CPW TRUST.

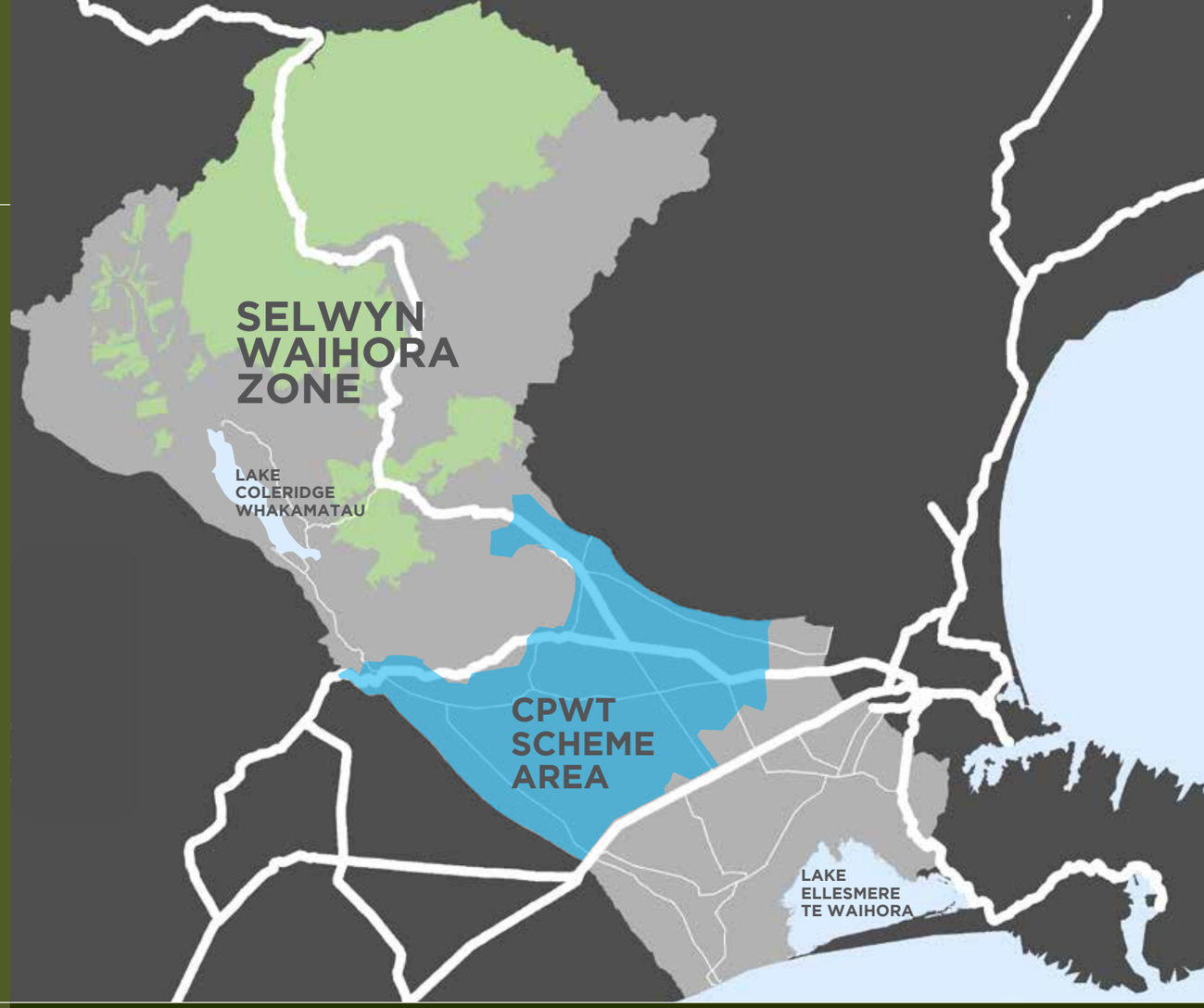
CENTRAL PLAINS WATER TRUST

2025 Sustainability Report

Contents

This annual report is compiled with information from CPWL, other industry and environmental sources.

CPW TRUST.



An independent overview

Monitoring the performance of Central Plains Water.

CPW TRUST.

Pat McEvedy
Central Plains Water Trust

Chair's foreword

Welcome to the Central Plains Water Trust's (the Trust) Sustainability Report for 2024–25. As in previous years, this report provides an independent overview of the performance of Central Plains Water Ltd (CPWL, the scheme) during the past season. It draws on both independently collected data and CPWL data supplied to the Trust for analysis.

The Trust holds the resource consents for the scheme, licensing their operation to CPWL. The Trust are appointed by the Settlor councils – Selwyn District Council and Christchurch City Council – and are required, under the Statement of Intent, to publish this report annually. Our role is to support the sustainable use of water resources while taking a long-term oversight approach. Acting as an "honest broker," we both support and challenge CPWL to achieve the wider community aspirations that were envisaged when consents were first granted in 2010.

This report aligns with the strategic initiatives of CPWL and reports environmental performance year-on-year to track CPWL's sustainability journey. The process is focused on gathering and providing insights from the mass of data available. The report also attempts to provide some clarity around the role and effectiveness of audited farm environment plans at minimising the impacts of farm practices on water quality over time. We also report on the abundance and quality of biodiversity in the scheme area and beyond.

For further detail on the Trust's role and activities, you can access our website at www.cpwt.co.nz. On our website there is information on the compliance and oversight of CPWL, you will also find background information on trustees and their Governance role and accountabilities. The Environmental Management Fund (EMF) work is outlined and how it contributes to investing in environmental outcomes across the Selwyn District. Available in the website is a list of historical reports and documents for the general public along with contact details for the Trust.

CPW TRUST.

THE TRUST'S ROLE

in Monitoring Performance

The Trust monitors environmental performance across the CPWL

With a focus on:

- Progress towards surface and groundwater targets, which act as indicators of ecosystem health and will inform the scheme's consent review in 2047.
- How the Trust can support performance and consenting beyond 2047.
- The target of a 30% reduction in nitrate-nitrogen (N), determining:
  - The sampling effort needed to detect changes from farm actions in 5, 10 or 20 years.
  - The number of on-farm actions needed to achieve (or exceed) the 30% reduction.
  - The influence of lag times between actions and measurable improvements.
- Biodiversity monitoring, including bird and fish surveys, supported by a photographic catalogue of critical species to educate stakeholders.

Farm Environment Plans

Our 2023-24 report described the regulatory Farm Environmental Plan (FEP) processes. Farmers are steadily improving their audit grades in 2024-25. So how do the audited FEP's make a difference to the amount of nitrate loss from the farm, and how and when does that reduction show up in groundwater nitrate levels?

The FEP is a formal document describing each specific farm management practice relevant to CPW farms in a way which a trained auditor can consistently assess. Good management practices (GMP's) are a set of generally agreed farming management practices that all Canterbury farmers could reasonably be expected to be undertaking today. The base document is on the ECan website and covers 21 GMP's focussed on water quality.

Being audited is a confronting experience for the farmers and managers. The auditor visits on-farm for up to four hours, having first become familiar with the farm records, nutrient budgets and previous audits. They not only establish what and how the farmer carries out practices that risk nutrient loss, such as irrigation, fertiliser and effluent management practices, but also question the farmer about their understanding of why these actions are important, as well as examining other evidence such as photos and maintenance records.

Responses are given a High, Medium or Low level of confidence grade for each management practice by the auditor, which taken overall provide a justifiable A, B, C, or D grade for the farm. A written report is provided soon after, with a list of actions and deadlines for improvement, and when a revisit will occur.

A look at the 41 CPWL farmers' audits undertaken for 2024-25 (Table 1) indicates 97% of our farmers are already achieving or are progressing towards an A grade. Almost all provided a high level of confidence to the auditor that fertiliser, effluent and soil management was at good management level or beyond (Table 2). However, the results suggest there is an opportunity to improve irrigation management, which is one of the most direct ways to reduce nitrate loss from soils, since nitrate is highly soluble in water.

Table 1.

Audit results for 2024-25 season. (Note that about a third of all farmers are audited each year.)

AUDIT GRADES	TOTAL	PERCENTAGE
A	33	80
B	7	17
C	1	2
D	0	0
TOTAL	41	100

Table 2.

Count of the confidence that practices (by class) are being implemented by shareholder farms within their FEP

The total number of audits were 41 and the total number of practices audited across farms was 330.

CONFIDENCE	IRRIGATION	NUTRIENTS	SOIL	COLLECTED EFFLUENT	ALL CLASSES	PERCENT OF APPLICABLE PRACTICES
HIGH	34	39	40	13	312	94
MED	6	2	1	0	18	5
LOW	1	0	0	0	1	1
N/A	0	0	0	28	38	

Good management practices will evolve as science, technology, and market expectations change. A farm earning a B grade today may slip to C if practices remain static. The Trust's expectation is that all farms will reach at least good management practice annually in the near future and then go on to continually improve over time.

Improved management practices not only reduces nitrate leaching, especially in autumn and winter, but also benefits farm profitability by using less water and fertiliser. While individual gains may be modest, collectively they will contribute to measurable improvements in water quality, which are being tracked through ongoing monitoring.

The next section on groundwater well monitoring illustrates how those reductions in nitrate loss from farms are beginning to show improvements in groundwater nitrate concentration. Each year, as part of an on-going process, the FEP and water quality data will build an evidence base that will provide confidence to shareholder farmers and the wider community that the efforts are worthwhile and heading in the right direction. Year on year trends will also suggest where further improvements might be needed.

CPWL PROCESSES AND PRACTICES

for shareholder farmers and the community, that lead to better water quality.

1.

DETERMINE PERCENTAGE REDUCTION

ON FARM NITRATE LOSS

Informed by collaborative work between Environment Canterbury and CWPL at a scheme level.

→

2.

SELECT FARM PRACTICES

Gauge suitability of practices to contaminants of interest and enterprise.

Consider cost effectiveness, speed, co-benefits and limitations.

→

3.

PLAN AND IMPLEMENT PRACTICES

Map losses and practices by assigning them to 'leaky' parts of the farm.

Determine percentage reduction.

→

4.

MAXIMISE CHANCE OF DETECTING REDUCTIONS

Auditing of plans. Measure surface and groundwater quality and trends.

→

5.

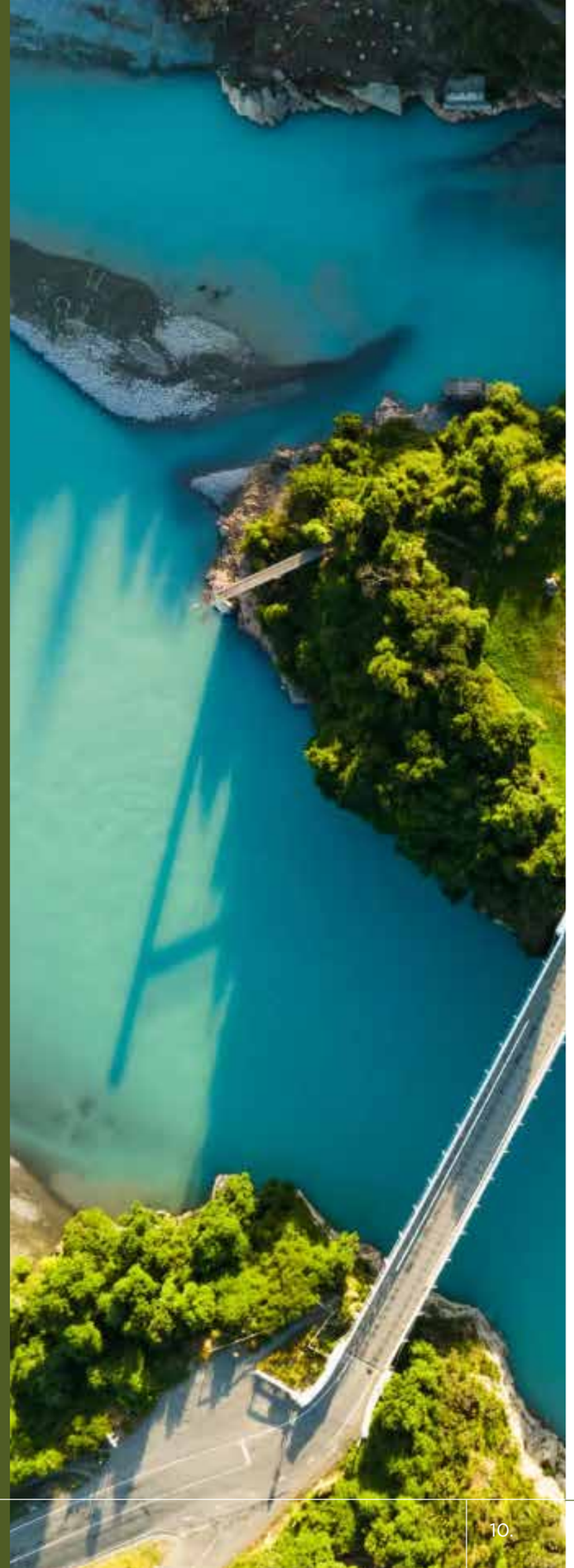
ATTRIBUTE TO PRACTICES

Remove effects of lag times between doing practices and water quality change, climate variation and production on trends.

Identify when improvements should appear.

↑ Evidence for improvement or to encourage more practices or better implementation.

Monitoring surface and groundwater quality is central to CPWL's environmental impact.



Surface and groundwater

Monitoring surface and groundwater quality is central to understanding CPWL's environmental impact and providing evidence for where practices need to improve to fix poor water quality. Since 2014, almost 3,800 samples have been collected from 60 sites. These data inform management actions and track compliance with concentration limits designed to protect water quality.

Surface water

In 2024–25, limits for total nitrogen, phosphorus, and chlorophyll-a (an indicator of algal growth) in Te Waihora / Lake Ellesmere were exceeded. Concentrations have increased from the previous year [1]. However, concentrations will be influenced by climate and lag times as nutrient make their way to the lake; hence, it is unclear how much the change in nutrients were influenced by changes in land use practices.

Limits for streams in the catchment area are set as a median concentration of nitrate-N for hill-fed (1.8 mg/L) and spring-fed streams (5.2 mg/L). Limits were exceeded in two of nine hill-fed streams and 5 of 16 spring-fed streams monitored. Again, lags between farm losses and stream concentrations complicate interpretation, especially in spring-fed systems.

Groundwater

Limits for groundwater have been set for nitrate-N (7.65 mg/L) and the faecal indicator bacterium - E. coli (1 mg/L). Of the 20 wells monitored by CPWL, two consistently exceed the limit for E. coli and are being investigated for the cause of contamination.

For nitrate-N, 11 of the 20 wells exceeded the limit in 2024-2025 [1], but anecdotal evidence suggests improved groundwater quality in the last five years [2]. A breakdown of short-term trends is provided in Table 3 suggests nitrate concentrations are decreasing (i.e., improving) in more wells in the last five years than the previous five years.

Table 3.

Percentage of groundwater wells showing short-term trends in groundwater nitrate-nitrogen concentrations (5-Year Analysis).[2]

CONCENTRATION (mgL^{-1} Nitrate-N)	2021-2025	2015-2021 PERCENTAGE
VERY LIKELY INCREASING	20	35
LIKELY INCREASING	0	10
INDETERMINATE	5	10
LIKELY DECREASING	15	15
VERY LIKELY DECREASING	60	30

However, like surface water, nitrate concentrations are influenced by

Variation in climate which can mean nitrate stays in the subsoil or is moved from the subsoil in dry and wet years, respectively.

Time lags between when nitrate is leached from topsoil and detected in groundwater caused by water that could be old or young.

Farm actions to mitigate nitrate leaching from topsoil.

An example of how the modelling is linking farm actions to groundwater trends.

New modelling below helps link farm actions with observed groundwater trends. Where degrading trends are identified, CPWL can assess whether good management practices are in place and determine if further action, including additional practices, is required.

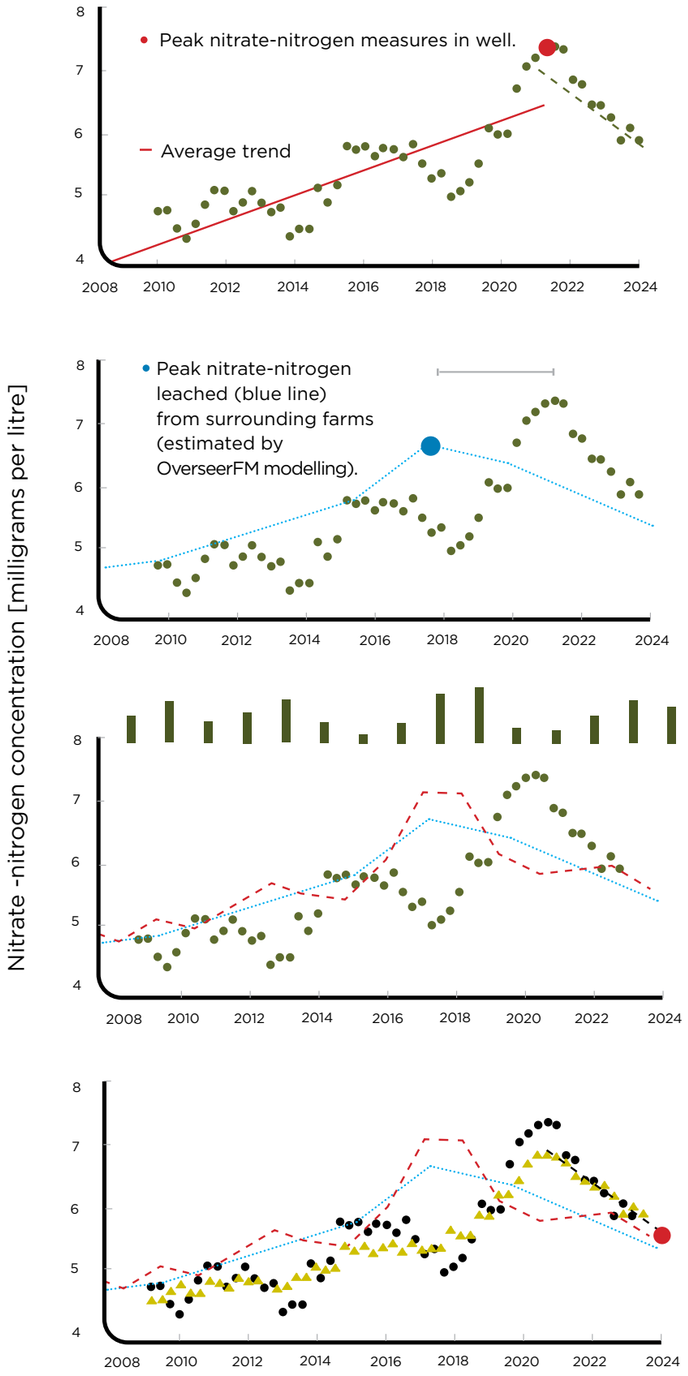


Figure 1.

1. Actions to mitigate nitrate loss started in 2018, but concentrations continued to increase.

2. – – Is the decreasing trend real?

3. Lag time (3 years) as the difference in peaks in nitrate leached from farms and measured in the well.
····· Leached nitrate-nitrogen levels

4. Measured amount of rainfall that reaches groundwater.

5. – – Modelling adjusts nitrate leaching by the amount of rainfall and irrigation reaching groundwater.

6. ▲ Modelling further adjusts nitrate leaching (triangles) for time lag.

7. THE DECREASING TREND IN NITRATE-NITROGEN IS REAL AS A RESULT OF ACTION TAKEN IN 2018.

CPWL's wells generally tap younger water (median age: 4.4 years) compared with ECan's (37.3 years), meaning CPWL's wells are more likely to detect improvements sooner (Table 4, Figure 2).

Table 4.

Mean and the modelled likely minimum and maximum range of likely ages (years) of groundwater sampled in wells by CPWL and ECan.

STATISTIC	CPWL	ECAN
MEDIAN	4.4	37.3
MINIMUM LIKELY	2.4	24.5
MAXIMUM LIKELY	6.6	49.8

After accounting for groundwater age, some sites are likely to show changes in nitrate-N concentrations relatively quickly, while others, particularly those influenced by flows from the Rakaia and Waimakariri Rivers, are expected to respond much more slowly (Figure 2).

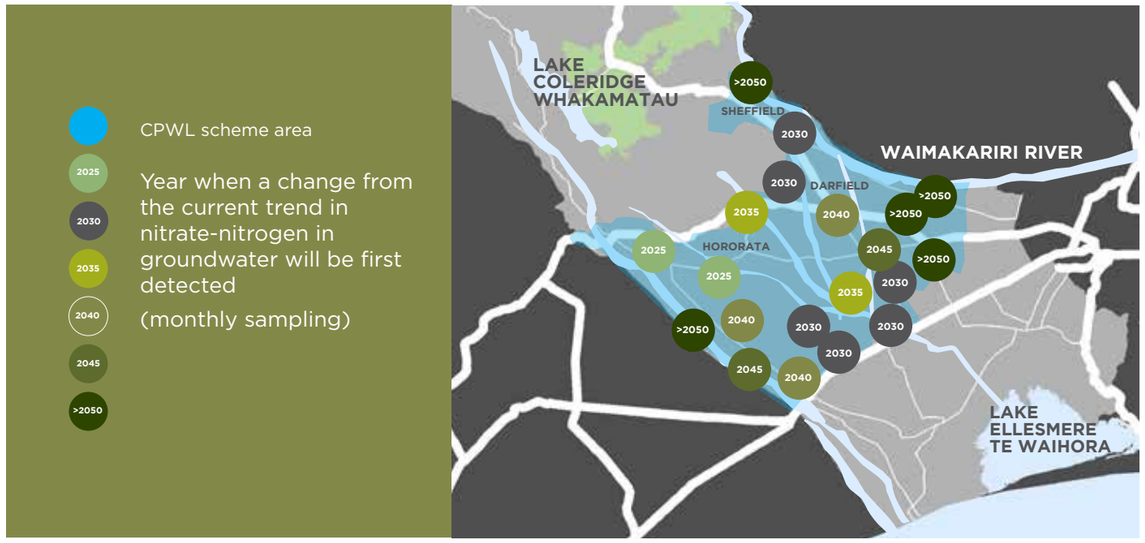
The Map below shows when nitrate-N concentrations in groundwater wells monitored by CPWL are likely to first show measurable changes.

Using the process outlined in Figure 1, and after removing the effects of climate variation and lagtimes, 4 of the 20 CPWL wells already show strong evidence of improvement. These are shallow wells containing very young water (<1 year old), making them the most responsive to on-farm mitigation actions.

Many other wells, apart from those near the Rakaia and Waimakariri Rivers, are expected to show detectable changes within the next 5–25 years.

Further work is underway to assess whether mitigation actions can be directly linked to trends in ECan-monitored wells. Together, results from CPWL and ECan sites will help determine whether additional actions are needed when improvements are not observed within the expected timeframes.

Figure 2.



CPWL GUARDIANSHIP KAITIAKITANGA

Caring for wildlife

Every spring and summer, Canterbury's braided rivers provide nesting habitat for threatened and at- risk native birds such as the Wrybill (ngutu pare), Black-fronted tern (tarapirohe), Black-billed gull (tarapunga), and Banded dotterel (pohowera).

To check if CPWL activities are affecting their abundance, CPWL engages Wildland Consultants Ltd to survey the count and diversity of bird life near the Rakaia and Waimakariri rivers inlets (Table 5). These braided rivers are biodiversity hotspots and important ecological corridors. They also hold deep cultural significance, supporting both unique wildlife and the wider health of river ecosystems.

Upholding wāhi taonga

In addition to counting different species, they note and map nesting behaviour. Since 2022, when the surveys started, ecologists have recorded 16 species, including four classified as nationally critical (black-billed gull), nationally endangered (black-fronted tern), at-risk (white-fronted tern), or nationally vulnerable (wrybill, banded dotterel), and have noted:

- Black-billed gulls (tarapunga) sightings
- Black-fronted terns (tarapirohe): nesting at several sites, though some were later abandoned.
- Banded dotterel (pohowera): nesting and raising chicks.
- Wrybill (ngutu pare): foraging and displaying territorial behaviour.
- Other regular sightings: South Island pied oystercatchers (tōrea), pied stilts (poaka) and white-faced herons (matuku moana).

Whenever active nests were found, buffer zones were established to minimise disturbance. If works paused for more than eight working days, sites were resurveyed to ensure no new nests had been established during downtime.

This approach meets consent conditions and strengthens understanding of how CPWL operations interact with native bird populations. Just as importantly, it helps uphold the mauri of wāhi taonga — places treasured for their ecological and cultural importance. Protecting these birds is a small yet critical step in keeping our river ecosystems balanced, resilient, and thriving.

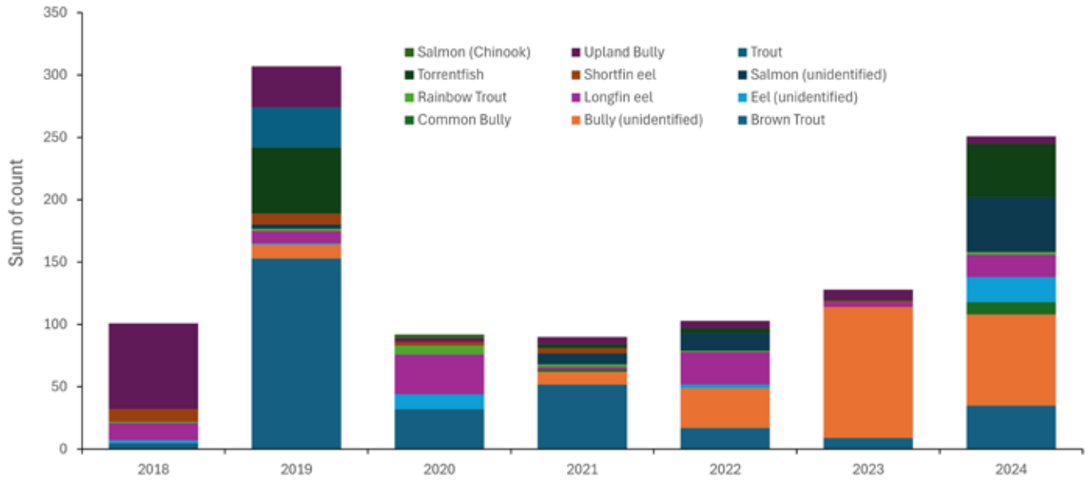
Table 5.

Total count of significant species at the Rakaia and Waimakariri intakes.

Annual counts	RAKAIA	WAIMAKARIRI
Black-billed gulls (Tarapunga)	-	2
Banded dotterel (Pohowera)	6	52
South Island pied oystercatchers (Tōrea)	3	14
White-fronted tern (Tara)	1	-
Black-fronted tern (Tarapirohe)	29	40
Wrybill (Ngutu pare)	-	7
Total	39	115

In addition to bird surveys, fish are also monitored at intake structures and fish return to the river. Results show a diverse aquatic community, though current data are insufficient to identify long-term trends (Figure 3).

Figure 3.



Annual count of fish seen in the surveys at the Rakaia and the Waimakariri intake sites. The data show no change in abundance or diversity over the period of record. The sum count of inanga, koaro and lamprey over the same period was 32.

Providing the data

Over the past year, CPWL has been developing new ways to house, analyse, and present the wealth of environmental and operational data generated through the scheme. Historically, this information has been dispersed across multiple reporting channels, making it difficult for farmers, stakeholders, and the wider community to gain a clear and timely picture of performance. The new data infrastructure is designed to provide a single, accessible platform that supports transparency, accountability, and shared learning.

The platform brings together groundwater and surface water monitoring results, farm environment plan audit data, and wider scheme performance indicators. This allows for more effective tracking of trends over time, enabling shareholder farmers to see how their individual actions contribute to collective outcomes. Importantly, the system has been built with access in mind giving shareholder farmers with user-friendly dashboards, maps, and downloadable reports.

A beta version of the interface has already been trialled with selected farmers and environmental partners. Early feedback highlights the value of being able to overlay farm practices with water quality outcomes, creating a clearer line of sight between actions taken on the land and their environmental impact. As the platform matures, CPWL intends to expand functionality to include predictive modelling, allowing users to better understand the long-term implications of different management choices. Public reporting of data continues through CPWL's Annual Report.

Next Steps

The Trust provides an independent check on CPWL's environmental performance. We continue to link water quality and biodiversity outcomes to on-farm practices through FEP audits. As more data and modelling become available, these links will strengthen, supporting evidence for additional practices where improvements are needed and recognition where performance is improving.

References

1. Lincoln Agritech (2025). Central Plains Water Limited: Ground and Surface Water Report (Lincoln Agritech).

2. Robb, L., and Rutter, H. (2025). CPW: Nitrate Analysis 2025 (Lincoln Agritech).

3. McDowell, R.W., Hanson-Dumont, M., Snelder, T., and McNab, I. (2025). Evidence that actions to mitigate contaminant losses from land via Farm Planning can improve water quality (AgResearch Ltd).