

Washdyke

Stormwater Issues Summary October 2021

Timaru District Council (TDC) and Te Rūnanga o Arowhenua are making a plan to help manage stormwater discharges from the urban areas of the Washdyke Catchment. This Stormwater Management Plan will help us better manage stormwater and protect our waterways. It will also help us meet the legal requirements for discharge of stormwater into Washdyke Creek, and the Waitarakao-Washdyke Lagoon.

We have completed baseline studies and have identified key stormwater issues that will be addressed in the plan. This document summarizes the issues and provides additional context for what we’ve discovered with the current stormwater management system.

Issues Summary

We have identified six key issues which are discussed in detail below:

1. **Flooding**
2. **Pollution**
3. **Reduced Aquatic Life**
4. **Maintenance**
5. **Increased Development**
6. **Climate Change**

Issue 1 - Flooding

Parts of the urban area of Washdyke suffer from nuisance flooding and ponding, particularly when it rains for an extended amount of time. This is due to runoff from the rural areas, blockage of natural flow paths and variability of water levels in Washdyke Creek and the lagoon.

Flooding is a natural phenomenon and typically occurs around waterway corridors, overland flow paths and in low lying areas. Our stormwater network is designed to a specific capacity or level of service, so that it can carry stormwater to the creeks/streams and Ocean. This helps reduce flood risk for houses, business and roads during relatively small rain events. This level of service may not prevent stormwater flooding from some large rain events. The stormwater ponding related issues we have identified in Washdyke include:

- 1.1 Poorly drained soils in some of Washdyke presents issues for draining stormwater to ground and causes ponding for extended amounts of time. This happens more often in low lying areas and areas with no established connection to the stormwater system.
- 1.2 The height of the ocean tide impacts on how quickly stormwater can drain from the system, in Washdyke, as sometimes the stormwater outfalls to Washdyke Creek, No.1 Drain, Seadown Drain and the Waitarakao-Washdyke Lagoon, are already full due to sea levels, leaving little room for stormwater to drain. This can increase flooding on properties and roadways
- 1.3 Blocked overland flow paths are causing stormwater ponding, as we have built in or obstructed places where stormwater would naturally flow. The loss of these natural flow paths mean stormwater moves into, and impacts more on the built environment. In these areas, stormwater can no longer flow along the natural path and will continue to build up and cause flooding or other damage.
- 1.4 Flooding in the urban area, which can also be caused by overland flow from the wider rural catchment following historic river flood channels.

Issue 2 – Pollution

Polluted stormwater is contributing to reduced water quality and diminished ecosystems in our local rivers, streams and other waterways – this impacts how the community and Te Rūnanga o Arowhenua interacts with these ecosystems.

Stormwater runoff picks up pollutants from hard surfaces such as roads, carparks, industrial yards and certain building materials. Polluted stormwater is discharged to the environment, putting strain on the health of our waterways. This affects what lives in them and how we interact with them. The stormwater pollution related issues we have identified in Washdyke include:

- 2.1 A considerable proportion of stormwater discharges from the Washdyke catchment are untreated before entering the waterways, including the culturally significant Waitarakao Washdyke Lagoon
- 2.2 Polluted stormwater is contributing to poor water quality in Washdyke waterways. This impacts on the relationship of Te Rūnanga o Arowhenua with the waterway and the Waitarakao Washdyke Lagoon, which is a mahinga kai/food gathering areas.
- 2.3 Pollution in the stormwater impacts the limits for safe consumption of food gathered from the waterways.
- 2.4 High nutrient concentrations (Nitrogen and Phosphorus) have been found in the waterways. This is consistent with nutrients from agricultural runoff and surrounding urban activities in the areas. Elevated nutrients can result in algae growth that can harm aquatic life.
- 2.5 High heavy metals concentrations (Arsenic, Zinc and Lead) have been found accumulating in the waterways. These can be attributed to surrounding industrial and urban activities in the area, vehicle movements and roofs/building materials.
- 2.6 High petroleum hydrocarbon and heavy metal concentrations have been found accumulating in the sediments in the waterway, which indicates pollution from stormwater is accumulating within the beds of waterways. This is likely from industrial activities, vehicles on the high use roads and carparks in the area.
- 2.7 High use roads (e.g. State Highway 1) and carparks without treatment of the stormwater runoff contributes to the pollution in the stormwater system and the waterways.
- 2.8 Industrial and commercial activities in Washdyke present risks to the quality of the stormwater and the waterways. There are numerous commercial and industrial properties in the plan area and, some of which have been identified as high risk due to the potential impacts of spills and discharge to the system.

Stormwater Management in Washdyke

TDC provides stormwater management for the urban area and some* of the industrial areas of the Washdyke Catchment, approximately 391 ha including 643 properties via a stormwater system of pipes and open channel network. The network is limited in some areas and most of the stormwater that travels through it is not treated* before discharge to the waterways and Ocean.

Stormwater System	Quantity
Stormwater Pipes	17789m
Swales and Open Channels	2032m
Sumps and Inlets	282
Soak Pits	0
Outfalls to waterways	14
Waterways	Washdyke Creek and Waitarakao-Washdyke Lagoon..

**Some Industrial sites in Washdyke provide some treatment of stormwater before discharge into the network or they have their own consent from Environment Canterbury (Ecan) for discharge to ground (soakage) or to a waterway*

Washdyke

Stormwater Issues Summary October 2021

Issue 3 – Reduced Aquatic life

Wildlife in the waterways is being reduced by both pollution and loss of natural habitat or shading - birds, fish, eels, plants and other native species are unable to thrive.

Our waterways have recreation and cultural significance and the protection and return to a healthy mauri / life-force is very important. A measure of the health of a waterway is the presence and variety of aquatic life like fish, plants and other native species, and the ability of these organisms to thrive and travel. The waterways in Washdyke are habitats for several native fish and vital for their migration to and from the coast. They are also important for mahinga kai, cultural use and the transmission of matauranga Māori. The stream and coastal waters are also important features in the urban landscape and contribute to the general wellbeing of our community. The key stormwater issues related to aquatic life identified in Washdyke include:

- 3.1 Extensive industrial development in the catchment and coastal erosion have contributing to significant pollution and loss of natural habitat in the catchment, with the Waitarakao-Washdyke Lagoon in particular being severely impacted. This impacts on the relationship of Te Rūnanga o Arowhenua with the culturally significant Mahinga Kai Waitarakao Mātaitai Reserve.
- 3.2 Fine sediment has been observed smothering vegetation, insects and fish. This is likely from erosion of soils within the urban area, stream bank erosion or upstream agricultural practices. This fine sediment can be resuspended in rainfall events resulting in low water clarity.
- 3.1 Barriers to fish passage have been identified on the waterways, including the Ocean outlet from Washdyke Creek, the outlet from the Seadown Drain into the Waitarakao Washdyke Lagoon and the weir at the confluence of Washdyke Creek and Waitarakao Washdyke Lagoon. These in-stream structures can prevent certain species from breeding or their offspring from migrating to suitable habitats, which can result in a decline in fish population.
- 3.2 The ecosystem in the catchment has been significantly altered. In addition to waterways, Washdyke also has an extensive network of land drainage channels (Seadown drainage scheme). This has changed the way water feeds the Waitarakao-Washdyke Lagoon, and has created complexity in the interactions between Washdyke Creek, the drainage scheme, the lagoon and the coastal outlet.

Issue 4 – Maintenance

The limited maintenance of the stormwater system and waterways is impacting their function and our ability to enjoy the waterways.

Maintenance of the stormwater system ensures its proper functioning and reduces the impact of discharge into the waterways. Preventive maintenance will help reduce the need for expensive improvements to the stormwater system and will also ensure waterways are more accessible for our enjoyment. The key stormwater issues related to maintenance identified in Washdyke include:

- 4.1 Operations and maintenance responsibilities of the stormwater system and waterways are spread amongst multiple organisations. This impacts the consistency and level of service provided.
- 4.2 Parts of the streams are on private property which affects the maintenance and use of the waterways.
- 4.3 Some maintenance of waterways that occurs generally falls under Environment Canterbury's drainage bylaw, which focuses on maintaining conveyance/flood capacity. There is currently no mechanism to consider maintenance of waterways from a water quality or aquatic health perspective.

Issue 5 – Development

Our communities will continue to grow and as development intensifies, stormwater will increase. This puts greater pressure on the existing stormwater system and our environment.

Stormwater is runoff from rainfall on hard surfaces, this increases in line with development. Previously as development occurred, stormwater systems were designed to collect and transport runoff as quickly as possible to waterways, largely untreated. This approach has resulted in damage to the natural environment and limitations for the system to cope with increased development and the need to provide treatment before discharge into waterways. Growth and development in the town requires careful stormwater planning and management to ensure adequate level of service is provided. The key stormwater issues related to development identified in Washdyke include:

- 5.1 Legacy issues due to the previous approach to development, where existing stormwater networks are no longer meeting the capacity and treatment level of service
- 5.2 Development will increase stormwater runoff and put greater pressure on the existing capacity of stormwater networks, making flooding and water quality issues worse if we don't change the way we develop.

Issue 6 - Climate Change

Our climate is changing, and more extreme weather and sea level rise will impact the ability to effectively drain the Washdyke catchment long-term.

The magnitude of the effects of climate are uncertain due to the long-term nature of climate change. Predictions indicate an increase in rainfall intensity in the area, which will increase stormwater runoff. In addition, sea level rise and coastline movements are projected to impact the catchment. The key stormwater issues related to climate change identified in Washdyke include:

- 6.1 It is likely that more intense rain events will occur more frequently, which will further increase flooding, pollution and damage to the natural environment.
- 6.2 Sea level rise and projected future erosion of the coastline will significantly impact the ability of the stormwater in Washdyke, to discharge to the drains, the Waitarakao Washdyke Lagoon and the sea.
- 6.3 The projected erosion of the coast and sea level rise is expected to result in significant increase in groundwater levels (1m or more) over parts of Washdyke. This may result in groundwater inundating or coming up to the surface at times.
- 6.4 The stormwater management system will need to be resilient and adaptable to cope with the impacts of climate change.