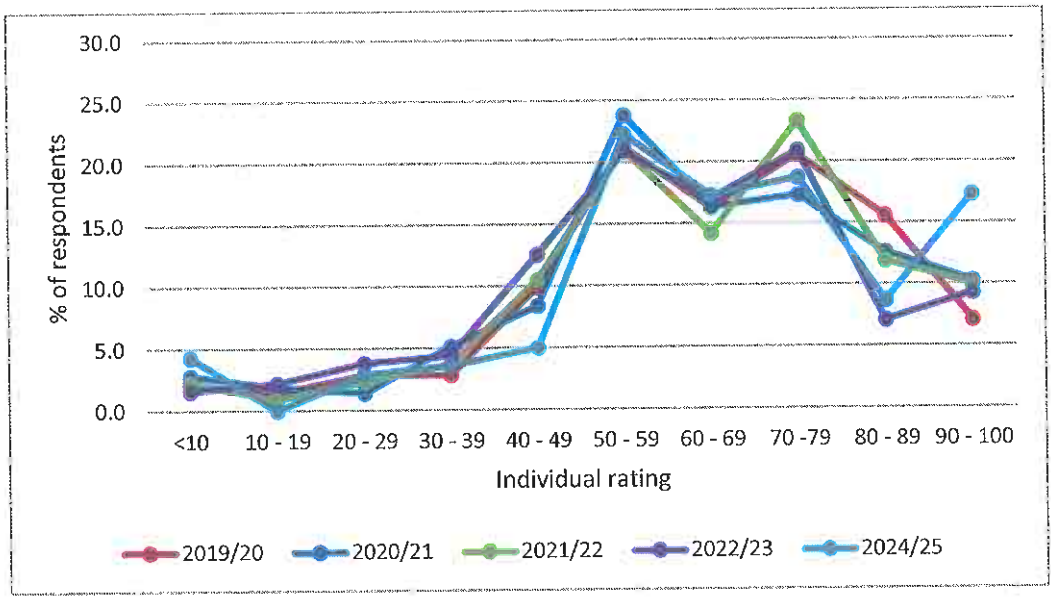


Q6. Overall, how do you rate the size (and condition) of the trout you caught this past season?

For 144 respondents (those who provided a zero-score were removed), 22.3% of respondents provided a rating between 50-59, in similar fashion to the 2022/23 and 2021/22 survey results, with 20.9%, and 21% respectively. 84.3% of respondents for this angling season provided a rating of 50 or higher, with 44.7% of respondents provided a rating of 70 or higher.

A notable difference between the results of previous surveys is found with anglers reporting a very high level of satisfaction with the size and condition of catches this season. 17.3% of anglers reported a rating of 90 or higher. In 2022/23 and 2021/22 only 9.3% and 10% of anglers reported satisfaction levels this high.

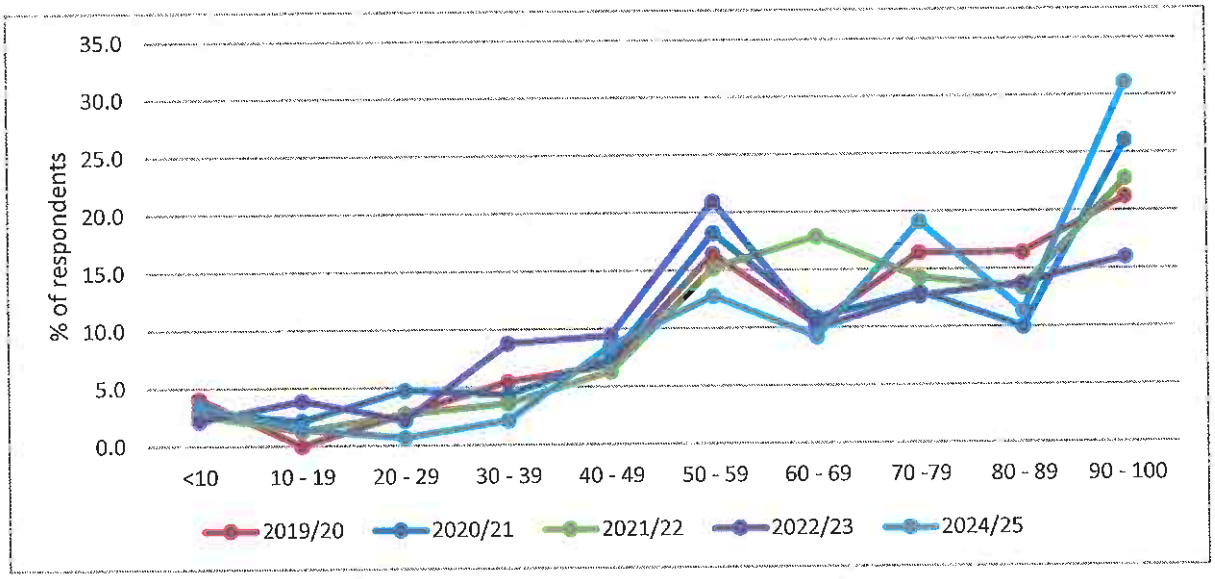
Figure 6. Distribution of individual responses regarding how anglers rated the size and condition of trout in the 2019/20, 2020/21, 2021/22, 2022/23 and 2024/25 seasons.



Q7. Overall, how satisfied were you with your fishing experiences this season?

Of the 145 respondents to this question, 12.8% reported an overall fishing satisfaction rating between 50-59, which is lower than previous years where 21%, 15.2%, and 18.3% were reported. In contrast, there was an increase in the proportion of anglers (31.1%) that placed their overall fishing satisfaction in the 90-100 range. This is a significant increase compared to the previous year's results which wielded 22.8% for the same range, outlining a shift in the proportion of anglers that had an average fishing season to that of a great /excellent season. Although in making this comparison, this year's survey was completed by 28.4% less people than the previous year. Some anglers that were dissatisfied with the previous season may have decided not to participate in another survey.

Figure 7. Distribution of individual responses regarding how satisfied anglers were with their fishing experiences in the 2019/20, 2020/21, 2021/22, 2022/23 and 2024/25 seasons.



Q8. What, if anything, detracted from your angling enjoyment this season?

Of the 102 respondents to this question, 51 provided some form of feedback, and 51 outlined they had no comment to make. 64 chose to skip this question entirely. These responses can be summarised below.

Aspect	% of respondents 2024/25	% of respondents 2022/23	% of respondents 2021/22	% of respondents 2020/21	% of respondents 2019/20
Work/ lack of time	8.82	6.5	9.1	10.4	9.3
Covid-19 (lockdown in 2019/20)	0	0	6.6	0	13.9
Lack of or difficult access	6.86	9.2	10.1	10.9	15.2
Algae/ low flows/ litter/ pollution/poor water quality/high water temperatures	7.84	7.0	11.1	8.5	13.2
Poor weather, flooding, river instability	4.9	21.1			
Small/ less fish/poor condition	5.88	10.8	7.6	11.4	8.6
Age/health issues	3.92	3.8	2.0	0	3.3
Number of other anglers (crowding)	2.94	4.9	1.0	2.8	3.3
Other	8.84	7.0	6.5	8.1	11.3
Nothing or no comment	50	29.7	46.0	50.2	34.4

When asked about the main factors detracting from angler's fishing experience, access issues were a recurring theme. There were some concerns around the lack of legally designated access points for anglers, and others citing dense vegetation such as blackberry and gorse restricting river entry, and causing a lack of casting room for fly fishing anglers.

While 51 anglers (around half of respondents) indicated they had no specific concerns, a few other issues were mentioned. Angler etiquette was raised as a consideration (anglers jumping ahead of others or not maintaining adequate space between those fishing).

Other responses outlined a concern with the overall condition of certain rivers. For example, excessive aquatic weed growth was cited with two mentions of the Waiwhakaiho River. Although in highlighting this, several anglers suggested that the extended dry spell and drought conditions experienced in Taranaki from December to February may have contributed to this problem.

A lack of trout and low catch rates were also noted by some anglers, with the Waingongoro River mentioned on more than one occasion. A small proportion of respondents indicated that they were still learning the sport, which may have shaped their experience.'

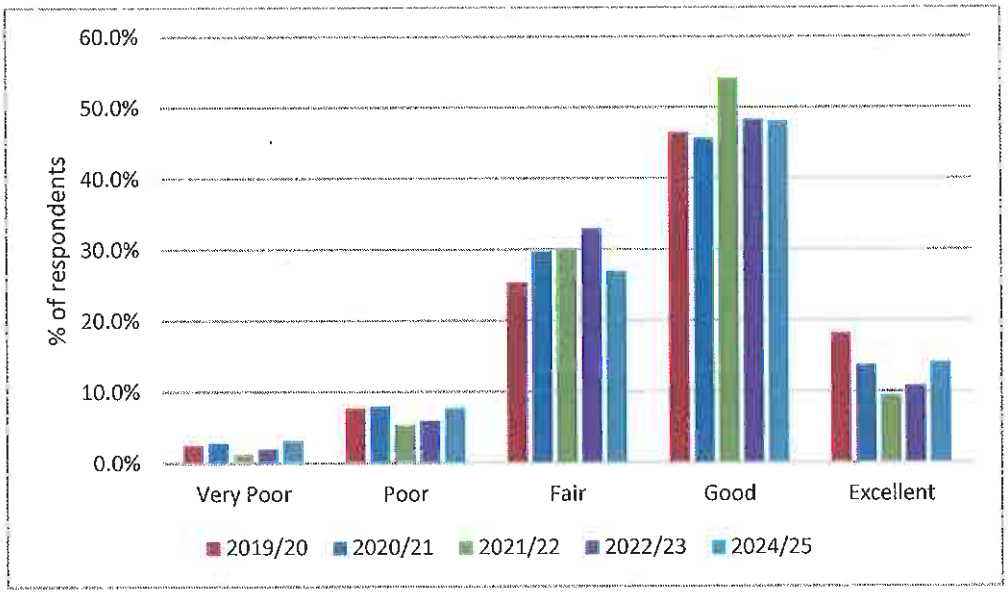
Some environmental concerns were also evident, with anglers reporting rubbish in waterways ranging from farm-related materials such as baling twine, to road cones and other general litter. The presence of livestock in or near rivers was also raised as a negative factor.

Q9. Overall how would you rate trout fishing opportunities in the Taranaki region?

The responses of the 156 anglers for the 2024/25 season are summarised below and in Figure 8

	2024/25	2022/23	2021/22	2020/21	2019/20
Very Poor	3.21%	2.0%	1.2%	2.8%	2.4%
Poor	7.69%	5.9%	5.3%	8.0%	7.7%
Fair	26.92%	33.0%	30.1%	29.7%	25.3%
Good	48.08%	48.3%	54.1%	45.7%	46.5%
Excellent	14.10%	10.8%	9.4%	13.7%	18.2%

Figure 8. Rating of trout fishing opportunities in the Taranaki Region 2019/20, 2020/21, 2021/22, 2022/23 and 2024/25 seasons.



Fishing opportunities in the Taranaki region rated well in the 2024/25 season, with 14.1% of respondents rating an "Excellent" fishing experience for this season, which is the highest rating within this category since the 2019/2020 season.

48% of respondents rated a "Good" fishing experience this year, which sits close to the 5-year average of 48.5% respondents choosing this category as their answer.

It is Important to note that when interpreting this data, one should consider that this year's response rate (156) was lower than previous years (249 responses in 2021, 246 responses in 2022, and 203 in 2023) and therefore the significance of any trend observed when comparing each season responses may not be representative. For example, 3.21% of respondents for the 2024/25 fishing year outlined a "Very Poor" fishing experience, which is the highest proportion of responses in this category for all 5 survey years, yet 3.21% in this circumstance represents the views of 5 people.

Discussion and Conclusion

Responses to the survey were much lower than previous years with 166 total. Much less than the previous four-year average, therefore trends outlined in this year's report may be limited in their representation of the view of Taranaki anglers. It is also important to interpret these results considering the idea that often those who engage in surveys like this are those who are more enthusiastic about their sport and perhaps more successful.

The trend of most respondents having fished for 20 or more years held true as it has with previous years, with a slight drop in those reporting they had fished for 5 years or less (13.25%, previous 4-year survey average: 22%) and a slight increase in those outlining 6 to 10 years of fishing experience (13.25%, previous 4-year survey average: 8.7%). This may suggest an increase in the experience levels of Taranaki anglers, although in outlining this, it is important to note junior anglers were not included in this survey. License sales for junior anglers saw a significant rise from the 2023/24 fishing season to the 2024/25 season, with 569 licenses issued this year, compared to 366 in 2023. Full season Junior, and junior day licenses also saw an increase from 108 to 152, and 57 to 83 respectively.

In terms of time spend fishing during the season, almost half of respondents (45.73%) indicated they had fished for 11 days or more, which is a significant increase compared to previous year's survey results (36.5% in 2022/23, and 37% in 2021/22). Also, while fishing outside of the Taranaki region remains popular, this survey recorded the highest proportion of anglers fishing Taranaki rivers in the 5 years of survey, at 63.95%. 22.45% of anglers reporting fishing Taranaki lakes, which sits near the average for the previous 4 years of 21.7%.

20% of respondents indicated a catch rate satisfaction rating between 70-79, which is a notable increase compared to the two most recent survey years data, with respective ratings of 15.6% and 15.2%. 17.3% of respondents provided a catch size satisfaction rating of 90 or higher, which is a notable increase from 9.3% in 2022/23 and 10% in 2021/22. In terms of overall angler satisfaction, there was an increase of 8.3% compared to last year's survey. Catch rate, size and overall satisfaction may have a correlation, indicating more and larger trout caught this season in comparison to the two previous years. Only 5.88% of anglers reported small or a lack of fish as a reason for their fishing experience being negatively impacted this season, which is the lowest proportion of respondents in 5 years of study.

Regarding fishing method, fly is consistently the most popular, with 74% of respondents reporting it as their chosen method, which sits next to the 5-year average of 75.2%, followed by spin fishing (58.1%), and bait fishing (10.1%).

In line with previous survey years, most respondents (50%) outlined that they had no comments to make for Question 8. (Detractions). 8.82% of respondents mentioned other responsibilities, work and a lack of time to fish as a key detraction. 4.9% of those surveyed listed poor weather as a detraction, compared to the previous survey year where 21.1% of respondents mentioned poor weather. This may outline the long periods of calm and dry weather experienced over the 2024

summer and may relate to the 7.84% of respondents highlighting algae, water temperatures and water quality as an issue this season.

Although the survey response rate was lower this year, two consecutive stable summers appear to have supported increased angling opportunities and the presence of larger fish, contributing positively to overall satisfaction levels.

The majority of the Taranaki region's fisheries comprise wild trout populations which inherently fluctuate in response to climatic and environmental conditions, including (but not limited to) the adverse effects of periods of warmer weather and droughts.

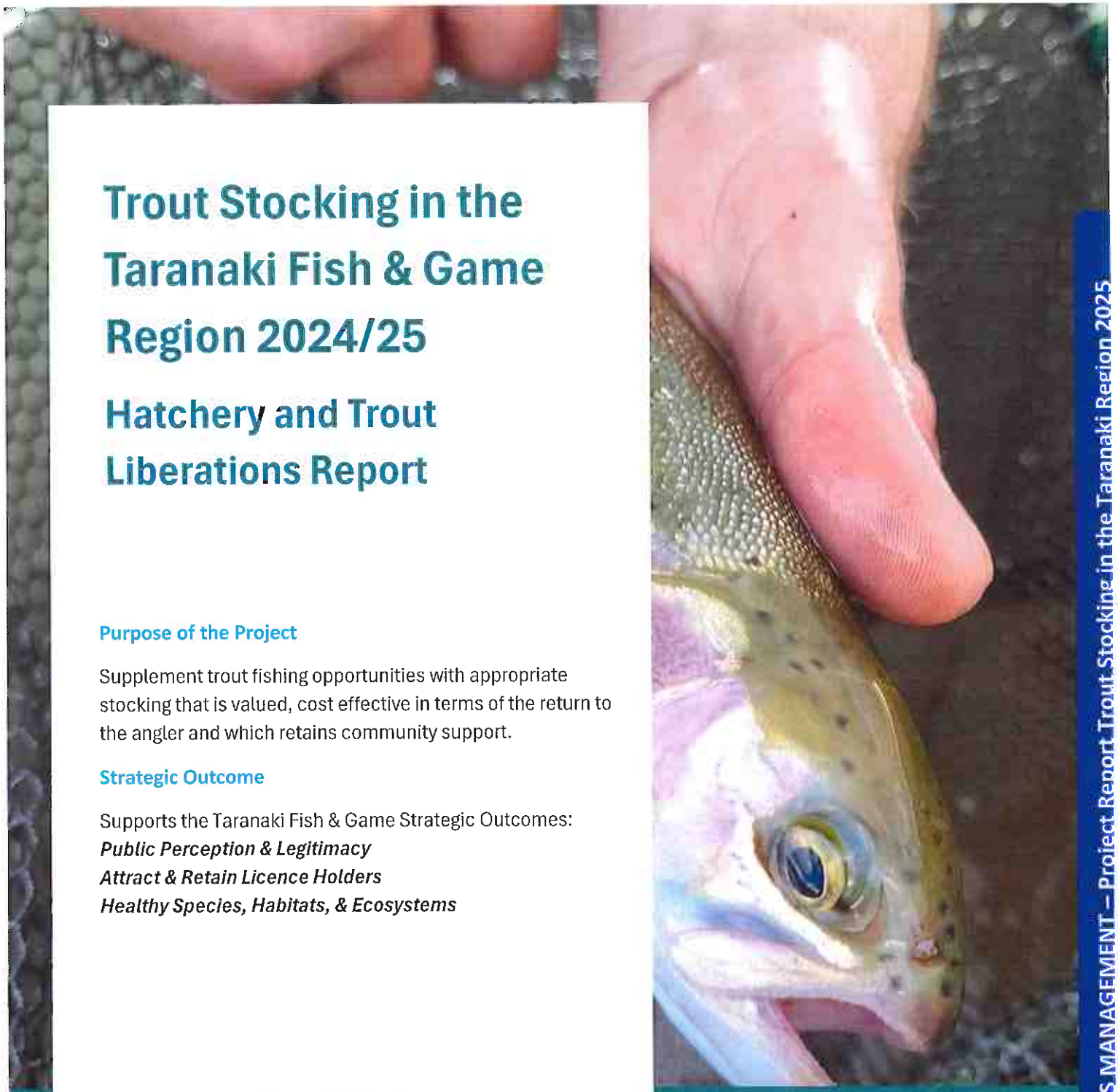
The Stony and Waiaua rivers are particularly dynamic systems, with fishery quality closely linked to weather conditions. These waterways hold considerable potential for the recreational trout angler, but sustained favourable weather and an absence of headwater erosion events is critical to realising that potential.

RECOMMENDATION

- That Taranaki Fish and Game Council receive this report on Taranaki angler satisfaction for the 2024/25 season.

Jack Harland and Allen Stancliff

23rd September 2025



Trout Stocking in the Taranaki Fish & Game Region 2024/25

Hatchery and Trout Liberations Report

Purpose of the Project

Supplement trout fishing opportunities with appropriate stocking that is valued, cost effective in terms of the return to the angler and which retains community support.

Strategic Outcome

Supports the Taranaki Fish & Game Strategic Outcomes:
Public Perception & Legitimacy
Attract & Retain Licence Holders
Healthy Species, Habitats, & Ecosystems

Allen Stancliff / Jack Harland

Taranaki Fish and Game Council

August 2025

SPECIES MANAGEMENT – Project Report Trout Stocking in the Taranaki Region 2025

Fish & Game NEW ZEALAND

Executive Summary – Hatchery and Trout Liberations Report (2024/25)

Overview of Results

Trout Releases

- During 2024/25 a total of 2,773 trout (877 brown, 1,896 rainbow) were released into four lakes and four rivers in the Taranaki Region where the species already exists. This included;
- 352 17-month trout (150 brown, 202 rainbow) into the Patea River downstream of Patea Dam;
- 372 rainbow trout for a successful kid's trout fishing day in the upper Patea River at Stratford;
- 500 rainbow trout from the Eastern Fish & Game Region for a successful family fishing day at New Plymouth's Lake Rotomanu;
- 110 rainbow trout from the Tongariro National Trout Centre into Sattler's Dam near Raetihi for family fishing; and
- 450 trout (150 brown, 300 rainbow) to support fly fishing opportunities at Lake Mangamahoe.

Hawera trout hatchery

- During 2024/25 a team of nine volunteers ran the hatchery on a daily basis;
- A total of 3,186 trout (1,201 brown, 1,985 rainbow) were raised at the hatchery during the year at a cost of $3.26 per fish, with 2,163 released and 1,023 held over until the 2025/26 year.

Statement of Service Performance

Planned Result:

Undertake an annual trout stocking programme which concentrates on creating and maintaining valued lake fisheries.
Undertake release of up to 200 17-month brown and rainbow trout into the lower Patea River and assess angler returns to gauge the potential for a long-term programme
Operate Hawera hatchery in an effective, cost efficient and sustainable manner utilising volunteer support to meet the identified stocking objectives.

Actual Result:

- 2,773 trout (877 brown, 1,896 rainbow) were released into four lakes and four rivers in the Taranaki Region where the species already exists;
- The total included 352 17-month trout (150 brown, 202 rainbow) released into the Patea River downstream of Patea Dam;
- A team of nine volunteers ran the Hawera trout hatchery and produced a total of 3,186 trout (1,201 brown, 1,985 rainbow) at a cost of $3.26 per fish, with 2,163 released and 1,023 held over until the 2025/26 year.
- Results were reported to Council on 15 October 2025 – Stancliff, A. and J. Harland. 2025. ***Hatchery and Trout Liberations Report 2024/25.***

- **Budget Variance**

	Budget ($)		Actual ($)	
External	16,000		16,344	
Internal	21,013	210 hrs	18,986	189.75 hrs
Income	3,238		3,488	
Total	33,775		31,842	

Comments: All work completed within acceptable budget and schedule variance.

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

HATCHERY AND TROUT LIBERATIONS REPORT 2024/25

1. INTRODUCTION

The Council's 2024/25 Annual Operational Plan has a species management objective to "Supplement trout fishing opportunities with appropriate stocking that is valued, cost effective in terms of the return to the angler and which retains community support".

The project planned results are:

- Undertake an annual trout stocking programme which concentrates on creating and maintaining valued lake fisheries;
- Undertake release of up to 200 17-month brown and rainbow trout into the lower Patea River and assess angler returns to gauge the potential for a long-term programme;
- Operate the Hawera hatchery in an effective, cost efficient and sustainable manner utilising volunteer support to meet the identified stocking objectives.

The Performance Measures are: that the Hāwera hatchery operation is effective and within budget, with measures being the number of fish produced, the cost per fish and volunteer satisfaction.

3. HAWERA HATCHERY

There were 1,566 adipose-fin clipped brown and rainbow trout yearlings from the 2023 year-class (777 browns and 789 rainbows) held in the Hawera hatchery at the beginning of the 2024/2025 financial year.

An estimated 2,000 brown and rainbow trout fry from the 2024 year-class were also held at that time. These fish originated from 1,000 eyed brown ova and 2,000 eyed rainbow ova received from the Eastern F&G Region's Ngongotaha hatchery on 23rd May 2024 (Figure 1). Brown and rainbow trout from the 2024 year-class were adipose fin-clipped on 23rd April 2025, at which time the count was 1,620 fish (424 browns and 1,196 rainbows). This was a lower number than usual, owing to losses occurring during the early fry stage.

A total of 2,000 eyed rainbow trout ova and 1,000 eyed brown trout ova (2025 year-class for 2026 release) were received from the Eastern F&G Region's Ngongotaha hatchery on 4th June 2025. From these ova, approximately 2,750 fry were held in the hatchery at year-end (31st August 2025).

A team of nine volunteers ran the hatchery daily on Council's behalf. Two volunteers retired from the hatchery roster during the year, and with one new volunteer added, there was a team of eight volunteers at year's end. A dinner was held for the hatchery team on 18th August 2025.

2. RELEASES OF BROWN AND RAINBOW TROUT

During the 2024/25 financial year, a total of 2,163 yearling and up to 18-month brown and rainbow trout from the 2023 and 2024 year-classes were released into two lakes and four rivers in the region (777 brown trout and 1,186 rainbows; Tables 1 & 2).

Releases were made consistent with the release schedules presented to the March 2024 and 2025 Council meetings, except for a release of 201 brown trout into Te Henui Stream in New Plymouth, which was a one-off. In accordance with the Council's Sports Fish & Game Management Plan 2011, and relevant legislation (Conservation Act s26ZM), the Council only released trout into waters where they already exist.

The total included 115 brown trout and 47 rainbows released into the upper Waiaua River near Opunake in early January 2025 at 18 months old. This was the last of three years of releases to help restore the fishery following a major headwater erosion event in the Waiaua mainstem during a flood on 17th July 2021. Anglers fishing the Waiaua River during the 2024/25 season caught well-grown hatchery rainbows (Photo 1) and an occasional wild rainbow, along with well-conditioned wild brown trout adults. An electric fishing survey of the Waiaua River is scheduled for spring / summer 2025/26 to assess juvenile recruitment. Given the recovery in the Waiaua fishery, it is not proposed to make any further releases of hatchery fish, other than into Opunake Lake if conditions improve.

Releases of 352 17/18-month brown and rainbow trout (150 browns and 202 rainbows) were made into the lower Patea River below Patea Dam in October and November 2024 in the first of five years of Manawa Energy funded releases. Details of the releases are provided in a separate report.

A total of 372 well grown hatchery rainbows were also released into the upper Patea River at Stratford for a well-attended kids' trout fishing promotion on 14th December 2024 (Photo 3).

Releases into the Hangatahua (Stony) River provided good angling opportunity (Photo 2) through to 3rd July 2025, when a large flood caused major changes to the riverbed and minor headwater erosion which filled much of the holding water with sand. However, the river cleared quickly, and anglers have reported catching fish as the habitat gradually recovers.

For the 2023 year-class, the total number of brown and rainbow trout raised through to release was 3,391 fish (777 browns and 2,614 rainbows) from the 3,000 ova received in June 2023. This result shows there were significantly more rainbow ova than the 2,000 that were purchased. The nominal survival rate from 3,000 ova was 113% (Figure 2).

Survival to release for the 2024 year-class is tracking below average with 597 released to date and 1,383 held over (699 rainbow & 324 brown).

3. RELEASES OF TWO-YEAR-OLD RAINBOW TROUT FROM NGONGOTAHA

A total of 500 two-year-old rainbows from the Eastern Fish & Game Region's Ngongotaha hatchery were released into Lake Rotomanu on 29th October 2024 (Table 3). These fish cost $6,081.77 (GST exclusive) or $12.16 each once transport was included. No outside funding was obtained for this release.

Following the release, a family trout fishing promotion was held at New Plymouth's Lake Rotomanu on Sunday 3rd November 2024 which, while successful in terms of participation, resulted in only a few rainbow trout being caught on the day. Reasons for this are unclear. The 2024 event was held in conjunction with the Inglewood Rod, Gun & Recreation Club and Taranaki Hunting & Fishing and it was the fifth year that trout were released into the lake rather than corralled in a holding net. Hynds Pipe Systems kindly provided their BBQ trailer for this event.

A release of 110 two-year+ rainbow trout was also made into Sattler's Dam near Raetihi by Wellington F&G staff on 18th February 2025. These fish were donated by DOC's Tongariro National Trout Centre. Local anglers with email addresses were notified of the release.

4. PLANNED RESULTS FOR HAWERA HATCHERY TROUT RELEASES

5.1 *Undertake an annual trout stocking stocking programme which concentrates on creating and maintaining valued lake fisheries.*

As shown in Tables 2&3, hatchery rainbow trout were liberated into four lakes in the region (including Sattler's Dam) during the year. Lakes Mangamahoe and Rotomanu are well used by anglers. Lesser numbers fish Lake Ratapiko, where the annual March/April lake level drawdown reduces fishery productivity. No release was made into Lake Namunamu as access has been restricted for forest harvest over the next 3-5 years. A top-up release to Lake Namunamu is scheduled for April 2026.

Four rivers were also stocked with hatchery rainbow trout during the year. In the case of the Hangatahua (Stony) River, the release of 429 17/18-month Hawera hatchery fish (261 browns and 168 rainbows) was successful in sustaining a productive and valued fishery in between headwater erosion events.

The release of 372 Hawera hatchery rainbows into the upper Patea River in the centre of Stratford enabled a kids' trout fishing promotion attended by 90 children to go ahead on 14th December 2024. The release provided ongoing opportunities for local anglers and following 26 years of releases a wild rainbow trout population is also becoming well established in the upper Patea River.

The release of yearling and older brown and rainbow trout into the Waiaua River at Opunake is a temporary measure to promote recovery of the fishery following the July 2021 erosion event. Previously, rainbow trout released into Opunake Lake had been able to access the Waiaua River via the Opunake HEPS inlet race, but with the power scheme shut down since 1 June 2018 this has not been an option.

5.2 *Undertake release of up to 200 17-month brown and rainbow trout into the lower Patea River and assess angler returns to gauge the potential for a long-term programme.*

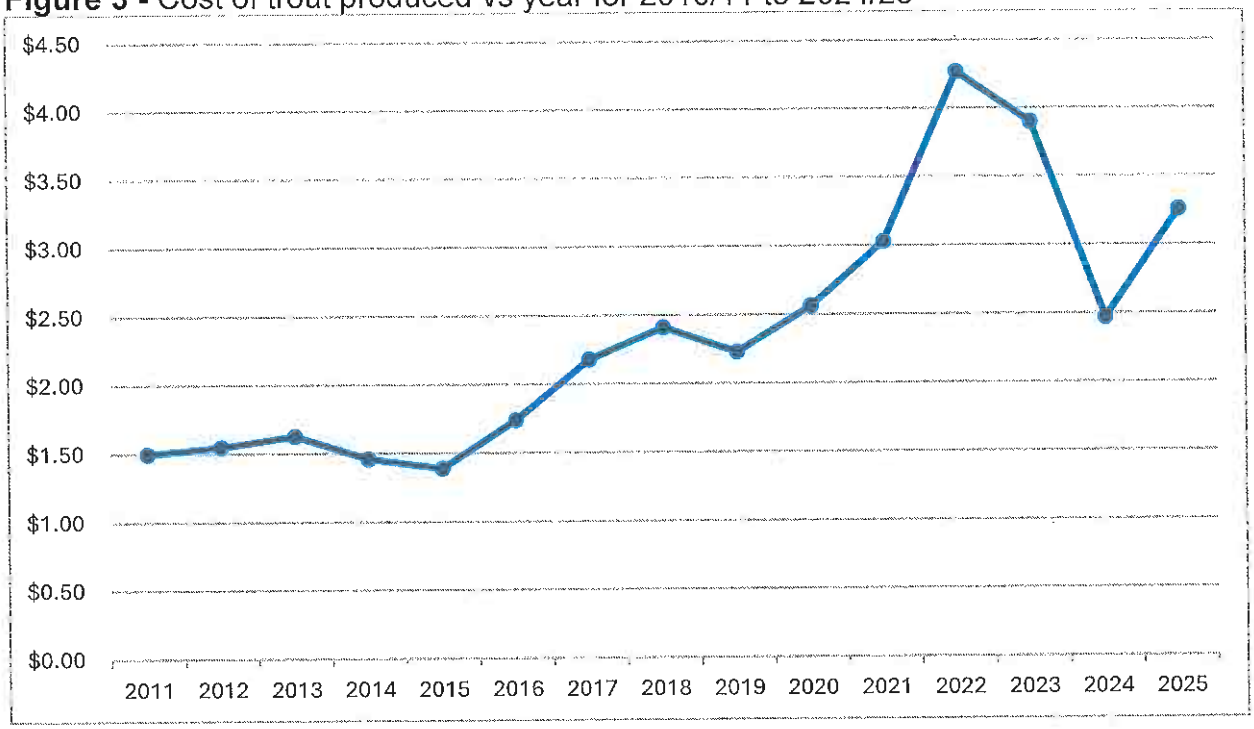
In October and November 2024, 202 Hawera hatchery rainbow trout and 150 browns were released into the lower Patea River below Patea Dam in the first of five years of additional releases (2024 – 2028) in an agreed programme to assess whether releasing trout at a larger size increases the return to anglers. A greater number of trout were released than planned, owing to larger numbers being available at the hatchery for release.
During the year there was little feedback from anglers as to the success of the releases. Long-standing access to the power station tailrace has been stopped by Manawa Energy following a H&S Audit, denying anglers access to the most popular fishing site on the river.

5.3 *Operate the Hawera hatchery in an effective, cost efficient and sustainable manner utilising volunteer support to meet the identified stocking objectives.*

Operating costs for the Hawera hatchery over the period 1 September 2024 - 31 August 2025 came to $13,876.32 (compared with $13,212.66 in 2023/24, $12,119.64 in 2022/23, $10,680.94 in 2021/22 and $8,862.29 in 2020/21). This included the cost of trout ova ($634.66), fish food ($5,778.60), insurance ($972.11), power ($929.85), liberation and hatchery expenses ($2,037.84), fish trailer expenses ($946.40) and resource consent monitoring fees ($2,576.86) but excluded staff time.

With a total of 3,186 trout raised at the hatchery in the 2024/2025 financial year, (2,163 released and 1,023 held over) this put the average cost of raising trout at the Hawera hatchery at $4.36 per fish. However, in 2024/25 there was $3,488 of income from Manawa Energy ($3,239) and the Taranaki Electricity Trust ($249), which brought the cost per fish down to $3.26 (Figure 3). This compares to $2.47 in 2023/24, $3.90 in 2022/23, $4.27 in 2021/22 (no TET grant) and $3.03 in 2020/21 (TET grant received) (all figures GST exclusive). So, while total operating costs for the hatchery increased, the income earned during the year meant the cost per fish was lower than it otherwise would be.

Figure 3 - Cost of trout produced vs year for 2010/11 to 2024/25



While costs continue to rise, the smaller number of fish raised in recent years and rearing some fish through to 18 months of age means that fish are now much larger at release, and they will have better survival and higher angling value as a result.

The figure of $3.26 per fish compares favourably with the cost of purchasing 2-year rainbow trout directly from the Eastern F&G Region ($8.21 each, plus transport @ $3.07/km), particularly given that the oldest Hawera fish are much larger at release (1 – 1.5kg compared with 0.5 – 0.8kg).

Having trout available at Hawera retains the flexibility to release fish when receiving water conditions are suitable. As indicated in Section 4, the large Hawera rainbows raised for the Stratford, Hangatahua (Stony) River and lower Patea River releases would have cost at least $12.16 each to buy and transport from Ngongotaha.

6. RECOMMENDATION

That the 2024/2025 Hatchery and Trout Liberation Report dated 3rd September 2025, be received.

Allen Stancliff & Jack Harland
Taranaki Fish & Game
3rd September 2025

TABLE 1 - Releases of fry, fingerling or yearling rainbow trout into Taranaki Region rivers and lakes during the 2023/2024 financial year. All fish raised at the Hawera hatchery were produced from Lake Tarawera-strain ova received from the Eastern Fish & Game Region.

Water	Release Date	Hatchery Origin	Fish Year Class	Brown Trout	Rainbow Trout
Patea River (lower)	22.10.24	F&G Hawera	2023		200
Stony River	04.11.24	F&G Hawera	2023	160	101
Patea River (lower)	25.11.24	F&G Hawera	2023	150	2
Stony River	25.11.24	F&G Hawera	2023	101	67
Lake Mangamahoe	28.11.24	F&G Hawera	2023	50	
Te Henui Stream	28.11.24	F&G Hawera	2023	201	
Patea River (upper)	13.12.24	F&G Hawera	2023		372
Waiaua River	09.01.25	F&G Hawera	2023	115	47
Lake Mangamahoe	23.04.25	F&G Hawera	2024		200
Lake Ratapiko	14.08.25	F&G Hawera	2024		197
Lake Mangamahoe	28.08.25	F&G Hawera	2024	100	100
Total Released				**877**	**1,286**

TABLE 2 - Total number of fingerling, yearling or older brown and rainbow trout released into each water during the 2024/2025 financial year

Water	Number Released
Lake Ratapiko	197
Lake Mangamahoe	450
Hangatahua (Stony) River	429
Patea River (upper)	372
Patea River (lower)	352
Waiaua River	162
Te Henui Stream	201
Total Released	**2,163**

TABLE 3. Releases of 2-year-old hatchery rainbows in the Taranaki Region during the 2024/2025 financial year.

Water	Date	Hatchery Origin	Number Released
Lake Rotomanu	29.10.24	F&G Ngongataha	500
Sattlers Dam	18.02.25	DOC Turangi	110
Total Released			**610**

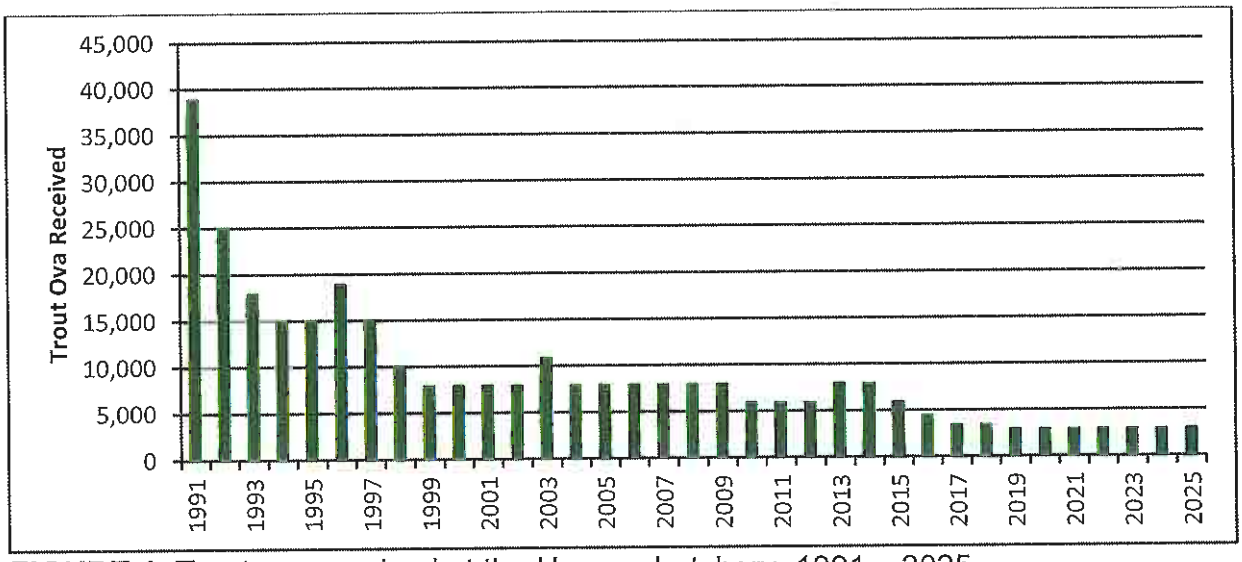


FIGURE 1. Trout ova received at the Hawera hatchery, 1991 – 2025.

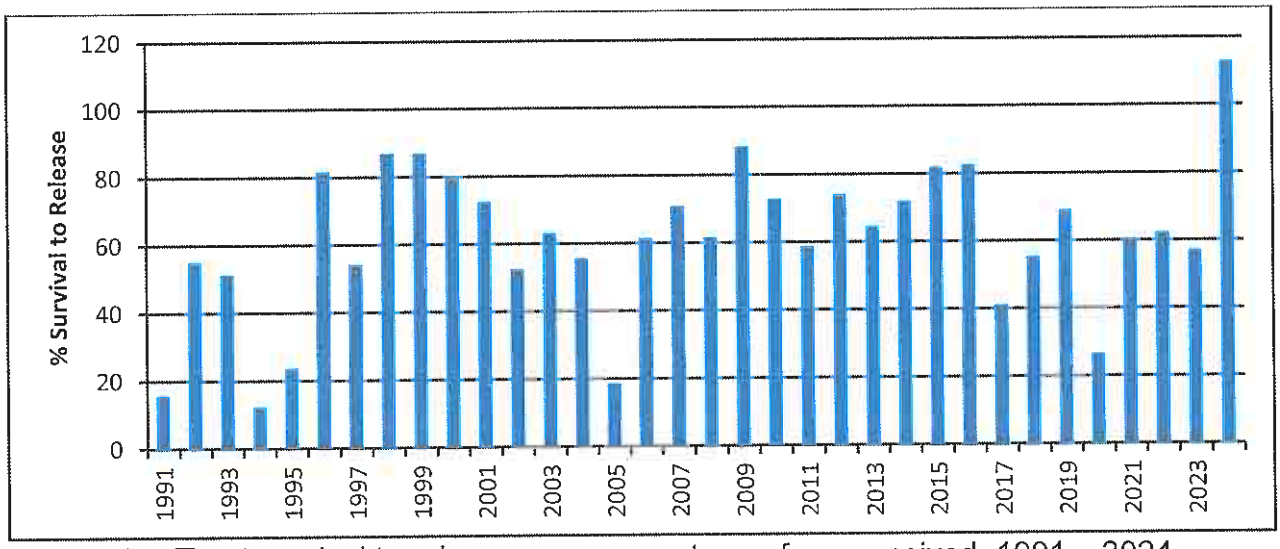


FIGURE 2. Trout survival to release as a percentage of ova received, 1991 – 2024.

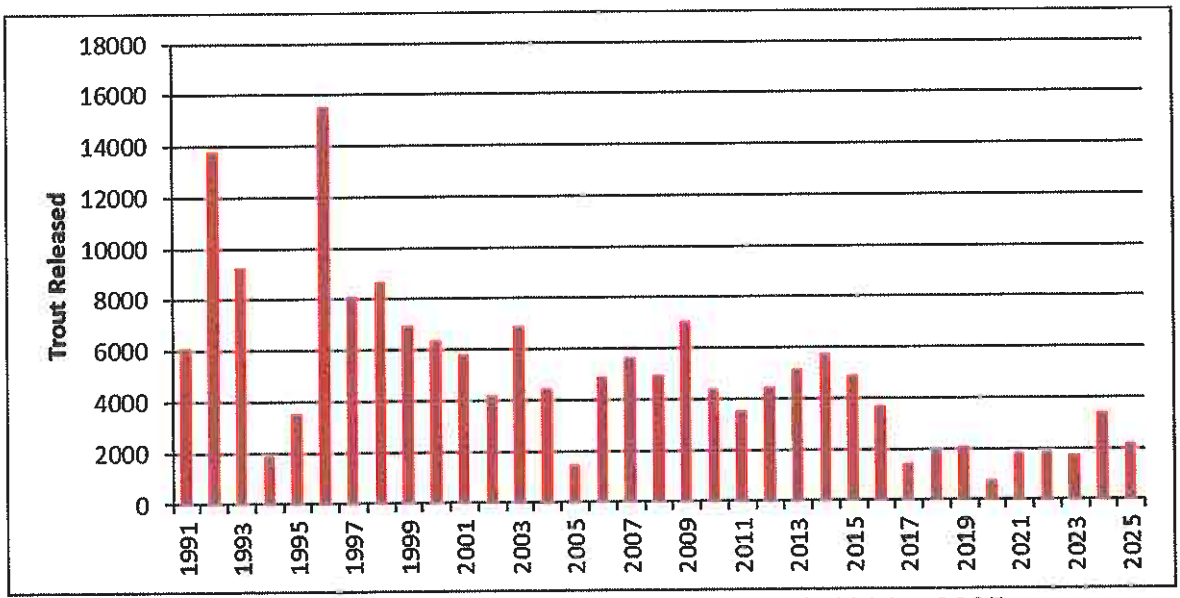
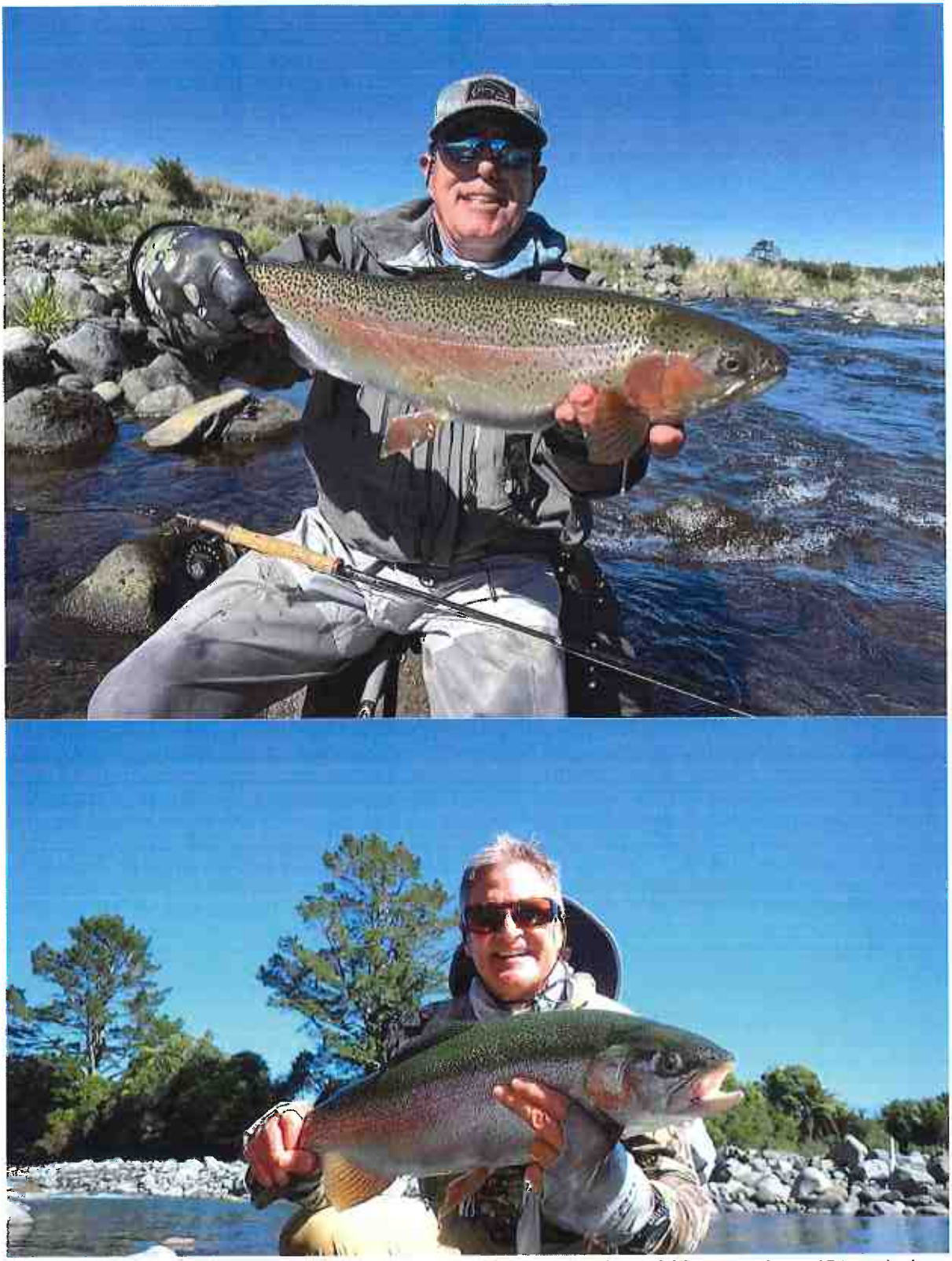


FIGURE 3. Total number of Hawera hatchery trout released, 1991 – 2025.



Photos 1 &2. Hatchery rainbows from the Waiaua (top) and Hangatahua (Stony) rivers, 2024/25 season (top photo courtesy of Adam Priest of TnT Guided Fly Fishing NZ).

Photo 3. Hawera hatchery rainbow caught at the Stratford kids' trout fishing day, 14th December 2024.

Report on Lower Patea Trout Release – October / November 2024

Following a review of the 2017 – 2021 trout stocking programme in the lower Patea River downstream of Patea Dam, the Expert Panel supported the review's recommendation that 200 larger trout be restocked to the Patea River downstream of the dam, per year. Manawa Energy agreed to the revised restocking programme whereby Taranaki Fish & Game will raise and release up to 100 17-month rainbow trout and 100 17-month brown trout each year for a period of five years from 2024 – 2028, after which there would be a review of the effectiveness of the releases.

This report provides details of the releases that occurred in October and November 2024, the first year of the revised programme. Releases were carried out at the McColl's crossing site located some 3.5km downstream of Patea dam (1734000E, 5619575N NZTM) in accordance with Fish & Game's Methodology and Hazard Control Plan October 2024. Manawa Operations were contacted prior to each restocking to log an outage to ensure suitable flow conditions for Health & Safety reasons and to facilitate survival of the restocked fish. All trout were marked with an adipose fin clip to indicate their hatchery origin.

Rainbow trout

Eyed rainbow trout ova from the Eastern Fish & Game Region's Ngongotaha hatchery were received at Taranaki Fish & Game's Hawera hatchery on 22nd June 2023 and 200 well-grown fish were released into the lower Patea River on 22nd October 2024 at 16 months of age (Photos 1 & 2). The number released was higher than that originally proposed, owing to fish availability.

River flows were held steady at 18 cumecs for 24 hours post release to provide favourable conditions for fish establishment (Figure 1). Water temperatures were in the 15.1 - 17.7 ^{O}C range immediately post release (Figure 2) and were also favourable for fish establishment.

Brown trout

Eyed brown trout ova from the Eastern Fish & Game Region's Ngongotaha hatchery were received at Taranaki Fish & Game's Hawera hatchery on 22nd June 2023 and 150 well-grown fish were released into the lower Patea River on 25th November 2024 at 17 months of age (Photos 3 & 4). Brown trout are more difficult to raise than rainbow trout and the average size at release was smaller than for the rainbows. The number released was higher than that originally proposed, owing to fish availability.

River flows were held steady at 18 cumecs for 24 hours post release to provide favourable conditions for fish establishment (Figure 3). Water temperatures were in the 16.9 - 19.8 ^{O}C range immediately post release (Figure 4) and were also favourable for fish establishment.

Figure 1. *Patea River Flow 20 – 27 October 2024 as recorded at McColl's Bridge (data courtesy Taranaki Regional Council).*

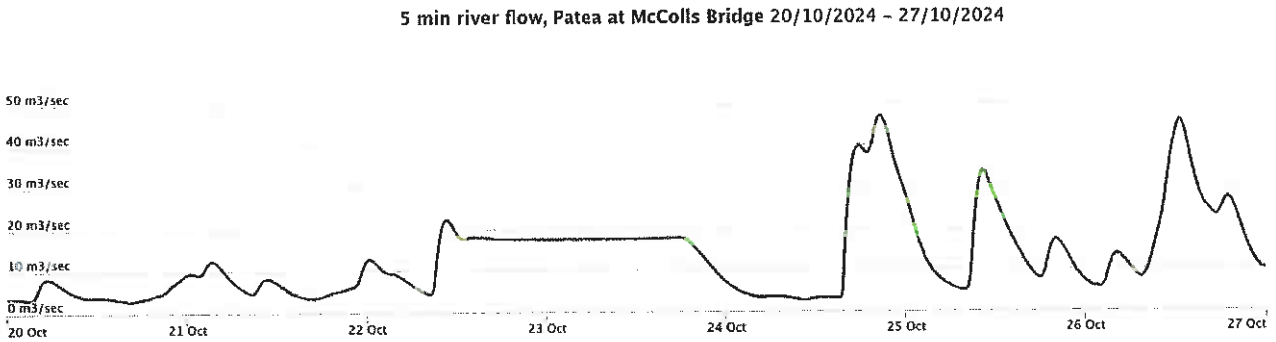


Figure 2. *Patea River water temperatures 20 – 27 October 2024 as recorded at McColl's Bridge (data courtesy Taranaki Regional Council).*

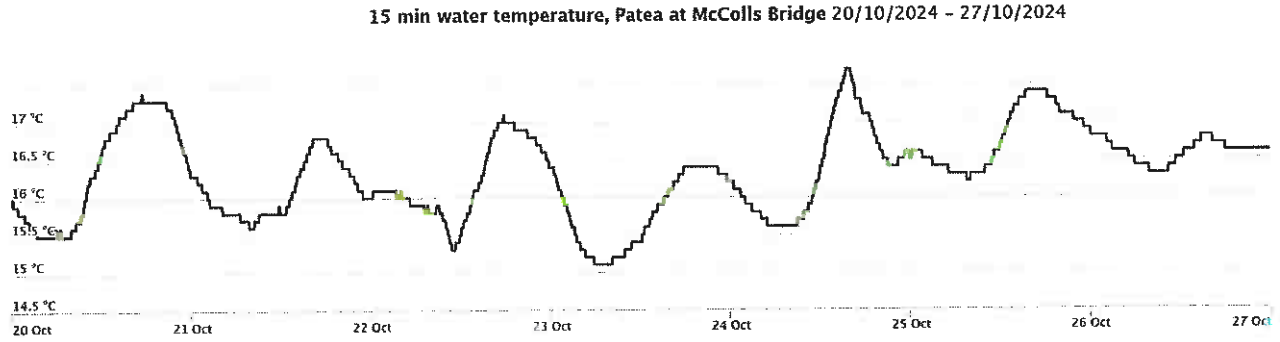


Figure 3. *Patea River Flow 23 – 30 November 2024 as recorded at McColl's Bridge (data courtesy Taranaki Regional Council).*

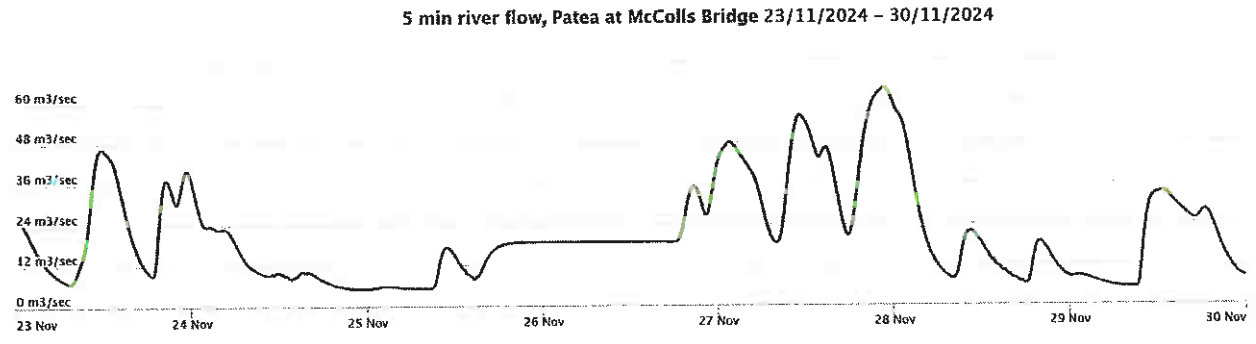
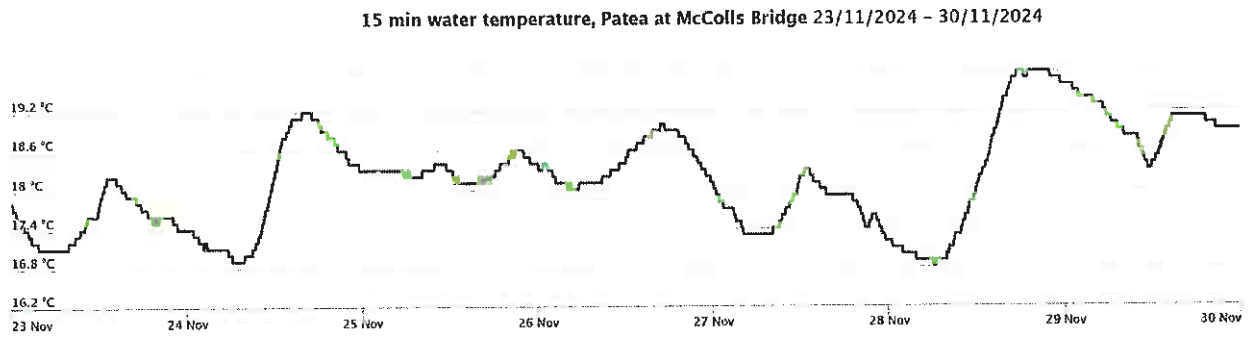


Figure 4. *Patea River water temperatures 23 – 30 November 2024 as recorded at McColl's Bridge (data courtesy Taranaki Regional Council).*



Recommendations

The release protocol as described in the attached 'Patea Trout Release – Methodology and Hazard Control Plan' worked well and no changes are recommended for future releases.

Allen Stancliff

Senior Field Officer

Taranaki Fish & Game

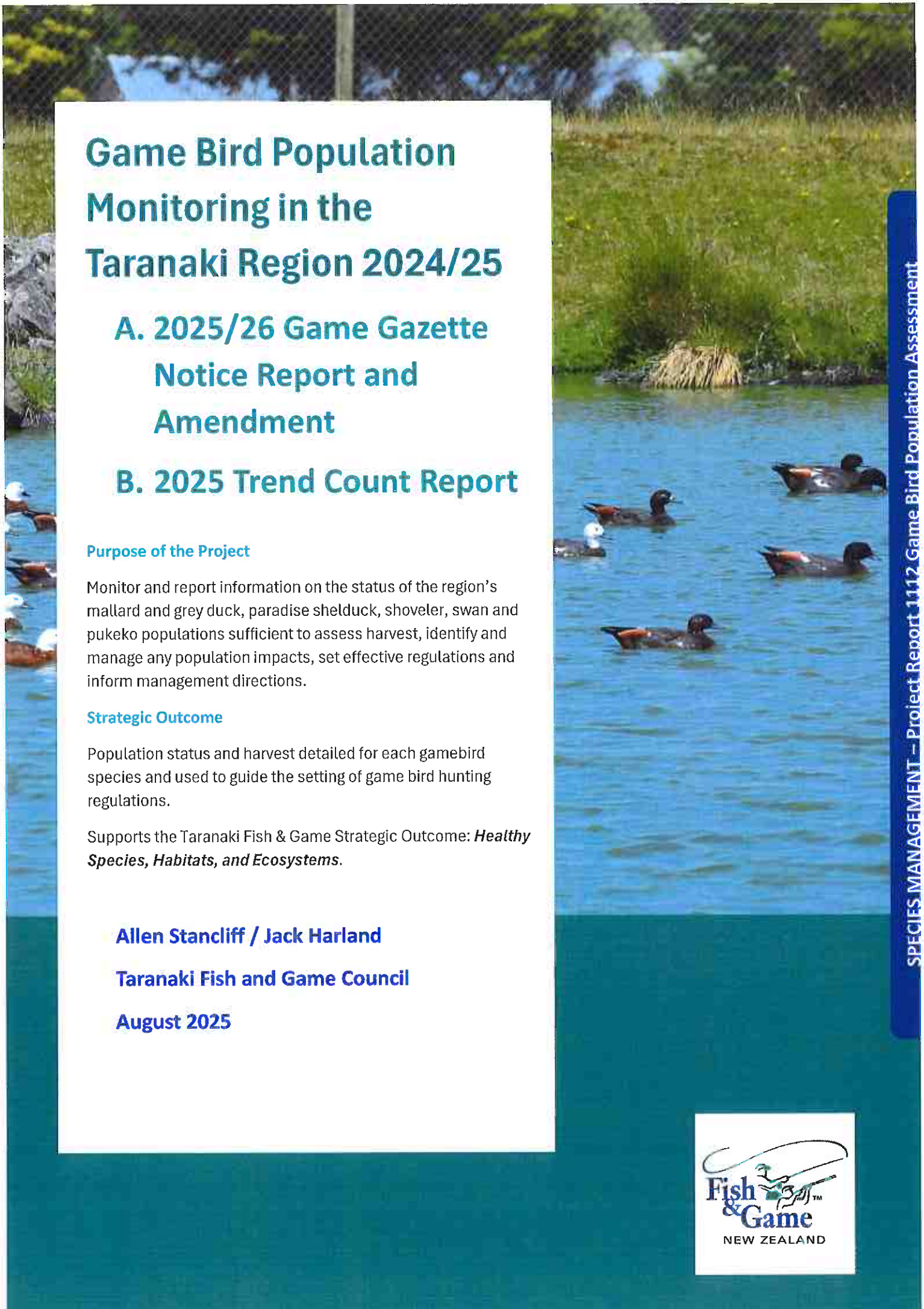
12 December 2024

Photo 1. Rainbow trout being loaded for release into the lower Patea River, 22nd October 2024.

Photo 2. Rainbow trout being released into the lower Patea River at McColl's crossing, 22nd October 2024.

Photo 3. Brown trout being loaded for release into the lower Patea River, 25th November 2024.

Photo 4. Brown trout being released into the lower Patea River at McColl's crossing, 25th November 2024.



Game Bird Population Monitoring in the Taranaki Region 2024/25

A. 2025/26 Game Gazette Notice Report and Amendment

B. 2025 Trend Count Report

Purpose of the Project

Monitor and report information on the status of the region's mallard and grey duck, paradise shelduck, shoveler, swan and pukeko populations sufficient to assess harvest, identify and manage any population impacts, set effective regulations and inform management directions.

Strategic Outcome

Population status and harvest detailed for each gamebird species and used to guide the setting of game bird hunting regulations.

Supports the Taranaki Fish & Game Strategic Outcome: ***Healthy Species, Habitats, and Ecosystems***.

Allen Stancliff / Jack Harland

Taranaki Fish and Game Council

August 2025

SPECIES MANAGEMENT – Project Report 1112 Game Bird Population Assessment

Fish & Game NEW ZEALAND

Executive Summary – 1112 Game Bird Population Monitoring (2025)

Overview of Results

Trend count and harvest information was presented for grey/mallard duck, shoveler duck, paradise shelduck, black swan and pūkeko. Harvest information was also presented for pheasant and California quail.

Following an increase in the January 2025 trend count for paradise shelduck around the Taranaki ringplain, the daily bag limit for this species was raised from 10 birds to 15 in Game Management Area C for opening weekend of the 2025 game season. Otherwise, no changes were made to the Game Gazette Notice from the previous year. All species were judged to be sustainably managed.

Statement of Service Performance

Planned Result:

Monitor and report information on the status of the region's mallard and grey duck, paradise shelduck, shoveler, swan and pukeko populations sufficient to assess harvest, identify and manage any population impacts, set effective regulations and inform management directions.

Actual Result:

- A 2025/26 Draft Game Season Gazette Notice Report was presented to Council's 7 December 2024 meeting;
- A 2025 Game Bird Trend Count report was presented to Council's 15 February 2025 meeting;
- A 2025/26 Game Gazette Notice amendment report was presented to Council's 15 February 2025 meeting; and
- Project Report 1112 Game Bird Population Monitoring for the Taranaki Region 2025 was prepared.

- **Budget Variance**

	Budget ($)	Actual ($)
External		
Internal		
Total		

Comments:

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

2025/26 GAME SEASON GAZETTE NOTICE

This report provides an assessment of population monitoring and harvest information to support the recommended conditions for the 2025/26 Game Season. Recommended season conditions for Paradise shelduck and Black swan will be re-confirmd following results of the January 2025 trend counts.

Background

Since 2016 the Council has had a policy of retaining consistent game regulations from year to year unless new information supports a need to make significant changes to protect the resource.

This reflects that detailed analysis of long-term harvest data from the Eastern Region indicates that large changes in bag or season length would be required to make any meaningful difference to the duck harvest.

There is also increasing evidence that maximising bag limits does not necessarily maximise hunter satisfaction. To maximise sustainable harvest also requires precise and accurate monitoring. However, with such patchily distributed and highly mobile species like ducks, it is both difficult and very resource intensive to achieve robust estimates. This is further complicated by the timing of the gazettal process which requires that Council agree next season's recommendations in December before we can measure this spring's production.

Second, total harvest is directly related to total effort and analysis by Eastern Fish and Game found annual changes in effort were best explained by changes in the duck population size. In other words, in years of low duck numbers, hunters spend less time in the field and the total harvest is inherently smaller irrespective of any regulation changes. Hunter behaviour in Taranaki is expected to display a similar trend.

Collectively, all these factors suggest that rather than trying to maximise bag limits every year Council is better to set consistent season conditions which they can be confident do not impact on resource sustainability while providing sufficient opportunity and setting realistic expectations which ultimately result in greater overall hunter satisfaction.

This consistency from year to year also provides hunters with confidence that they are adhering to season regulations and can invest in equipment and/or habitat development and predator control programmes to improve the game bird resource. This paper is therefore presented from the perspective of whether there is any good reason to depart from the status quo for each gamebird species.

However, having said that, given the decision to amalgamate the Taranaki and Wellington Fish & Game regions, it is also important to have regulations as consistent as possible across the wider region. For this reason, Taranaki adopted a daily bag limit of 12 grey/mallard duck for the 2024 game season, an increase of two birds from the usual 10-bird limit. This follows a 15-bird limit for opening weekend of the 2023 season.

Current Population Status

Grey and Mallard Duck (Greylard/rakiraki)

Given the degree of interbreeding and hybridisation between mallard and grey duck these species are treated as a single population for this discussion.

From 2016 - 2019 annual aerial counts along 20 randomly selected transects were undertaken around the Taranaki ringplain in early April using a helicopter. After missing two years of flights (2020 and 2021) owing to Covid–19 lockdowns and covid-related budget cuts, aerial helicopter transect flights resumed in April 2022. The 2024 count of 1,491 birds was higher than the 1,273 greylards counted in 2023 (Figure 1), but still below the average of 1,751 birds for the seven years of counts. Conditions for the 2024 count were very good, as flying in the morning reduced glare from the water on ponds and the pilot kept to the 500 feet observation level, meaning that the count accuracy was likely better than in 2023.

However, what was evident was that traditional farm dairy oxidation ponds on the coastal and south Taranaki ringplain which provide habitat for ducks are gradually being replaced with vertical-sided round metal ponds or steep-sided polythene-lined ponds as farms upgrade their effluent disposal systems. This highlights the importance of working with willing landowners to create open water wetlands to off-set the loss of habitat.

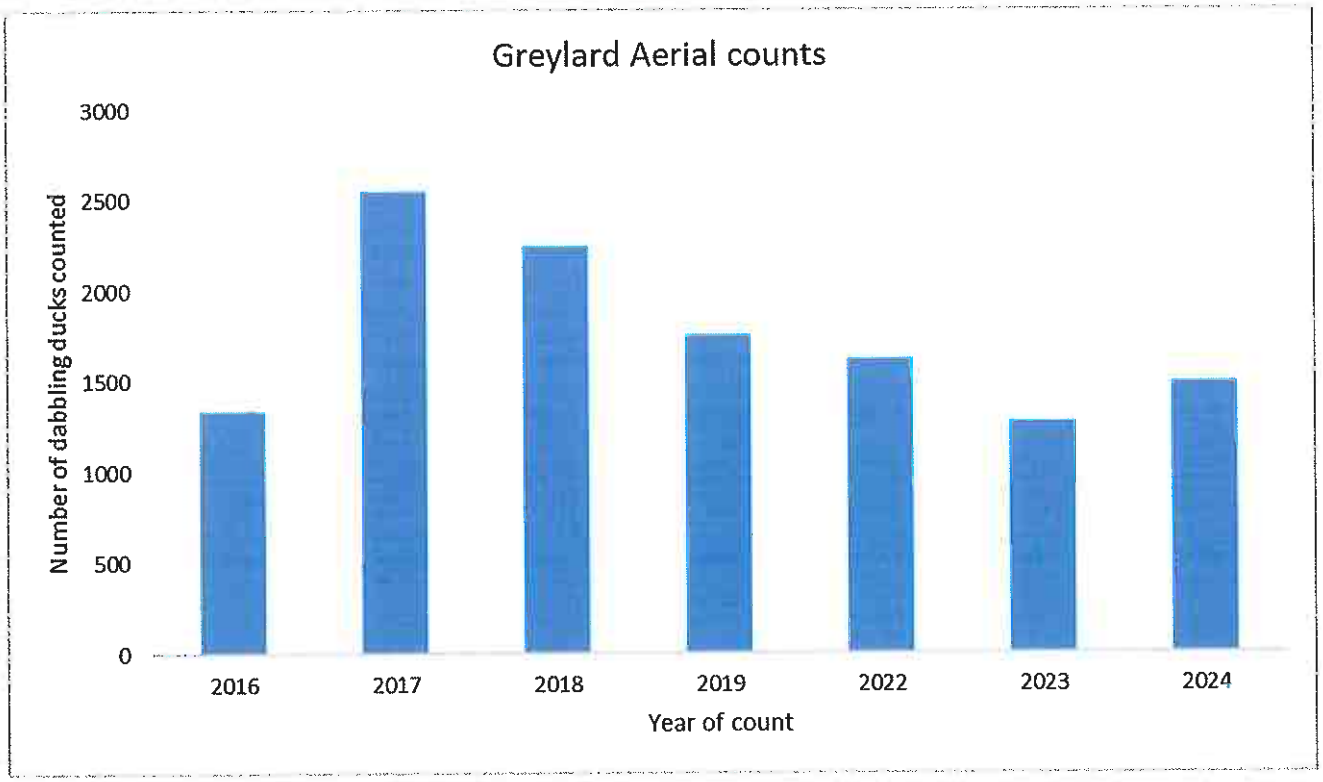


Figure 1. *Total Greylards counted during helicopter aerial transects in the Taranaki ringplain, 2016 – 2024 (note: no counts undertaken in 2020 and 2021).*

Hunter survey results for the 2024 season indicate that there was a decrease in hunter success rate for greylard duck from 2023 (Figure 2) and as hunting hours remained stable, this resulted in a decrease in overall harvest compared with 2023 (Figure 3).

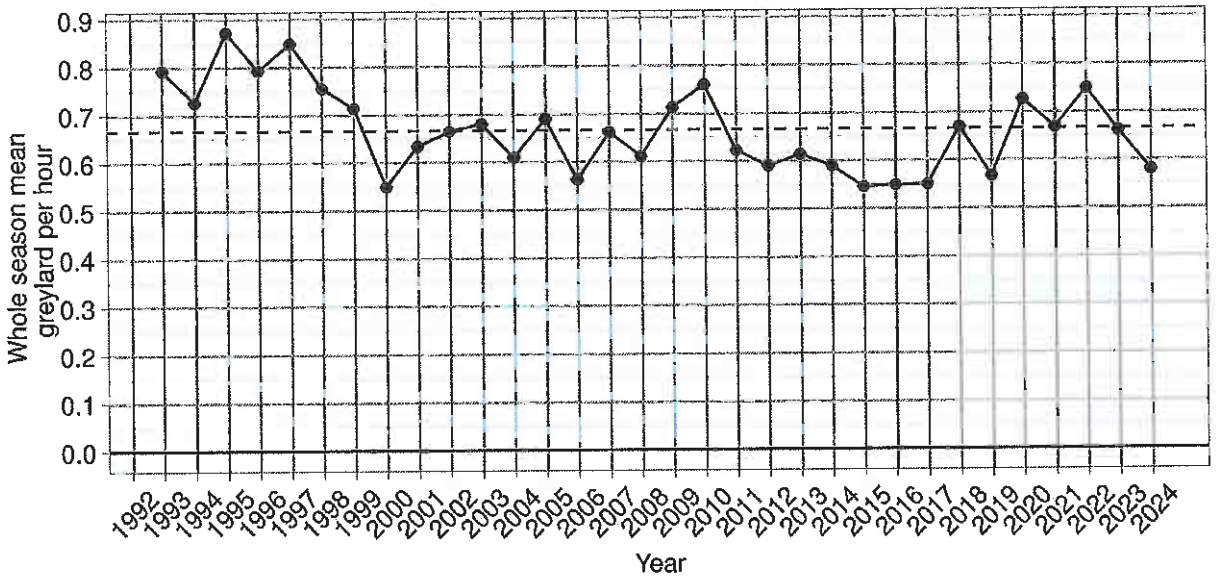


***Figure 2**. Average hunter harvest rate of greylards (ducks per hour) from the National Hunter Survey 1993 to 2024 seasons.*

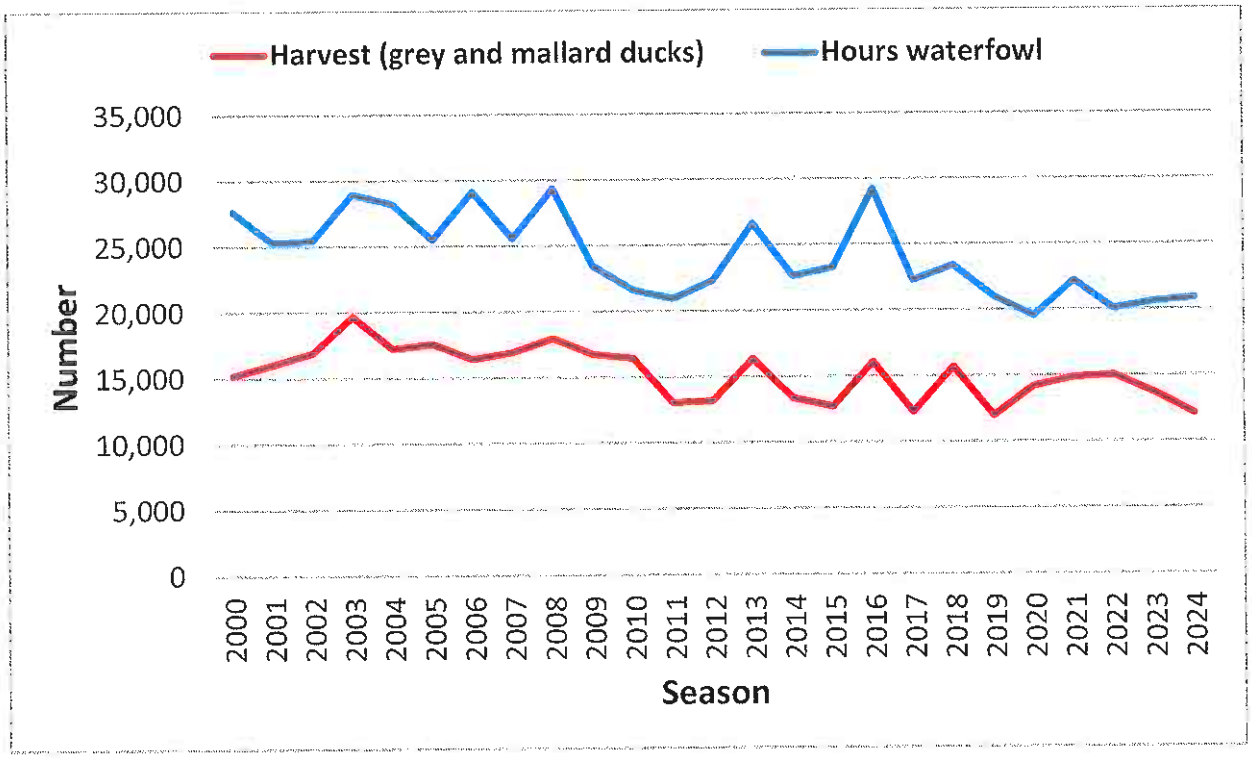


***Figure 3.** Total hunting effort (hours) and harvest of greylards in the Taranaki region 2000 to 2024.*

A 15-bird opening weekend bag limit for greylard duck in 2023 and a 12-bird limit in 2024 (rather than the usual 10) did not result in an increase in the average opening weekend bag taken by hunters (Figure 4). In fact, the 2024 average opening weekend bag was below average, which may well have been due to the fine, clear and calm weather conditions which firmly favoured the ducks.

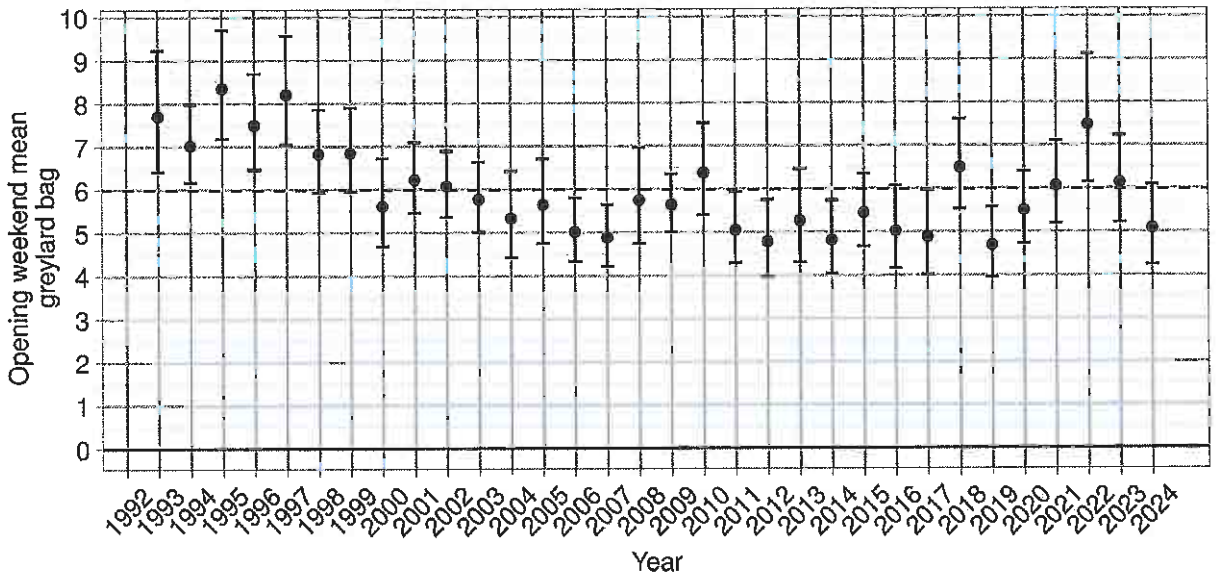


Figure 4. *Average opening weekend bag for greylard duck in the Taranaki region 1993 to 2024.*

Given this analysis, and the intention to align regulations between the Wellington and Taranaki regions where practicable, it is recommended that the Council revert to the usual 10-bird limit for greylard duck for the whole of the proposed 8-week season in 2025.

Shoveler Duck

Monitoring of known aggregations of Australasian Shoveler Duck (Kuruwhengi) has occurred in early August each year since 2000. At this time, birds congregate to select mates before dispersing to secluded breeding sites. Monitoring occurs concurrently throughout New Zealand to reflect the view that the population is a single national population with birds moving throughout NZ.

Across the Taranaki region 459 shoveler duck were counted at 27 sites on 4th & 5th August 2024, which was higher than the 422 counted in 2023 and 26% higher than the long-term average (363 ducks). Results of the 2024 national count indicate that the population is stable over the long-term despite a decrease in the last two years.

The low level of harvest during the 2024 game season (an estimated 22 birds, Figure 5) was consistent with recent seasons and the low numbers suggest shoveler are not generally targeted by Taranaki hunters and/or are not particularly prevalent in Taranaki during the game season. Given the low level of harvest, it is recommended that the status quo of a 2–bird bag limit and 8-week season be retained for 2025, which is the same as recommended for the Wellington region.

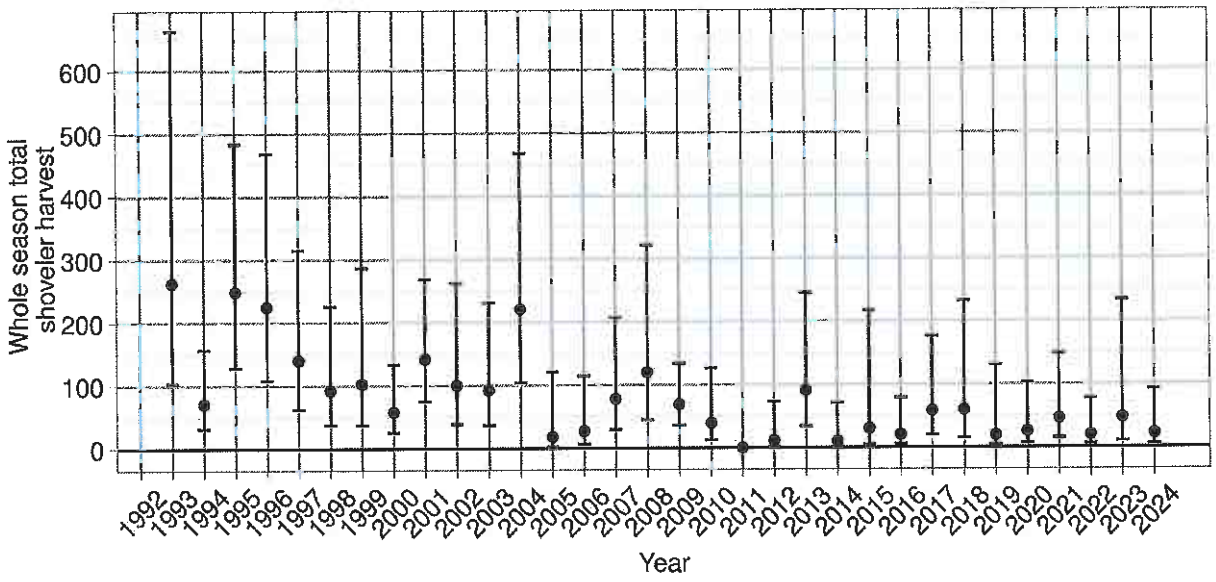


Figure 5. *Estimated Shoveler duck harvest in the Taranaki Region 1993 to 2024 seasons (National Hunter Survey).*

Paradise Shelduck

The paradise shelduck (Pūtangitangi) moult count in January 2024 in the Waimarino area (2,849 paradise shelduck) represented 204 birds per moult site which is lower than in recent years, but similar to 2023 (Figures 6 & 7). Counts around the Taranaki ringplain showed a decrease in total birds from 14,063 to 12,569, but only a slight decrease in birds per site (327 to 314 per moult site) and the total count was still above the long-tern average of 11,905 birds. The Whanganui count remained at a low level, with this year being the lowest recorded count of 1,566 birds, or 157 birds per moult site.

The counts suggest that the population is stable but at the 'low end' of the historical range of abundance in the Waimarino. The continued downward trend in the Whanganui count is of concern and suggests possible overharvest. The count in Taranaki looks to be decreasing but is still at a relatively high level.

The operational amalgamation between Taranaki and Wellington will allow monitoring of the Waimarino and Whanganui paradise shelduck populations to be added into the Wellington aerial counts. Aerial counts of existing and potential moult sites should help to answer the question as to whether there are moult sites that are not being counted, or whether the current count accurately reflects what is happening in the population. If counts in Whanganui continue to decrease, then a review of season length and bag limits should be undertaken.

In respect of the harvest, the estimated total regional harvest of 7,411 paradise in 2024, was an increase on the 6,044 birds in 2023, but the long-term trend is still one of decline (Figure 8). Reasons for the gradual reduction in harvest could be related to declining numbers in the Waimarino/ Whanganui/ Waverley area. However, the whole season harvest rate of 0.36 birds per hour for paradise shelduck was an increase on 2023 (0.24 birds per hour) and just above the long-term average of 0.35 birds per hour (Figure 9).

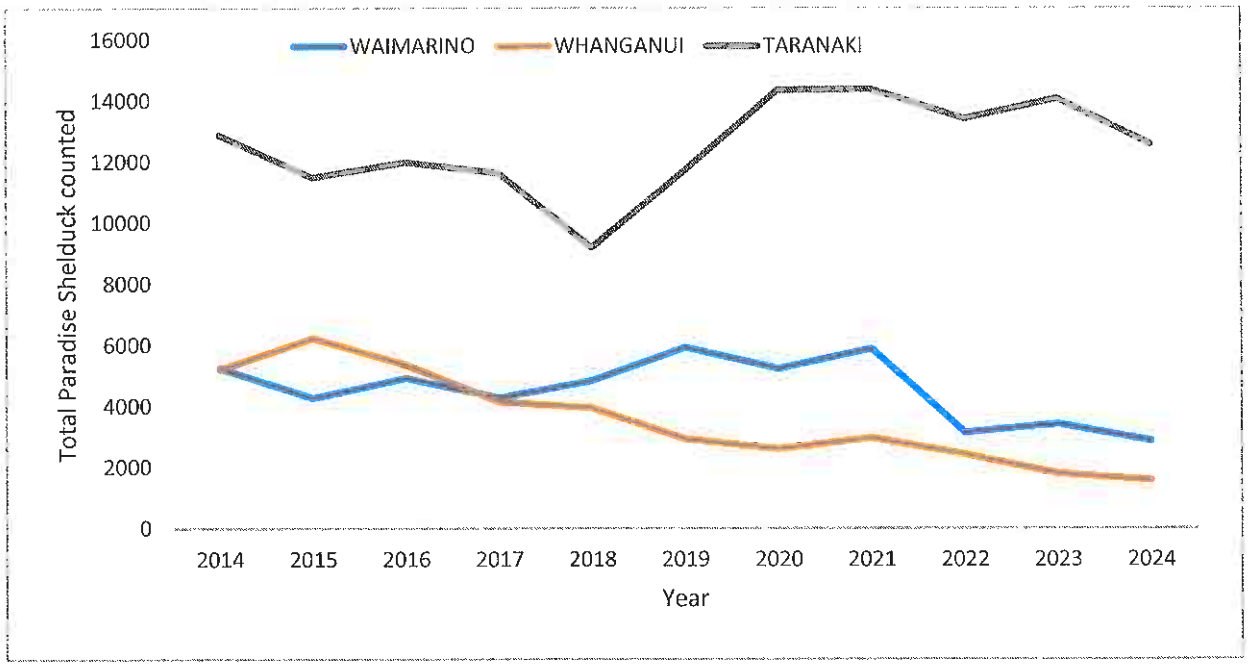


Figure 6. Total January trend count of Paradise shelduck in the Waimarino, Whanganui and Taranaki areas from 2014 to 2024.

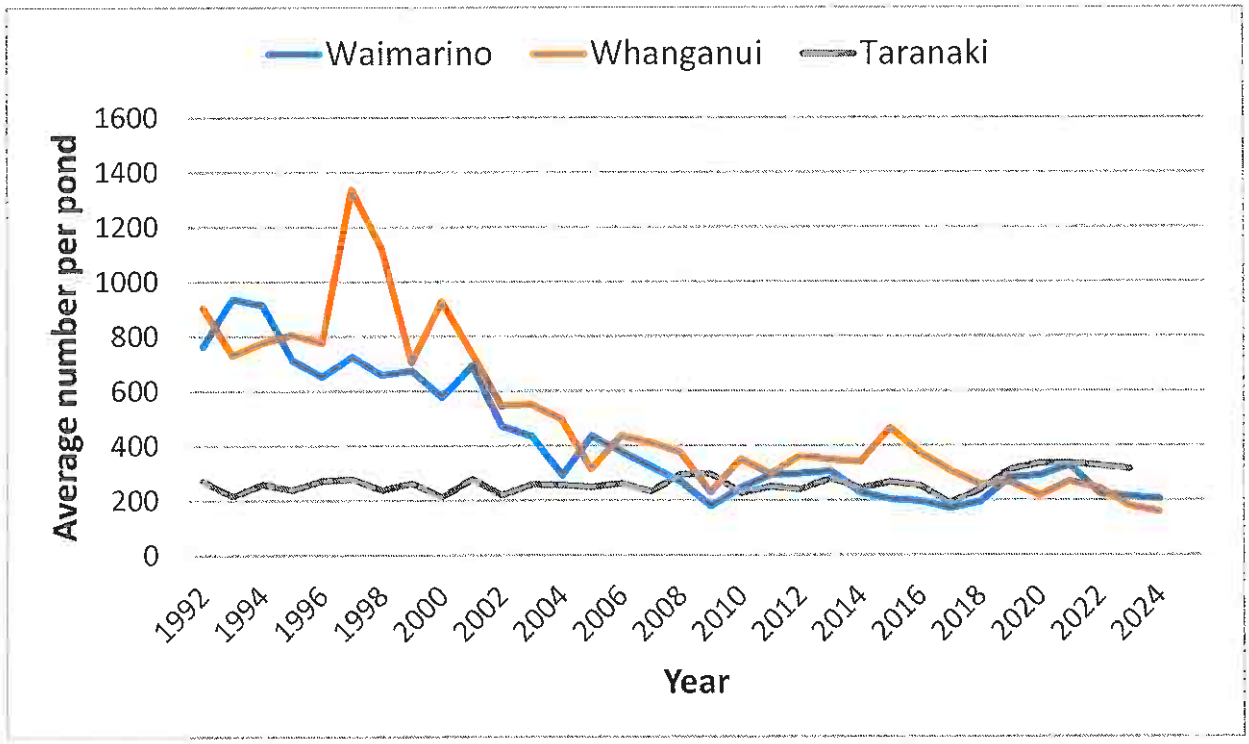


Figure 7. *Average number of Paradise shelduck per moult site counted across the Waimarino, Whanganui and Taranaki areas from 1992 to 2024 moult counts.*

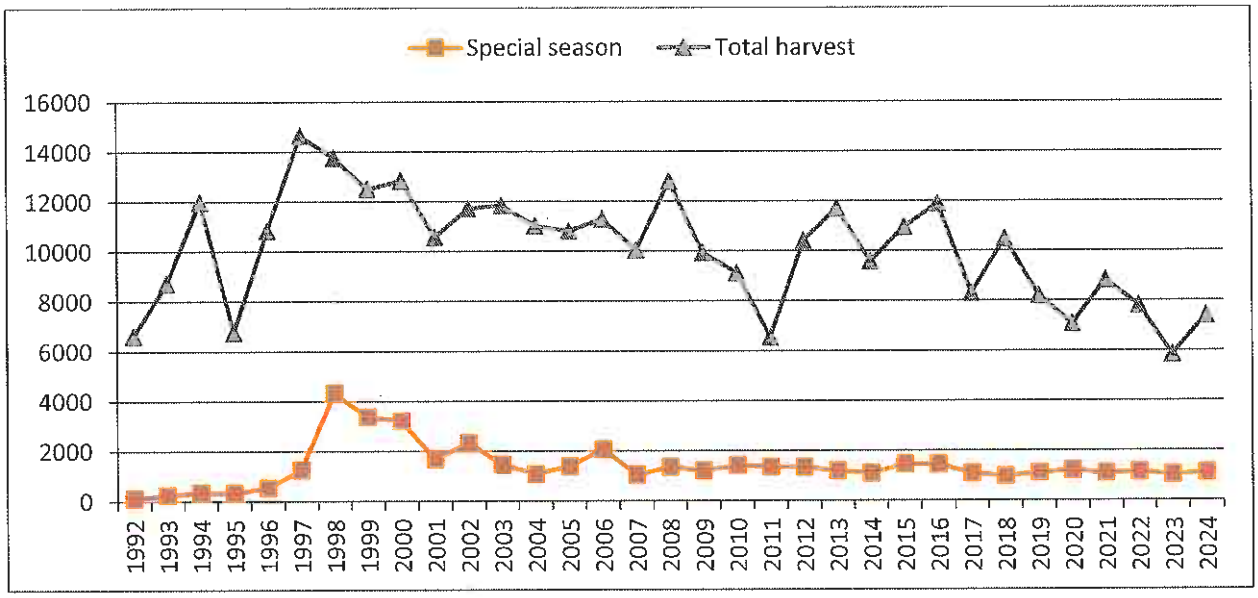


Figure 8. *Estimated special season harvest and total annual Paradise shelduck harvest across the Taranaki region, 1992 to 2024.*

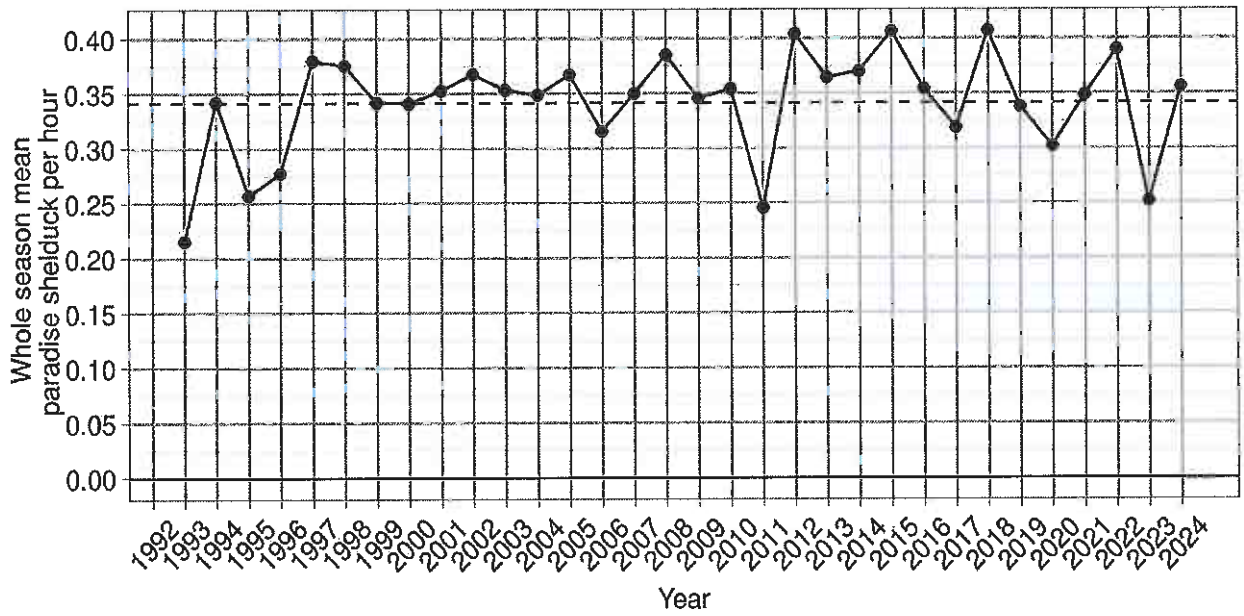


Figure 9. *Whole season harvest rate for Paradise shelduck (birds per hour) in the Taranaki Region, 1993 - 2024. Data excludes harvest during the special summer season.*

The special summer season for paradise shelduck in Area C continues to play an important role in the dispersal of post-moult birds that cause a nuisance to farmers by grazing and fouling areas of new grass, recovering hay paddocks and fodder crops like chicory. It also provides an additional hunting opportunity for licence holders and land occupiers. As Figure 8 shows, the harvest from the special summer season is consistently around 1,000 birds per year and this remains a small but significant proportion of the total annual harvest.

Manipulating the harvest is complicated by the need to set the special season regulations more than a year in advance, however it is recommended that the Council retain the current special season conditions. With population numbers in Areas A and B at the lower end of abundance, any additional harvest from a special season is not supported in those areas. Any impacts from aggregations of birds are best managed by working directly with the impacted landowners.

In respect of the special season in Area C, the Council resolved to extend season to 3 weekends including Taranaki anniversary day (total 7 days) in 2023. The 2025 dates are already set in the 2024 Gazette Notice and are 22/23 February, 1/2 March and 8/9/10 March 2025.

In 2026, Taranaki Anniversary Day falls on Monday 9th March, so the special season dates will be 21/22 February, 28th February/1st March, and 7/8/9/ March 2026. Including an extra weekend in 2023 and 2024 resulted in the same hunting effort being spread out over a longer timeframe with a similar harvest. A 7-day season does allow for greater dispersal of paradise shelduck from moult sites and more hunter opportunity. Disturbance of mallards will occur a little closer to the main season, but the impact is unlikely to be significant.

On the basis that paradise shelduck populations generally appear stable, along with a moderate existing harvest, it is recommended that Council retain the status quo with an extension to the special season in Area C to include Taranaki Anniversary weekend. That is:

- A 10-bird daily limit for Areas A, B & C for an 8-week main season (as is also recommended for the Wellington F&G Region);
- A 3-weekend special season in Area C for 2026 (21/22 February, 28th February/1st March, and 7/8/9/ March 2026).

Black Swan

In 2016 the daily bag limit for black swan (Kakīānau) was increased from 1 bird to 2. Most Taranaki hunters choose not to harvest swan and the increase allowed the few who do to take an extra bird for the table. The harvest has generally fluctuated between 20 and 300 swan, with 150 harvested in 2024 (Figure 10). The 2016 increase in the daily bag limit doesn't appear to have significantly increased the harvest, which remains small overall.

Counts of black swan undertaken in January 2024 were above the long-term average in Whanganui (563 cf an average of 345 swan), Waimarino (45 cf an average of 33 swan) and Taranaki (490 cf an average of 374 swan). The total count of 1,098 swan was nearly 300 greater than in 2023 (805 birds) with Lakes Kaitoke (281 swan) and Marahau (102) showing significant increases.

Black swan are relatively mobile and it is thought that a single population extends over central New Zealand, if not further afield. The January 2024 trend counts in Wellington, Nelson/Marlborough (including Farewell Spit) showed a decrease from 2023, but remain at a relatively high level (Figure 11).

On the basis that the Taranaki harvest is small, and that the counts are also relatively small, it is recommended that the status quo (2 bird daily limit for an 8-week season) remain.

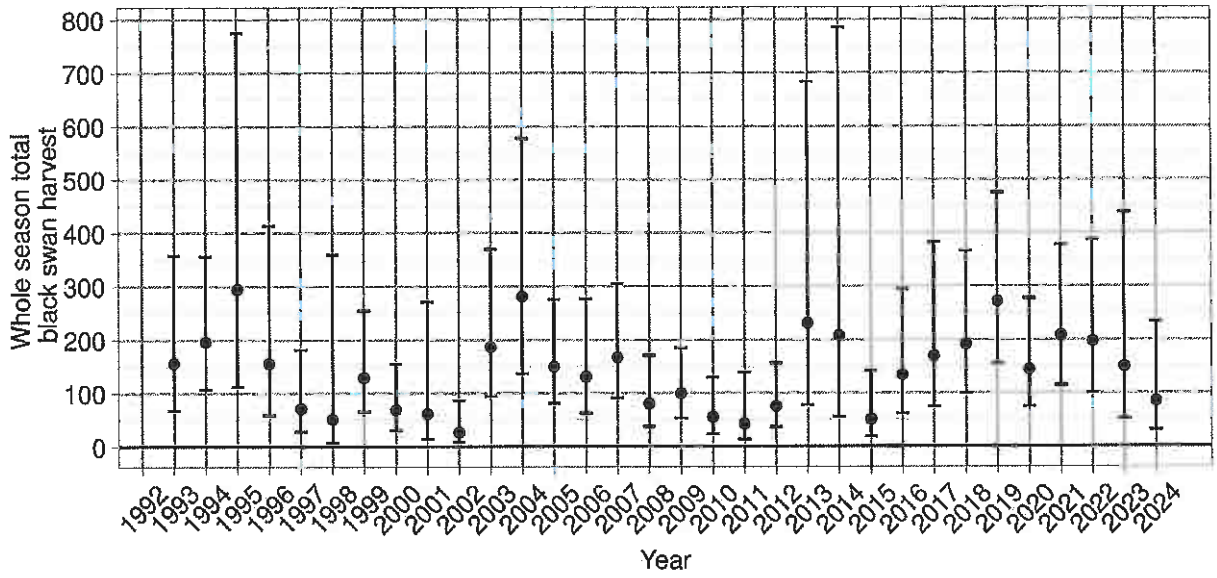


Figure 10. *Estimated black swan harvest in the Taranaki Fish and Game region 1993 to 2024.*

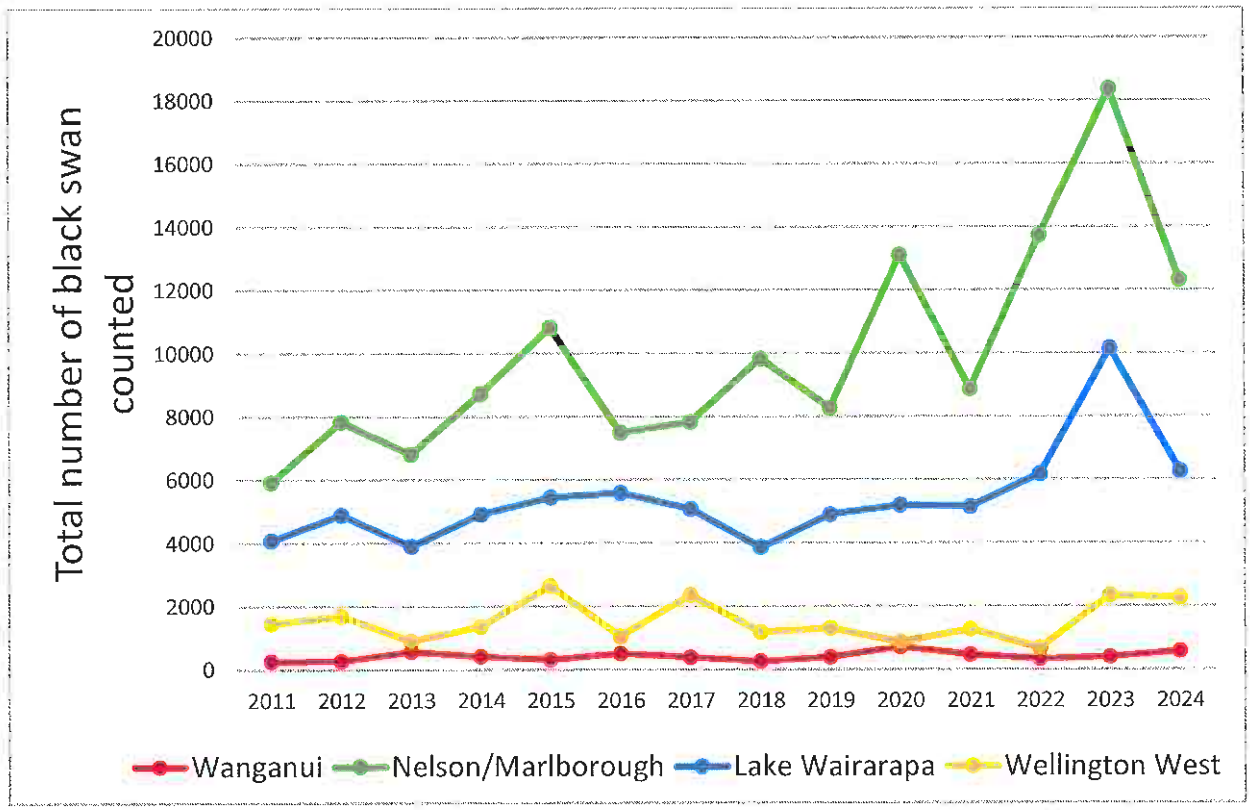


Figure 11. *January black swan trend counts for the Taranaki, Wellington and Nelson/Marlborough regions 2010 to 2024.*

Pūkeko

Early April counts of pūkeko have been made along 17 randomly selected transects around the Taranaki ringplain since 2005, although no counts were undertaken in 2020 owing to the covid-19 lockdown. Total counts have varied between 91 and 336 birds, with an average of 178. The April 2024 count was 274 pūkeko which was the highest since 2017.

The 19-year trend analysis (Figure 12) indicates that the population remains stable or slowly increasing, although birds are patchy in distribution with greater numbers in the wetter north and central Taranaki areas.

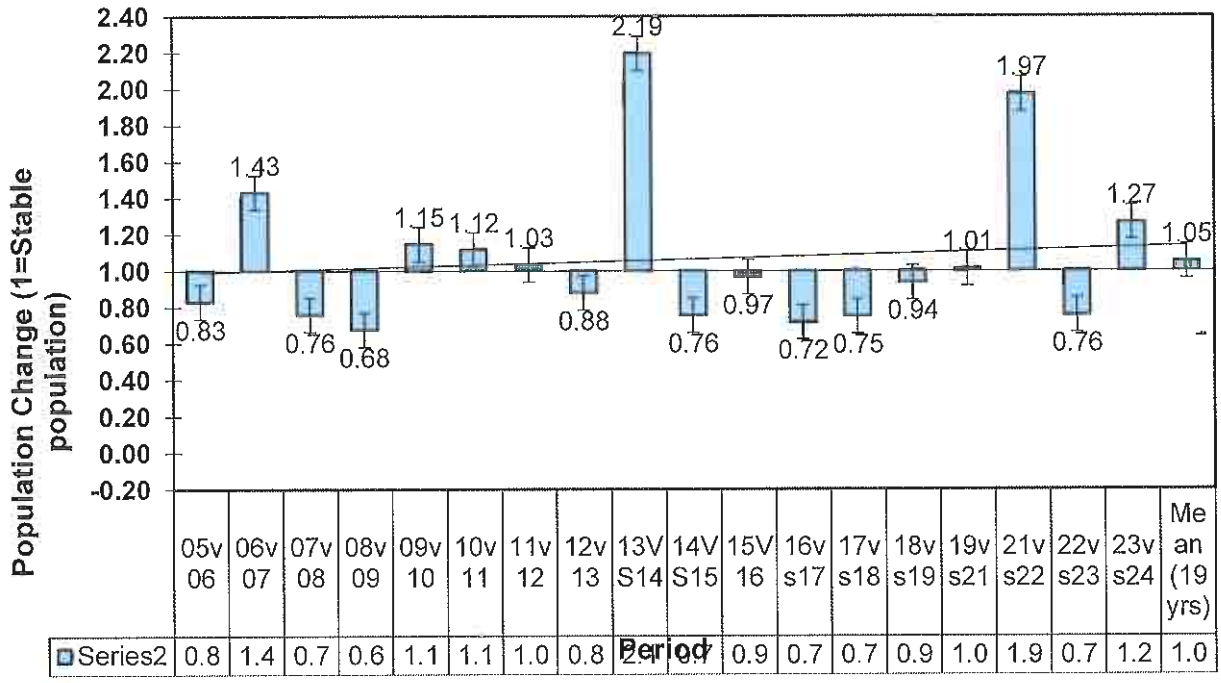


Figure 12. *Route regression analysis of pūkeko counts along 17 randomly selected road transects around the Taranaki ringplain, 2005 to 2024.*

Counts in Whanganui were restarted in 2023 following initial counts from 2015 to 2017. These are also done in April and consist of 10 randomly selected road transects between Waverley and Turakina. The total count in Whanganui in 2024 was 55 birds compared with 122 in 2023. The Whanganui area was very dry prior to the count, and this may have been a significant influence. There is not yet enough data from Whanganui to conduct trend analysis.

During the 2023/24 year there were 49 permits issued to disturb pūkeko with 20 in urban areas and 29 in rural areas. The majority of these urban permits were issued for New Plymouth.

Harvest during the 2024 gamebird season showed a substantial decrease from last year with an estimated 629 pūkeko harvested compared with 1,422 in 2023 (Figure 13). This was also below the long-term average harvest of 1,143 birds. This year, the hunter survey did not find any harvest of pukeko occurring during the 2-month extended season, compared with 42% of the season total harvested during the extended season in 2023 (Figure 14).

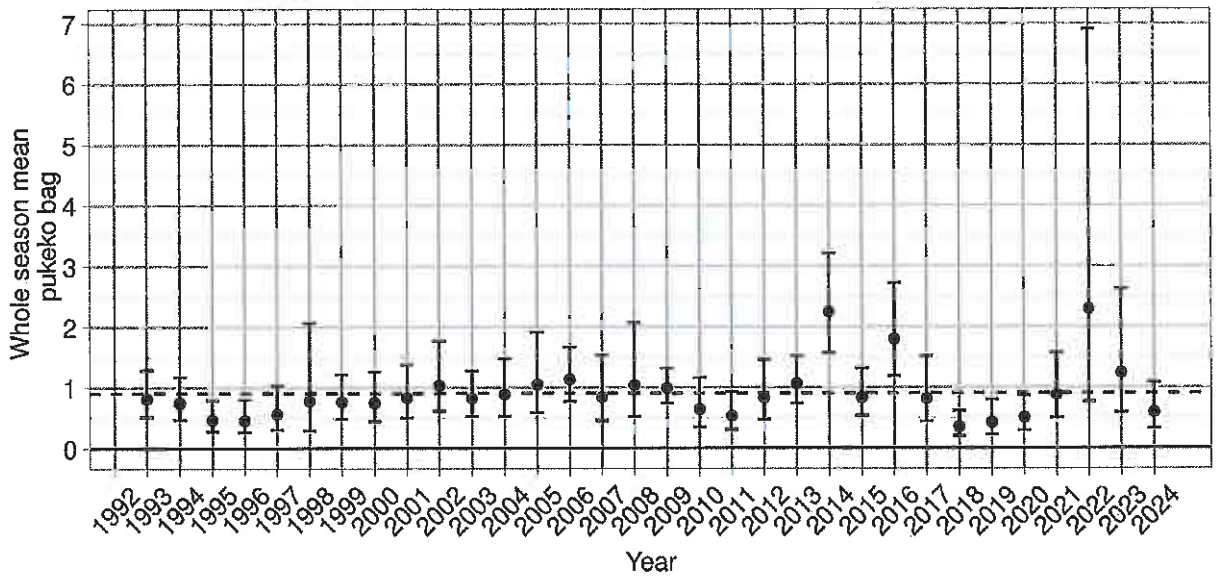


Figure 13. *Estimated annual pūkeko harvest in the Taranaki region 1993 to 2024.*

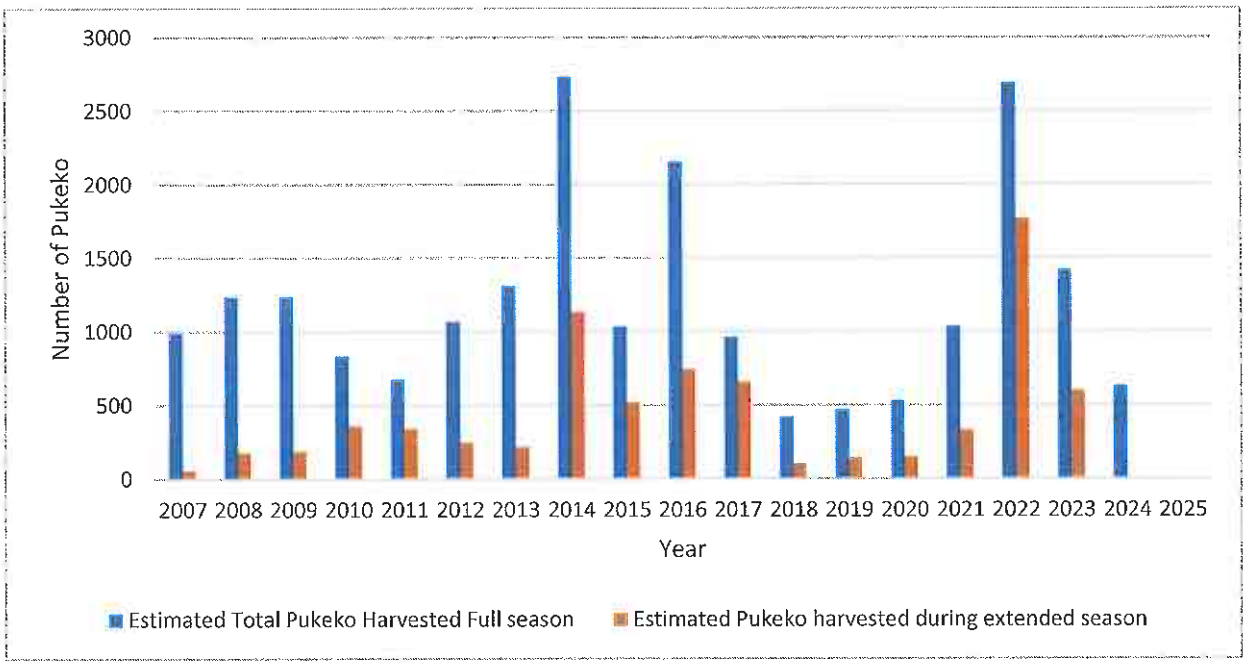


Figure 14. *Estimated pūkeko harvest during the Taranaki full season and the proportion taken during the extended season using gamebird hunter survey results.*

Area C currently has a 10-bird daily bag limit for pūkeko along with a 4-month season through to the last Sunday in August. The extended season enables hunters to target localised aggregations of pūkeko scattered over the ringplain and in problem areas around New Plymouth to address their impacts on agriculture and horticulture as well as to create additional hunting opportunity after the main duck season has ended. Past monitoring suggests that the Whanganui and Waimarino populations might struggle under this level of harvest if it was mis-directed, but in the case of the Taranaki ringplain population it appears that the harvest may be self-limiting. In other words, as the larger mobs are controlled, hunters may be less inclined to target pūkeko.

Given that monitoring indicates that pūkeko populations in Area C remain stable, it is recommended that Council continues with a 10-bird limit in Area C and a 5-bird limit in Areas A and B.

The Wellington Region is likely to recommend a 5-bird limit for pūkeko with the same season length extension as Taranaki and their 5-bird limit aligns with that recommended for Whanganui and the Waimarino.

Pheasant

The harvest of pheasant in the 2024 season was estimated at 116 birds, down from 252 birds in 2023 and the lowest estimate since 2011 (Figure 15). Hunting hours were (857, Figure 16) were a little higher than in 2023 (553 hours) but still well below average. The harvest rate of 0.14 pheasant/hour was the lowest since 2011 (Figure 17).

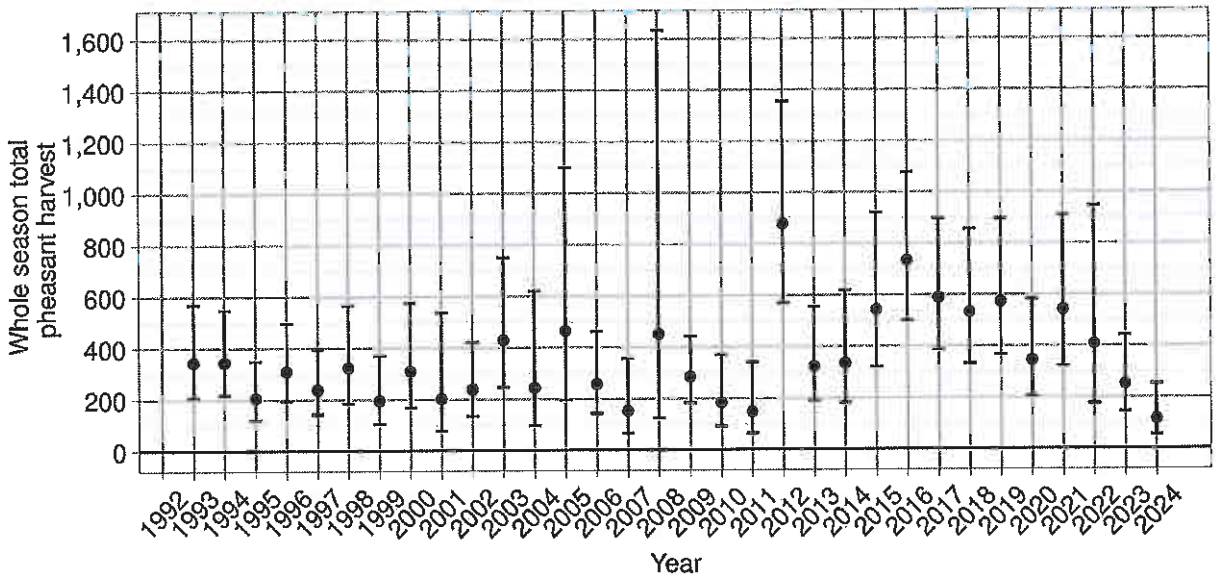


Figure 15. *Estimated annual pheasant harvest in the Taranaki Region 1993 to 2024.*

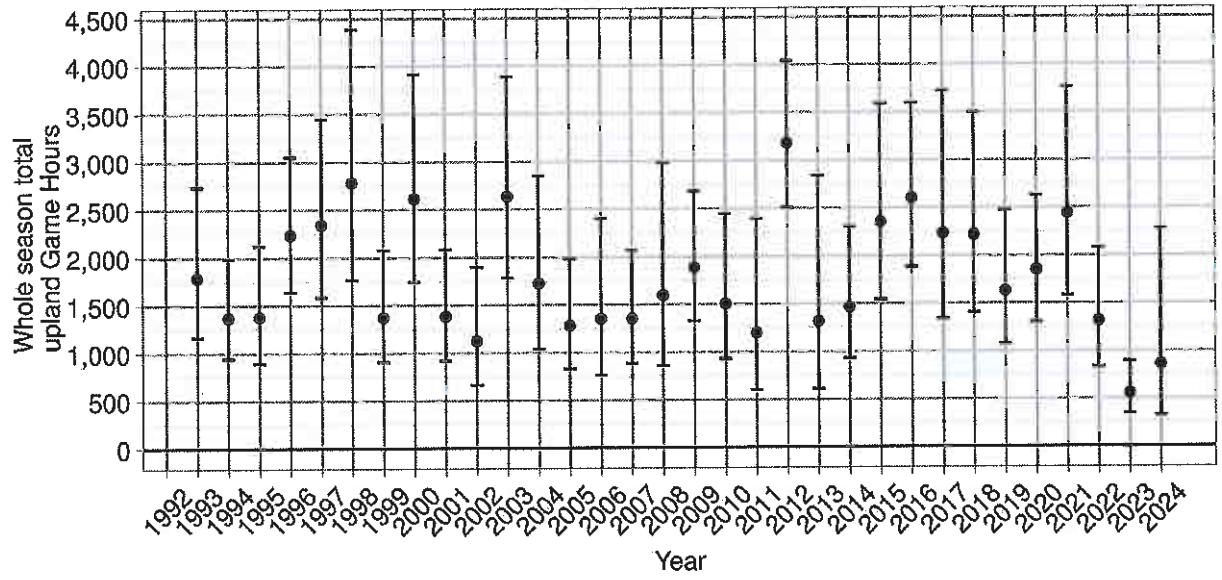


Figure 16. *Estimated upland game hunting hours in the Taranaki Region 1993 to 2024.*

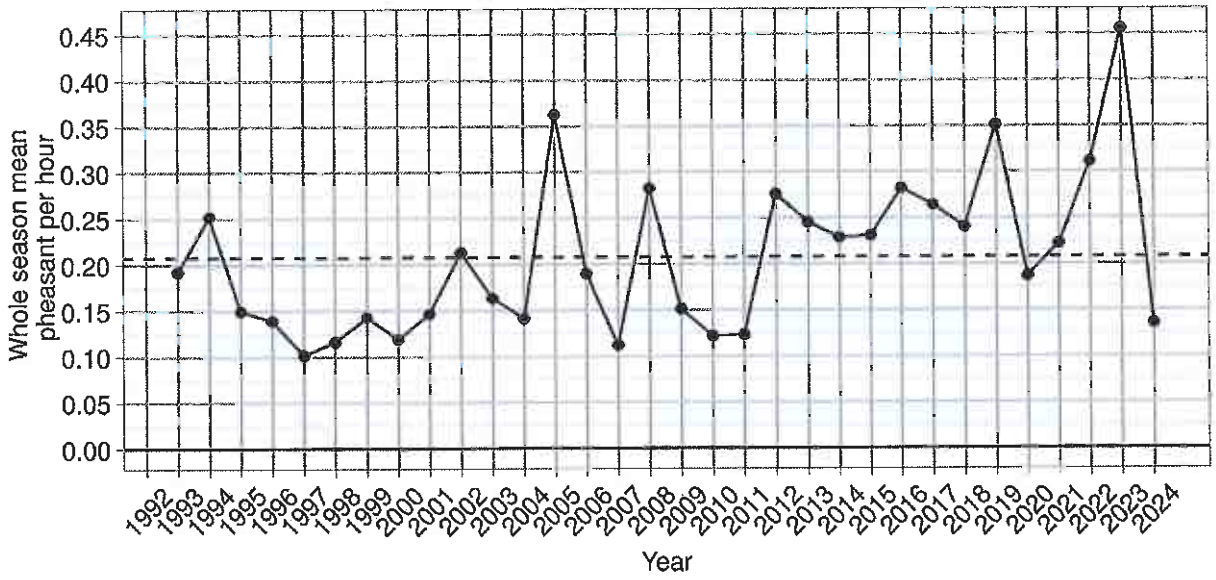


Figure 17. *Harvest rate (birds per hour) of pheasant in the Taranaki Region 1993 to 2024.*

While we do not have an estimate for the current size of the pheasant population, they have been very visible around much of the region in recent years. This may well reflect that large-scale predator control programmes and the planting of manuka, woodlots and riparian areas are potentially having a positive impact. As it is apparent that many populations still go largely un-hunted, the current level of effort and harvest suggests there is no need to further restrict the harvest, nor does there appear any justification to liberalise the regulations. Results of the gamebird hunter survey reported to Council in December 2018 indicate very strong support for the status quo of a 2-bird daily limit and four-month season. It is therefore recommended that these conditions be retained. The same conditions are likely being recommended for the Wellington Region.

California Quail

California quail are restricted in distribution with few substantial coveys remaining, though there has been comment that they are being seen more frequently, similar to the apparent increase in pheasant numbers. With such low numbers, hunters generally perceive hunting them as difficult and/or inappropriate. Harvest totals are small (an estimated 22 birds in 2024; Figure 18) and variable, which in part is an artefact of the hunter survey design and the fact that just a few hunters shoot quail.

Such low levels of harvest indicate that the daily bag limit of 5 is for the most part irrelevant, however it does allow hunters to make use of the opportunity provided by large coveys where these still exist. As such, it is recommended that the status quo of a 5-bird limit for a 4-month season remains. The same season length and bag limit is likely being recommended for the Wellington Region.

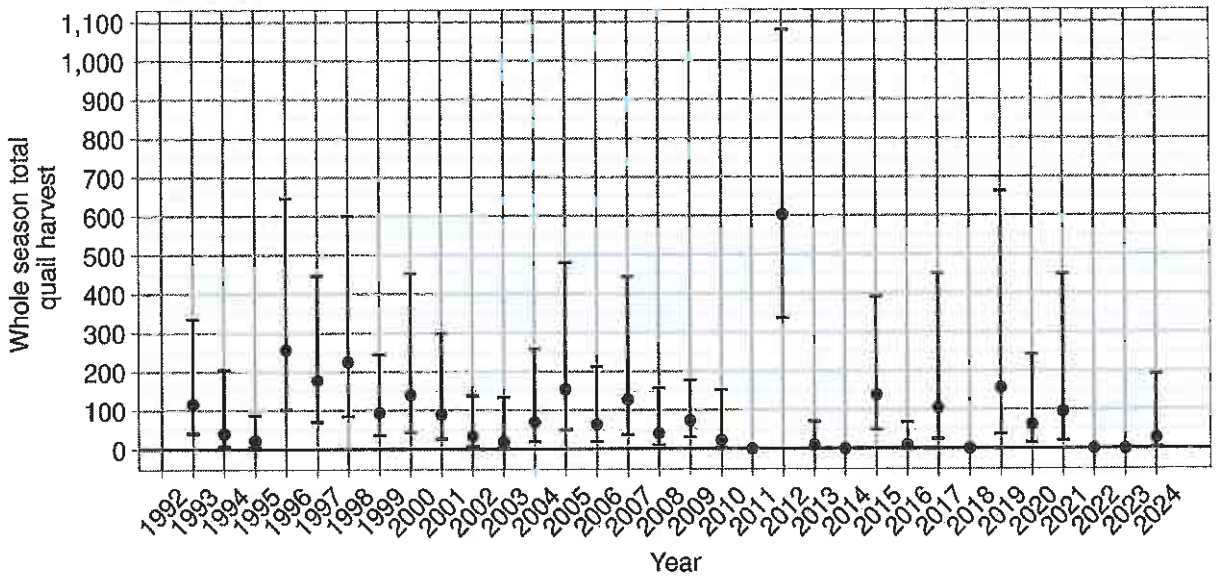


Figure 18. *Estimated annual harvest of California quail in the Taranaki Region 1993 to 2024.*

Bobwhite and Red-legged Partridge

Some backyard breeders have permits from the Department of Conservation to breed and release these species and there could also potentially be escapees from game preserves. The Council has therefore provided an opportunity for game bird hunters to harvest these species where they exist in the region.

Upland game property with special conditions

A *Gazette* listing for an upland game property with special conditions to enable syndicate (non-commercial) shoots for ring-necked pheasant on a property at 336A Kauarapaoa Road, Brunswick, Whanganui was approved for the 2024 season. The applicant met the requirement to release at least 400 pheasant and provide information to the Council pursuant to Clause 6.8 of the Notice. It is therefore recommended that the listing be approved for the 2025 game season.

RECOMMENDATIONS:

1. That Taranaki Fish & Game Council approves the recommended 2025/26 Taranaki Region Game Gazette Notice (as listed below).

Allen Stancliff
Senior Field Officer
26 November 2024

TARANAKI FISH AND GAME REGION[1]

1 Game That May be Hunted or Killed—Duration of 2025/2026 Season

Species	Season Duration (dates inclusive)	Daily Bag Limit	Hunting area
Grey/mallard duck	3 May to 29 June 2025	10	All areas
NZ shoveler duck	3 May to 29 June 2025	2	All areas
Paradise shelduck	3 May to 29 June 2025	10	All areas
	21 and 22 Feb 2026	10	Area C
	28 Feb and 1 March 2026	10	Area C
	7 to 9 March 2026	10	Area C
Black swan	3 May to 29 June 2025	2	All areas
Pūkeko	3 May to 31 August 2025	5	Area A&B
	3 May to 31 August 2025	10	Area C
California quail	3 May to 31 August 2025	5	All areas
Cock pheasant	3 May to 31 August 2025	2	All areas
Bobwhite (Virginian) quail	3 May to 31 August 2025	5	All areas
Red legged partridge	3 May to 31 August 2025	2	All areas
Pheasant, both sexes	3 May to 31 August 2025	No limit	Upland game properties with special conditions in clause 6 for this Region.

2 Definition of Areas

2.1 **Area A**: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Tawhata; then by Tawhata Road to the boundary; then by the generally eastern boundary of the region to Waiaruhe Road.

2.2 **Area B**: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Makakaho Junction down the eastern bank of the Waitotara River to the sea; then by the sea coast and generally eastern boundary of the region to Waiaruhe Road.

2.3 **Area C**: The balance of the region contained by the westerly boundaries of Area A and B and the sea coast between the Mokau River and Waitotara River mouths.

3 Shooting Hours

[1]Reference to Description: *Gazette*, No. 83, of 27 May 1990, at page 1861

6.30am to 6.15pm.

4 Decoy Limit

No limit.

5 Special Conditions

5.1 Special Paradise Shelduck Season

Area C only: For the Special Paradise Shelduck Season on 21 February, 22 February, 28 February, 1 March, 7 March, 8 March and 9 March 2026, the hours of hunting are extended 6.30am to 8.00pm. In addition, all hunters, including land occupiers, must, within a month of the end of the season, provide the Taranaki Fish and Game Council with particulars of: the dates and locations where they hunted paradise shelduck; the hours hunted each day; the number of birds taken each day; and the number of birds not retrieved.

5.2 No person shall hunt, as specified, within 100m of any urban sewage oxidation pond.

5.3 No person may wilfully leave on the hunting ground any game bird(s) shot or parts of any game birds shot.

5.4 No person may shoot game from a boat on the Whanganui River downstream of Kemps Pole (Kauarapaoa Stream confluence).

5.5 Any licensed game bird hunter who has a Department of Conservation permit to take or kill wildlife for the purpose of hawking may hunt with an Australasian Harrier (*Circus approximans*) to take gamebirds. This is subject to the season length and bag limit for each gamebird species in clause 1 of this notice for this region and subject to any conditions imposed by the Director-General of Conservation under such a permit.

6 Upland Game Properties with Special Conditions

6.1 This clause applies to the following specified property only:

Paetawa station. 366a Kauarapaoa Road Whanganui being lots1-2 DP 29356. Waipukurau SD. 1307.9440ha administered by Hienni investment Ltd.

6.2 Where hunting takes place in any specified property defined in this notice, no person shall have in that person's possession outside that specified property any game taken from that specified property, unless affixed to the game is a label with the name of the specified property where that game was taken or killed written legibly on it, and the additional words on the label, "for personal consumption, not for sale or profit" written legibly on it.

6.3 A person must not clip the wings of a bird released on any specified property after the bird is 8 weeks old.

6.4 A person must not clip the beak of any bird released on any specified property at any time.

6.5 A person must not hunt a pheasant before it is 18 weeks old.

6.6 A person must not hunt waterfowl on a specified property on the same day that a pheasant hunt takes place on that property.

6.7 The unlimited daily bag limit for the specified property shall only apply when at least 400 pheasants have been released on to that specified property within 5 months of the opening day of the season, otherwise the daily bag limit shall be 2 cock pheasants.

6.8 A property owner listed in subclause (1) or a lessee of that property owner must keep a register of:

(a) the names and addresses of hunters and all other persons who take game from that property;

(b) the number and type of birds taken by those persons;

(c) the description of that person's role in the hunting and killing of game birds on that day.

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

2025/26 GAME SEASON GAZETTE NOTICE

Following presentation of the draft 2025/26 Game Season Gazette Notice report to Council at its meeting on 7th December 2024, trend counts for paradise shelduck and black swan were carried out in January 2025.

Paradise shelduck

Counts for paradise shelduck remain relatively stable at the low end of abundance in Waimarino and Whanganui (Areas A & B) with 2,899 paradise counted at 18 sites in the Waimarinho and 1,587 counted at 10 sites in Whanganui (Figure 1). No change to the current season conditions of a 10-bird daily bag limit for an 8-week season is recommended for those areas.

However the count of 14,135 paradise at 46 sites in Area C is at an historically high level, similar to 2020 and 2021 (Figure 1). Most of the birds are located at moult sites on the Taranaki ringplain within the area bounded by Hawera, Eltham, Stratford, Inglewood and Waitara, with large moult gatherings on the Opunake, Eltham, Stratford and Inglewood town oxidation ponds, Wiremu Station, Barrett Lagoon, Umutekai and Lake Cowley.

As the Taranaki ringplain consists almost entirely of productive dairy farms, with chicory crops and pasture, there is significant potential for damage to occur. So far this season, 21 permits to disturb paradise shelduck have been issued in this area and currently there are several landholders adjacent to moult sites that are very unhappy with the damage that is occurring.

By contrast, the total harvest of paradise shelduck in the region has been declining over time (Figure 2). Some of the decline is likely due to the reduction in the Waimarino and Whanganui populations, including in the Patea – Waverley area. However, the current ringplain count and the harvest information together indicate that this area could sustain an increase in harvest.

Promotion of the 2025 three-weekend (7-day) summer hunting season may help. However, it is also recommended that the opening weekend bag limit for paradise shelduck in Area C be increased from 10 birds to 15 for the 2025 game season to promote an increase in harvest from the Taranaki ringplain population.

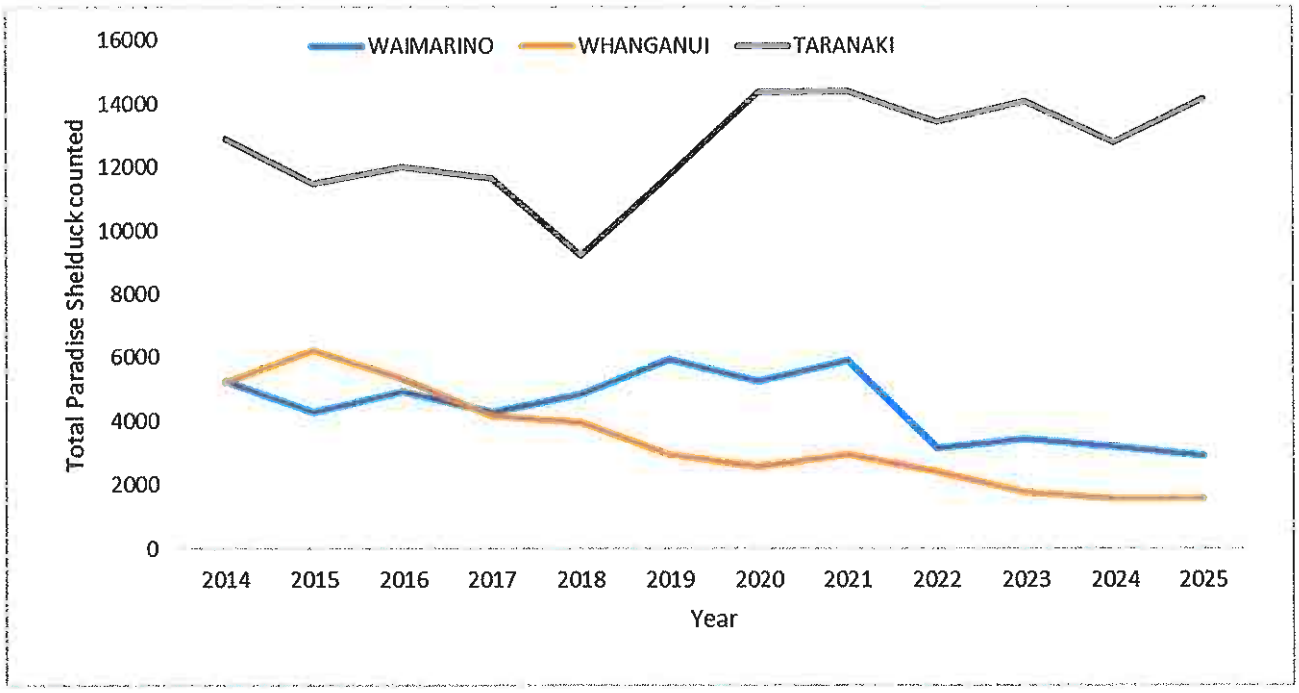


Figure 1. Total January trend count of paradise shelduck in the Waimarino, Whanganui and Taranaki areas, 2014 to 2025.

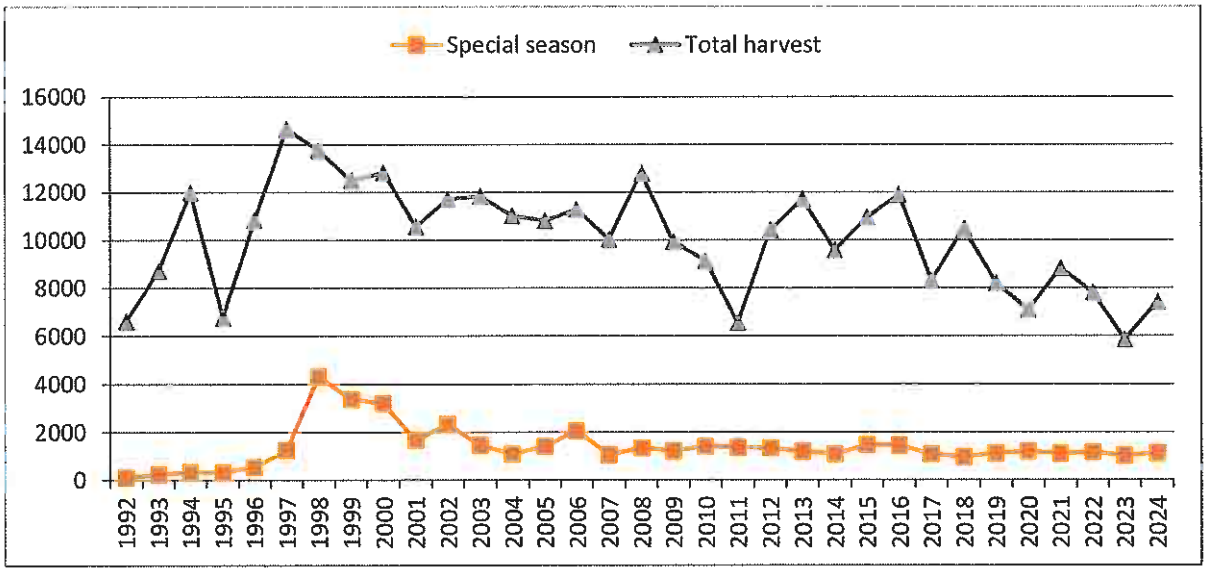


Figure 2. Estimated special season harvest and total annual harvest of paradise shelduck across the Taranaki region, 1992 to 2024.

Black Swan

January trend counts of black swan remain stable in the Taranaki region, with 27 swan counted at nine sites in the Waimarino, 384 swan at nine Whanganui sites and 542 swan at 31 sites on the Taranaki ringplain.

While count data from Nelson / Marlborough is not yet available, swan counts in the Wellington region totalled 6952 birds, down 18% from 8517 swan counted in 2024 (Figure 3).

Given, this information, it is recommended that there is no change to the Taranaki season conditions, of a 2-bird daily bag limit for an 8-week season.

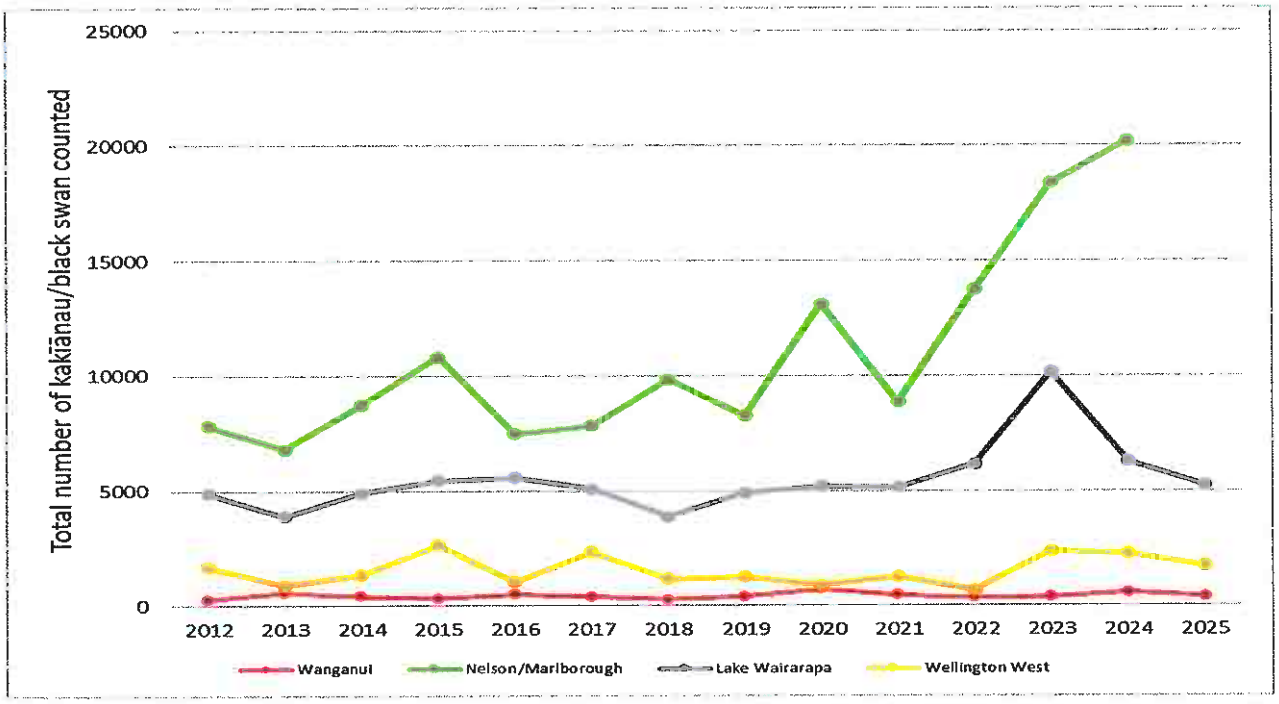


Figure 3. January black swan trend counts for the Taranaki, Wellington and Nelson/Marlborough regions 2010 to 2025.

RECOMMENDATION

- That the daily bag limit for paradise shelduck be amended to 15 birds in Area C for opening weekend only.

Allen Stancliff

Senior Field Officer

28th January 2025

TARANAKI FISH AND GAME REGION[2]

1 Game That May be Hunted or Killed—Duration of 2025/2026 Season

Species	Season Duration (dates inclusive)	Daily Bag Limit	Hunting area
Grey/mallard duck	3 May to 29 June 2025	10	All areas
NZ shoveler duck	3 May to 29 June 2025	2	All areas
Paradise shelduck	3 May to 4 May 2025	15	Area C
	3 May to 4 May 2025	10	Area A&B
	5 May to 29 June 2025	10	All areas
	21 and 22 Feb 2026	10	Area C
	28 Feb and 1 March 2026	10	Area C
	7 to 9 March 2026	10	Area C
Black swan	3 May to 29 June 2025	2	All areas
Pūkeko	3 May to 31 August 2025	5	Area A&B
	3 May to 31 August 2025	10	Area C
California quail	3 May to 31 August 2025	5	All areas
Cock pheasant	3 May to 31 August 2025	2	All areas
Bobwhite (Virginian) quail	3 May to 31 August 2025	5	All areas
Red legged partridge	3 May to 31 August 2025	2	All areas
Pheasant, both sexes	3 May to 31 August 2025	No limit	Upland game properties with special conditions in clause 6 for this Region.

2 Definition of Areas

2.1 Area A: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Tawhata; then by Tawhata Road to the boundary; then by the generally eastern boundary of the region to Waiaruhe Road.

2.2 Area B: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Makakaho Junction down the eastern bank of the Waitotara River to the sea; then by the sea coast and generally eastern boundary of the region to Waiaruhe Road.

2.3 Area C: The balance of the region contained by the westerly boundaries of Area A and B and the sea coast between the Mokau River and Waitotara River mouths.

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[2]Reference to Description: *Gazette*, No. 83, of 27 May 1990, at page 1861

3 Shooting Hours

6.30am to 6.15pm.

4 Decoy Limit

No limit.

5 Special Conditions

5.1 Special Paradise Shelduck Season

Area C only: For the Special Paradise Shelduck Season on 21 February, 22 February, 28 February, 1 March, 7 March, 8 March and 9 March 2026, the hours of hunting are extended 6.30am to 8.00pm. In addition, all hunters, including land occupiers, must, within a month of the end of the season, provide the Taranaki Fish and Game Council with particulars of: the dates and locations where they hunted paradise shelduck; the hours hunted each day; the number of birds taken each day; and the number of birds not retrieved.

5.2 No person shall hunt, as specified, within 100m of any urban sewage oxidation pond.

5.3 No person may wilfully leave on the hunting ground any game bird(s) shot or parts of any game birds shot.

5.4 No person may shoot game from a boat on the Whanganui River downstream of Kemps Pole (Kauarapaoa Stream confluence).

5.5 Any licensed game bird hunter who has a Department of Conservation permit to take or kill wildlife for the purpose of hawking may hunt with an Australasian Harrier (*Circus approximans*) to take gamebirds. This is subject to the season length and bag limit for each gamebird species in clause 1 of this notice for this region and subject to any conditions imposed by the Director-General of Conservation under such a permit.

6 Upland Game Properties with Special Conditions

6.1 This clause applies to the following specified property only:

Paetawa station. 366a Kauarapaoa Road Whanganui being lots1-2 DP 29356. Waipukurau SD. 1307.9440ha administered by Hienni investment Ltd.

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6.6 A person must not hunt waterfowl on a specified property on the same day that a pheasant hunt takes place on that property.

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(a) the names and addresses of hunters and all other persons who take game from that property;

(b) the number and type of birds taken by those persons;

(c) the description of that person's role in the hunting and killing of game birds on that day.

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

2025 GAMEBIRD TREND COUNT REPORT

This report presents the January 2025 trend count information for paradise shelduck and black swan. The Council made recommendations on the draft 2025/26 Game Gazette Notice at its meeting on 7th December 2024. As the final deadline for provision of regulation details to the NZ Fish & Game Council has passed (29th January 2025), this report is for the Council's information only.

PARADISE SHELDUCK

WAIMARINO (AREA A)

Count information for paradise shelduck was obtained from 17 Waimarino moult sites in early January 2025, compared with 14 in the previous year (Appendix 1, Table 1). The three additional sites for this year's count included a continuation of counts at the Makakahi Lodge site, which was missed in 2024, and the inclusion of two new sites, Mangawherawhera, and Waiharuru. 53 and 151 shelduck were recorded at each site respectively, and therefore both sites will be surveyed again next year.

The count estimation of 51 Shelduck at the Harris site was provided by the landowner and considered to be accurate. The count at Lake Otamaraha was obtained from the Wellington F&G aerial flight, due to Raupō obstructing views of the lake from the ground. The 2025 count of 2,745 paradise shelduck confirms that the Waimarino population remains at the "low end" of its historical range of abundance, with a 13.65% decrease on the 2024 count of 3,179 birds. The average number of Paradise shelduck per moult site in 2025 was 161 birds, which is lower than the 2024 average of 227 birds, but consistent when it is considered that less birds were counted this year over more survey locations, in comparison with 2024.

WHANGANUI (AREA B)

Paradise shelduck were counted at 10 Whanganui coastal and hill country moult sites in January 2025. These are the same 10 sites that have been counted from 2022 onwards, including Lakes Oturi, Waiau and Maumahaki located in Area C just north of the Waitotara River (Appendix 1, Table 2). Counts at the Lake Westmere location are known to be challenging due to the dense riparian vegetation surrounding the lake, but there is confidence in the reported count number of 204 being reasonably accurate.

The overall count of 1,736 birds was slightly higher than in 2024 (1,566), with a 9.79% increase. Although there was an overall increase for the year, at a site-specific level, only four sites showed an increase in bird numbers when compared to 2024 site count data. There was a particularly notable increase in numbers at Lake Kaitoke, where counts increased to 717, compared with Kaitoke's 2023 count of 290, and 2024 count of 325.

The overall count of 1,736 birds maintains the trend that the Whanganui paradise population remains situated around the "low end" of its historical range of abundance.

WAITOTARA RIVER CATCHMENT (AREA B&C)

Counts in the Waitotara Catchment were undertaken at 5 of the 7 sites in January 2025. Four birds were recorded at Bush Pond, alongside 7 at the pond of the true right bank of Makakaho Road. The pond on the true left bank of Makakaho Road was not counted this year due to access issues, but there may well be a small population of shelduck there, as 141 birds were counted here in 2022, and 122 in 2023.

TARANAKI PROVINCE (AREA C)

Counts of paradise shelduck were undertaken at 46 sites in January 2025 compared with 39 in 2024 (Appendix 1, Table 4). This included sites in the Taranaki eastern hill country, ringplain and coastal areas as far north as Mohakatino and as far south as Manutahi.

The total count of 14,135 birds was right up there with the record highs of 2020, 2021 and 2023 (Appendix 1, Table 4) and well above the long-term average (2008 – 2025) of 12,040 birds.

Sites on the ringplain bounded by Hawera, Eltham, Stratford, Inglewood and Waitara held the bulk of the moulting population, with sites in the eastern hill country holding only moderate numbers. Highest numbers were almost exclusively in dairying country where the impacts of moult aggregations can be significant.

Counts at the Waingongoro Road site (Appendix 1, Table 4) remained low owing to dispersal of birds with a gas gun. A similar situation occurred at an upper Egmont Road moult site where the dairy farmer had had enough of the birds and obtained a permit and a gas gun in December 2024. However, this was more than offset by increases at other sites, particularly at the Opunake, Eltham, Stratford and Inglewood town oxidation ponds. A farmer adjacent to the Opunake oxidation ponds is very unhappy with numbers of paradise shelduck (and Canada geese) coming onto his property, even with the use of a gas gun. The Manager at nearby Wiremu Station has also complained about the number of paradise grazing pasture, during what has been a particularly dry period. Chicory crops are also being targeted by post-moult birds, with one farmer at Tikorangi having up to 300 paradise causing damage.

Overall, the population remains at the high end of abundance and given the number of permits issued to farmers to disturb paradise shelduck causing damage to pasture and crops in Area C (21 so far in 2024/25), a summer hunting season to disperse birds after the moult remains a necessity.

Given the high numbers of paradise shelduck at moult sites on the Taranaki ringplain, it is also recommended that the opening weekend bag limit be increased from 10 birds to 15 in Area C, with the usual 10-bird limit for the rest of season.

BLACK SWAN

WANGANUI – WAVERLEY COASTAL STRIP

A total of 386 Black Swan were counted during a ground survey of 10 dune lakes in the Whanganui to Waverley coastal strip in January 2025 (Appendix 2, Table 5). This was less than the count in 2023 (563 birds) yet still above the long-term (32-year) average of 344 birds.

A notable increase in Swan was found on Lake Herengawe, with 61 birds recorded this year, in comparison with 0 for 2024. This is because Lake Herengawe was once popular with watercraft users that would push any resident swan away from the lake, but a recent introduction of the invasive aquatic weed hornwort has now reduced watercraft use, in turn enabling birds to re-settle, and take advantage of this new food source. By contract the swan count at Lake Marahau declined from 102 in 2024 to only 1 in 2025, for unknown reasons.

WAIMARINO - WANGANUI HILL COUNTRY

A total of 27 black swan were counted at 12 sites visited in the Waimarino, which was less than the total of 45 counted in 2024. This is mostly due to the absence of swan at Sues Pond, with none recorded for 2025, contrasting with the 17 found there in 2024. As swan populations are mobile and of a much smaller total number than other gamebird species, this change is not considered significant. The total count of 27 birds for 2025 sits just below the long term (17-year) average of 33 birds (Appendix 2, Table 6).

TARANAKI RINGPLAIN

A total of 542 black swan were counted at 38 sites visited in the Taranaki ringplain area during January 2025 (Appendix 2, Table 7). This was the highest count so far and well above the long-term average (2007 – 2025) of 383 swan.

CENTRAL NEW ZEALAND

Black swan are relatively mobile and it is thought that a single population extends over central New Zealand, if not further afield. The January 2025 count from Lake Wairarapa (5,226 birds) decreased further from its high in 2023, back to average levels (Figure 1). Counts in Wellington west (1,726 swan) also decreased from 2024 (2,258 swan) but remain at slightly elevated levels. The Nelson/Marlborough count increased back to the 2023 high, with Farewell Spit (9,850) and the Wairau Lagoons (6,100) accounting for the majority of swan. Overall counts remain well above average when compared with the full record of monitoring (Figure 2; 1977 – 2025).

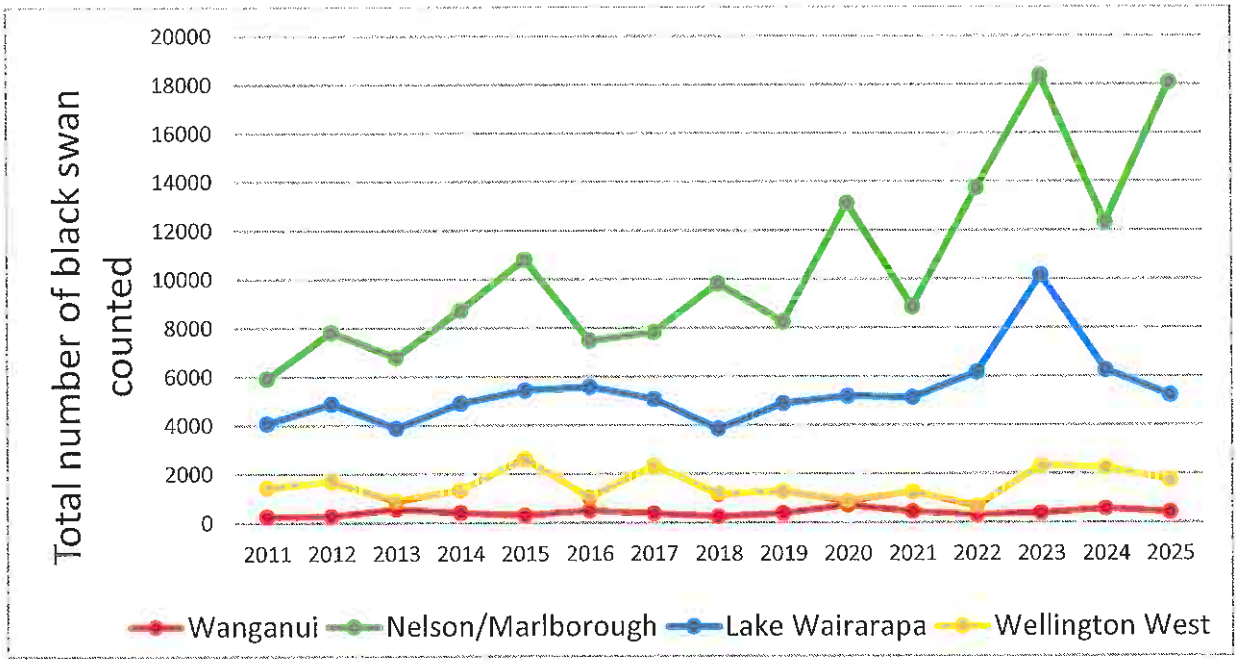

FIGURE 1. Central NZ trend counts for black swan, 2011 - 2025.

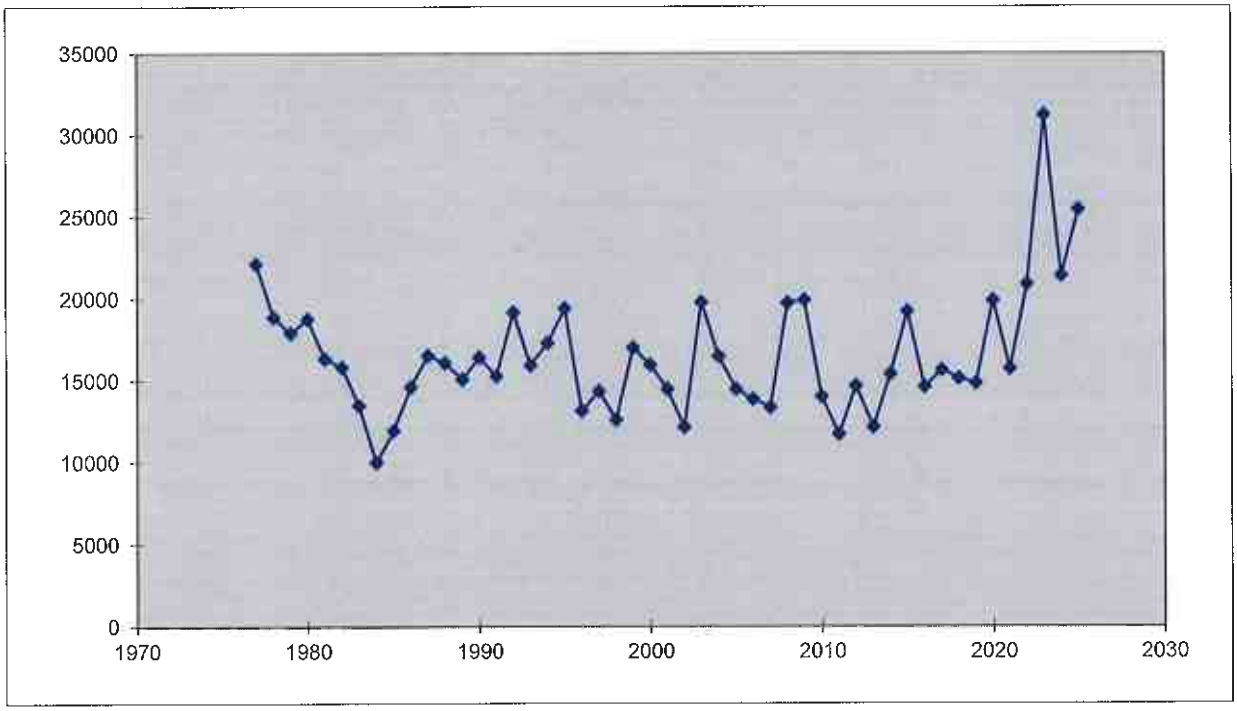

FIGURE 2. Central NZ trend counts for black swan, 1977 - 2025.

RECOMMENDATION:

- THAT THE 2025 GAMEBIRD TREND COUNT REPORT BE RECEIVED.

Jack Harland
Allen Stancliff
30 January 2025

TARANAKI FISH AND GAME REGION[3]

1 Game That May be Hunted or Killed—Duration of 2025/2026 Season

Species	Season Duration (dates inclusive)	Daily Bag Limit	Hunting area
Grey/mallard duck	3 May to 29 June 2025	10	All areas
NZ shoveler duck	3 May to 29 June 2025	2	All areas
Paradise shelduck	3 May to 4 May 2025	15	Area C
	3 May to 4 May 2025	10	Area A&B
	5 May to 29 June 2025	10	All areas
	21 and 22 Feb 2026	10	Area C
	28 Feb and 1 March 2026	10	Area C
	7 to 9 March 2026	10	Area C
Black swan	3 May to 29 June 2025	2	All areas
Pūkeko	3 May to 31 August 2025	5	Area A&B
	3 May to 31 August 2025	10	Area C
California quail	3 May to 31 August 2025	5	All areas
Cock pheasant	3 May to 31 August 2025	2	All areas
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Red legged partridge	3 May to 31 August 2025	2	All areas
Pheasant, both sexes	3 May to 31 August 2025	No limit	Upland game properties with special conditions in clause 6 for this Region.

2 Definition of Areas

2.1 Area A: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Tawhata; then by Tawhata Road to the boundary; then by the generally eastern boundary of the region to Waiaruhe Road.

2.2 Area B: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Makakaho Junction down the eastern bank of the Waitotara River to the sea; then by the sea coast and generally eastern boundary of the region to Waiaruhe Road.

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[3]Reference to Description: *Gazette*, No. 83, of 27 May 1990, at page 1861

2.3 **Area C**: The balance of the region contained by the westerly boundaries of Area A and B and the sea coast between the Mokau River and Waitotara River mouths.

3 Shooting Hours

6.30am to 6.15pm.

4 Decoy Limit

No limit.

5 Special Conditions

5.1 Special Paradise Shelduck Season

Area C only: For the Special Paradise Shelduck Season on 21 February, 22 February, 28 February, 1 March, 7 March, 8 March and 9 March 2026, the hours of hunting are extended 6.30am to 8.00pm. In addition, all hunters, including land occupiers, must, within a month of the end of the season, provide the Taranaki Fish and Game Council with particulars of: the dates and locations where they hunted paradise shelduck; the hours hunted each day; the number of birds taken each day; and the number of birds not retrieved.

5.2 No person shall hunt, as specified, within 100m of any urban sewage oxidation pond.

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5.4 No person may shoot game from a boat on the Whanganui River downstream of Kemps Pole (Kauarapaoa Stream confluence).

5.5 Any licensed game bird hunter who has a Department of Conservation permit to take or kill wildlife for the purpose of hawking may hunt with an Australasian Harrier (*Circus approximans*) to take gamebirds. This is subject to the season length and bag limit for each gamebird species in clause 1 of this notice for this region and subject to any conditions imposed by the Director-General of Conservation under such a permit.

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(b) the number and type of birds taken by those persons;
(c) the description of that person's role in the hunting and killing of game birds on that day.

APPENDIX 1. PARADISE SHELDUCK

TABLE 1. Paradise shelduck trend counts in the Waimarino (Area A)

Site	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Pritts			70	50	0	0							3	12	0	0	0	0	0		0	0	0	32	20	15	10				18		
Browns	1974	2203	1592	1500	1800	2210	1875	717	1700	280	114	320	1320	944	435	363	423	378	358	319	463	102	265	230	300	150	41	380	450	316	42	60	61
Mokanui								900	740	510	342	9	68	21	42	43	15	18	15	3	1	3	4	7	5	27	18						
Tohunga	380	214	657	342	0	200	240	12	8	0	0		13	0	0	0	0	0						101	150	2	0	0	0				
Roke	1931	1542	631	1000	800	1043	710	270	750	640	273	200	68	48	125	289	67	99	48*	64	143	316	0*	0*		0				255	145	187
Sue	420	786	1020	1348	1300	1068	880	1062	1300	360	561	500	530	477	428	460	123	250	309	287	357	186	103	34	90	192	243	315	275	111	63	45	2
Punch				375	400	676	360	380	410	270	220						0	0															
Raetihi oxy				700	850	250	480	650	310	520	390	395	444	*226	410	298	176	167	48*	205	0	264	7	210	132	310	450	420	300	132	155	520	422
Omerei						600	964	688	900	870	1446	540	210	280	372	331	312	270	206			144	153	116	150	119							
Fields Track									580		703	620	780	1181	495	411	302	383	286	348	310	5	3	0	17	0							
Harris											293	110	82	269	252	161	0		150	83	228	309	73	34	28	295	202	142	300	222	102	75	51
Taonui	1000	605	370	38	750	850	600	814	1280	640	527	500	1222	675	630	353	432	385	494	440	518	135	93	127	147	117	279						
Aranui	150	250	248	180	340	344	362	415	35	440	369	400	314	294	342	223	265	249	218	239	160	167	167	125	80	47	121						
Waiharuru																																	151
Ohakune Lake											50	0		0	0	0	0	0	0	0	0	0											
Ohakune Oxy											730	540	997	875	525	590	386	512	469	533	348	376	442	665	209	171	95	240	294	135	181	122	76
Mangawhera whera																																	53
Nat Park Oxy											986		1884	2000	1100	957	457	1102	824	785	1038	1254	1200	1225	1450	1670	2200	1800	2400	840	970	750	845
Tanupara 1											372	120	143	0	12	45	0	0						24	24	230	40	398	220	223	290	42	179
Tanupara 2											360	150	18	32	27	6	318	350	235	301	201	213	196	103	161	141	400	96	23	102	75	360	4
Papahau (2)											119	50	82	155	122	69	92	118	96	111	71	72	85	38	39								
Ohorea											195	0	2	180	142	195	45	243	187	152	193	0	59	198	48	0	9	16	3				
Lake Otamaraha												400	550	560	775	550	235	613	357	441	827	256	206	225	72	20	55	21	0	16	8	215	88
Lahar Lake														72	10	0		0	4	0	0												
Ruatiti Flats														100			0	0				0	12	7	10	0							
Manson Estate												500	213	27	0	20	420	756	683	611	702	545	501	191	92	231	244	185	20	20	32	25	0
Kaahu Estate																120	4	16	77	96	107	119	31	8	0	0	0	0	0				
Blue duck lodge																								55	60	60	3	24	18				
Makakahi lodge																								284	234	178	198	164	134	117	128		98

Morikau (2)	700	800	1114	1000	1000	168	604	642	625	730	664	293	478	748	903	785	463		532	678	412	446	331	735	420	562	823	331	580	416	705	214	77
Mokanui						490	340	370	360	400	402	190	189	112	585	422	134		641	560	670	340	336	144	330	297	500	660	800	411	353	600	412
SH4 Kakatahi																												40	60	68	32	6	39
Total	**6555**	**6400**	**5702**	**6533**	**7240**	**7899**	**7415**	**6920**	**8998**	**5660**	**9116**	**5837**	**9610**	**9062**	**7732**	**6691**	**4669**	**5909**	**6141**	**6256**	**6749**	**5252**	**4267**	**4918**	**4268**	**4834**	**5931**	**5232**	**5877**	**3129**	**3409**	**3,179**	**2,745**

TABLE 2. Paradise shelduck trend counts in Whanganui (Area B)

Site	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
L Marahau	500		822	536	433	782	1600	1205	1105	1284	610	1740	988	910	731	616	1115	884	313	287	241	399	299	254	328	186	192	552	237	493	330	667	341	288	203
L Waikato										310	850	0	521	315	436	1351	490	625	574	982	673	749	721	562	721	771	490	358	391	515	420	45	132	135	170
Maewa	550	905	494	1144	1149	850	1700	1200	794	1377	1250	630	1115	605	870	1177	420	523	371	616	489	473	397	227	28	71	9	0	16	0					
L Waipu	300		874	647	835	692	710	964	215	742	250	60	128	370	175	173	394	575	326	287	251	438	531	1070	2430	1255	1200	980	920	470	670	631	338	325	234
L. Rotokauwau												300	0	330	134	334	222	420	178	654	685	127*	576	432	151	147	130	300	24	19	4	6	50	43	7
L. Kohata															46	4		10	4	23	13	0	0	0	4	0		1							
L. Kaitoke															238	575	275	330	424	763	710	1024	1101	943	962	1140	650	153	720	562	730	483	290	325	717
Arranmore																														52	149	160	203	220	160
L. Westmere																204		420	129	342	268	586	257	535	547	594	515	402	522	428	545	337	328	190	204
L. Pauri																		20	8	27	35	20	0	0	0	0	0	0	0	0	1				
L. Grassmere																		0	12	0	17	8	23	2											
Lake Oturi+														445	250	185	530	485	380	376	321	370	289	240	212	93	137	293	71	14	31	39	12	10	26
Lake Waiau+															210	56	196	210	195	130	74	110	93	100	170	172	31	8	2	3	28	30	0	0	0
L Maumahaki +															45	120	60		70	65	82	170	245	60	10	41	33	39	20	35	40	20	90	30	15
TOTAL										**4725**	**3945**	**3860**	**3818**	**3458**	**3810**	**5655**	**5190**	**5709**	**3581**	**4552**	**5032**	**5712**	**5614**	**5209**	**6230**	**5349**	**4137**	**3945**	**2923**	**2591**	**2948**	**2418**	**1784**	**1566**	**1,736**

+Sites in Area C * disturbed site

TABLE 3. Paradise shelduck trend counts in the upper Waitotara catchment (Area C)

Site Name	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TLB Makakaho Rd	635	220	150	640	310	979	797	1029	770	730			508	431	525	106							1	0	141	122		
"Kidney pond"		260	470	60	370	80																	Dry	Dry	0	22		0
"Bush pond"		90	20	10	0																		430	285	0	19		4
Ponds at top of Makakaho Rd		6	0																				0	9	2	12		
TRB Makakaho Rd	0	83	425	360	420	214	420	409	389	269			294	68	27	27							31	100	31	7		7
Makakahi Road Lower																									26	12		0
TOTAL	**635**	**659**	**1065**	**1070**	**1100**	**1273**	**1217**	**1438**	**1159**	**999**			**802**	**499**	**552**	**133**							**462**	**394**	**200**	**194**		**11**

-- no count in 2008 & 2009

TABLE 4. Paradise shelduck trend counts in the Taranaki province (Area C).

POND LOCATION	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Waitara River	355	350	25	450	260	425	330	600	234		124	380	370	740	912	577	815	644	757	477	608	1154	1000	1007	615	100	240	345	103	468	434	135	482
Waitara River (Purangi)		150											70	98	233	307	400	302	287	249	365	366	368	580	712	283	347	380	400	372	383	243	279
TRB Waitara River		175			80	100	55	62	10		0					150																	
Huiroa Ponds	360	380	320	150	230	20	297	295	30		65	70	68	30	30	105	80	30	70	52	17	20	32	6	2	15	23						
Whangamomona	70	85	160	75		35	55	57	73		10	62	90	155	38	97	202	180	190	155	210	199	32	55	31	19	20	20	17	11	0	4	19
Huiroa					390	850	550	8	750	680	920	505	790	770	930	380	517	680	490	450	516	560	240	dry	0	0	205	195	260	45	195		82
Huiakama																	130	6	82	102	119	25	115	240	214	71	15	6	15	10	2		5
Hiuakama 2																																	210
Tahora	240	195	50	115		195	90	115	266		30	330	270	156	125	0	100	133	68	99	7	53	39	66	176	130	210	302	455	294	455	572	456
K1 Tahora	30	125	0	370	250	290	340	190	160	324	450	600	590	530	530	465	415	260	5	20	47	4	78	230	300	233	410	153	55	105	105	33	0
K2 Tahora														85	136	120	27	55	110	101	17	93	102	137	177	23	6	15	41	1	5		
Rimuputa Rd Tahora																			145	4*	170	12			250	32	0	3	5	210	181	71	0
Moki Road Tahora																							787	430	9	137	278	700	750	260	365	312	285
Mt. Damper	125	180		85	50	0	40	90	0		0			30	150	250	150	150	100	250	150	200	300	250	300	300	250	250					
Boar Road	155	520	500	450	250	780	675	610	550	660	714	635	520	715	580	680	800	607	217	183	196	140	126	151	94	37	35	0	2	11			
Waitaanga	120	0		25	35	35	0	170	154		30			22	12									80	100								
Lower Mohakatino Estuary (SH3)								100	130	170	177	202	300	250	250	186	320	243	194	165	253	263	302	409	441	301	313	104	234	215	18	181	35
Lwr. Mangaehu River			255			645	670	530	700	500	504	585	575	715	435	220	254	448		819	613	1100	913	884	605	565	490	472	727	209	374	766	432
Upr. Mangaehu River																				245	40	20	30		55	70							
Lake Cowley (Waitara)	300	280	200	470	530	210	180	590	530	1000	820	1000	750	480	340	340	970	620	800	720	645	650	178	315	188	390	266	300	570	950	1180	980	830
Lake Ratapiko	70	0	0	0	0	80	10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0				
Tariki Road		150	300	20	13	0	50	90	35	13	0	55	0	0	0	0	57	4	59	41	29	20	7	0	4	0	0	0	0				5
Croydon Rd JT	300	50	0		18	40	2	40	38	38	0	0	3	0	0	0	0	10	20		0	0	5	0								
Croydon Road											10	0	0	15	21	0	0	0	0	12	0	0	10	14	15	14	0	0					0
Wiremu Station (Opunake)	800	700	1400	910	1650	1640	1300	1500	920	650	780	1100	1000	1000	1340	1075	1300	1640	1150	1140	950	1250	1000	700	1000	800	1000	1434	1300	1300	1300	575	1000
Saunder's Road	230	300	300	430																													
Corbett Lake (Saunders Rd Okato)		20	1	9	190	270	300	450	385	700	500	200	650	295	295	66	300	275	335	405	185	260	295	500	270	210	460	470	575	330	250	490	345
Oxford Road Lake														315	395	534	510	702	400*	10	260	240	57	0	13	2	17	47	75	4	2	0	
SH45 Omata		16	9	7	0	0	0	9	20	20	92	0	27	170	0	3	5	7	1	7	0	0	8	6	0	0	0	0					
Barrett Lagoon (New Plymouth)	100	65	350	430	610	550	620	700	650	340	300	600	615	570	703	450	590	827	581	640	587	826	670	640	950	335	620	663	780	500	680	850	900
Umutekai Road	270	250	475	300	500	640	520	600	600	500	400	480	450	420	420	380	545	450	400	580	735	550	480	555	470	390	650	1038	1050	1150	1061	800	1000
Alfred Road	800	550	550	300	226	263	157	277	126	194	305	380	305	490	638	730	810	487	686	622	590	600	450	330	400	205	420	400	90	20	7	34	30
upper Egmont Road				70	180	28	30	85	160	200	6	2	3	0						105	285	360	385	270	330	370	178	425	550	800	500	600	104
Richmond Rd.			50	110	72	31	5	45	50	180	385	350	490	475	620	875	770	775	450	420	411	435	285	407	450	430	114	220	270	128	90	220	124
Upper Newall Road					190	90	30	0	0			0	7	0	0	dry																	

Punehu						0	70	54	36	8	15	4	3	19	0	7	0	2	38	60	3	15	5	5	0	62	0	0	0		1	45	105
Hawera oxidation ponds (2)						20	70	95	122	190	200	260	260	274	320	415	450	394	421	483	347	460	485	490	350	475	360	414	476	355	470	380	380
Waingongoro Road									60	23	2	55	210	470	365	90	0		10	33	204	285	195	600	40	470	750	733	650	1200	1160	0	80
Beach Road Omata (2)									12	0	25	0	0	0	1	3	7	1	1	0	0	0	1	0	0	8	11	0					
Perth Road (2)							0	0	0	18	0	0	2	5	8	2	5	1	3	10	7	5	5	5	6	0	0						
Upland Rd (2)											165	0	26	7	16	0	0	7	0	0	0	0	0	0		0	0	0					
Waiwiri Road														40	30	30	30		0	0	60	25	20			0							
Kaipi Road														9	18	2	19	0	1		14	0	7			7	0	49	50	21	9		
Stratford oxidation ponds												375	300	450	564	617	900	1020	950	1123	1000	1050	1100	1240	1400	1180	1470	1769	1400	1300	753	1200	1600
Sangster Rd Rotokare (3)												40	70	7	7	0																	
Parihaka Station													300	415	472	430	450	170	47	300	135	62	47	2	120	dry	75	20	0	320		2	0
Kina Road													100	450	59	45	25	200	130	145	360	506	265	220	204	180	45	130	170	100	195	330	155
Nowells Lakes (2)									0	0	0	6	30	30	0	2	0	0	0	0	0	0	0	0	40	2	0	82	0	50	0	0	0
Winstones Manutahi Road																145	2	7	8	23	83	6*	128	180	150	100	295	365	360	137	289	437	340
Opunake oxidation ponds																	135	220	279	344	350	320	440	385	400	470	635	770	600	500	780	770	1000
Rugby Road																				175	275	434	220	300	354	46	175	340	dry				
Inglewood Oxidation ponds													0	0	0	0	5	5	4	1	135	252	160	270	297	217	573	220	700	480	950	770	1000
Eltham Oxidation Ponds																					36	62	30	31	103	180	340	586	560	510	580	1000	950
Jimmy Stewart Wetland																							93	0	0	0	0						
Lake Mangamahoe																			0	0				16	20	49	87	149	78	112	103	116	311
NPDC Waiongana																										158	260	79	217	210	212	246	253
Durham Road upper																												600	300	226	350	152	400
Manaia oxidation pond																											43	73	17	115	95	79	235
Kaponga oxidation pond																												290	366	0	0*	200	207
Patea oxidation pond																													31	0	0		11
Komene Lagoon																													91	350	350	55	320
Waipu Lagoons																															11	0	0
Bell Block Oxy ponds																															66	118	145
Opunake Lake																															18	3	0
100 Wills Road																															14	0	1
Richmond Road 2																														36	20	0	20
Lake Kaikura																																	59

TOTAL	4325	4541	5325	4776	5759	7507	6748	7722	6801	6408	7029	8270	9244	10154	10993	9778	12095	11562	9489	10770	11014	12882	11495	11990	11635	9196	11706	14346	14390	13415	13663	12769	14195

APPENDIX 2. BLACK SWAN

TABLE 5. Black swan trend counts in the Wanganui - Waverley coastal strip.

Name	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Waipu	17	74	37	9	17	20	33	10	82	35		14	47	118	60	10	40	3	1	4	10	32	135	55	11	27	22	30	117	8	6	0	8	15
Rotokauwau	60	7	25	5	5	38	11	12	14	6		29	25	16	50	50	51	74	41	3	38	8	13	2	12	4	9	15	21	50	110	83	81	42
Grassmere	13	11	0	0	0	18	0	2	1									8	0	1	1	0	1											
Wiritoa	0	0	10	0	0	1	0	0	0	0		4	0	0	0	0	4	1	0	0	0	0	0	0	6	0	0	0	0	0				
Pauri	76	65		13	10	14	0	27	10	10		32	0	0	57	14	4	2	14	7	46	8	32	4	4	7	14	0	0	0		4		
Kohata			7	8	0	5	0	0	4	0		8	4	9	16	2	48	18	12	8	7	2	10	6	1		32						10	
Kaitoke	48	25	36	24	24	19	105	21	30	175		56	69	52	31	140	15	24	74	25	43	360	40	86	271	214	48	213	405	153	106	115	281	176
Westmere	1			14	0	6	0	1	2	6		12	5	6	8	4	4	5	6	22	5	37	16	31	20	13	11	5	3	1	7	2	0	0
Arranmore																													8	8	2	6	0	2
Marahau	19	70	40	39	36	14	8	116	42	50		20	56	64	26	4	33	28	38	47	41	16	30	13	51	18	11	41	13	18	37	9	102	1
Waikato	7	20	6	10	0	6	5	13	9	10		23	9	0	46	7	9	3	8	5	7	4	6	5	8	2	0	0	5	51	16	54	4	1
Waiau	16	10	7	3	25	36	11	47	0	0		0	7	8	6	4	4	0	0	8	0	0	10	5	9	4	68	2	31	26	3	4	12	21
Herengawe	3	11	7	22	0	25	40	4	35	4		41	0	11	2	0	0	0	0	0	0	0	6	6	0	0	27	0	36	0	0	18	0	61
Oturi	125	33	119	45	0	32	95	7	45	20		0	57	26	94	170	114	119	107	131	70	95	102	95	117	91	14	75	44	134	30	82	65	67
Hawkins			5	7	15	8	19	80	26	7		4	11	6	8	17	9																	26
Okoia														7	2	1	0																	
TOTAL	**385**	**326**	**299**	**199**	**132**	**242**	**327**	**340**	**300**	**323**	**224**	**243**	**290**	**323**	**406**	**423**	**335**	**285**	**301**	**261**	**268**	**562**	**411**	**308**	**510**	**380**	**256**	**381**	**683**	**449**	**317**	**377**	**563**	**412**

TABLE 6. Black swan trend counts in Waimarino and Whanganui hill country sites.

Site	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Browns	4	6	2	0	2	3	4	3	0	0	5	3	4	1	0	0	0	0	
Roke	13	12	14	3	5	1	4	8	0	0							16	15	11
Ohakune Oxy Pond	2	2	0	0	0	0	0	2	5	0	0	0	1	1	2	5	9	1	0
Raetihi Oxy Ponds (2)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morikau (3)	19	12	0		2	4	6	6	1	9	6	9	8	13	16	8	5	6	4
Mokanui	6	5	0		3	1	0	6	8	8	6	7	14	12	5	1	3		
Taonui	6	5	0	0	2	0	0	0	0	0	0	3	5						
Harris	8	6	7			0	0	6	5	5	3	1	9	8	5	2	0	6	0
Old Fields Track		1	0	1	0	0	0	0	0	0	1	0							
Kaahu Estate		2	0	0	4	0	0	1	0	0	3	3	1	0	0				
Lake Otamaraha		10	1	3	5	2	12	7	0	1	0	6	0	4	0	0	4		0
Waiharuru																			6
Mangawherawhera																			5
Sues								2	1	1	0	4	3	4	2	1	5	17	0
National Park Oxy Pnd								4	0	0	0	0	0	0	0	0	0	0	0
Makakahi																	2		1
Total	**59**	**61**	**24**	**33**	**23**	**13**	**31**	**45**	**20**	**24**	**24**	**36**	**45**	**43**	**30**	**17**	**44**	**45**	**27**

TABLE 7. Black swan trend counts in north and south Taranaki.

POND LOCATION	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lake Cowley (Waitara)	53	29	32	52	16	24	35	17	104	60	92	98	28	67	34	84	83	69	133	67	77	74	112	115	85	92	99	138	81	114	100	185
Lake Ngangana	3	7	1	6	6	6	7	6	5	4	9	6	5	3	4	5	0	2	1	0	0	1	7	0	4	1	5	6	0	0	7	4
Lake Mangamahoe	16	9	11	12	14	15	24	9	5	20	12	16	19	32	48	19	17	30	27	75	31	93	44	38	52	34	44	28	37	37	59	37
Umutekai Rd	0	0	0	4	3	5	0	5	0	0	10	0	3	0	0	3	1	0	5	0	0	0	2	0	0	4	1	3	1	2	0	0
Winstones Manutahi Rd						3	1							0	1	2	7	5	5	1	1	2	5	4	0	4	1	4	2	0	2	7
Barrett Lagoon	0	4	2	7	4	3	4	3	1	7		7	2	3	7	8	1	2	2	10	7	0	4	7	7	0	2	22	25	19	31	17
Alfred Road	10	12	18	16	13	15	17	18	22	14	20	30	32	39	42	24	28	40	56	42	50	47	38	72	30	14	14	5	5	10	0	0
Waipu Lagoons	0	5	0	3	4	0	4	0	6	0	0	0	4	3	4	1		3	6	3	2	1	3	2	0	4	4	6	5	5	6	0
Bell Block Oxy Ponds	0	0	15	15	0	10	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	4	0	0	1	0	10	4	0
Tariki Road	0	1	0	1	0	0	4	6	0	0	5	0	0	0	0	0	3	0	0	2	2	0	0	2	7	2	0	0				8
LandCorp Wiremu	1	1	6	5	4	0	6	3	1	0	0	3	5	2	5	2	6	0	0	0	1	0	0	1	4	0	0	0	0	0		0
Arawhata Road		1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0				0	0	0	0	0				
Beach Road Omata	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0					
Richmond Rd									6	0	6	0	6	9	0	5	4	4	5	4	4	1	4	2	1	1	1	7	3	1	1	1
Perth Road				0	0	0	0	3	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Upland Road										7	10	0		2	0	3	0	0	0	0	2	0	0		0	0	0					
Komene Lagoon (Okato)											11	0	0	27	dry	1	1	dry	0		15	dry	dry	3	dry	dry	dry	7	5	8	33	0
Inglewood Oxy Ponds												6	5	4	0	0	0	3	6	5	0	3	7	2	5	3	1	7	10	4	0	7
Egmont Road																											1	8	5	0		
Clarke Rd															5	0			0					0	2	0						
Stratford oxidation ponds													0	3	2	2	3	7	7	11	17	13	18	17	13	4	20	27	37	43	58	68
Opunake Lake					0	0	0	0				0		0					0	11	5	14	0	2	5	5	2	0	4	2	9	3
Punehu					24	7	8	7	7	0	3	10	8	1	6	6	4	4	5	6	6	6	7	17	2	2	25	22	0	2	20	3
Opunake oxy ponds																8	1	6	1	4	5	6	3	5	2	1	3	5	4	2	0	0
Hawera oxidation ponds					140	118	111	83	47	57	39	25	37	42	51	81	73	84	132	130	120	135	151	101	80	92	108	145	94	68	102	79
Nowell's Lakes (2)		28			0	0		4	36	25	47	38	14	19	28	20	12	18	29	16	29	29	18	24	41	22	18	33	44	42	32	68
Lake Taumaha		0									1	8	0	6	1	1		4	0	1	0	5	7	5	2	16	4	5	3	1		8
Lake Kaikoura (Ball Rd)												5	0	5	2	0		9		1		0	0	7	12	18	7	29	13	10		5
Spence Road												7		2																		
Patea oxidation pond														5								9	2	7	8	2	3	3	1	1		0
Ihupuku Lagoon												3	0	0	0	0								0	0	0	0	0		1		0
Lake Maumahaki (2)												0	7	5		5	0	2	0	0	3	0	2	3	0	0	1	3	5	7	0	2

Manaia oxidation pond																									5	3	12	2	13	0	3
Tokaora quarry pond																									5	6	0	2	1	0	2
Hauroto Road																													11	6	7
100 Wills Road																													8	18	17
Eltham oxidation pond																										1	5	0	2	2	4
Waverley oxy																															7
TOTAL	**83**	**69**	**85**	**121**	**222**	**125**	**225**	**168**	**240**	**195**	**265**	**262**	**178**	**280**	**240**	**280**	**246**	**292**	**420**	**389**	**394**	**441**	**435**	**436**	**366**	**331**	**374**	**531**	**388**	**424**	**490**	**542**

Taranaki Region 2024/25 Waimarino/Whanganui Banding Report

SPECIES MANAGEMENT – POPULATION MONITORING: 2024/25 Waimarino/Whanganui Banding Report

Purpose of the Project

The Taranaki 2024/25 Waimarino/Whanganui Banding Report summarises all banding work undertaken within the Taranaki Fish and Game region.

Strategic Outcome

Healthy Species, Habitats and Ecosystems. Contribute toward planned result 4 and 6 under the Species Management output class within the 2024/25 annual plan.

Strategic Monitoring Plan

Undertake annual gamebird banding in the Whanganui region. Waimarino

Jack Harland and Allen Stancliff

Taranaki Fish and Game Council

September 2025

Fish & Game NEW ZEALAND

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

Waimarino/ Whanganui Banding Report

For the last eight years in February, staff, in conjunction with Eastern and Wellington Fish & Game staff and volunteers, have undertaken a duck banding programme in the Waimarino (2017, 2018, 2019) and Whanganui areas (2020 - 2025). This involved building traps and learning new techniques to develop an effective programme. This has proved successful and in the Waimarino in 2017 we banded 122 grey and mallard ducks at 3 sites (Table 1), 248 ducks at 4 sites in 2018 and in 2019, 148 ducks at 3 sites (a 4th site didn't 'switch-on' that year for unknown reasons).

In Whanganui in 2020 we banded 74 grey and mallard ducks at 2 sites, 289 ducks at 2 sites in 2021 554 ducks at 3 sites in 2022, 567 ducks at 3 sites in 2023, 383 ducks at 2 sites in 2024, and 467 over two sites in 2025. The reduced number of ducks banded in Whanganui in 2024 resulted from a feral cat entering one of the traps, so that none of the 5 traps at the upper site caught ducks on the second day.

In 2025, 455 mallard ducks and 12 grey ducks were banded, with banding occurring at two sites over two days at Lake Rotokauwau, south of Whanganui.

As part of the programme, hunters were encouraged to return data on any banded ducks they shot, either via contact during the gamebird harvest survey, by articles in F&G magazine, hunting newsletters, newspapers, ezines or through personal contact.

The numbers of ducks banded, number of band returns, and banding location of returned ducks are summarised in tables 1, 2 and 3.

Banding Year	Mallards banded	Grey duck banded	Total banded	Banding site
2017	87	35	122	Waimarino
2018	188	60	248	Waimarino
2019	105	43	148	Waimarino
2020	43	31	74	Whanganui
2021	281	8	289	Whanganui
2022	549	5	554	Whanganui
2023	553	14	567	Whanganui
2023 (Nov)	38	0	38	New Plymouth
2024	380	3	383	Whanganui
2025	455	12	467	Whanganui
Total	2,679	211	2,890	

Table 1. *Number of ducks banded 2017 to 2025*

Table 3 below shows the percentage of bands recovered for each banding year.

In Whanganui, the total band returns to date have been between 5.9% and 20.2% (Table 3). Returns for Whanganui in 2025 were 8.1%, indicating a return rate sitting around the average mark for this 5-year period (note that total numbers of birds banded per year has varied).

In 2020, 9 out of the 12 Whanganui banded birds were shot locally within the Whanganui area, with another 2 shot in the Waimarino and one in Morrinsville, 265km away from where it was banded.

In 2021, 2 of the 8 banded birds were shot in Whanganui area, 4 were shot in the Waimarino, 1 was shot at Lake Aniwhenua east of Rotorua (175 km from its banding site) and 1 was shot north of Morrinsville (216 km from its banding site).

In 2022, most of the 50 Whanganui band returns were from the local Whanganui area and down into the Manawatu. There appeared to be little movement up into the Taranaki ringplain area, with just one band returned from a duck shot at Kahui Road, some 129km from the banding site.

In 2023, nearly all 45 band returns were from birds shot in the local Whanganui/Manawatu area, with one shot in Masterton some 123km away and one shot in Taranaki at Upper Dudley Road Inglewood, 122km from the banding site.

In 2024, most of the 84 band returns came from the local area and Manawatu, with two ducks from Whanganui shot at Wataroa Road Pungarehu, some 139km away. One of the 33 birds banded at Lake Mangamahoe, New Plymouth was shot 185km away at Foxton.

In 2025, 97.2% of band returns (70 of 72) were from birds that were banded between 2022 and 2025 in Whanganui, with 70.8% (51 returns) from birds that were banded between 2024 and 2025. See table 2.

From this year's band return data, the average distance from banding to recovery was 19.9km. This distance is reduced to 13.4km if an outlier is excluded (a juvenile mallard drake that travelled from its 2023 Whanganui banding location to be recovered 472 kilometres north, near Dargaville). In contrast to the vast distance covered by this bird, an adult drake was recovered this year only 3.3 kilometres away from where it was banded over 6 years before in 2018 at Tohunga Junction. Interestingly, the Taranaki ringplain to the north provides excellent duck habitat with consistent hunting pressure, yet few Whanganui ducks appear to go there, as returns from this area form only a small percentage of total returns.

Year banded	Gordon Site	Mangamahoe Site	Rotokauwau Site	Tohunga Site
2018	0	0	0	1
2022	0	0	13	0
2023	0	1	6	0
2024	6	0	7	0
2025	27	0	11	0
Total	33	1	37	1

Table 2. Banding site and year of banding for the 72 duck bands returned in 2025.

The results currently do not include analysis of recaptures of previously banded birds at banding sites. For example, on day 1 of banding at Whanganui in 2024, 92 ducks banded in previous years were trapped in addition to the 354 unbanded ducks trapped.

Although more ducks were banded in 2025 compared with 2024 (467 compared to 383), there were fewer recaptures recorded on the first day of this year's banding (46), compared with last year's day

1 recapture of 92, which shows a varying but still significant level of site fidelity (i.e. the Whanganui banding sites are a good place to live).

The landowner has kindly committed to another year of trapping at Whanganui, with banding scheduled for February 2026.

RECOMMENDATION:

1. That the 2025 Whanganui banding report be received.

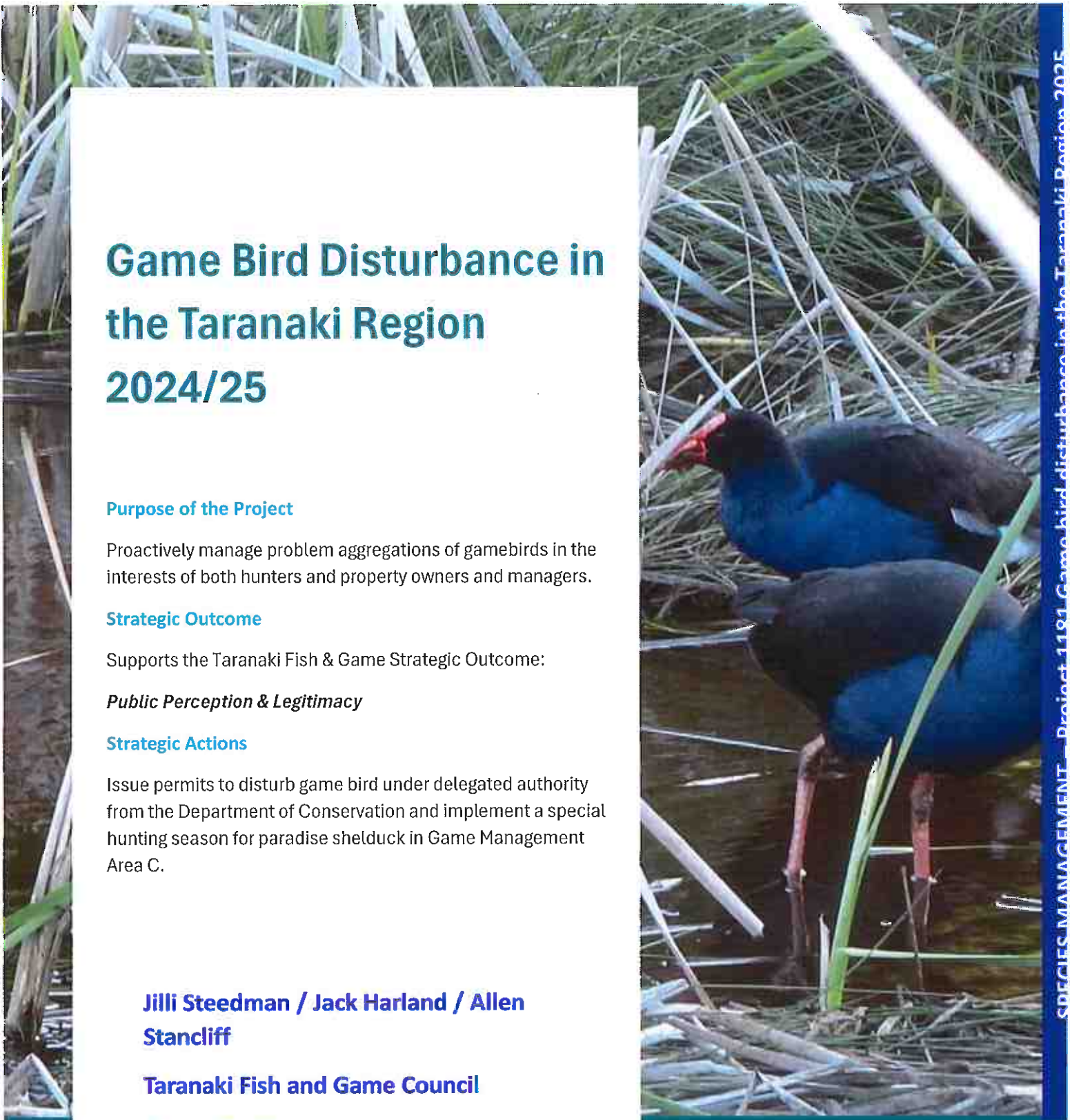
Jack Harland and Allen Stancliff

30th September 2025

Table 3. *Number of bands returned by hunters and the percentage of band returned, 2017 to 2025*

Year	Total # banded	Recovered 2017	%	Recovered 2018	%	Recovered 2019	%	Recovered 2020	%	Recovered 2021	%	Recovered 2022	%	Recovered 2023	%	Recovered 2024	%	Recovered 2025	%	Total % recovered to date
2017	122	6	4.9	5	4.3*	3	2.7*	0		1	0.9*	1	0.9*	0		0				13.1
2018	248			12	4.8	6	2.4*	1	0.4*	1	0.4*	0		0		0		1	0.4	8.5
2019	148					3	2.0	0		3	2.0*	0		0		0				4.1
2020	74							11	14.9	1	1.6*	1	1.6*	0		2	3.3*			20.2
2021	289									2	0.7	8	2.7*	3	1.1*	4	1.4*			5.9
2022	554											41	7.4	17	3.3*	14	2.8*	13	2.7	15.3
2023	567													25	4.4	26	4.8*	7	1.4*	10.2
2024	383															40	9.5	13	3.8*	13.8
2025	467																	38	8.1	8.1

* Adjusted to account for banded birds shot in previous years



Game Bird Disturbance in the Taranaki Region 2024/25

Purpose of the Project

Proactively manage problem aggregations of gamebirds in the interests of both hunters and property owners and managers.

Strategic Outcome

Supports the Taranaki Fish & Game Strategic Outcome:

Public Perception & Legitimacy

Strategic Actions

Issue permits to disturb game bird under delegated authority from the Department of Conservation and implement a special hunting season for paradise shelduck in Game Management Area C.

Jilli Steedman / Jack Harland / Allen Stancliff

Taranaki Fish and Game Council

August 2025

Fish & Game NEW ZEALAND

Executive Summary – 1181 Game Bird Disturbance Report 2024/25

Overview of Results

- 60 permits to disturb game birds were issued under delegated authority 73848-FAU from the Director General of Conservation during the 2024/25 year.
- There were 17 permits issued for the disturbance of mallard ducks causing damage to crops (4 were for mallards only, 13 included paradise shelduck)
- 29 permits were issued for the disturbance of pūkeko.
- 26 permits were issued for the disturbance of paradise shelduck (13 were for paradise shelduck only, 13 including mallard duck).
- One permit was issued for the disturbance of black swan.
- A 3-weekend (7-day) hunting season for paradise shelduck was held in Game Management Area C in late February and early March 2025 in which 134 active hunters spent 817 hours of effort to harvest 1,115 paradise shelduck, at a success rate of 1.36 birds per hour.

Statement of Service Performance

Planned Result:

Manage problem aggregations of gamebirds through implementation of a special Paradise shelduck season in Area C and proactively responding to and assisting landholders.

Performance Measure:

Implementation of special season including number of permits issued and harvest, along with number of permits to disturb issued.

Actual Result:

- 60 permits to disturb game birds were issued under delegated authority 73848-FAU from the Director General of Conservation during the 2024/25 year.
- A 3-weekend (7-day) hunting season for paradise shelduck was held in Game Management Area C in late February and early March 2025 in which 134 active hunters spent 817 hours of effort to harvest 1,115 paradise shelduck, at a success rate of 1.36 birds per hour.
- Results reported to Council on 15 October 2025 – Steedman, J. Harland, J. and A. Stancliff 2025. ***Project Report 1181 Game Bird Disturbance 2024/025.***

Budget Variance

	Budget ($)		Actual ($)	
External	2,000		2,352	
Internal	16,011	160 hours	15,659	156.5 hours
Income	1,250		945	
Total	16,761		17,066	

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

2024/2025 Game Bird Dispersal Report

This paper reports on operational activity conducted during the reporting period under project 1181. The objective of this project is to ensure the dispersal or control of congregations of game birds where they cause unacceptable damage.

A total of 60 permits to disturb were issued by Taranaki Fish & Game staff within the reporting period (72 permits issued last year). Note that some of these permits cover more than 1 species.
The area with the highest number of permits issued was Taranaki (54) then Whanganui (6) and 0 permits were issued in the Waimarino. 16 Permits were issued between the months of November and May (47 last year).

Income of $575 ($640 last year) for the hire of gas guns was received during the year,

MALLARD
There were 17 permits (9 permits issued 2023/2024) issued for the disturbance of Mallard ducks, causing damage to crops (4 were for only mallards, 13 included Paradise shelduck).

BLACK SWAN
There was 1 permit issued to disturb Black Swan (0 last year).

PUKEKO
29 permits were issued for the disturbance of pukeko, (49 permits issued 2023/2024).

Problem	No. permits issued	Disturbance method used
Damage to gardens	17	Trip traps (9) Shot gun / .22rifle (8)
Damage to crops & pasture	4	.22 rifle
Fouling troughs	2	.22 rifle
Damage to Nursery trees	1	.22 rifle
Attacking Chickens	1	.22 air rifle
Dog has salmonella	1	Trip trap
Damage to new grass on landfill cap	3	.22 rifle

PARADISE SHELDUCK
26 permits were issued for the disturbance of Paradise shelduck (13 were for Paradise shelduck only, 13 including Mallard. This compares to 21 permits issued 2023/2024.

Problem	No. permits issued	Disturbance method used
Damage to crops & pasture	26	Gas gun / Shot gun

Recommendation
That the Game Bird Dispersal Report – 2024/2025, be received.
Jilli Steedman
SECRETARY
1 September 2025

Valid From Date	City/Town	Method	Species
5/09/2024	New Plymouth	Silenced .22	Pukeko
5/09/2024	New Plymouth	Silenced .22	Pukeko
11/10/2024	Hawera	Silenced .22	Pukeko
11/10/2024	Waitara	Silenced .22	Pukeko
17/10/2024	New Plymouth Central	trip traps (2)	Pukeko
1/11/2024	New Plymouth	trip trap	Pukeko
6/11/2024	Stratford	Gas gun (own gun)	Paradise shelduck/Mallard duck
6/11/2024	New Plymouth 4372	Gas gun	Paradise shelduck/Mallard duck
7/11/2024	Whanganui	.22 rifle	Pukeko
7/11/2024	Whanganui	.22 rifle	Pukeko
11/11/2024	Kohuratahi	1x Gas Gun	Paradise shelduck/Mallard duck
20/11/2024	Auroa	1x gas gun	Paradise shelduck/Mallard duck
21/11/2024	Stratford	2x gas gun	Paradise shelduck/Mallard duck
25/11/2024	Stratford	1x Gas Gun	Paradise shelduck
26/11/2024	Auroa	1x Gas Gun	Mallard duck
27/11/2024	New Plymouth 4330	1x gas gun	Paradise shelduck/Mallard duck
28/11/2024	Hawera 4679	1x Gas Gun	Paradise shelduck/Mallard duck
3/12/2024	Stratford	Gas gun/Shot gun (x2)	Paradise shelduck/Mallard duck
6/12/2024	Inglewood	1x Gas Gun	Mallard duck
9/12/2024	Stratford	1x Gas Gun	Mallard duck / Paradise shelduck
9/12/2024	Stratford	Gas Gun	Paradise Shelduck
9/12/2024	Midhirst	1x gas gun, 1x lpg bottle	Mallard duck / Paradise shelduck
9/12/2024	Lepperton	Permit only (personal gas gun)	Mallard duck / Paradise shelduck
9/12/2024	Waitara	Shotgun	Paradise Shelduck
9/12/2024	Whanganui	Shotgun (non-lethal)	Mallard duck / Paradise shelduck
16/12/2024	Oakura	Shotgun	Paradise Shelduck
16/12/2024	Inglewood 4386	Gas gun/Shot gun	Paradise Shelduck
17/12/2024	Inglewood	gas gun	Paradise Shelduck
3/01/2025	Inglewood	gas gun	Mallard duck / Paradise shelduck
8/01/2025	Opunake	gas gun	Paradise Shelduck
13/01/2025	Stratford	Gas Gun	Paradise Shelduck
15/01/2025	Stratford	gas gun	mallard duck
17/01/2025	New Plymouth	.22 rifle	Pukeko
20/01/2025	New Plymouth	trip trap	Pukeko
22/01/2025	Whanganui	.22 rifle	Pukeko
24/01/2025	Hawera	shotgun or suppressed .223	Pukeko
27/01/2025	Waitara	Shotgun	Paradise Shelduck
29/01/2025	Opunake	gas gun	Paradise Shelduck
5/02/2025	New Plymouth	Gas gun/Shot gun	Paradise Shelduck
21/02/2025	Hawera	Silenced .22	Pukeko
12/03/2025	New Plymouth	trip trap (1)	Pukeko
14/03/2025	New Plymouth 4310	Trip traps (2)	Pukeko
25/03/2025	New Plymouth	.22 rifle	Pukeko
27/03/2025	New Plymouth	2x Gas Guns	Mallard
2/04/2025	New Plymouth	Trip traps (2)	Pukeko
7/04/2025	New Plymouth	gas gun & timer	Paradise Shelduck
11/04/2025	Oaonui	gas gun & timer	Paradise Shelduck
22/04/2025	New Plymouth	.22 air rifle	Pukeko
6/05/2025	New Plymouth	supressed .22	Pukeko
8/05/2025	New Plymouth 4310	.22 rifle or .177 or .22	Pukeko
20/05/2025	Omata	.22 rifle	Pukeko
6/05/2025	New Plymouth	supressed .22	Pukeko
27/05/2025	Whanganui	.22 rifle	Pukeko
29/05/2025	New Plymouth	Trip Trap	Pukeko
24/06/2025	New Plymouth	2x Trip trap	Pukeko
24/06/2025	New Plymouth	2x Trip trap	Pukeko
25/06/2025	Whanganui	.22 rifle	Pukeko
30/06/2025	New Plymouth	.22 rifle	Pukeko
7/07/2025	New Plymouth	gas gun	Black swan
21/07/2025	New Plymouth	2x Trip Trap	Pukeko

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

2025 SPECIAL PARADISE SEASON REPORT

A 3-weekend (7-day) hunting season for paradise shelduck was held in Game Management Area C (Taranaki) on 22nd – 23rd February and 1st 2nd, 8th, 9th & 10th March 2025, with hunting hours from 6.30am to 8pm each day. 2025 was the third year the season had been run over three weekends, including Taranaki Anniversary weekend. Previously, the season had been restricted to two weekends (4 days).

To participate in the season, hunters were required to have a 2024 game licence (unless hunting on the land they occupied), obtain a $5 permit (free for land occupiers) and fill in and return a diary. The daily bag limit was 10 paradise shelduck per hunter per day.

The special season was held to:

1. Disperse flocks of post-moult paradise shelduck that can cause damage to areas of new sown grass, recovering hay paddocks and fodder crops such as chicory; and
2. Provide an additional hunting opportunity for licence holders and land occupiers.

RESULTS

Permits were issued to 189 hunters, of which 134 went hunting, 52 didn't go out and 3 could not be contacted for their results (Table 1). Of the 57 land occupiers issued with permits, 25 went hunting, 28 didn't go out and four could not be contacted for their results.

Out-of-region hunters comprised just 6.7% of hunters (Table 2), which was the lowest on record (Figure 1). Auckland/Waikato licence holders made up most of the out-of-region participants (8 of 9 hunters). As usual, most hunters (125 in total) came from within the Taranaki region and 11.7% of Taranaki's 1,066 2024 game licence holders (968 AWS + 98 JWS) participated in the 2025 special season.

The 134 active hunters participating in the season expended a total of 817 hours of effort for a harvest of 1,115 paradise shelduck, which corresponded to a success rate of 1.36 birds per hour (Table 3). The success rate was a little below average, while the number of birds harvested was average (Tables 3 & 4, Fig. 2). While the special season harvest of paradise has remained stable in recent years, the total annual harvest over the wider region has been trending downwards (Fig.3).

Of the 233 days spent hunting in 2025, 106 (45%) occurred on the first weekend, 66 (28%) on the second and 61 (26%) on the third weekend (Table 4). The total number of days hunted was similar to previous years and increasing the available opportunity has resulted in only a minor increase in participation and little change in harvest. The average number of days per hunter (1.74) was lower than in the previous four years (Table 4), perhaps indicating that hunters have less time available to participate in the season. There's little doubt that the season was very useful in dispersing mobs of paradise after the moult. A 3-weekend special season has again been gazetted in Area C in 2026.

RECOMMENDATION:
THAT THE REPORT ON THE 2025 SPECIAL PARADISE SEASON, DATED 7th MAY 2025, BE RECEIVED.

Jilli Steedman
Allen Stancliff
7th May 2025

TABLE 1. Breakdown of Special Season Permits Issued, 2009-2025

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Nil Hunting	57	54	45	47	46	43	63	56	43	41	37	44	43	46	48	65	52
Not able to be contacted	7	10	5	3	6	2	3	0	2	2	3	3	4	10	6	6	3
Active Hunters – Area A																	
Active Hunters – Area B	36	19	16	12	14	8	9	18									
Active Hunters – Area C	122	111	102	130	116	114	132	113	99	94	104	109	108	105	92	111	134
Total Active Hunters	**158**	**130**	**118**	**142**	**130**	**122**	**141**	**131**	**99**	**94**	**104**	**109**	**108**	**105**	**92**	**111**	**134**
Total Permits Issued	222	194	168	192	182	167	207	187	144	137	144	156	155	161	146	182	189

TABLE 2. Origin of Participants in the Taranaki 2025 Special Season.

F&G Region	Area C	% from each Region
Auckland/Waikato	8	6.0
Hawkes Bay	1	0.7
Taranaki	125	93.3
Total	**134**	

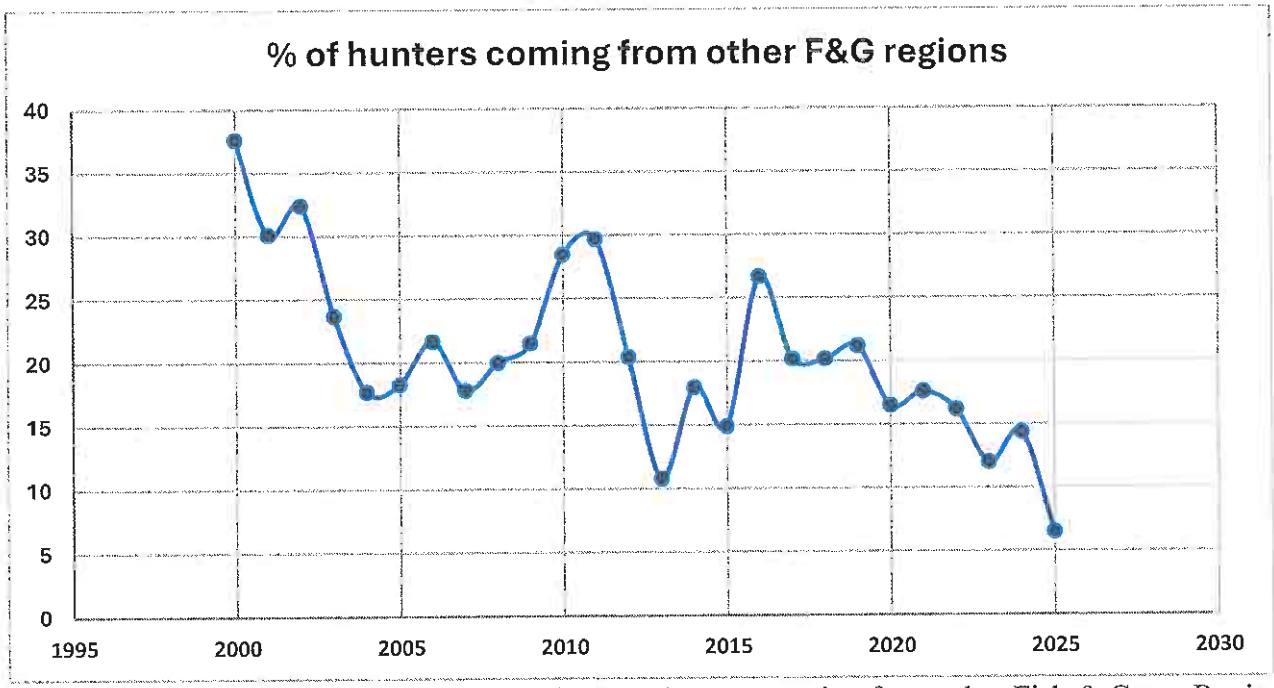


FIGURE 1. Proportion of Taranaki special season hunters coming from other Fish & Game Regions. No special season has been held in the Waimarino (Area A) since 2002 and in Whanganui (Area B) since 2016.

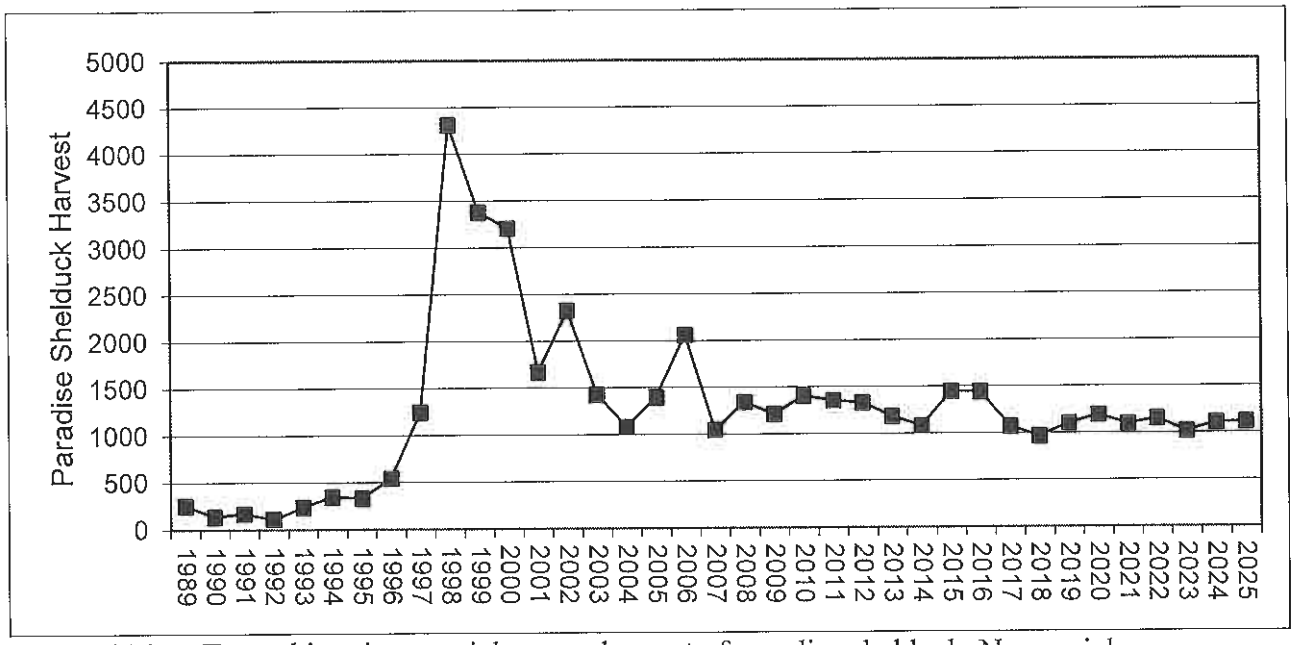


FIGURE 2. Taranaki region special season harvest of paradise shelduck. No special season has been held in the Waimarino since 2002 and in Whanganui since 2016.

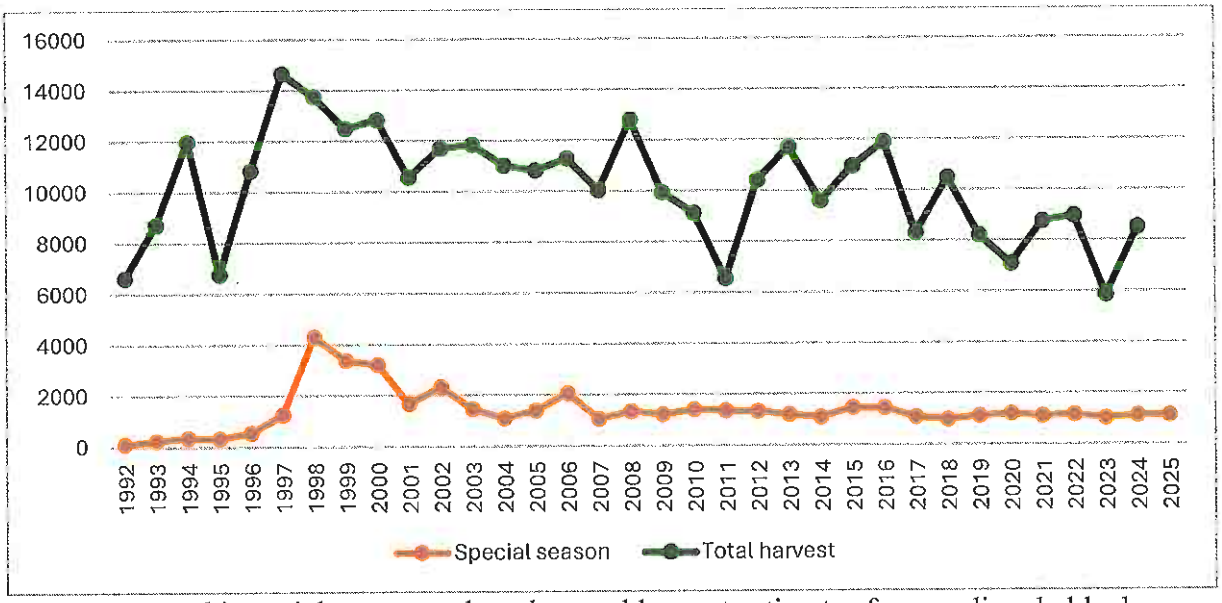


FIGURE 3. Taranaki special season and total annual harvest estimates for paradise shelduck. The total harvest estimate for 2015 does not include the harvest in Taranaki by hunters from other regions during the 2015 main season.

TABLE 3. Comparison of special paradise season harvest statistics. The season was extended to include Area C in 1998. There has not been a season in Area A since 2003 and in Area B since 2016.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
No. Hunters	130	131	161	118	135	158	130	118	142	130	122	141	131	99	94	104	109	108	105	92	111	134
Paradise Shot	1,085	1,397	2,065	1,049	1,342	1,212	1,408	1,356	1,334	1,186	1,086	1,451	1,446	1,076	968	1,107	1,195	1,098	1,153	1,017	1,110	1,115
Not retrieved	29	49	58	70	41	26	35	52	37	65	71	33	33	56	49	35	36	36	33	26	26	23
Banded	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geese Shot	55	76	72	57	87	53	48	22	--	--	--	--	--	--	--	--	--	--	--			
Hunting hours	958	1,125	1,479	949	--	1,068	997.5	932.5	1,026	849.3	845.8	1,040	960.8	716	728	750	868	897	820	713	742	817
Paradise/hour	1.13	1.24	1.40	1.11	1.67*	1.13	1.41	1.45	1.30	1.40	1.28	1.40	1.50	1.50	1.33	1.48	1.38	1.22	1.41	1.43	1.50	1.36
Paradise/hunter	8.3	10.7	12.8	8.9	9.9	7.7	10.8	11.5	9.4	9.1	8.9	10.3	11.0	10.9	10.3	10.6	11.0	10.2	11.0	11.0	10.0	8.3
Ave effort (hrs)	7.4	8.6	9.2	8.0	5.9*	6.8	7.7	7.9	7.2	6.5	6.9	7.4	7.3	7.2	7.7	7.2	8.0	8.3	7.8	7.8	6.7	6.1
Total Days	232	258	340	200	224	251	207	202	220	207	195	258	255	182	174	189	190	199	225	209	228	233
Days / hunter	1.78	1.97	2.11	1.69	1.66	1.59	1.59	1.71	1.55	1.59	1.60	1.83	1.95	1.84	1.85	1.81	1.74	1.84	2.14	2.27	2.05	1.74

TABLE 4. Harvest Statistics for Game Management Area C (Taranaki). The season was extended from one weekend to two in 2015 and two weekends to three in 2023.

Harvest Statistic	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
No. Hunters	97	109	122	111	102	130	116	114	132	113	99	94	104	109	108	105	92	111	134
Paradise Shot	906	1,066	1,008	1,265	1,233	1,205	1,077	1,026	1,365	1,310	1,076	968	1,107	1,195	1,098	1,153	1,017	1,110	1,115
Paradise not retrieved	57	38	20	30	51	34	60	71	33	30	56	49	35	36	36	33	26	26	23
Canada Geese Shot	50	87	53	48	21	--	--	--	--	--	--	--	--	--	--	--			
Geese not retrieved	0	1	1	1	0	--	--	--	--	--	--	--	--	--	--	--			
Hours	823.5	443.5	837	884	827	938	793.3	799.3	995	866.5	716	728	750	868	897	820	713	742	817
Av. No. paradise / hour	1.10	1.55*	1.20	1.43	1.49	1.28	1.36	1.28	1.37	1.51	1.50	1.33	1.48	1.38	1.22	1.41	1.43	1.50	1.36
Av. No paradise/ hunter	9.3	9.8	8.3	11.4	12.1	9.3	9.3	9.0	10.3	11.6	10.9	10.3	10.6	11.0	10.2	11.0	11.0	10.0	8.3
Av. Effort in hours	8.5	6.1*	6.9	8.0	8.1	6.7	6.8	7.0	7.5	7.7	7.2	7.7	7.2	8.0	8.3	7.8	7.8	6.7	6.1
Total Days	172	187	187	180	176	200	186	183	246	230	182	174	189	190	199	225	209	228	233
Days 1st weekend									156	122	125	105	138	146	127	163	95	98	106
Days 2nd weekend									90	108	57	69	51	44	72	62	63	86	66
Days 3rd weekend																	51	44	61
Av. No. days per user	1.77	1.72	1.5	1.6	1.7	1.5	1.6	1.6	1.86	2.04	1.84	1.85	1.81	1.74	1.84	2.14	2.27	2.05	1.74

Compliance Report for the Taranaki Region 2024/25

SPECIES MANAGEMENT – Project 1531 Compliance Report for the Taranaki Region 2024/25

Purpose of the Project

Provide effective compliance to protect resource sustainability (including revenue base) and user experience to maintain licence holder satisfaction

Strategic Outcome

Supports the Taranaki Fish & Game Strategic Outcomes:

Public Perception & Legitimacy

Attract & Retain Licence Holders

Allen Stancliff / Jack Harland

Taranaki Fish and Game Council

August 2025

Fish & Game NEW ZEALAND

Executive Summary – Taranaki Compliance Report (2024/2025)

Overview of Results

Ranger Management and Training:

- Ranger warrant renewals completed for 10 honorary rangers and one staff.
- One new staff member completed training and obtained warrant.
- One honorary ranger transferred to another region at year's end.
- Five honorary rangers and two staff attended a fish season training day in New Plymouth on 21/09/2024. One honorary ranger and two staff attended game season training in New Plymouth on 12/04/2025, with one additional honorary ranger attending a game season training day in the Wellington Fish & Game Region.

Compliance Activity:

- Rangers checked 47 anglers throughout the region during the year. Two no-licence offences were detected, giving a compliance rate of 95.6%.
- Rangers checked 93 game bird hunters throughout the region. One no-licence offence was detected giving a compliance rate of 98.9%.
- Warrantless powers of entry and/or search (Sec 39 Wildlife Act 1953 and Sec 40 Conservation Act 1987) for entry to land were exercised on 15 occasions while carrying out game bird hunter ranging.

Statement of Service Performance

Planned Results:

Review and renew ranger warrants and maintain a skilled honorary ranger team of at least 12 rangers consistent with requirements and objectives of the Compliance Policy and Strategy and also R3 principles.

Undertake safe and effective compliance coverage across the Taranaki Region, including a target of 100 licence checks of anglers and also of hunters.

Process detected offences in a fair and timely way consistent with national prosecution guidelines.

Actual Result:

- Management of honorary rangers met the planned result in the Operational Plan;
- Compliance checks did not meet the target of 100 for anglers and hunters;
- Compliance with the regulations was 95.6% for anglers checked, which met the target of 95%;
- Compliance with the regulations was 98.9% for hunters, which exceeded the target of 95%.
- Three offences (2 fish, 1 game) were detected.

- Warrantless powers of entry and/or search (Sec 39 Wildlife Act 1953 and Sec 40 Conservation Act 1987) for entry to land were exercised on 15 occasions while carrying out game bird hunter ranging.

Budget Variance

	Budget ($)		Actual ($)	
External	3,000		962	
Internal	28,218	282 hours	18,911	189 hours
Income	1,000		0	
Total	30,218		19,873	

Comments:

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

2024/25 Compliance Report

The Council's 2024/25 annual plan requires production of a compliance report detailing compliance activities, including ranger management and results for the year.

The planned results for the year in the Council's annual plan were to: review and renew ranger warrants and maintain a skilled honorary ranger team of at least 12 rangers consistent with requirements and objectives of the Compliance Policy and Strategy and also R3 principles; to undertake safe and effective compliance coverage across the Taranaki Region, including a target of 100 licence checks of anglers and also of hunters; and to process detected offences in a fair and timely way consistent with national prosecution guidelines. Performance measures were: Ranger warrants renewed as appropriate, rangers trained, safe and effective and number of compliance checks, level of compliance exceeds 95% and outcomes reported of any non-compliance detected.

Ranger management and training

The Taranaki Region began the 2024/25 year with 10 warranted honorary rangers and one warranted staff member.

Five honorary rangers and two staff attended a fish season training day in New Plymouth on 21/09/2024. One honorary ranger and two staff attended a game season training in New Plymouth on 12/04/2025, with one additional honorary ranger attending a game season training day in the Wellington Fish & Game region.

Ranger warrant renewal

Ranger warrant renewals were completed for 11 honorary rangers and one staff member. However, one honorary ranger decided not to continue for health reasons, bringing the total back to 10. A new staff member completed the CERT on-line training modules on 2nd October 2024 and one-on-one training with CERT Managing Director Brad Dannefaerd on 18th November 2024.

One experienced honorary ranger notified staff of his move to Dunedin, where he'll continue as a ranger for Otago Fish & Game. This brought the total to nine honorary rangers and two staff at year's end.

Compliance activities

Rangers checked a total of 47 anglers throughout the region during the season. Two no-licence offences were detected, giving a compliance rate of 95.6%. One no-licence offender gave a false name and was unable to be identified. The other was given a verbal warning.

There was a good turnout of rangers on opening weekend of the 2025 game season, with 93 hunters checked in the Pākaraka, Waitotara, Waverley, Tikorangi and Ratapiko areas. One offence was detected in relation to a hunter visiting from Australia who purchased a licence after he was first contacted by Fish & Game rangers. This is still being followed up. The overall compliance rate for game bird hunting was 98.9%.

The number of anglers and hunters checked over the year, with offences detected, is shown in Table 1 below. The numbers checked did not reach the target of 100 identified in the Council's Compliance Strategy, but still represented a good effort by rangers, given the dispersed nature of angling in the region.

Table 1 Number of anglers and hunters checked and offences detected over the 2024/25 season

	Number of checks	% of total licences sold (using provisional 2024/25 figures)	Number of offences detected	User compliance rate (%)
Anglers	47	2.6% of 1,797	2	95.7%
Hunters	93	7.5% of 1,235	1	98.9%

RECOMMENDATION

That the Taranaki Fish & Game Council receive this compliance report for 2024/25 noting that:

- management of honorary rangers met the planned result in the Operational Plan;
- compliance checks did not meet the target of 100 for anglers and hunters;
- compliance with the regulations was 95.6% for anglers checked, which met the target of 95% compliance;
- compliance with the regulations was 98.9% for hunters, which exceeded the target of 95%.

Allen Stancliff
Senior Field Officer
4 September 2025

2025 GAME BIRD HUNTER

SATISFACTION SURVEY

Fish & Game™

Prepared by Matthew Garrick, North Canterbury Fish & Game
and H. Sanders Garrick, North Canterbury Fish & Game

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

2025 Game Bird Hunter Opening Weekend Satisfaction Survey

In consultation with regions, Matthew Garrick and Heather Sanders Garrick (NCF&G) formulated a question about hunter satisfaction, with the objective of obtaining results on a national basis for comparison for the second year running.

Hunters were surveyed as a part of the annual opening weekend harvest survey, and those who hunted during opening weekend were asked about their level of satisfaction with their opening weekend experience. They were asked to rate satisfaction on 5-point scale (1 = very dissatisfied, 5 = very satisfied). A total of 1,536 surveys were collected from the 12 participating regions.

This agenda item provides Councillors with results of the survey.

For Taranaki:

- 84% of hunters said they were either satisfied or very satisfied with their overall opening weekend experience;
- 7% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience;
- Mean satisfaction (4.3; 95%CI 4.2–4.4) was similar to the 2024 opening weekend;
- Taranaki hunters were the most satisfied in the country.

This is not a bad result considering the region experienced fine, calm weather conditions over opening weekend which favoured the ducks.

Asking the satisfaction question involved quite a bit of extra work for the harvest survey interviewers and we thank them for their effort.

RECOMMENDATION:

- THAT THE 2025 GAME BIRD HUNTER OPENING WEEKEND SATISFACTION SURVEY REPORT BE RECEIVED.

Allen Stancliff

7 October 2025

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

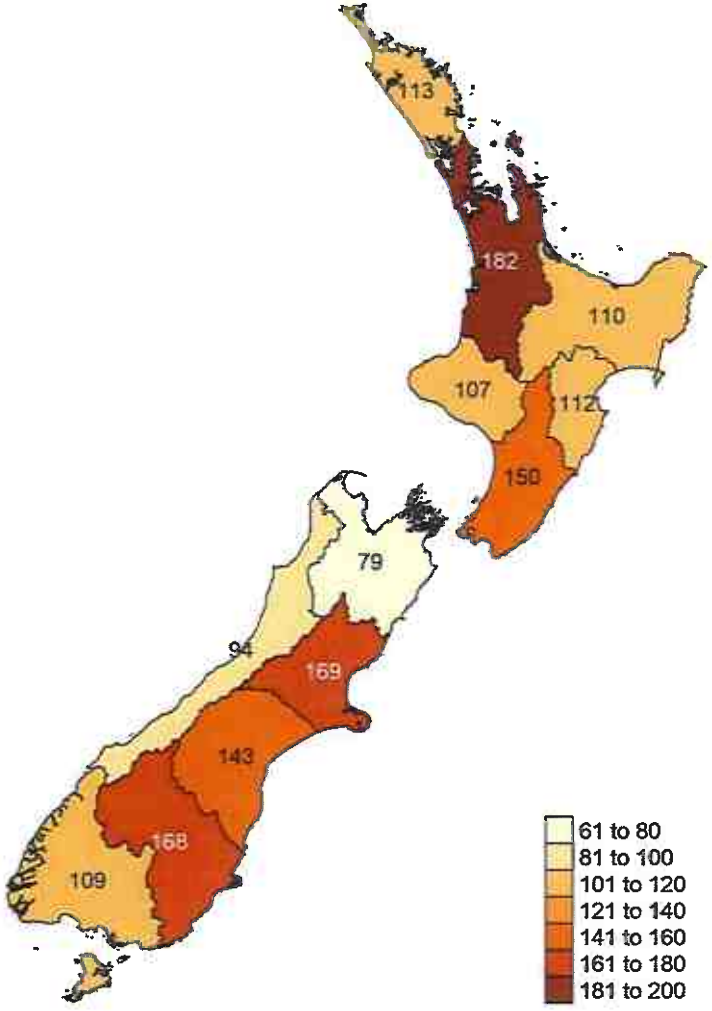
Fish & Game

- Hunters surveyed as a part of the annual opening weekend harvest survey
- Hunters who had hunted during opening weekend were asked about their satisfaction with their opening weekend experience
- Asked to rate satisfaction on 5-point scale (1 = very dissatisfied, 5 = very satisfied)
- 1,536 surveys collected across 12 regions

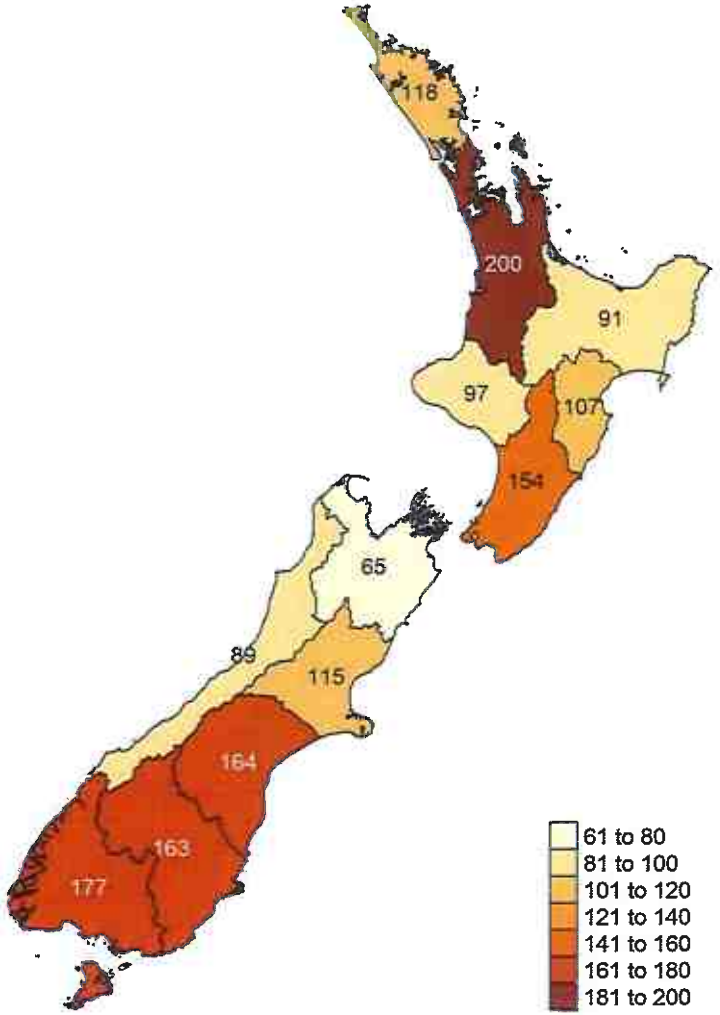
Photo Credits: Richard Cosgrove, New Zealand Fish & Game
Matthew Garrick, North Canterbury Fish & Game

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

Fish & Game



Surveys per Region



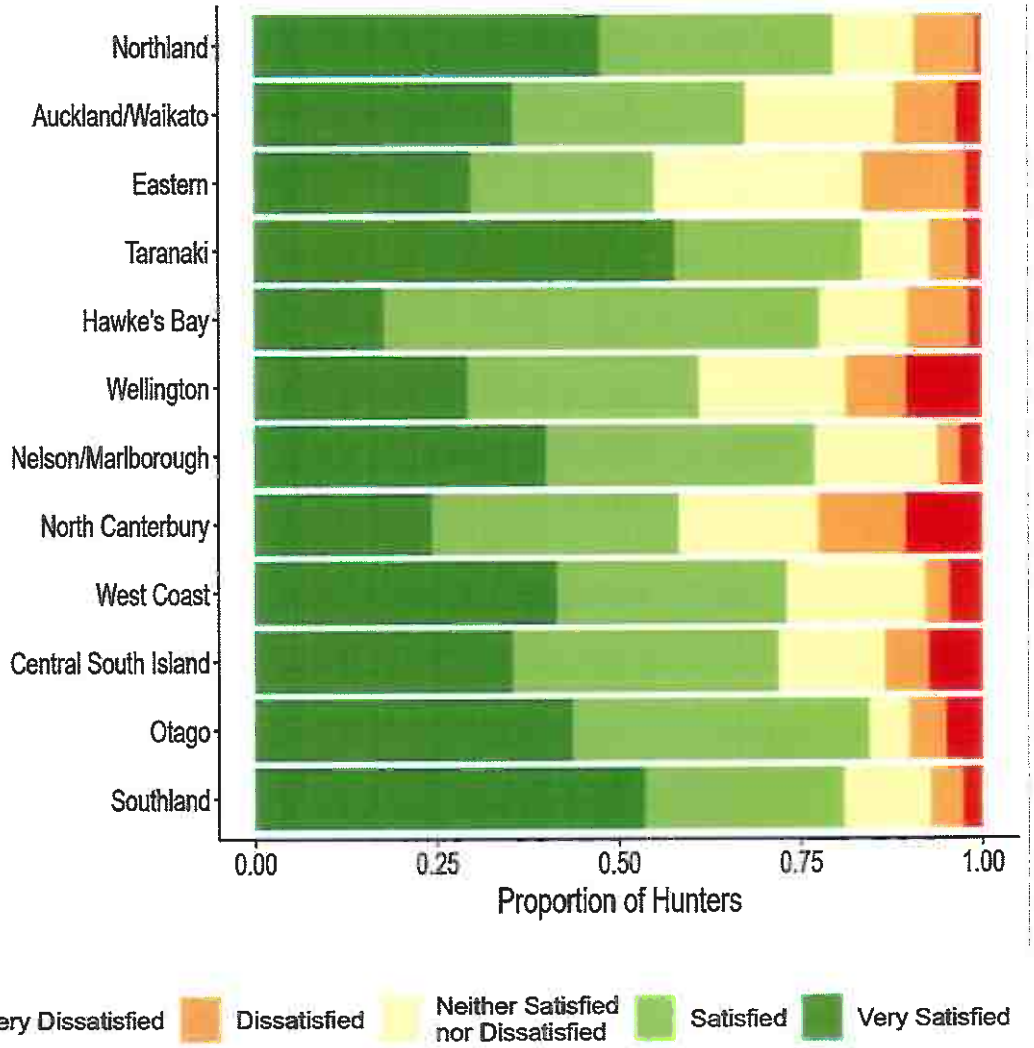
Hunters per Region

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

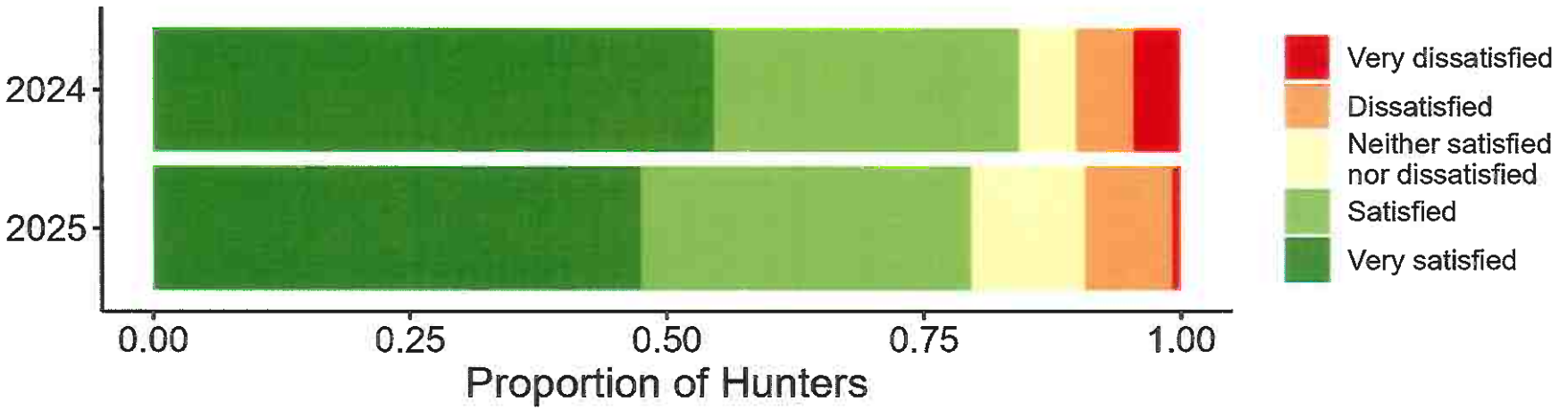
Fish & Game

How satisfied were you with your Opening Weekend experience?

- Mean satisfaction was 3.9 (95% CI 3.8-4.0), or satisfied
- Mean satisfaction was similar to the 2024 opening weekend
- Mean satisfaction was largely similar between regions, with means ranging from 3.5 to 4.3
- More than 70% of hunters reported they were satisfied or very satisfied with their opening weekend experience



2025 GAME BIRD HUNTER **SATISFACTION SURVEY** **NORTHLAND**



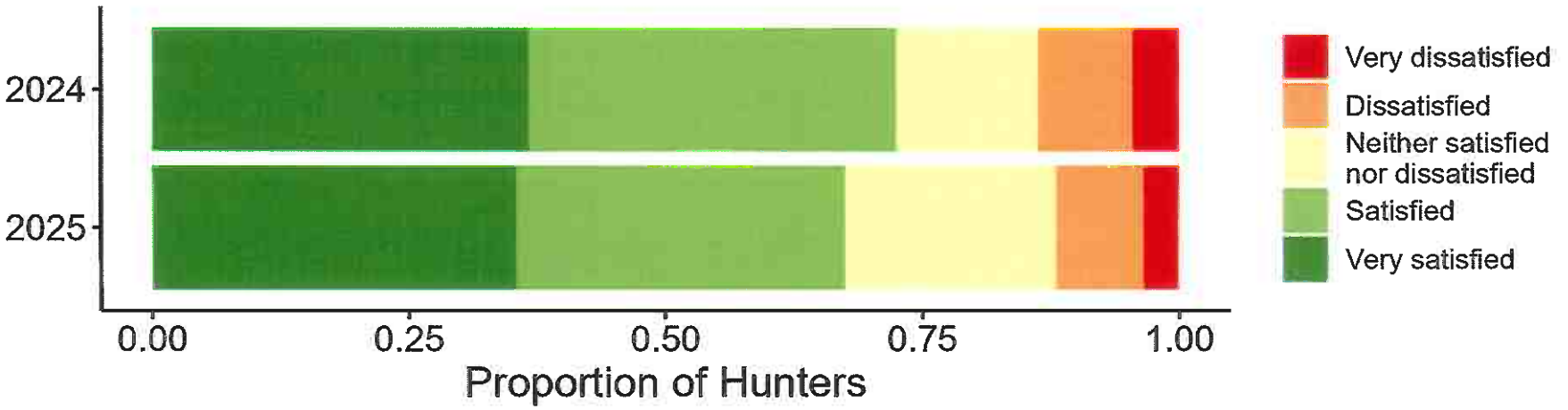
- 80% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 9% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was similar to the 2024 opening weekend, 4.2 (95% CI 4.1-4.3)

2025 GAME BIRD HUNTER SATISFACTION SURVEY

AUCKLAND/WAIKATO



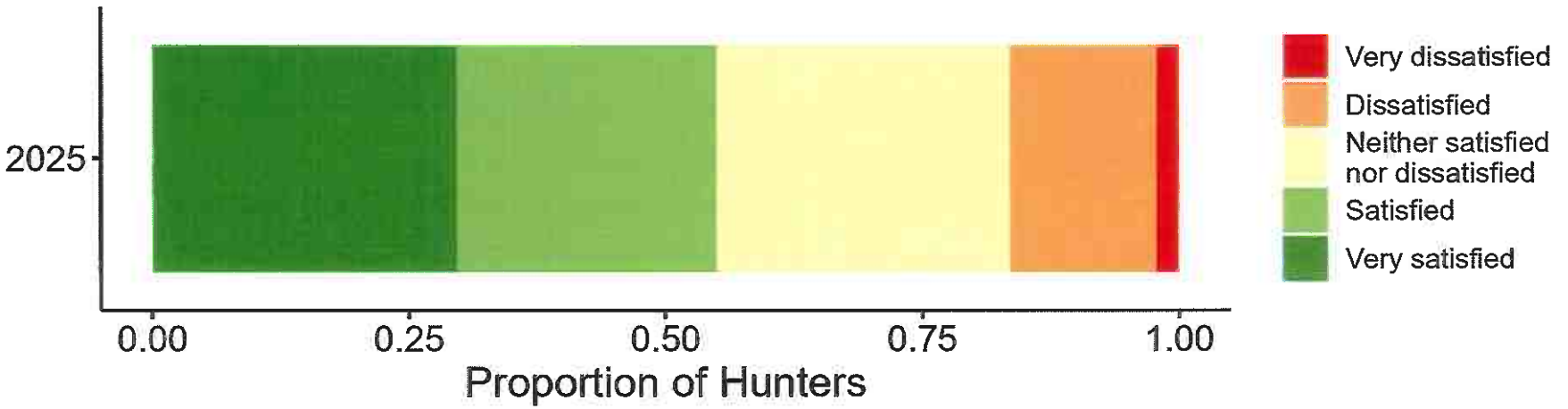
- 68% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 12% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was similar to the 2024 opening weekend, 3.9 (95% CI 3.8-4.0)

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

EASTERN



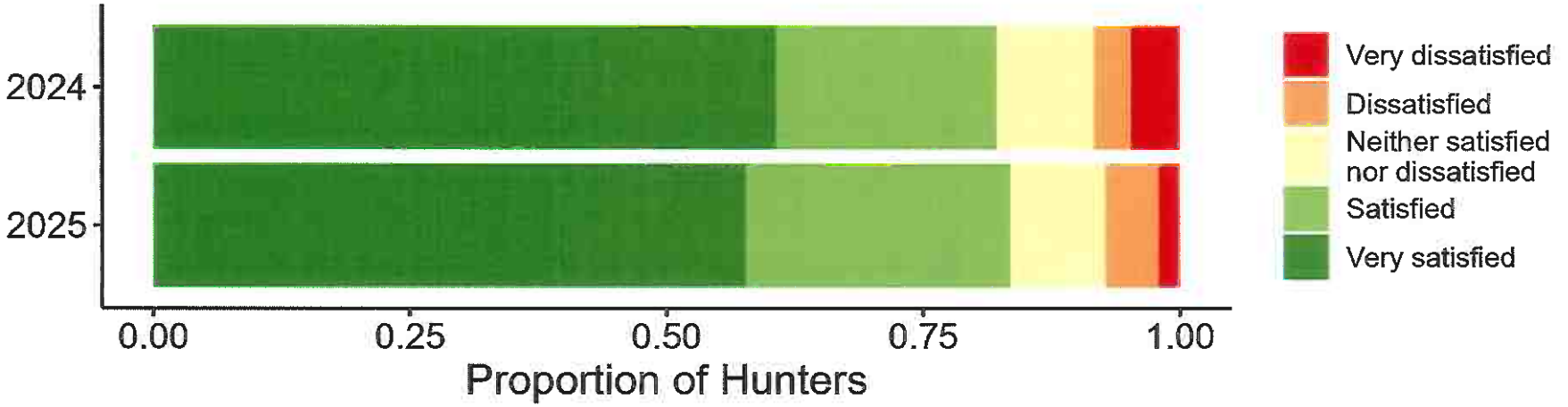
- 55% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 16% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was 3.7 (95% CI 3.6-3.8)

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

TARANAKI



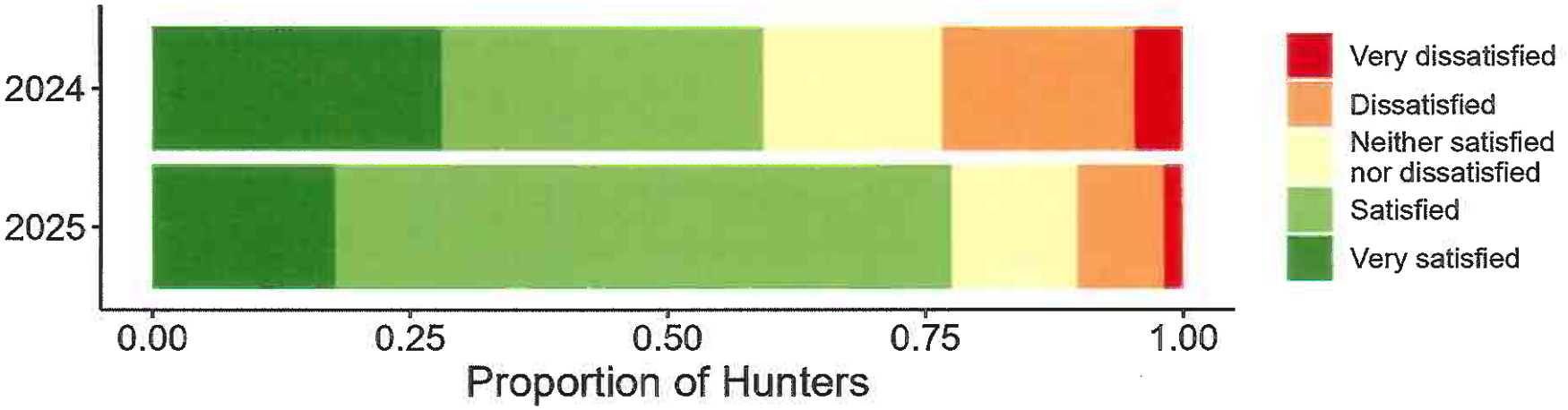
- 84% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 7% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was similar to the 2024 opening weekend, 4.3 (95% CI 4.2-4.4)

2025 GAME BIRD HUNTER SATISFACTION SURVEY

HAWKE'S BAY



- 78% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 10% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was slightly increased relative to the 2024 opening weekend, with a mean score of 3.8 (95% CI 3.7-3.9) vs. 2024's 3.6 (95% CI 3.4 – 3.7)

2025 GAME BIRD HUNTER SATISFACTION SURVEY

WELLINGTON

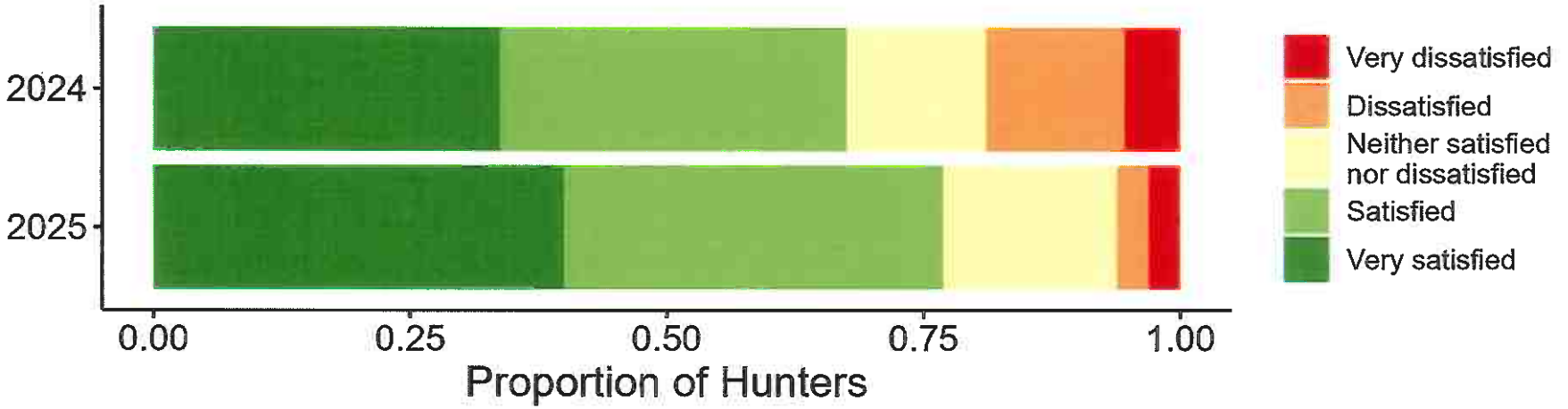
- 61% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 19% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was slightly decreased relative to the 2024 opening weekend, 3.6 (95% CI 3.5-3.7) vs. 2024's 3.8 (95% CI 3.7-3.9)

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

NELSON/MARLBOROUGH



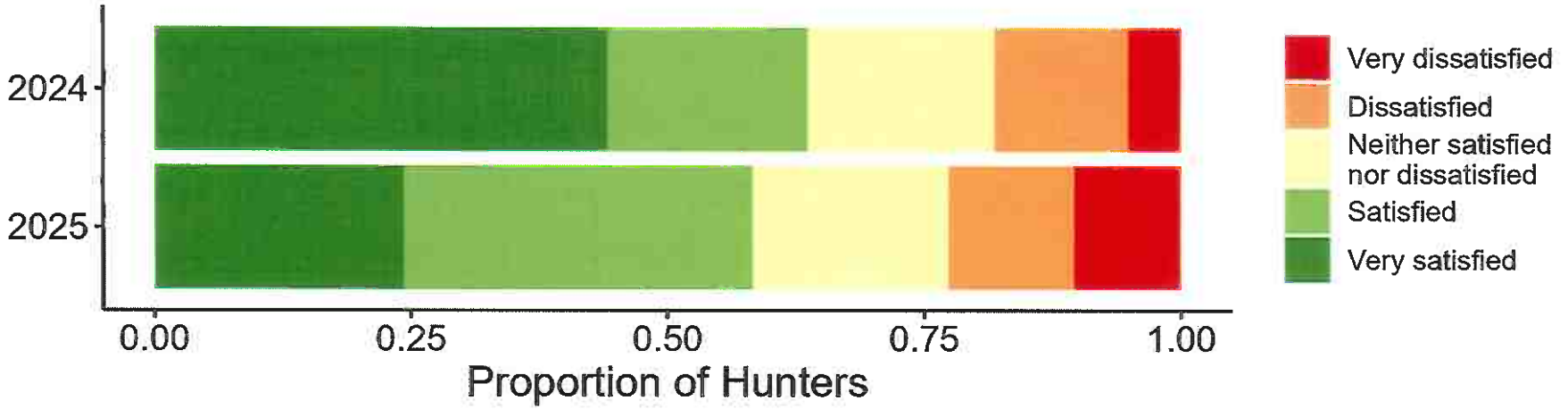
- 77% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 6% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction increased relative to the 2024 opening weekend, with a score of 4.1 (95% CI 4.0-4.2) vs. 2024's 3.8 (95% CI 3.7-3.9)

2025 GAME BIRD HUNTER **SATISFACTION SURVEY**

NORTH CANTERBURY



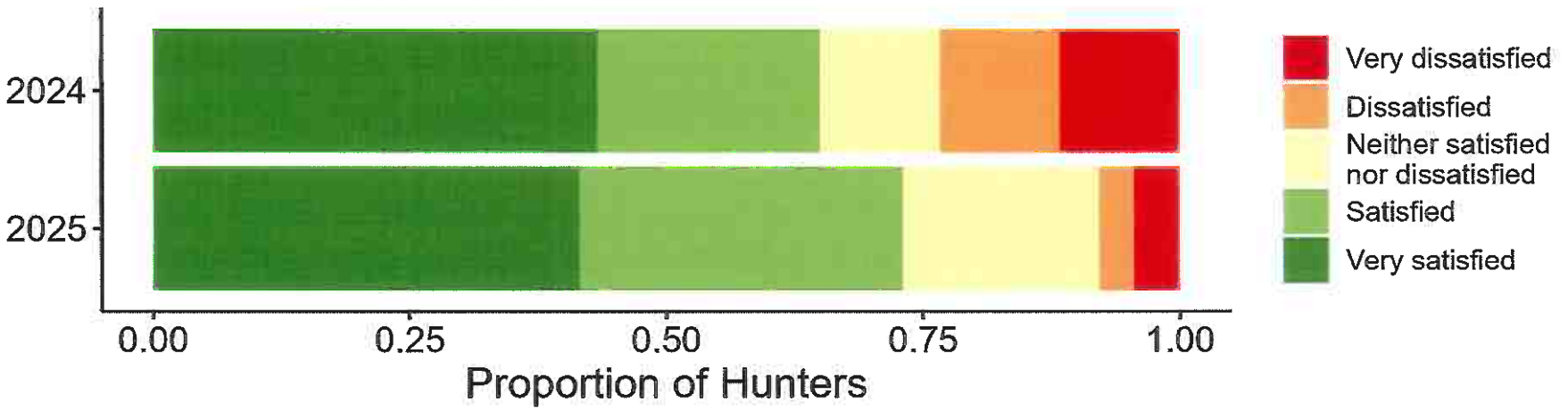
- 58% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 23% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was decreased relative to the 2024 opening weekend, with a mean score of 3.5 (95% CI 3.4-3.6) vs. 2024's 3.8 (95% CI 3.7-3.9)

2025 GAME BIRD HUNTER **SATISFACTION SURVEY**

WEST COAST



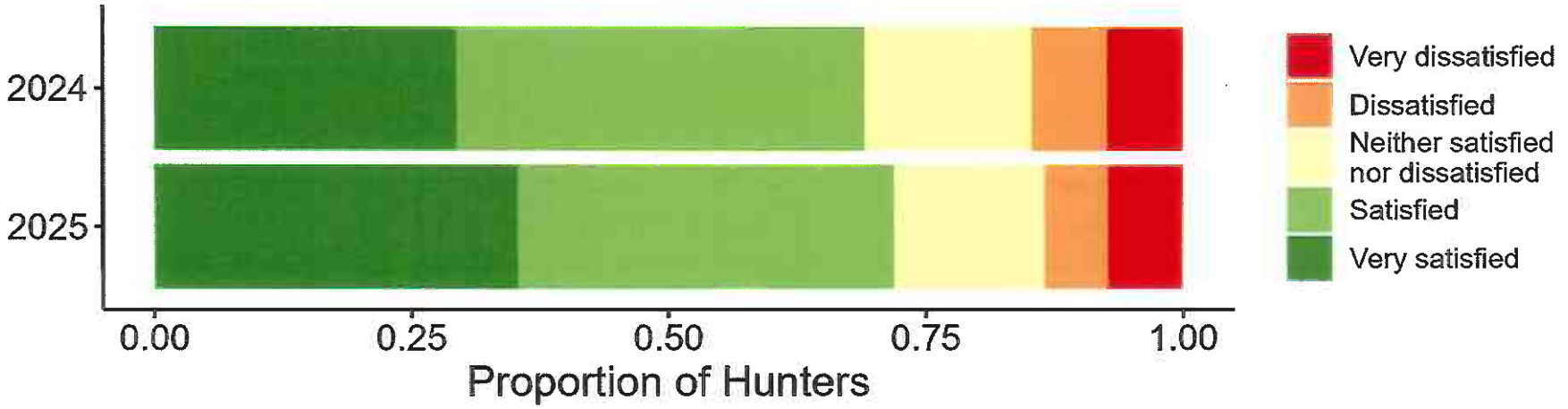
- 73% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 8% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was slightly increased relative to the 2024 opening weekend, with a mean score of 4.0 (95% CI 3.9-4.1) vs. 2024's 3.7 (95% CI 3.4-3.9)

2025 GAME BIRD HUNTER SATISFACTION SURVEY

CENTRAL SOUTH ISLAND



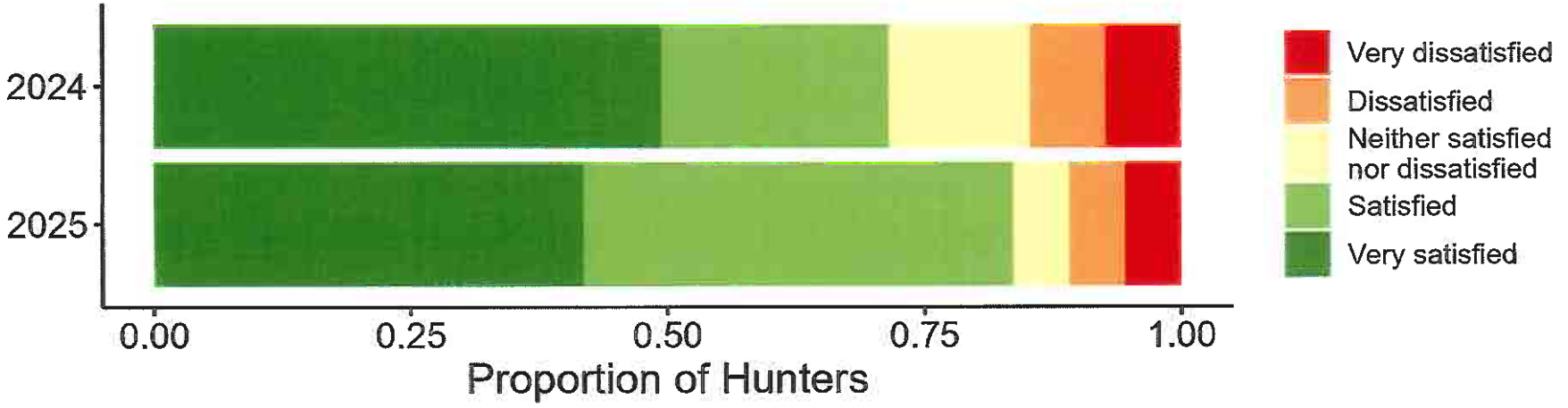
- 72% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 13% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was similar to the 2024 opening weekend, 3.9 (95% CI 3.8-4.0)

2025 GAME BIRD HUNTER
SATISFACTION SURVEY

OTAGO



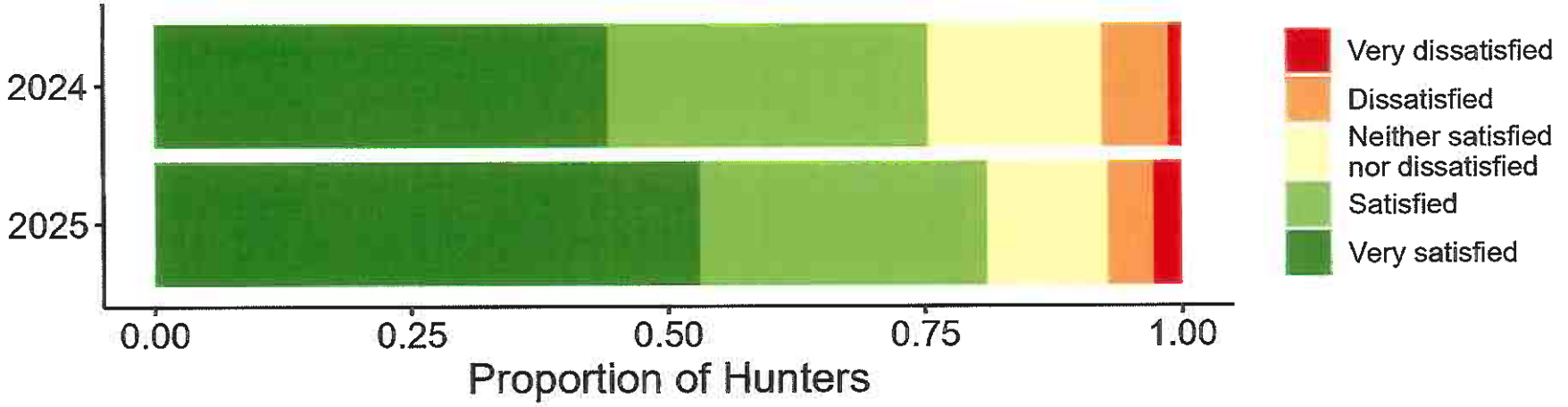
- 84% of hunters said they were either satisfied or very satisfied with their opening weekend experience

- 11% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience

- Mean satisfaction was slightly increased relative to the 2024 opening weekend, with a mean score of 4.1 (95% CI 4.0-4.2) vs. 2024's 4.0 (95% CI 3.9-4.1)

2025 GAME BIRD HUNTER SATISFACTION SURVEY

SOUTHLAND



- 81% of hunters said they were either satisfied or very satisfied with their opening weekend experience
- 7% of hunters reported feeling dissatisfied or very dissatisfied with their opening weekend experience
- Mean satisfaction was slightly increased relative to the 2024 opening weekend, with a mean score of 4.2 (95% CI 4.1-4.3) vs. 2024's 4.1 (95% CI 4.0-4.2)