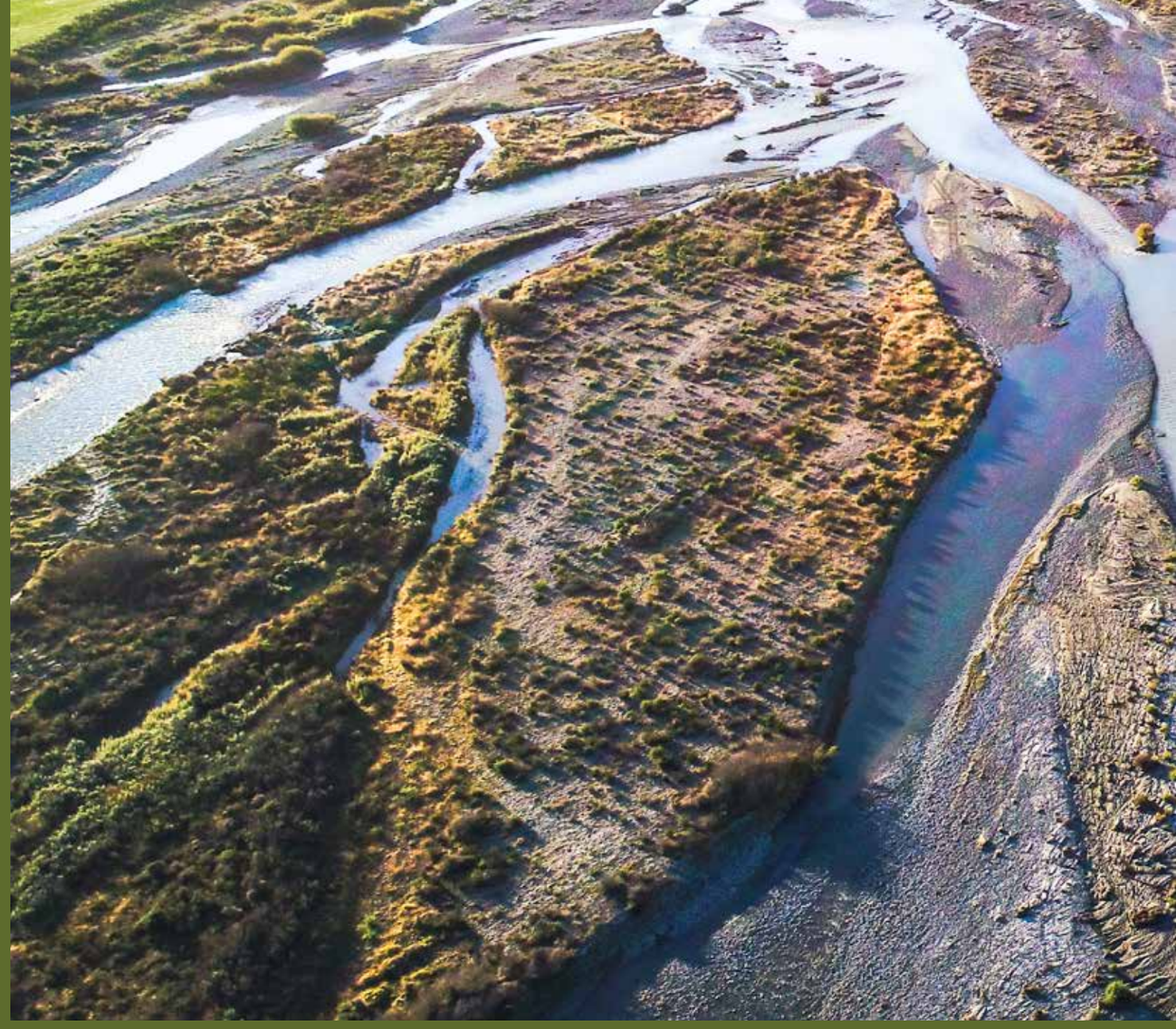

CENTRAL PLAINS WATER TRUST

2025-2026 Sustainability Report

CPW TRUST.

CPW TRUST.

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Figure 1. CPWL's scheme area in geographic context.

An independent overview

Monitoring the performance of Central Plains Water.

CPW TRUST.

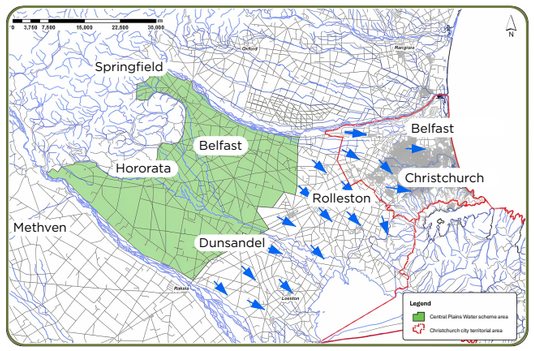
Pat McEvedy
Central Plains Water Trust

Chair's foreword

The Central Plains Water Trust (the Trust) is pleased to welcome you to our Sustainability Report for 2025-26. This report, as in previous years, 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 data supplied by CPWL to the Trust for analysis.

The Central Plains Water Trust holds the resource consents for the scheme (Fig 1.) on behalf of the community, licensing them to CPWL to operate the scheme. The Trustees are appointed by the Settlor councils - Selwyn District Council and Christchurch City Council - and are required under their Statement of Intent to publish this report annually. The Trust's role is to support sustainable agricultural development and use of water resources while taking a long-term oversight approach. The Trust considers it is providing and undertaking a role as the "honest broker" on the community's behalf as we both support and challenge CPWL to achieve and deliver on the aspirations that were envisaged when the consents were granted in 2010.

This report aligns with the strategic initiatives of CPWL and reports on environmental performance year-on-year tracking CPWL's sustainability journey. The process is focussed on gathering and providing insights from the data available. The report also attempts to provide some clarity around the role and effectiveness of the audited farm plans at minimising the impacts of on-farm practices on water quality over time. As a matter of context, our focus on water is on groundwater and surface water as they flow towards Lake Ellesmere / Te Waihora; the water quality for Christchurch City is unaffected (Fig. 2). Also contained in this report is a section on the abundance and quality of biodiversity in the scheme area and beyond. For further detail and to develop a wider understanding of the Trust's role and activities, you can access our website at www.cpwt.co.nz. Within our website there is information on the compliance and oversight of CPWL, you will also find background information on the appointed Trustees and their governance role and accountabilities. The Environmental Management Fund's work is outlined and how it contributes to investing in environmental outcomes across the Selwyn District. Also available on the website is a list of historical reports and documents for the general public along with the contact details for the Trust.



LEGEND
Central plains water scheme area
Christchurch city territorial area

Figure 2.

Groundwater flow towards Lake Ellesmere / Te Waihora bypassing Christchurch city. (PDP, 2006)

CPW TRUST.

THE TRUST'S ROLE

in Monitoring Performance

The Trust monitors environmental performance across the CPWL scheme.

CPWL provides water to irrigate 45,000 ha, managing 73,000 ha within a wider 100,000 ha area upslope of Lake Ellesmere / Te Waihora (Figure 1). The Trust monitors environmental performance across the scheme.

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:
  - If an increase in sampling frequency would detect changes faster.
  - The number of on-farm actions needed to achieve (or exceed) the 30% reduction.
  - The influence of climate and 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.

Compliance

During the 2025-2026 year CPWL reported no issues material to the consents. Indeed since the scheme's inception, moving from abstracting groundwater to using surface water and efficient spray irrigation has decreased groundwater abstraction by CPWL shareholders by 75% (Central Plains Water Ltd, 2025). CPWL did identify and manage 21 risks across its water take, biodiversity, farm environment planning, and infrastructure management programmes. Actions to manage these risks included targeted monitoring, technological improvements, independent expert reviews, consent amendments, and enhanced environmental management practices.

Farm Environment Plans

Last year's report described how the auditing of farm environment plans (FEP) is undertaken, what the grades A-D mean, and explained how these are based on good management practice.

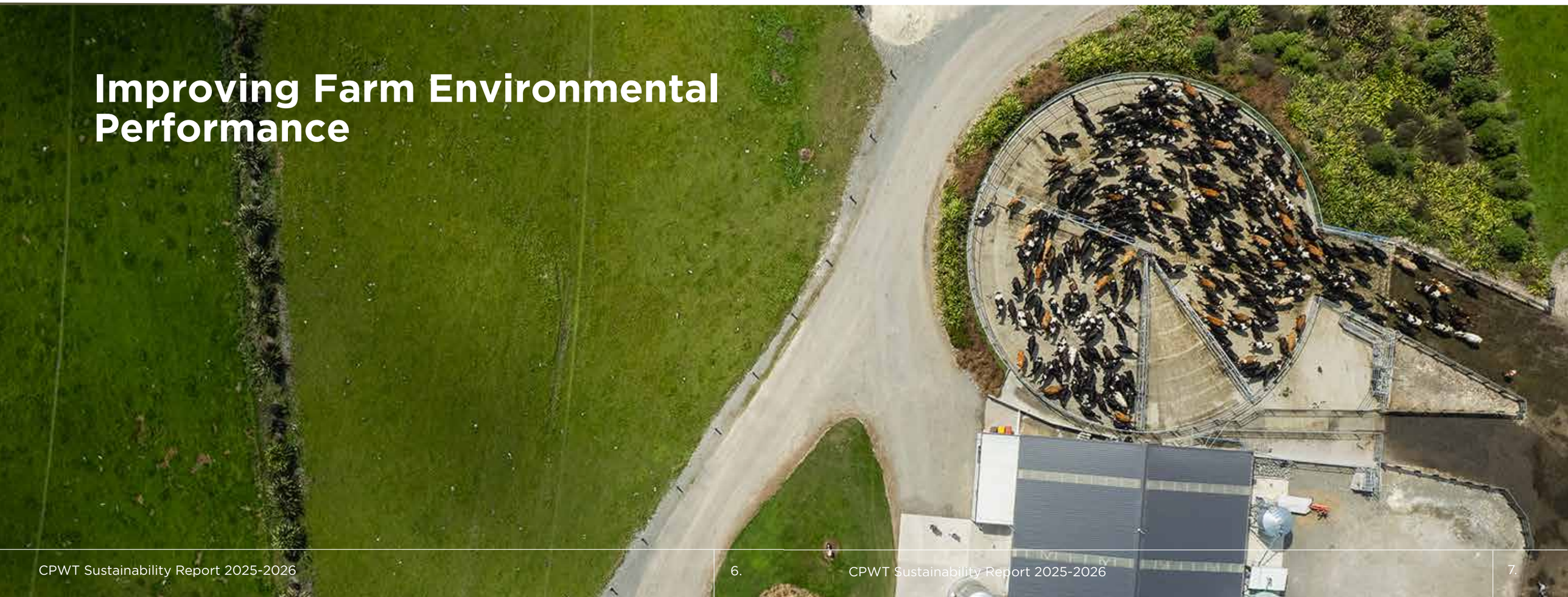
There were 93 audits for the 2025-26 year, with 97% receiving an A or B grade (Table 1). Audits are undertaken when farms change ownership, land use changes or when key managers change, and at least every fourth year. So, the number fluctuates every year and results can vary. The aim is for everyone to adopt a continuous improvement culture, at a comfortable rate, and for the A and B standard to also lift over time. Indeed, FEP performance (Table 1) has improved substantially over the decade: A grades have increased from approximately 40% in 2016–18 to 72% in 2024–26, while C or D grades declined significantly (X^2 test, $P < 0.001$) from approximately 7% to 3%.

Table 1.

Number of audits and proportion of farms receiving each Farm Environment Plan audit grade, by two-year period. The numbers in parentheses represent the 2025-2026 year audit grades

TWO-YEAR PERIOD	AUDITS	A	B	C or D
2016–18	132	40	53	7
2018–20	311	48	48	4
2020–22	119	69	27	3
2022–24	152	80	20	0
2024–26	134 (93)	72 (64)	25 (26)	3 (3)

This year, there have been a similar number of C grades to last year. This has mainly been due to soil moisture monitoring concerns, which translates into identifying irrigation efficiency as a likely area where improvements can be made.



Continuous Improvement

Several basic management deficiencies have been largely eliminated (Table 2), such as faulty or absent irrigation timers, ponding from irrigation, and outdated FEPs. Remaining deficiencies are concentrated in improving irrigation efficiency (which account for 61% of issues). Inefficient irrigation (i.e. more water going on than the soil can hold, like a saturated sponge) results in applied water draining through the soil and into shallow groundwater taking any soluble nitrate with it.

Rainfall has the same effect, so one relatively easy management improvement is to closely monitor the daily soil water levels and the short run 3-4 days rainfall forecast, and match irrigation application depth, always keeping a buffer within the soil layer to allow for further rainfall. Easy to say but in practice difficult to get exactly right, as irrigation systems cannot apply a daily amount to the whole farm – more likely, an educated and informed guess is made every 5-7 days.

This is the reality in a complex multi-faceted biophysical system in which major variables are constantly changing and is why we value our farmers and their ability to own these challenges. Actual outcomes will only be achieved by their judgements and actions, not by regulation alone.

Table 2.

Changes in practices not meeting good management practice.

Practice deficiency	2018-19	2019-20	2024-25 to 2025-26	Change from 2019-20	Assessment
No application-depth or distribution-uniformity testing	34	56	20	−64%	Improved, but remains the leading deficiency
Inappropriate soil-moisture monitoring	20	26	14	−46%	Improved, but remains a major priority
Insufficient or no records	14	13	5	−62%	Substantial improvement
Limited corrective action after testing	1	14	4	−71%	Substantial improvement, but follow-up still needed
Irrigation staff not adequately trained	6	6	5	−17%	Small but persistent issue with little change
Commissioning tests incomplete	15	14	0	−100%	Resolved
No maintenance evidence	6	1	0	−100%	Resolved
Ponding or irrigation of non-target areas	3	4	0	−100%	Resolved
System under-or over-applying against target	0	0	5	New measure	Emerging performance issue
Limited use of climate forecasts	0	0	2	New measure	Emerging decision-making issue
Irrigation above field capacity	0	0	1	New measure	Uncommon but important

CPWL has contracted independent advisers to work with the C grade farms one-on-one, to help shareholders and staff understand how to get the best out of their soil moisture monitoring equipment. Sometimes, success is providing reassurance that stopping the irrigation for a day or two when rain is predicted won't mean that the farm will get behind. This is one of the significant advantages. CPWL has a very reliable and adequate water supply, available the day after ordering, so the farmer can almost exactly match irrigation amount to plant needs.

The advice that these advisers provide is having an effect. Of the 28 farms with an audit after receiving a C or D, 86% improved to an A or B at their next audit, and all eventually achieved an A or B (Table 3).

Table 3.

Outcomes after a farm received a C or D (2018-26)

Outcome	Farms
Received an A or B at the next recorded audit	24
Received another C or D at the next audit, but later improved to A or B	4
No subsequent grade available	4
Total farms receiving at least one C or D	32

The water quality section of this report shows how reductions in nitrate-N loss from farms are beginning to be reflected in groundwater nitrate-N concentrations. As part of an ongoing process (Figure 2), annual FEP and water quality data will build an evidence base showing farmers and the wider community whether actions are worthwhile and moving outcomes in the right direction. Year-to-year trends will also indicate where further improvement may 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 CPWL at a scheme level.

→

2.

SELECT FARM PRACTICES

Gauge suitability of practices to contaminants of interest and enterprise.

Consider cost-effective-ness, 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.

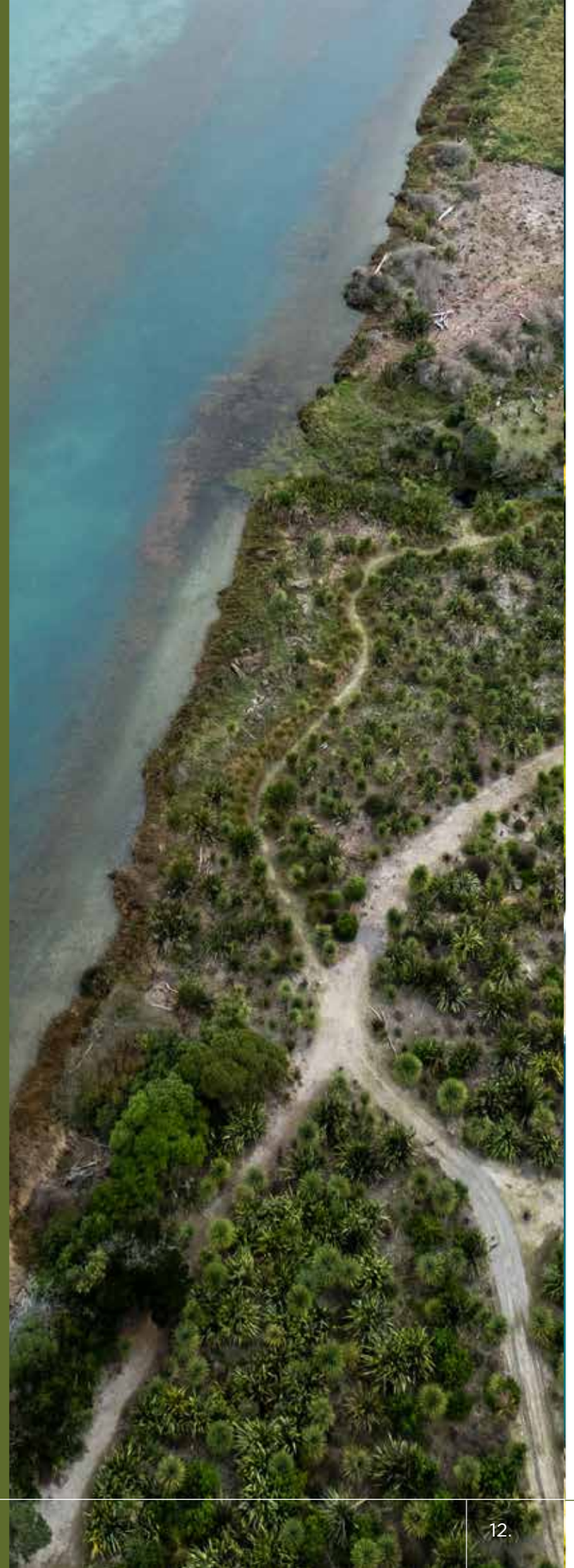
ATTRIBUTE TO PRACTICES

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.

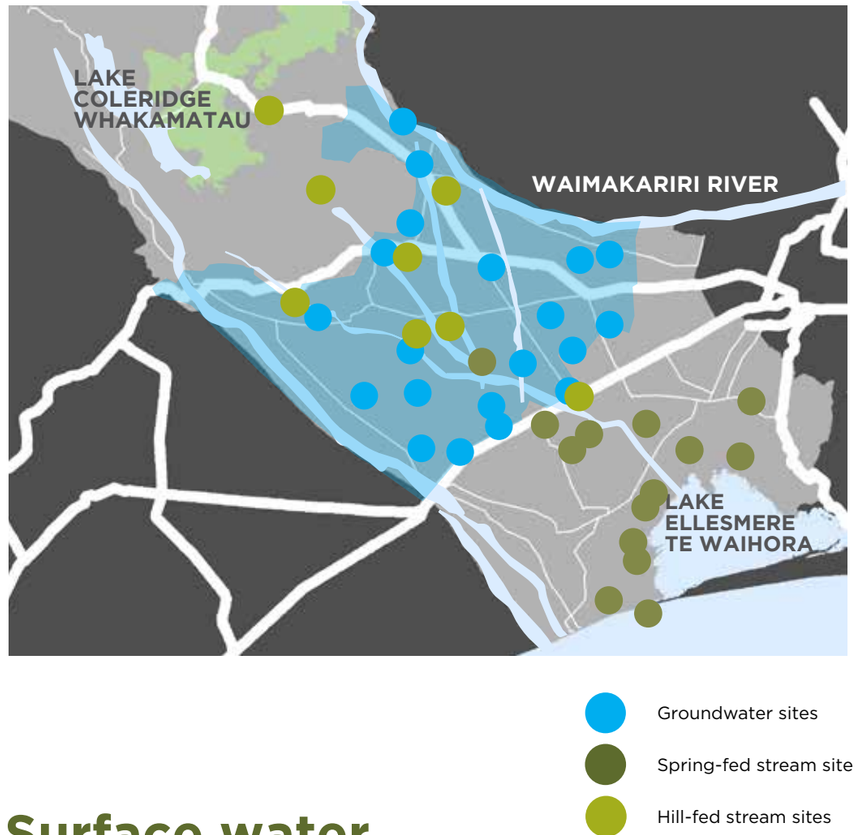
Monitoring surface and groundwater quality is central to CPWL's environmental impact.



Surface and groundwater

Figure 3.

Approximate location of hill- and spring-fed streams and groundwater sampling sites.



Surface water

In 2025–26, limits for annual average concentrations of total nitrogen (3.4 mg/L), total phosphorus (0.1 mg/L), and chlorophyll-a (0.074 mg/L; an indicator of algal growth) in Te Waihora / Lake Ellesmere were exceeded. Concentrations were similar to those in the previous year. However, concentrations will be influenced by climate and lag times as nutrients make their way to the lake; hence, it is unclear how much the changes in nutrients were influenced by changes in land use practices.

Limits for streams in the catchment are expressed as median nitrate-N concentrations of 1.8 mg/L for hill-fed streams and 5.2 mg/L for spring-fed streams, and as 95th-percentile concentrations of 2.6 and 7.4 mg nitrate-N/L, respectively.

Among hill-fed streams, two sites exceeded the median limit and three exceeded the 95th-percentile limit. Among spring-fed streams, three sites exceeded the median trigger and two exceeded the 95th-percentile trigger. The total number of sites breaching either limit was similar to previous years (Table 4). Lags between farm losses and stream concentrations continue to complicate interpretation, especially in spring-fed systems.

Table 4.

Number of hill-and spring-fed stream sites with usable data (i.e. sufficient observations to calculate a robust statistic) and number breaching either the median or 95th-percentile limit.

YEAR	SITES WITH USABLE DATA	BREACHED MEDIAN OR 95TH PERCENTILE
2015-16	23	7
2016-17	24	9
2017-18	25	11
2018-19	25	6
2019-20	25	10
2020-21	25	8
2021-22	25	9
2022-23	25	10
2023-24	25	9
2024-25	25	8
2025-26	21	7

Groundwater

Groundwater limits have been set for nitrate-N (7.65 mg/L) and the faecal indicator bacterium E. coli (1 MPN/100 mL). Based on median concentrations from 2014 onwards, only one bore exceeded the E. coli trigger. No bore exceeded the trigger when only 2025/26 data were considered, an improvement from two bores in 2024/25.

Eleven of the 20 CPWL groundwater-monitoring bores exceeded the five-year nitrate-N limit during 2021-22 to 2025-26, unchanged from the previous five-year assessment.

The number of nitrate-N breaches has remained relatively stable at 11–12 bores since 2014/15, indicating little network-wide change in trigger status. However, nutrient budgets prepared through the FEP process suggest that nitrate-N leaching peaked in 2018 and has subsequently declined as mitigation actions were implemented. Robb and Rutter (2025) also found a reversal in nitrate-N trends: a greater proportion of bores showed decreasing concentrations during 2021–25 than during 2015–21 (Table 5).

Table 5.

Percentage of groundwater wells in each short-term nitrate-N trend category for 2021–2025 and 2015–21 (Robb & Rutter, 2025).

Concentration (mg L^{-1} Nitrate-N)	2021–2025	2015–2021 (%)
Very Likely Increasing	20	35
Likely Increasing	0	10
Indeterminate	5	10
Likely Decreasing	15	15
Very Likely Decreasing	60	30

However, groundwater comprises a mixture of young and old water, with shallower water usually being younger. Nitrate-N concentrations are also affected by climatic variation, which influences the rate at which nitrate-N leaches through the topsoil and aquifers. Consequently, nitrate-N leached from the soil may not be detected in groundwater for many years.

Using new modelling techniques (Dumont et al. 2026), we examined nitrate-N concentration patterns after accounting for climatic variation and groundwater lag times. The remaining pattern is more likely to reflect farm mitigation actions.

We linked audited Farm Environment Plan data and estimated decreases in the fraction of nitrate-N lost from farms within well capture zones (Figure 4) to information on groundwater age and well nitrate-N records. Because most mitigation actions were initiated and fully effective from 2018, we assessed the strength of evidence that subsequent trends were consistent with those actions, rather than simply testing whether a trend line increased or decreased.

Figure 4.

Stylised depiction of farms within and outside a capture zone contributing leachate and nitrate-N to groundwater of different ages that is detected in a downgradient monitoring well.

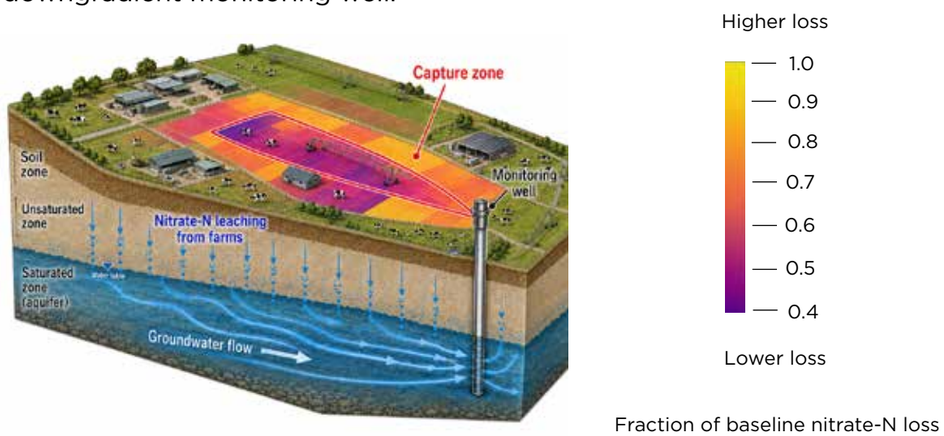


Figure 5.

Shows why a raw trend (dashed line) fitted after mitigation actions are implemented (1) can be misleading. Nitrate-N in a well can continue to rise after farm actions begin because the well is still receiving older water. To determine whether the trend reflects a real response (2), the modelling aligns peak nitrate-N loss from farms with peak nitrate-N measured in the well (3), accounts for groundwater lag, adjusts for land-surface recharge from irrigation and rainfall, which can dilute or concentrate nitrate-N leaching (4), and then tests the strength of evidence for change (5).

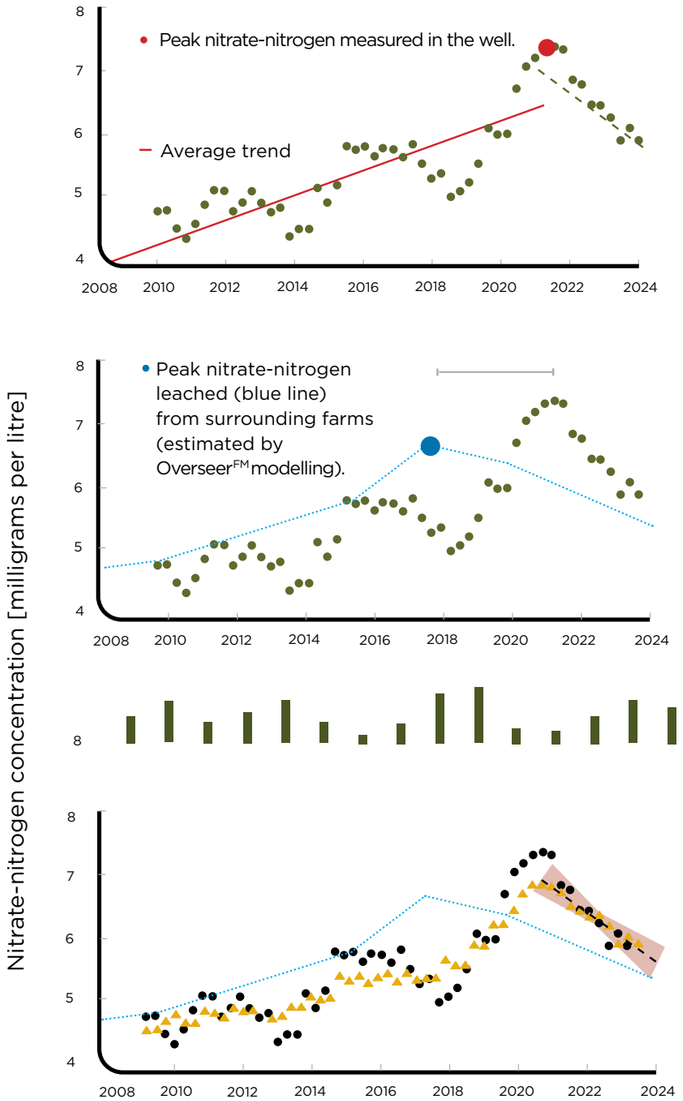


Figure 5. A stylised workflow for deciding whether a nitrate-N trend reflects recent farm actions after accounting for lag, recharge and monitoring noise.

1. Actions to mitigate nitrate-N loss started in 2017, but concentrations continued to increase.

2. – – Is the decreasing trend real?

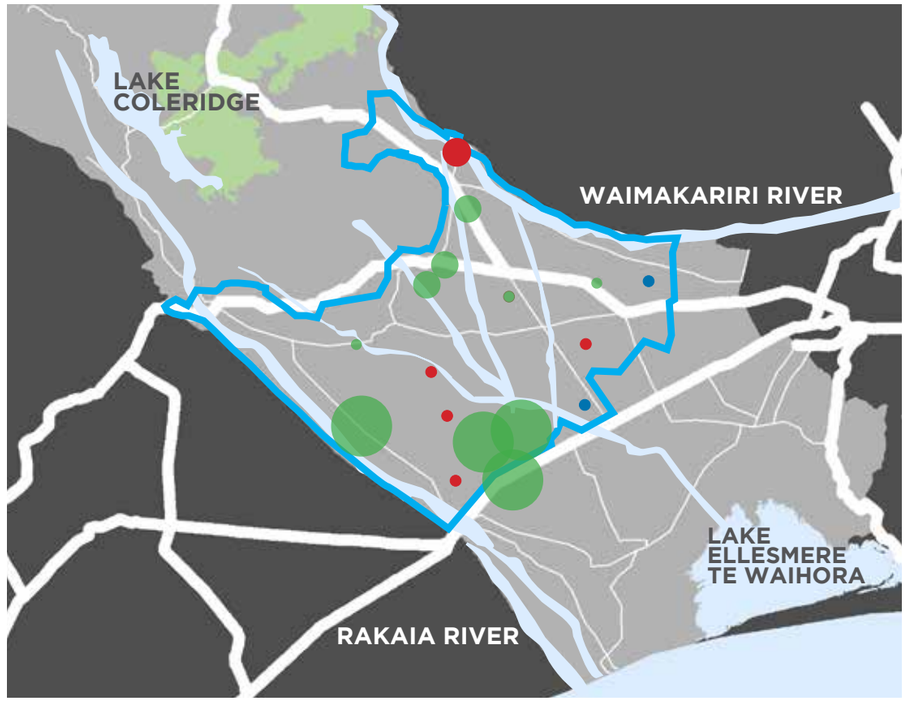
3. ⟷ Lag time (3 years) as the difference in peaks in nitrate-N leached from capture zones (i.e. from farms ····· and measured in the well. Lag times are supported by age dating data.

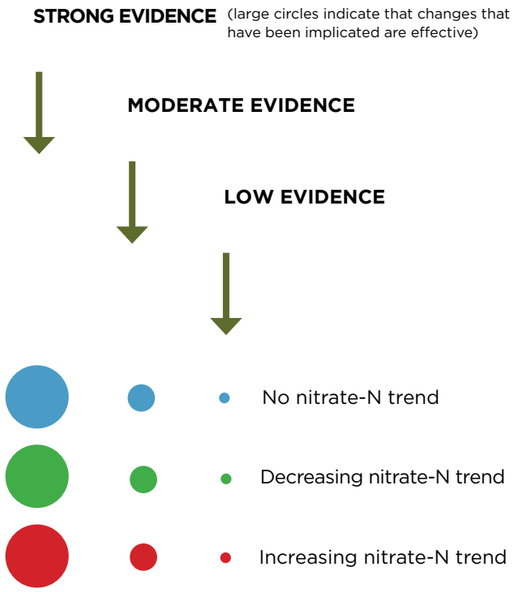
4. Modelling adjusts the predicted nitrate-N concentrations▲ at the well for the amount of N being flushed through the soil by rainfall / irrigation ▮▮ and time lags.

5. ▬ Modelling power estimates suggest that the decreasing trend in nitrate-N is real as a result of actions taken in 2017.

Figure 6.

Output from the new modelling showing the strength of evidence that trends in nitrate-N concentrations reflect farm actions.





The modelling found strong evidence that decreasing nitrate-N trends were linked to farm actions in four wells, and low-to-moderate evidence in another four wells (Figure 6). In one well, there was low-to-moderate evidence that an increasing concentration trend was linked to ineffective actions, although this is likely to reflect groundwater exchange with the Waimakariri River. For all other wells, the evidence was insufficient to attribute trends to farm actions, probably because much of the nitrate-N reduction associated with those actions has yet to reach the wells. On average across the monitoring network, the first early evidence of change is expected in 2032, with most of the improvement reaching wells by 2036 (Figure 7).

Additional analysis assessed whether more frequent sampling could detect changes sooner. Increasing sampling from quarterly to monthly was estimated to bring detection forward by about five years. Given the additional cost, monthly sampling should be considered selectively for wells expected to respond within a useful timeframe.

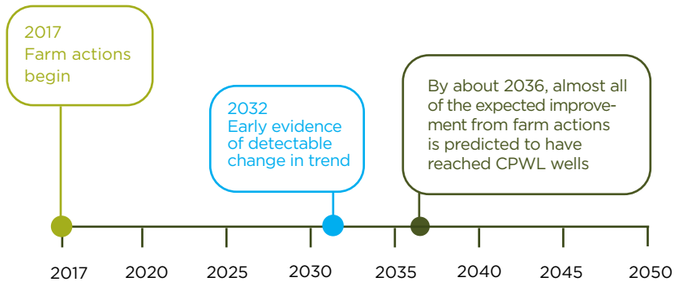
Tracking on-farm improvement below ground.

Figure 7.

Summary output from the new modelling showing the average timing of detectable changes in groundwater wells and the arrival of reductions associated with Farm Environment Plan mitigation actions.

CPWL Wells

Mean groundwater age ~13 years



Note:

These are mean average timings for each monitoring network Individual wells will respond earlier or later depending on their depth, location and groundwater age.

How to read this figure

The blue dot shows when the mean of monitoring is likely to first detect that concentrations are starting to improve. The dark green dot shows when nearly all of the expected improvements are predicted to have arrived at the well. The time between the two dots is the delay between first detection and the arrival of most of the improvement.

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 (tarapuka), 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 intakes. 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

Fish and bird communities

Fish and bird surveys are undertaken at sites near the scheme intakes to monitor for potentially detrimental effects. These areas support diverse communities, including several threatened or 'At Risk' Taonga species: Black-fronted tern, Wrybill, Banded dotterel and Black-bill Gull, and South Island Oyster Catcher. Southern black-backed gulls dominated bird counts in earlier years, but the bird community was more diverse in
2025-26, when waterfowl formed a greater share (Figure 8). This is a potential positive trend, as the black-backed is a predatory gull.

Native fish generally dominated counts, although community composition varied markedly among years, particularly among native bullies, torrent fish, and introduced salmonids (Figure 9). Mean fish species richness increased from approximately 3–4 species per survey in earlier years to about six during 2024–26.

However, differences among years should be interpreted cautiously due to variation in survey numbers,
locations and consistent monitoring has not yet continued long enough to establish formal population trends. Additional work is underway to refine the surveys to determine if more can be made of the data, beyond meeting their original resource consent.

Figure 8.

Distribution of bird community composition by year near intake sites for the scheme.

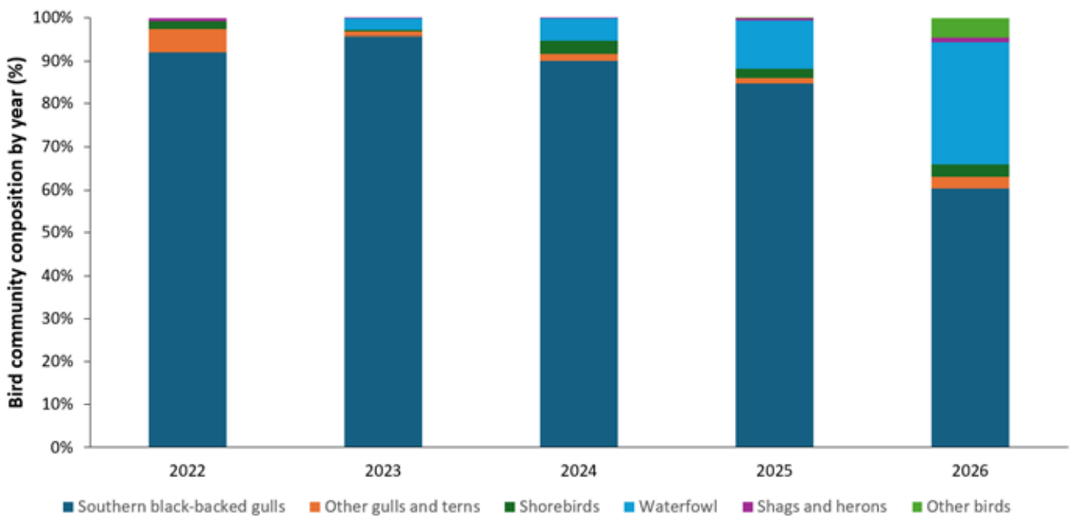
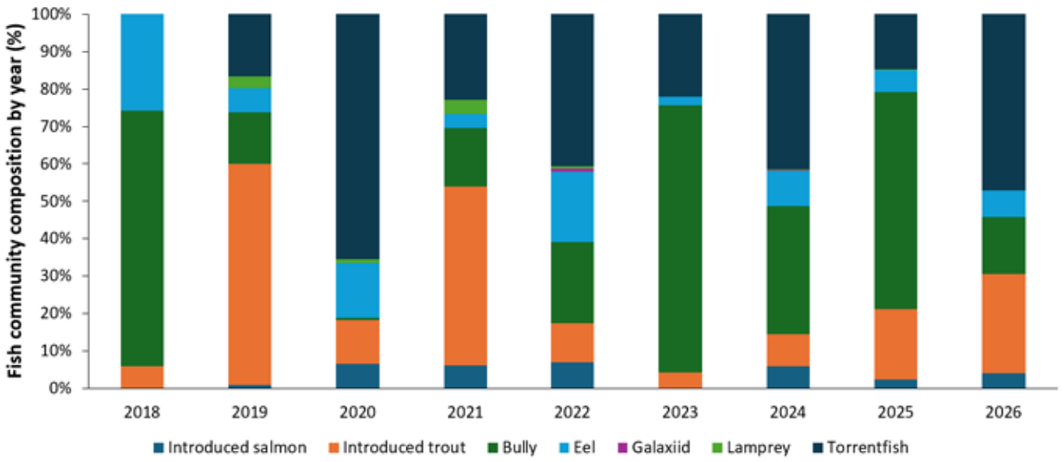


Figure 9.

Distribution of fish community composition by year near intake sites for the scheme.



Te whakangao ki te whakaora i te taiao

Investing in restoration

The Central Plains Water Environmental Management Fund (EMF) is an initiative funded by shareholder levies from CPWL and administered alongside the Trust to restore and protect ecosystems from the mountains to the sea, ki uta ki tai.

In 2026, the EMF had $146,930 available for allocation, more than in many previous years. Demand substantially exceeded available funding: 14 applications requested a combined $514,920 for projects with a total value of $892,942. Thus, each $1 requested from the EMF was associated with approximately $0.73 of applicant or partner co-funding ($1.73 in total project value).

Whereas earlier EMF expenditure was dominated by native planting (77% in 2021/22), the 2026 applications covered a broader range of activities, including native and riparian planting, wetland restoration, pest control, water quality and mātauranga Māori monitoring, and research on beneficial insects.

Figure 10.

EMF investment by project type up to 2025 and funding requested by project type in 2026.

Data, Systems and Governance

Reliable sustainability reporting depends on reliable information. During 2025/2026, the Trust has taken steps to strengthen the systems and governance that sit behind its Annual Sustainability Report, with a particular focus on understanding where our data comes from, how it is managed, its quality and readiness for use, and the evidence that supports the conclusions we report.

CPWL has been developing an internal platform to bring together groundwater and surface-water monitoring results, FEP audit data, and wider scheme-performance indicators. This integration supports more effective tracking of trends (e.g., Figure 11) and will in time allows farmers and shareholders to see how individual farm practices contribute to catchment outcomes. The system has also been designed to give shareholders and farmers access to user-friendly dashboards, maps, and downloadable reports. The new data infrastructure is intended to provide a single, accessible platform that supports transparency.
accountability, and shared learning.

Figure 11.

Example of an output from CPWL's data insight platform showing the audit results of a farm environment plan over time.

Next Steps

The Trust provides an independent check on CPWL's environmental performance and continues 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 both the adoption of additional practices where improvement is needed and recognition where performance is improving. The next Sustainability Report will extend the analysis to wells monitored both within and outside the scheme area by the Canterbury Regional Council (Environment Canterbury), providing a more complete spatial picture of the response to farm actions. However, water in these wells is, on average, older (46 years) than water in CPWL monitored wells (13 years) and may therefore respond more slowly.

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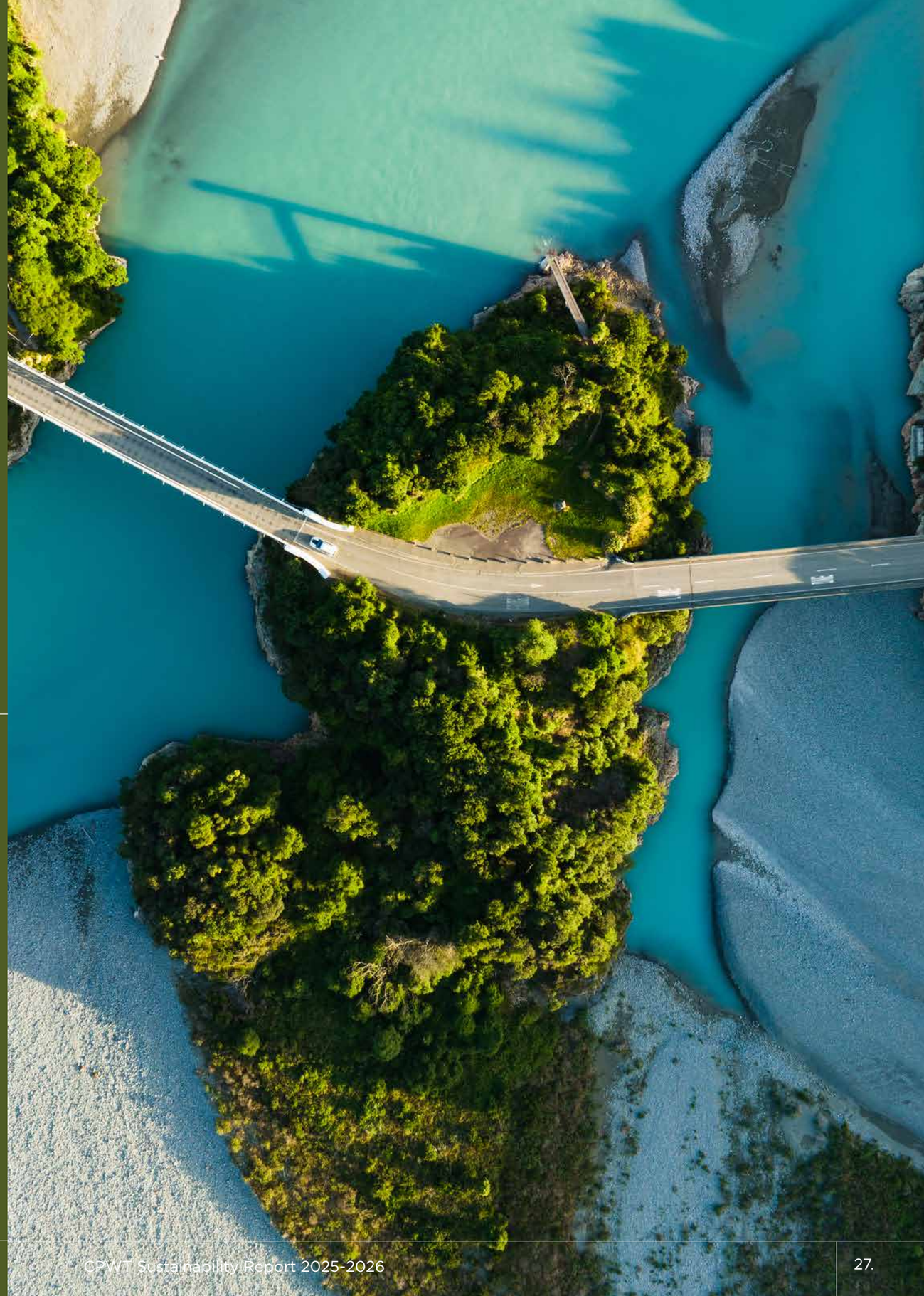
Find our report and other sustainability data at.

www.cpwt.co.nz - Document-library - Central Plains Water Trust Sustainability Report