2026

UC Watershed and Waterways Plan, 2026-2030

UC Sustainability Office and
Waterscapes Advisory Group, 2025

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Executive Summary

The University of Canterbury Dovedale and Ilam campuses host three waterways, which are all tributaries of the Ōtakaro/Avon River. These waterways are the Waiutuutu (Okeover Stream), the Haere Roa (Avon Stream) and Kā Waimaero (Ilam Stream).

In 2017, the University adopted its first Watershed and Waterways Plan. It was an ambitious plan weaving together ecological, cultural and research and teaching opportunities. In hindsight, it was probably too ambitious given the resources available for implementation. That Plan expired in 2025.

This new Plan is more focused on delivering stream restoration projects which have been developed and/or assessed by waterways experts at the University to address key risks identified. Instead of the original eight categories of works, it has been narrowed to five categories.

1 Contributors

This new Plan has been written by the Sustainability Office, with significant technical input from Dr Frances Charters (Senior Lecturer, Civil and Environmental Engineering), the UC Waterscapes Advisory Group (comprised of academics from across Civil and Environmental Engineering, School of Biological Sciences and the Waterways Centre for Freshwater Management) and data gathered by Waterways Monitoring Assistants (Elysia Harcombe, Rory Lennox, Saskia Brown, Matthew Edmonds, Harrison Keesing and Ciara Espiner) from 2022-2025.

2 Watershed and Waterways Plan (2017-2025) Review

The first UC Watershed and Waterways Plan, 2017-2025 (2017) was written by Katie Nimmo of the UC Sustainability Office, following her earlier Waterways Issues and Options paper (2015). The Plan highlighted the importance of improving the quality of UC's three waterways: the Waiutuutu (Okeover Stream), the Haere Roa (Avon Stream) and Kā Waimaero (Ilam Stream). All are tributaries of the Ōtakaro (Avon River).

This plan acknowledged the value of these streams for their inherent ecological attributes, as cultural assets by Ngāi Tūāhuriri[1], as frequently used resources for teaching and research[2], and as valued assets by the wider community[3]. Yet it also pointed to the ongoing ecological challenges faced by these streams: primarily from stormwater contamination by sediment (primarily from roads and carparks and instream erosion during rain events), and heavy metals (from roofs, gutters and downpipes, but also from roads and carparks). Stormwater enters the streams from both on and off campus; this plan focuses on on-campus contamination sources. For the streams to sustain healthy populations of animals a number of interventions were identified, all of which have value as additional teaching and research benefits (notably, research into how proposed interventions have a measurable positive impact on water quality and instream biota).

The Plan set out eight ambitious strategic pathways for UC to develop:

1. Governance, leadership and management
2. Te Tiriti o Waitangi
3. Ecological restoration
4. Sustainable resource management and maintenance on UC land

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[1] Subtribe or hapū exercising customary authority. For UC, this hapū is Ngāi Tūāhuriri.
[2] Examples of courses that regularly use the streams in teaching include: AKOP254, BIOL112, BIOL213, BIOL253, BIOL313, BIOL375, BIOL383, ENCN347, ENCN405, ENCN493, ENCH281, ENCI609, TECP223, TECP325/425, WATR203, WATR413. He Puna Pūtaiao is an outreach programme that has used the Waiutuutu/Okeover Stream for invertebrate and water chemistry teaching for the last decade.
[3] For example, students from Ilam School regularly conduct clean-ups and plantings along Haere-Roa/ Avon Stream (with support from the UC Sustainability Office).

5. Research and monitoring
6. Teaching and learning
7. UC community engagement: staff and students
8. Stakeholder and whole of catchment community engagement.

It has been the guiding document for UC waterways and watershed improvement actions.

A review of this Plan was undertaken in July 2023, led by UC Biodiversity Projects Coordinator Seamus Moran, with input from the Waterscapes Action Group and key personnel from Facilities Management. The review found that: 'while progress has been made in many areas, some areas have stalled.' A list of key findings from this review can be found in Appendix B.

Review conclusion

While considerable progress has been made against the actions set out in the first Watershed and Waterways Plan, the review identified several areas where progress has not been made (see Appendix B). These areas reflect ongoing resourcing limitations, and therefore this revised plan has a narrower focus on physical works to improve waterways. A large number of waterways projects have been initiated, and priority for this second Plan now turns to their successful implementation over the coming years. These are detailed in Section 7: Improvement Actions.

3 Vision

The vision of this new Watershed and Waterways Plan (2026-2030) remains mostly unchanged from the first iteration developed in 2016 by the then UC Waterways Group:

"A series of self-sustaining ecosystems, which have a natural physical character and function. These ecosystems will support communities of plants and animals dominated by indigenous species appropriate to a lowland South Island stream tributary. These waterways will be an integral part of the University's programme of research and teaching, supporting a Living Laboratory approach, and will contribute to an urban campus environment that can sustain wildlife and is enjoyed and valued by people. Allied to this is the vision for meaningful engagement with mana whenua and the surrounding community."

The interventions proposed in this Plan support that overall vision, noting that some of the best opportunities for improvements may be found in the Waiutuutu/Okeover Stream, which starts on UC land and is one of the best researched urban streams in New Zealand (see Appendix A for a selected bibliography). The catchment area for this stream, as surveyed in 2010, includes about 1550 people.[4] However, research has identified several major sources of contamination generated on site, while it is believed that inputs from the wider catchment could be significantly mitigated by interventions on the 'ephemeral' stretch of the stream running along Ilam Fields – a stretch of stream that currently only runs during rainfall, as it is not spring-fed at this point.

4 Current Status of the Campus Streams

A large body of evidence has been gathered over a period of at least twenty years on the health or ecological status of the campus streams. A coherent Waterways Monitoring Framework (WMF) was adopted in 2018 and since 2021 Facilities Management has employed Waterways Monitoring Assistants and trialed digital monitoring to ensure that the WMF has been kept up to date.

Monitoring has shown that in baseflow conditions our streams fluctuate between being severely to moderately polluted, using the Macroinvertebrate Community Index (MCI) as the measure. Our target is to shift this to 'mildly polluted' (meaning an MCI score of 120 or above). In 2023, the

[4] Natalie Scott, 'Whose Stream is it Anyway? Community Identification in Okeover Stream, Canterbury', (University of Canterbury), 15.

Waiutuutu/Okeover Stream MCI score was 90.1 (moderately polluted), while the Haere-Roa/Avon Stream MCI score was 64 (severely polluted).

In 2023, Facilities Management installed stormwater samplers in the Waiutuutu/Okeover Stream to capture and measure the 'first flush' of stormwater during rainfall events. Analysis of heavy metals from these samplers showed that while in baseflow conditions heavy metals were below guideline values for protecting 90% of species, during rainfall events these values were exceeded. For example, copper in storm conditions was 522.5% greater than in baseflow conditions, exceeding guidelines by 177%. Zinc levels were 23,514% greater than in baseflow conditions, exceeding guidelines by an extraordinary 1,676%.[5] This alone explains why the MCI score for the Waiutuutu/Okeover Stream is not improving. Improvement Actions detailed in Section 8 of this Plan are aimed at addressing this and other relevant issues.

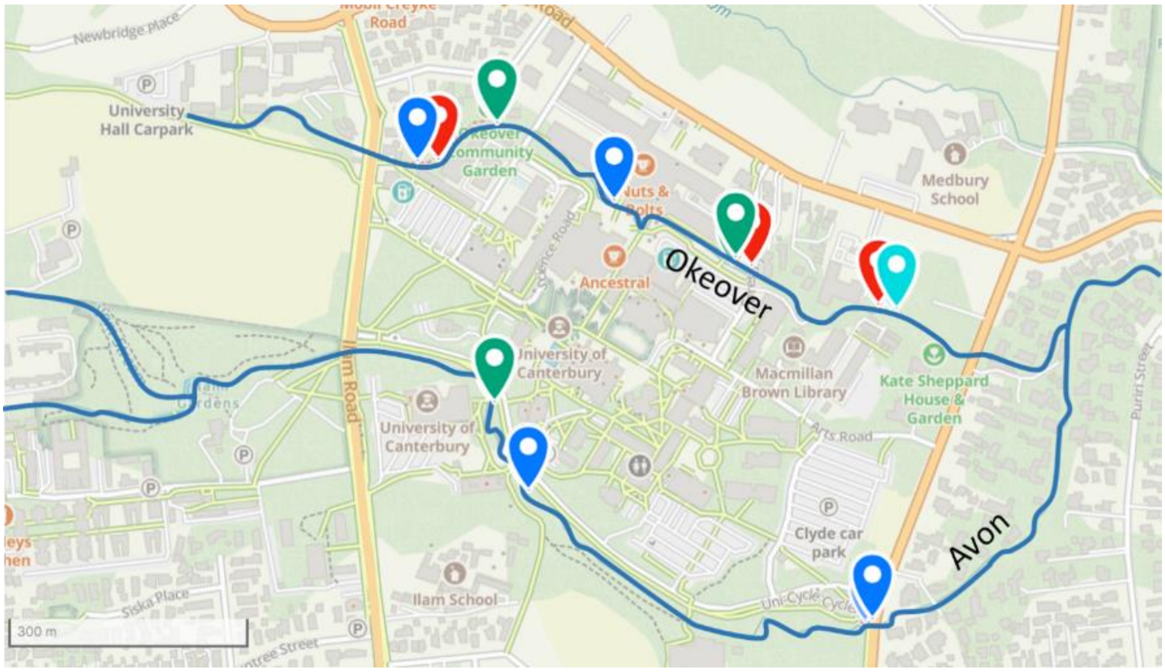

Figure 4-1: Waterways monitoring sites along the Waiutuutu/Okeover and Haere Roa/Avon streams. Blue pins show the location of water chemistry sampling sites, green indicates ecology (macroinvertebrates), and teal is both water chemistry and ecology. Red shows the locations of the stormwater samplers. Basemap: Gaia GPS.

5 Scope

The scope of this Plan is confined to the Dovedale and Ilam campuses, and the UC property in between these two campuses. Note that all improvement actions are contingent on budget availability. Much of the focus is on the Waiutuutu/Okeover Stream.

6 Key Drivers and Risks

6.1 UC Sustainability Policy

The UC Sustainability Policy lists a number of principles that explain the high importance the University attaches to ecological wellbeing[6]. In addition, the Policy specifically states that it will:

[5] See 2023 UC Sustainability Report for additional detail.

[6] In this context, ecological wellbeing refers to the abundance of species, especially indigenous species, present in a specific ecosystem.

"…responsibly manage watersheds/waterways on University lands (including stormwater) to reduce or eliminate the impact of potential marine pollution [as ultimate receiving environment] and conserve and restore aquatic ecosystems associated with the University."

Improvement actions to achieve this policy statement are described in Section 7: Improvement Actions.

6.2 UC Strategic Vision

The University Strategic Vision sets out a series of actions to be completed by 2030. The Environmental Sustainability chapter of this Strategic Vision forms the UC Sustainability Plan. Amongst the actions listed in this Plan is the implementation of the Watershed and Waterways Plan.

6.3 Mana Whenua concerns

The following priorities and actions relating to waterways were identified through consultation with mana whenua as part of the Climate Change Risk Assessment (see below). We have identified the two priorities most explicitly connected with waterways but recognise there may be others. This Watershed and Waterways Plan is one mechanism to start addressing these issues. Section 7: Improvement Actions, explains how these goals can be realised through this Plan.

Table 6-1: Mana whenua feedback relating to climate change impacts on waterways

Ngāi Tahu Strategic Objective	Priorities	Next steps for partnership	Risk Code
Te Kaitiakitanga me Te Tāhuhu (Governance and Organisational Development)	We can work together to:		
	Identify critical primary resources (Natural or "grey" infrastructure) and ways to secure these. Identify assets, activities, practices and dependencies vulnerable to climate change effects, and develop exit strategies and alternatives.	Discuss opportunities to identify critical primary resources vulnerable to the impacts of climate change.	MW1
		Clarify the purpose and objective of marae-centred climate change strategies.	MW2
		Develop partnership agreements to mitigate or adapt shared resources to the impacts of a changing climate, such as waterways management through a Te Ao Māori lens.	MW3
	Treating Papatūānuku (the earth) with respect to enhance Wai Tipuna (freshwater ecosystems) running through the campus, managing water pollution, restoring native flora, fauna and habitats, and addressing the impact of buildings and materials.	Develop strong partnerships to identify critical primary resources (Natural or "grey" infrastructure) that are vulnerable or exposed assets to climate change; transition to a net-zero carbon economy.	MW4
		Provide information resources and research to support the development and ongoing maintenance of assets for Mana Whenua communities and whānau to be prepared and resilient.	MW5
	Working collaboratively and proactively with Ngāi Tūāhuriri to reduce our Greenhouse gas emissions.	Develop funding options to secure appropriate management of crucial land and water assets and essential services. Such as climate or environmental financing that may provide an opportunity to establish higher-value environmental assets and additional funding to support management.	MW6

Ngāi Tahu Strategic Objective	Priorities	Next steps for partnership	Risk Code
Tō Tātou Ngāi Tūāhuriritanga (Culture and Identity)	Regular communications / wānanga to build knowledge and understanding of pūrākau and Ngāi Tūāhuriri journeys of courage, resilience, and wisdom	Involve Māori students in implementing climate change adaptation activities. For example, in improving river health or enriching biodiversity in university adaptation projects.	MW7

6.4 Ecological and Social Wellbeing

UC is firmly committed to identifying and implementing "affordable, evidence-based, sustainable practises" that both minimise the University's ecological footprint, while also seeking to "leave a net positive impact on the natural world through the University's operating practices."[7] It recognises the incredible ecological significance of healthy waterways, and that a flourishing natural environment can also boost general human wellbeing. However, there are many challenges to achieving healthy waterways on campus (Table 6-2). See Section 7: Implementation Actions for actions to address these issues.

Table 6-2: Ecological and Social Wellbeing Concerns related to Waterways

Ecological and Social Issue	Description	Risk Code
Water flow	Some sections of campus waterways do not have regular flow as they are not spring-fed but only flow during rain events. Historically, they were spring-fed but the springs have stopped flowing as urbanisation has occurred in the catchment (and groundwater recharge has therefore reduced). Flow is maintained in Waiutuutu on Ilam Campus predominantly through air conditioning water discharges. The air conditioning water is generally of good quality and provides a constant minimum flow. It mimics the former spring-fed flow that has stopped, spring pressures have reduced due to urbanisation (reduced infiltration of rainwater to recharge groundwater).	ESW1
Water quality	The catchments for the three streams running through campus are very large suburban areas. As such, stormwater running into the streams can contain significant sediment, heavy metals, hydrocarbons, and are particularly vulnerable to chemical spills or burst water mains (which can flush polluted sediment into streams). Coordinated catchment management is therefore needed to create long-term improvements in the receiving streams, and this requires engagement from University, Council and the surrounding community.	ESW2
	While UC makes every effort to manage contamination of waterways from its own operations, the use of metal in construction (e.g. copper or zinc roofs and gutters) continues to pollute these streams (especially Waiutuutu/Okeover) to an *unacceptable level*. (Please see 2023 Sustainability Report 5.2.2. Waterways Monitoring for details.)	ESW3
Ecology/ habitat	Many efforts have been made to improve in-stream habitats. While these are laudable, monitoring shows limited progress (if any) in restoring in-stream biota. This is likely a consequence of ESW2 and ESW3 above, indicating	ESW4

[7] UC Sustainability Policy (2022)

Ecological and Social Issue	Description	Risk Code
	that proposed waterway improvements need to directly address ESW2 and ESW3.	
	Riparian margins along streams have been restored significantly since the late 1990s, which has undoubtedly assisted overall biodiversity goals. There are many opportunities to expand this work, which is also a great way to engage staff, students and the wider community. However, such dense plantings need to be well planned in order to retain amenity values (such as views of the water).	ESW5
Engagement	Many staff, students and members of the wider community do not know what interventions UC is working on for waterways health, or what the logic of those interventions is. Education and information-sharing is therefore a focus of the proposed Implementation Plan.	ESW6

6.5 Climate Change Risk

Since the first Plan was written, the University's understanding of the impacts of climate change on the campus has matured considerably. Between 2021 and 2023 a Climate Change Risk Register (CCRR) and Climate Change Risk Assessment (CCRA) were undertaken which highlighted a number of areas for improvement, contained in an Asset Adaptation Plan. The CCRA review involved detailed engagement with mana whenua and students, as well as UC staff. This work, completed by AECOM, followed international best practice approaches to climate risk planning, and the New Zealand Government's reporting requirements as outlined in the Climate Standards. Amongst other things, this requires modelling for 2040 and 2090 scenarios, using most likely estimates of the worsening impacts of climate change over that period. Those recommendations pertaining to risks related to campus waterways have been folded into this second iteration of the Watershed and Waterways Plan.

6.5.1 Key risk to waterways identified from a climate change perspective

Risk RF5 in the Asset Adaptation Plan is that prolonged periods of heavy rainfall and flooding may lead to storm water breaching service tunnels, resulting in damaged tunnels, sewage breaks and inability to access tunnels leading to operational disruptions and increased maintenance costs.

The risk is regarded as significant in a 2040 scenario, and major in a 2090 scenario.

6.5.2 Current controls in place

- Sump pumps in water catchment areas to slow water down;
- Drainage of pumps would drain into a stormwater network; limited impact.
- Two distinct aspects: water on roof and water on ground. Both have distinct controls and maintenance programs.
- Currently undergoing a major stormwater upgrade program. Opportunity to drastically change the way UC captures water, including the development of pre and post inspections/ maintenance plans for stormwater assets.

6.5.3 Recommended controls

Recommended controls for this risk are:

Table 6-3: Recommended controls for Asset Adaptation Plan Risk RF5.

Controls	**Code**
Water management: detention basin, for example, sports fields may not be able to be used in winter so could use for storage of excess water.	AAP1

Add raingardens or other stormwater management devices to slow down the water ingress into the river; Discharge water into river.	AAP 2
Protecting tunnels from ingress of water in flood events.	AAP 3
Consider data technologies such as LiDAR to capture impact of flood relative to floor levels.	AAP 4
Reduce the likelihood of ponding in inappropriate spaces	AAP 5
Investigate the plausibility of a long-term retreat policy with regards to the waterway boundaries in Christchurch campuses and Westport. Above adaptation actions may be sufficient to reduce risk at Christchurch campuses. (Note that Westport is outside of the scope of this Plan and therefore this control is not addressed in it)	AAP 6
Ensure streams are free of debris.	AAP 7

In addition, controls for related risks are:

Table 6-4: Recommended controls for other Asset Adaptation Plan Risks

Implement greater downpipe diameter design, including overflows	AAP 8
Amend design guidelines to remove internal guttering	AAP 9
Increased condition reporting to inform degradation of materials with increased runoff, and utilise non-degradable materials	AAP 10
Review broader network capacity with the Christchurch City Council - concern that downstream facilities can take greater flow	AAP 11
Consider increasing canopy cover, consider onsite retention / detention capacities on campus rainfall interception	AAP 12
Develop a floodplain model around creeks and campus and monitor against events. Identify areas of high risk of flood. Post-event of high levels, identify cause and address. Integration of Internet of Things sensors with a digital waterways model	AAP 13
Investigate ways to manage flooding e.g.: Sport field closures during and post flooding; fencing and controls around this (Sports association manages this);	AAP 14a
Raingardens on campus: stormwater flow and volume control but also supposed to treat the stormwater (i.e. improve stormwater quality) before discharge. These stormwater management devices need management oversight, which is a current gap. Want to make sure raingardens can drain down temporarily stored water within a reasonable time before the next rain event.	AAP 14b
Further naturalisation of waterways and planting of banks and engagement with mana whenua	AAP 15

These risks have been incorporated into this Plan, as can be seen in Section 7: Improvement Actions. These risks associated with climate change are identified in the UC Climate Change Risk Register.

It should be noted that some risks identified in the above tables do not have mitigating actions, while some actions are not mapped to specific risks.

7 Improvement Actions

Improvement Action	Risks addressed
7.1 Governance of UC Waterways	
7.1.1 Committee structure	
The Waterscapes Action Group (WAG) will continue to meet at least twice per year, and progress will be reported to the Sustainability Programme	All risks

Improvement Action	Risks addressed
Board (SPB) through the WAG Chair. Completed actions are reported to the Chair of the SPB to the Vice Chancellor and thence to UC Council. The WAG receives secretarial support from the Sustainability Office (through the Biodiversity Projects Coordinator), which is embedded within Facilities Management.	
7.1.2 Annual review of this Plan to be undertaken.	All risks
7.1.3 Confirm MoU with Christchurch City Council regarding management of the stream, especially with regards to sediment removal.	AAP5, AAP7
7.1.4 Develop and approve a subsequent iteration of this Plan prior to 2030.	All risks
7.2 Ecological restoration	
7.2.1 Sediment removal in Waiutuutu Once roles and responsibilities for sediment removal have been clarified with Christchurch City Council, it should be undertaken as per the agreed schedule. This should be done no more frequently than once every two years, to minimise stream disturbance.	ESW2, ESW3, AAP5, AAP7
7.2.2 Daylighting box drain section of Waiutuutu on Ilam Fields Christchurch City Council and UC both see value in removing the current boxed drain between Ilam Fields and Te Whare Ākonga o Te Akatoki Māori (UC Māori Students' Study Centre) re-landscaping the area and enhancing indigenous plantings. It is expected that this will reduce sedimentation downstream.	MW3, MW6, MW7, ESW4, ESW5, AAP1, AAP3, AAP15
7.2.3 Ilam Homestead Weir upgrade The weir beside Ilam Homestead has been degraded for some years and risks exist of serious bank destabilisation. Repair of this area also creates opportunities for ecological enhancement (including fish passage and reduced sedimentation	ESW4, ESW5, AAP15
7.2.4 Additional planting along Haere Roa riparian corridor Risks identified through mana whenua consultation (see 5.3 Mana Whenua Concerns above) and through climate adaptation planning (see section 5.5 above, especially risk #AAP15). This work will also improve amenity values and make it easier for 'Living Laboratory'- focused hands-on teaching (e.g. water quality sampling) to be undertaken.	MW4, AAP15
7.3 Storm water management and maintenance on UC land	
7.3.1 Upgrade of roof drainage systems on E8 and E9 lecture theatres, including diversion of ecotoxic roof runoff into treatment devices prior to discharge into Waiutuutu. Note: Installation of treatment close to complete at end of 2025. Copper roof section of EPS Library is being replaced, end of 2025.	ESW3
7.3.2 Stormwater management on the upper end of the ephemerals stretch of Waiutuutu on Ilam Field, for example a detention pond or treatment bunds, to address sediment and heavy metals pollution. This could include scoping options for daylighting the stream around the tennis courts rather than piping water under the courts as is currently the case.	ESW4, ESW5, AAP1, AAP12, AAP15
7.3.3 Continued installation of dissolved metals treatment systemson downpipes around campus that are known sources of metal pollution.	ESW3
7.3.4 Integration of storm water mitigation with the Three Waters renewal programme Ensure opportunities are taken to improve UC's Three Waters infrastructure, taking into account the need to treat stormwater for sediment and heavy metals and the expected impacts of climate change.	AAP8, AAP9

Improvement Action	Risks addressed
7.4 Monitoring and reporting	
7.4.1 Develop digital twin of Waiutuutu Phase One of this project proved the value of a fully developed digital twin of the UC waterways, especially for timely response to serious events such as acute pollution or flooding. Phase Two would improve the quality of data digitally monitored, while also adding value to a regional digital waterways monitoring project.	AAP4, AAP13
7.4.2 Manual sampling of waterways to continue In addition to parameters identified in the UC Waterways Monitoring Framework, this could include monitoring of stormwater treatment systems' performance.	MW7, AAP15
7.4.3 Reporting on findings - quarterly reporting to Facilities Management - annual reporting through UC Sustainability Report	MW7, AAP15
7.5 Engagement with iwi, staff, students and other stakeholders	
7.5.1 Mana whenua-identified improvement actions to be implemented.	MW4, MW6, MW7, ESW5
7.5.2 Events to highlight importance of waterways.	MW7, ESW5

8 Stakeholder Consultation

This Plan has been reviewed by a wide range of stakeholders, including the following:

- Pro-Vice-Chancellor Sustainability
- People, Culture and Campus Director
- Facilities Management Director
- UC Waterscapes Action Group
- UC Asset Operations Manager
- UC Asset Planning & Delivery Manager
- UC Asset Manager
- UCSA Executive (2023)
- UC Wellbeing Team
- Neighbours of the Ilam Stream

9 Review

This Plan is to be considered a living document, and timeframes may change according to resourcing and changing priorities. Progress will be monitored annually by the Sustainability Office.

10 Conclusion

This second iteration of the Watershed and Waterways Plan builds on the ideas presented in the first. It moves beyond a conceptual framework to become more of an implementation plan.

11 Appendix A: Selected Bibliography

Theses	Format/location/owner of dataset
Blakely, T. (2003). Factors influencing benthic communities and colonisation in a Christchurch urban stream. *Unpublished BSc (hons) thesis, University of Canterbury*.	School of Biological Sciences
Charters, F. (2016) Characterising and modelling urban runoff quality for improved stormwater management. https://ir.canterbury.ac.nz/handle/10092/12602	Natural Resource Engineering
Eden, J. (2016) The impact of heavy metals on benthic macroinvertebrate communities in Christchurch's urban waterways https://ir.canterbury.ac.nz/handle/10092/12833	Waterways Centre for Freshwater Management
Murphy, L (2015) Quantifying Spatial and Temporal Deposition of Atmospheric Pollutants in Runoff from Different Pavement Types. https://ir.canterbury.ac.nz/handle/10092/10467	Natural Resource Engineering

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12 Appendix B: Review of 2017-2023 Watershed and Waterways Plan

9. *Governance, leadership and management*

- UC Waterscape Action Group contributed towards and influenced the UC master plan and landscape master plan,
- A formal liaison role was developed and filled to communicate between WAG and Facilities Management, which is current and continuing.
- Relationships have been built between UC and Christchurch City Council (CCC), and projects are underway (an MoU has been presented to CCC clarifying roles and responsibilities related to sediment removal in the Waiutuutu; this has not advanced and will need revisiting).
- Annual review of the plan was not undertaken, but is a focus in this revised plan.

10. *Te Tiriti o Waitangi*

- Some guidance on behalf of Ngāi Tūāhuriri was given for waterways planning (see Section 6.3 Mana Whenua Concerns). This needs more focus and drive in the new plan.

11. *Ecological restoration*

- Sediment was removed from the Waiutuutu stream in 2020. This was undertaken by City Care, organised by the Christchurch
- A project was started in partnership with CCC to remediate/redevelop the boxed drain section of Waiutuutu stream
- Consultation and planning phase started to remediate the weirs on Haere Roa river and Kā Waimaero stream, including the potential redevelopment of the riparian plantings of both

12. *Sustainable resource management and maintenance on UC land*

- To date no culverts have been removed and replaced with bridges but this continues to be monitored for the opportunity in the future.
- Storminator units installed to remove ecotoxic heavy metals from roof runoff that would otherwise enter the Waiutuutu/Okeover Stream.
- General maintenance of stormwater sumps and filters have been programmed in to be serviced periodically.
- Contamination events have occurred and procedures that are in place have been actioned.
- Preventive SOPs have been developed to prevent accidental spills from entering the waterways.
- All exposed stormwater openings have had signage to identify them.

13. *Research and monitoring*

- Quarterly monitoring currently takes place and is reported on annually through the Sustainability Report.
- A digital twin of the Waiutuutu stream is proposed as a pilot for the whole campus.
- Research around stormwater contaminants and climate change effects on the waterways is ongoing.

14. *Teaching and learning*

- While research and teaching involving the waterways is ongoing, this has not to date been captured through annual waterways reporting.

15. *UC community engagement: staff and students*

- Staff and student engagement has progressed well with riparian plantings and biodiversity walks through campus, and through annual waterways monitoring work.

16. *Stakeholder and whole of catchment community engagement*

- Ad hoc engagement with various community groups has been occurring but these could be wider reaching and more frequent.

Four additional improvements for UC waterways already undertaken should be noted:

a. Implementation of the Waterways and Watershed Plan is identified in the UC Strategic Vision as a priority;
b. As such, the Chair of the Waterscapes Action Group now sits on the Sustainability Programme Board, which has oversight of the sustainability components of the Strategic Vision;
c. The UC Sustainability Policy was updated in 2023 with specific provisions around improving the health of our waterways;
d. In a parallel workstream, Ngāi Tūāhuriri provided feedback on asset improvement plans to adapt to climate change impacts, identifying several ways in which waterways could be improved. This feedback has been considered in this revised Watershed and Waterways Plan.