Te Kaunihera-a-rohe ō Ngāmotu

Stormwater Vision and Roadmap

NPDC / Stormwater Public Document /DEC 2023

Te Kaunihera-ā-Rohe o Ngāmotu
New Plymouth District Council

Manaaki wai, manaaki whenua, manaaki tangata, haere whakamua!

Care for the water, care for the land, care for the people, go forward!

Contents

Acknowledgements

The Stormwater Vision and Roadmap has been written in collaboration with mana whenua, Morphum Environmental and Taranaki Regional Council. NPDC would like to acknowledge the following kaitiaki for their dedication and contribution to this mahi:

Te Rūnanga o Ngāti Mutunga
Te Kotahitanga o Te Atiawa
Te Kāhui o Taranaki
Ngāti Rāhiri hapū
Otaraua hapū
Manukorihi hapū
Pukerangiora hapū
Puketapu hapū
Ngāti Tawhirikura hapū
Ngāti Te Whiti hapū
Ngāti Tuparikino hapū
Ngāti Tairi hapū
Ngā Mahanga hapū

Mā pango, mā whero, ka oti ai te mahi.

2. District Context

NPDC collects, manages and releases stormwater runoff from around 6,600ha of urban land covering the communities of New Plymouth, Bell Block, Waitara, Inglewood, Urenui, Onaero, Lepperton, Egmont Village, Ōākura and Ōkato. This requires approximately $19m of operational expenditure and $74m of capital expenditure over the period 2021-2031, and utilises an asset base worth $240m.

From the 1900s to the early 2000s, NPDC's approach to stormwater was heavily focused on the mitigation of flooding. This often came at the expense of the environment, resulting in significant negative effects including erosion, changes in flow, loss of fish passage and the release of pollutants into our waterways and the ocean. This is a common story across New Zealand and internationally (refer to appendix A for a general discussion on the effects of urbanisation on our streams and water bodies).

Despite the historical stormwater management approaches, New Plymouth District retains many high-quality urban streams which are in comparatively good condition with good baseflow and ecological habitat. This is due to a combination of high rainfall, steep topography flushing any pollutants quickly away and relatively well-vegetated riparian margins, of which much is in public ownership, providing shade and treatment of runoff. In addition, the prevalence of on-lot soakage for disposal of stormwater provides good stream protection to reduce the impacts of flash-flows (short duration of high flows) and maintain baseflow in urbanised areas. The riparian margins also have an extensive network of public walkways that encourages a relatively strong community connection to our awa.

However, there is still a large number of issues and many of our water bodies are still unsafe for contact recreation, especially after rainfall. We are also falling behind some of our more proactive neighbours in resolving these issues. The section below explores some of the key elements, looking both backwards and forwards, that shape the stormwater context for the district and also this Vision and Roadmap. These are broken into the following sections:

- Existing infrastructure capacity and condition.
- Regulatory framework.
- Tangata whenua aspirations.
- Community expectations.
- Growth.
- Climate change.

2.1 Capacity of Existing Infrastructure

NPDC has the following target levels of service for stormwater:

- That the primary system (kerb and channel, pipes and open watercourses) will contain the 20% annual excedence probability (1:5-year ARI) storm for residential areas and the 10% AEP (1:10 year ARI) storm for commercial and industrial areas.
- That habitable floors should not be flooded in a 1% AEP event (1:100-year ARI).

Currently, NPDC does not have a good understanding of where these levels of service are met due to a lack of detailed modelling. However, on-the-ground experience, along with modelling (where it exists), indicate that we do not meet these levels of service for a moderate portion of our network. The reasons for this vary and include, but are not limited to, changing community and council expectations leading to an increase in the target level of service without the corresponding funding to meet this, the original development being done relatively cheaply resulting in a lower level of service that is difficult to retrospectively resolve (such as for many parts of Waitara), building houses/development in naturally flood-prone areas due to inadequate planning controls, and a desire for more housing.

In addition, overland flow paths across the district are often poorly understood and, in almost all instances, not adequately protected to prevent existing paths being obstructed by building or landform modification. In older parts of the district, sections of piped waterways have supported urban development within what would naturally be the active floodplain, resulting in public and private property being at risk whenever pipe capacity is exceeded or blocked. In other parts of the district, smaller flow paths (often associated with natural intermittent or ephemeral steams) exist through urban areas with limited community (or Council) knowledge of alignment and/or risks to property and life.

There is a historical reliance on ground infiltration (soakage) across the district, with many old and new properties discharging directly to ground in areas with suitable free-draining volcanic soils. The location, condition and long-term performance of these soakage wells are unknown. Many areas have no secondary network, with any overflow from residential and commercial properties discharging to overland flow paths.

Many urban waterways have headwaters on the upper slopes of Taranaki Mounga and are subject to significant headwater rainfall (increased intensity and frequency compared with lower slopes), resulting in increased flood risk for land alongside streams within urban areas (including the New Plymouth CBD).

Waitara is located on the floodplain of the Waitara River, which has a very large catchment draining both Taranaki Mounga and the hill country to the north. Rainfall can vary between the two arms of the upper tributaries, resulting in risks of coincidental flooding, long-duration events and potential breach of stop banks. Flood modelling has been undertaken in Waitara to better understand the risks and development constraints.

Resolving these issues can be particularly challenging given the size, location, ownership, etc of the infrastructure and the potential to simply move the problem around (i.e. exacerbate downstream flooding or cause environmental damage).

Despite all of the above, we do have a relatively low level of flood risk compared to many regions largely due to the relatively steep nature of the ring plain and its streams, meaning significant flood risk is restricted to specific houses/areas when compared with the wide flat flood plains of the East Coast.

2. District Context

2.2 Condition of Existing Infrastructure

Stormwater is often described as the poor third cousin, behind water and wastewater. This is also true in New Plymouth District. One example of this is based on funding in the 2018 LTP whereby stormwater assets would need to last for 1,695 years before they would be replaced.

Currently, we do not have a good understanding of the condition of our infrastructure. To date, we have inspected 14% of the network. Of the inspected network, 8% was found to be in poor or very poor condition, meaning they need to be renewed within 10 years. This is a relatively good result when placed in a national context, although it does include a number of concerning examples such as the collapsing Waiwaka Terrace tunnel (fixed in 2022). CCTV is currently ongoing, which should give us a better idea of how representative this is. We also have a number of assets that are not identified on the asset register, most notably a large proportion of the stormwater storage and treatment assets.

2.3 Regulatory Framework

The National Policy Statement for Freshwater Management has a number of implications for urban stormwater; however, at this time we are still waiting for many of these to play out. It is expected that the TRC's Natural Resources Plan, once developed, will give much better understanding of the implications.

Currently, stormwater in the Taranaki region is managed by individual discharge and structure consents. This makes it difficult for all stakeholders due to the large number of consents, not being conducive to taking a catchment-wide or district-scale approach, and/or taking a continuous improvement approach. To address this issue, a number of other regions are using a comprehensive stormwater consent that covers either specific catchments or the whole district and drives "continuous improvement" rather than "compliance". Discussions are underway with TRC to see if this would be appropriate for New Plymouth District as part of the Natural Resources Plan currently being prepared.

The District Plan has just been revised, with stronger policy direction around the environmental implication of stormwater and the inclusion of flood maps as non-statutory layers, which will help to keep these up to date and thus better manage development in flood-prone areas.

2.4 Tangata Whenua Aspirations

New Plymouth District Council has a legal obligation to take into account relationship of Māori to land, water, wāhi tapu, flora and fauna and other taonga, and to engage tangata whenua as kaitiaki over the district. In order for this to be realised to its fullest extent, iwi and NPDC need to work in partnership when it comes to managing stormwater in urban areas. To date, this has either not occurred, or occurred to a very limited extent. This Stormwater Vision and Roadmap aims to be the first step towards achieving this partnership with respect to stormwater.

Iwi and hapū have a number of concerns and aspirations regarding the state of the whenua, awa and moana as detailed in their respective environmental management plans. These concerns, where relevant to the stormwater activity, have been captured in the issues statement in section 3.1 and in the aspirations in the Vision.

The urban areas covered by this Stormwater Vision and Roadmap are within the rohe of three iwi and 10 hapū as follows:

Te Atiawa Iwi, comprising

- Ngāti Rāhiri hapū
- Otaraua hapū
- Manukorihi hapū
- Pukerangiora hapū
- Puketapu hapū
- Ngāti Tawhirikura hapū
- Ngāti Te Whiti hapū
- Ngāti Tuparikino hapū

Taranaki Iwi, compromising

- Ngāti Tairi hapū
- Ngā Mahanga hapū

Ngāti Mutunga Iwi

2.5 Community Expectations

The community's expectations around the stormwater activity are constantly increasing. When New Plymouth and Waitara were first settled by Pākehā there was minimal to no stormwater infrastructure and flooding was common. As time has passed the expectations have increased; however, much of this early infrastructure is very difficult to retrofit, particularly to provide for the 1:100-year level of service. Similarly, retrofitting stormwater treatment can be a significant challenge.

There is also a natural tendency for the community to get focused on the nuisance flooding events (i.e. where the level of service for the primary network is not met) as this is what they experience most often. However, from a community impact and resilience perspective it is better to focus on the large events (level of protection) that result in the flooding of habitable floors first then move onto nuisance flooding. There is a similar challenge when it comes to environmental effects where many of them are hard to see by the general community but can have acute and chronic effects over a wide area.

These increasing community expectations are set against a backdrop of significant financial constraints and affordability concerns. What makes this even more challenging is that flooding often affects a small number of individuals rather than the community as a whole. Managing these conflicting priorities will be a key challenge.

2.6 Growth

New Plymouth District's population is expected to grow by 24% during the next 30 years. This is expected to be accommodated through a mixture of greenfield development and infill/densification, with an increasing portion made up from infill and densification.

Greenfield growth is currently reasonably well managed; however, it is dependent on a small number of key individuals within the council and the development community as the standards and guidelines are considered vague.

Infill and densification is much more challenging as it typically involves smaller sites with less room for management structures. These sites also typically discharge into already under-capacity networks. Managing this is proving challenging in both New Plymouth District and around the country. The management of stormwater from future infill and intensification is however important as it provides a means of continuously improving environmental and social outcomes over the development timeframe and support ongoing enhancement in outcomes.

2.7 Climate Change

Climate change is expected to have a number of effects as follows (based on a RCP8.5 pathway):

- An increase in annual rainfall of between 8% and 22% over winter by 2040.
- An increase in sea level (from 1993) of 0.7m by 2090.
- A reduction in the mean annual low flow in rivers of 50% by 2100.

The higher rainfall and sea level will significantly increase the flood risk, particularly for currently flood-prone areas and older areas where climate change was not allowed for in the original design. The reduction in mean annual low flow in the rivers will have negative environmental effects, especially on aquatic life, due to higher water temperatures and reduced area with permanent water.

Additionally, the expected change towards rainfall patterns with extended dry spells interspersed with short sharp intense rainfall will increase the risks of ecological impacts due to the build-up of contaminants and subsequent flushing of higher concentrations and loads into receiving environments. This effectively results in more 'efficient' contaminant transport with a traditional piped stormwater network.

3. Vision, Aspirations and Objectives

The vision, aspirations and objectives are intended to act as a framework for anything related to stormwater within the district. This could include prioritisation, multi-criteria assessments, or tracking progress. They have been co-created with iwi and consulted upon with key stakeholders (TRC and within NPDC).

The first step in their creation was to establish a shared understanding of the current challenges and issues across the district. As shown in figure 3.1, the team then identified what our ideal would look like, which was then coalesced into the vision, aspirations and objectives. The vision is intended to be high-level and establish broad outcomes for the environment and community. The aspirations are intended to set more long-term outcomes for certain areas that NPDC aims to achieve. The objectives are intended to be more specific and measurable outcomes required to achieve the aspirations and vision. This increasing granularity is intended to not only provide a destination but also a path to get there.

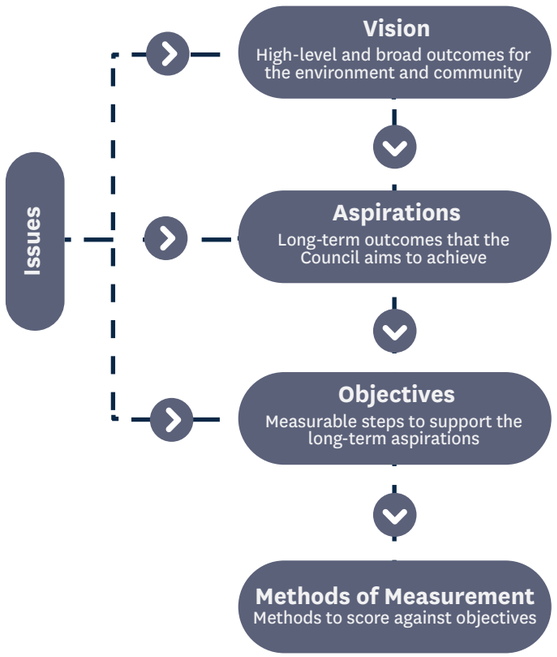


Table 3.1 - Vision, Aspirations and Objectives Framework

The current state and progress towards the vision, aspirations and objectives are to be measured using a set of bespoke methods of measurement.

The vision, aspirations and objectives provide a long-term goal for the future. It is acknowledged that it is sometimes not realistic, pragmatic or cost effective to achieve these in their fullest within the short to medium term. The SVR therefore includes three-year, 10-year and 30-year targets, using the methods of measurement to evaluate performance against the targets.

The development of the vision, aspirations and objectives was undertaken in 2022/23 in close collaboration with iwi/hapū and input from NPDC and TRC staff.

This process was intentionally focused on stormwater only, to keep the scope manageable. The effects of wastewater were only considered where there is a direct link, such as where stormwater inflows to the sewage network leads to wastewater overflows into the stormwater network and resultant public health, cultural and environmental implications.

In due course, once the process is up and working, there may be the potential to expand it to include wastewater and/or water supply.

3.1 Issues

A key basis for the development of the vision, aspirations and objectives was an in-depth understanding of current issues related to stormwater management and flooding, and their effects on people and the environment across urban parts of New Plymouth District. Meetings with staff from NPDC and TRC as well as a number of hui with iwi and hapū were held to identify the issues related to stormwater management.

An initial long-list of more than 140 issues was developed across a range of themes, with issues varying from generic district-wide issues through to very specific or local ones.

This identification process provided a useful way of highlighting the breadth and complexity of issues to be addressed through the Roadmap, and highlighted the clear crossovers where activities can often have unintended consequences that may not at first be apparent.

Following the identification of the long-list, the issues were condensed, rationalised and grouped into three categories: causes, symptoms and effects. The result is shown in Figure 3.2. The figure is designed to be read by selecting the relevant, cause symptom and effect to produce a complete problem statement. In this way it captures the richness of the feedback in a manageable form.

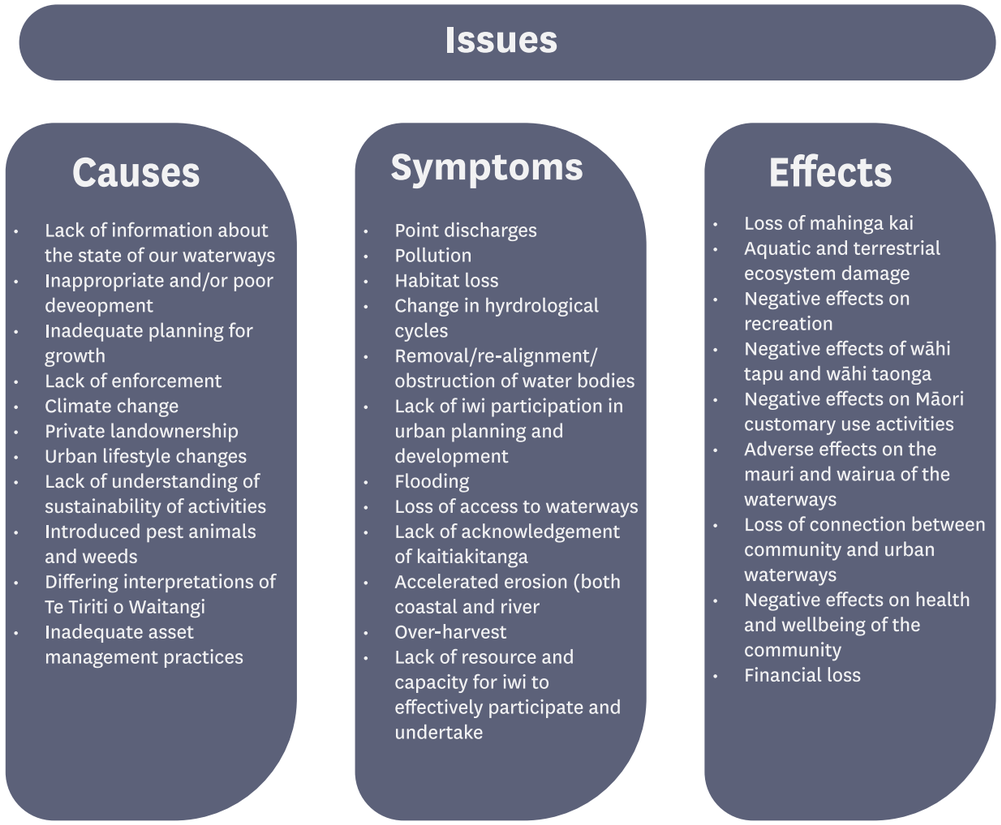
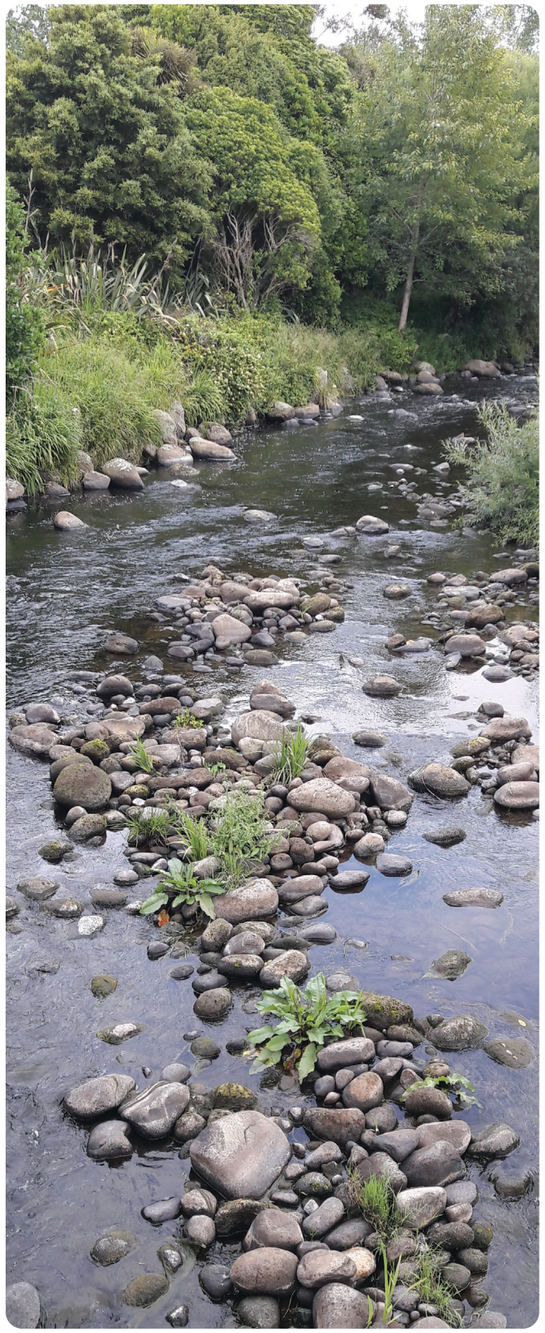


Table 3.2 - Summary of issues

3. Vision, Aspirations and Objectives



3.2 Development of Vision, Aspirations and Objectives

Following a general agreement on the key issues to be addressed, a follow-on process to define an overall vision, supported by aspirations and objectives, was undertaken and the results are given on the next page. These are intended to respond to the key groupings of practice areas where stormwater can be influenced, and provide three tiers of evaluation that can be understood by a mix of technical and non-technical audiences.

The aspirations were broken into five distinct themes to represent the key areas where management of stormwater is needed. These groupings are:

1. Stormwater – relates to the management of stormwater within urban areas prior to discharge into receiving environments (including any piped streams). This therefore reflects the need to manage stormwater in terms of quantity and quality, and ensure development allows for an appropriate level of stormwater treatment to protect downstream environments.

2. Streams and Water bodies – relates to the condition and health of remaining water bodies and their riparian margins following the inflow of any stormwater or other inputs. This therefore considers any in-stream structures (retaining walls, culverts, etc), stream stability and provision of habitat for indigenous biodiversity.

3. Community – relates to how people interact with water bodies for recreation, amenity and emotional connection. This therefore includes consideration of mana whenua values, accessibility and water quality for contact uses (including food collection and recreation).

4. Planning – relates to works undertaken in partnership with mana whenua to implement policy and programmes related to management of stormwater and water bodies.

5. Resilience - relates to resilience of communities specifically with regard to flood risks. It is noted that resilience to effects from more frequent events (such as changed frequent flow hydrology) is incorporated under ‘stormwater’ and ‘streams and water bodies’.

VISION

To protect and enhance the mauri of wai/lifeforce of water where:

- Our streams and waterbodies are healthy and flow naturally with clean, fresh water.
- Are alive with abundant indigenous species.
- Support the health of the community.

ASPIRATIONS

Stormwater
Urban stormwater is managed in a holistic way to reduce contaminants and mimic the natural water cycle minimising effects on stream flows.

Streams And Water bodies
Our streams and water bodies, aquatic habitats and coastal environment are protected and restored to support healthy, thriving ecosystems.

Community
Our streams and waterbodies are safe and accessible to all and the value of water is recognised and celebrated, empowering communities to connect with awa.

Planning
In partnership with Tangata whenua, we proactively plan and manage our urban areas and assets.

Resilience
Urban communities are resilient to flooding.

OBJECTIVES

District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented

Areas/activities with high impact or risk (flow or contaminant load) are identified and managed to minimise pollution of our waterways.

Treatment devices are functional and able to be maintained.

District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.

Current stream and water body ecological and cultural health are understood, issues identified and resolved where practicable.

District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.

Areas of cultural significance are identified and progressively enhanced and local iwi connection with the awa is respected and supported.

Stream and water body amenity values, connections and education are enhanced.

Streams and water bodies are safe for recreation and customary activities.

Tangata whenua are proactively involved in the planning and management of urban stormwater, streams and waterbodies.

Engagement with local communities, development community and other stakeholders is effective.

Natural and man-made stormwater assets are proactively managed.

All catchments have an up-to-date catchment management plan

An interdisiciplinary & opportunity based approach supports continuous improvement in stormwater & ensures growth is managed.

District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.

Flooding incidents are managed to minimise risk and post incident rehabilitation completed.

Risks related to flooding and overland flow are understood, mitigated and communicated.

3. Vision, Aspirations and Objectives

3.3 Measuring Current State and Progress Towards Vision

To enable measurement of current state, setting of goals and tracking of progress towards the vision, aspirations and objectives, a qualitative set of indicators were developed for each objective. These were based on the following principles:

- **Repeatable:** can be used now and for the foreseeable future to track progress.
- **Applicable:** able to be applied across a range of catchments.
- **Practical:** does not require large amounts of data that do not exist or would be very expensive to obtain.
- **Efficient:** does not require large amounts of staff or stakeholder time.
- **Collaborative:** is done with key stakeholders.

To meet these principles, a bespoke set of indicators was developed based on the water-sensitive cities benchmarking process developed by the Co-operative Research Centre for Water Sensitive Cities. This approach uses a qualitative scoring approach based on a standardised scale similar to the process used for tender evaluations. The process is intended to not only provide the final score but also support the dialogue and exploratory questioning across the wider stakeholder team involved in the scoring, as a way to increase understanding across the interdisciplinary group.

Each objective is scored on a scale from one to five at either a district scale or a catchment scale as appropriate for that objective. Each score is determined based on a suite of escalating outcome statements, with a score of five being an outcome comparable with fully meeting the objective.

As such, achieving a score of five might not always be possible. The scoring is somewhat subjective with supporting questions, definitions and source materials provided to encourage the interdisciplinary dialogue to facilitate knowledge transfer and shared awareness.

Scoring sessions are therefore intended to be undertaken in a workshop environment by a diverse group of stakeholders who are knowledgeable on at least some of the topics (but not necessarily all). These stakeholders are expected to include iwi/hapū and TRC representatives.

Each objective is assigned a score for the current state as well as goals for the three-year, 10-year and 30-year periods. These future targets are intended to align with the LTP timeframes to support ongoing evaluation of the progress towards achieving the vision, aspirations and objectives.

The district-scale objectives are intended to be measured every three years as part of the LTP cycle, while the catchment-scale objectives are intended to be measured whenever a catchment management plan is prepared and/or updated (expected to be every three-10 years depending on the amount of change occurring in the catchment).

For more information, refer to the example scoring sheet provided in Appendix B.

4. Current State and Goals

4.1 District-Scale Objectives

To understand the current state and set goals for the district-scale objectives (as described in section 3.3), workshops were held with iwi and hapū representatives, TRC and key stakeholders from NPDC on 16 August and 11 September 2023. The outcome of these workshops is given below in figure 4.1, as the agreed scores for the current state and the targets for 2026, 2033 and 2053. More details on the discussions supporting the scores and an example scoreing sheet is provided in Appendices B and C.

4.2 Catchment-Scale Objectives

As no catchment management plans have been completed yet, the catchment scale indicators have not been measured. It is expected that these, along with a weighted average will be included in future iterations of the Vision and Roadmap as they are completed. The weighted average can be considered to represent the score at a district scale for these objectives. The weighting for each catchment score will be based on the urban area within that catchment.

Current State and Targets

District-Wide Objectives

KEY - SCORES

- 1 = Significant improvement required
- 2 = Moderate improvement required
- 3 = Some improvement required
- 4 = Objective nearly achieved
- 5 = Objective achieved

Aspiration	Objective	Current State	Target in 2026	Target in 2033	Target in 2053
1 STORMWATER					
Urban stormwater is managed in a holistic way to reduce contaminants and mimic the natural water cycle minimising effects on stream flows.	1.1(a) District Plan requirements are fit for purpose to support vision, aspirations and objectives.	4	4	4	5
	1.1 (b) Engineering standards, guidelines and processes fit for purpose and staff and industry competent to ensure transition to improved stormwater outcomes.	2	3	5	5
	1.3 Treatment devices are functional and able to be maintained.	2	3	4	5
2 STREAMS AND WATERBODIES					
Our streams and water bodies, aquatic habitats and coastal environment are protected and restored to support healthy, thriving ecosystems.	2.1 District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.	3	3	4	5
3 COMMUNITY					
Our streams and water bodies are safe and accessible to all, and the value of water is recognised and celebrated, empowering communities to connect with awa.	3.1 District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.	2	3	4	5
4 PLANNING					
In partnership with Tangata whenua, we proactively plan and manage our urban areas and assets.	4.1 Tangata whenua are proactively involved in the planning and management of urban stormwater, streams and water bodies.	3	4	5	5
	4.4 An interdisciplinary and opportunity-based approach supports continuous improvement in stormwater and ensures growth is managed.	1.5	2	3	5
5 RESILIENCE					
Urban communities are resilient to flooding.	5.1 District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.	2	2	4	5
	5.2 Flooding incidents are managed to minimise risk and post-incident rehabilitation completed.	3	3	4	5

5. Stormwater Roadmap

The Stormwater Roadmap (figure 5.1) provides a series of actions and their approximate timing required to progress towards the vision, aspirations and objectives and meet the three-year and 10-year goals.

In general terms, the Roadmap is broken down into three components:

District-wide actions. (Section 5.1)

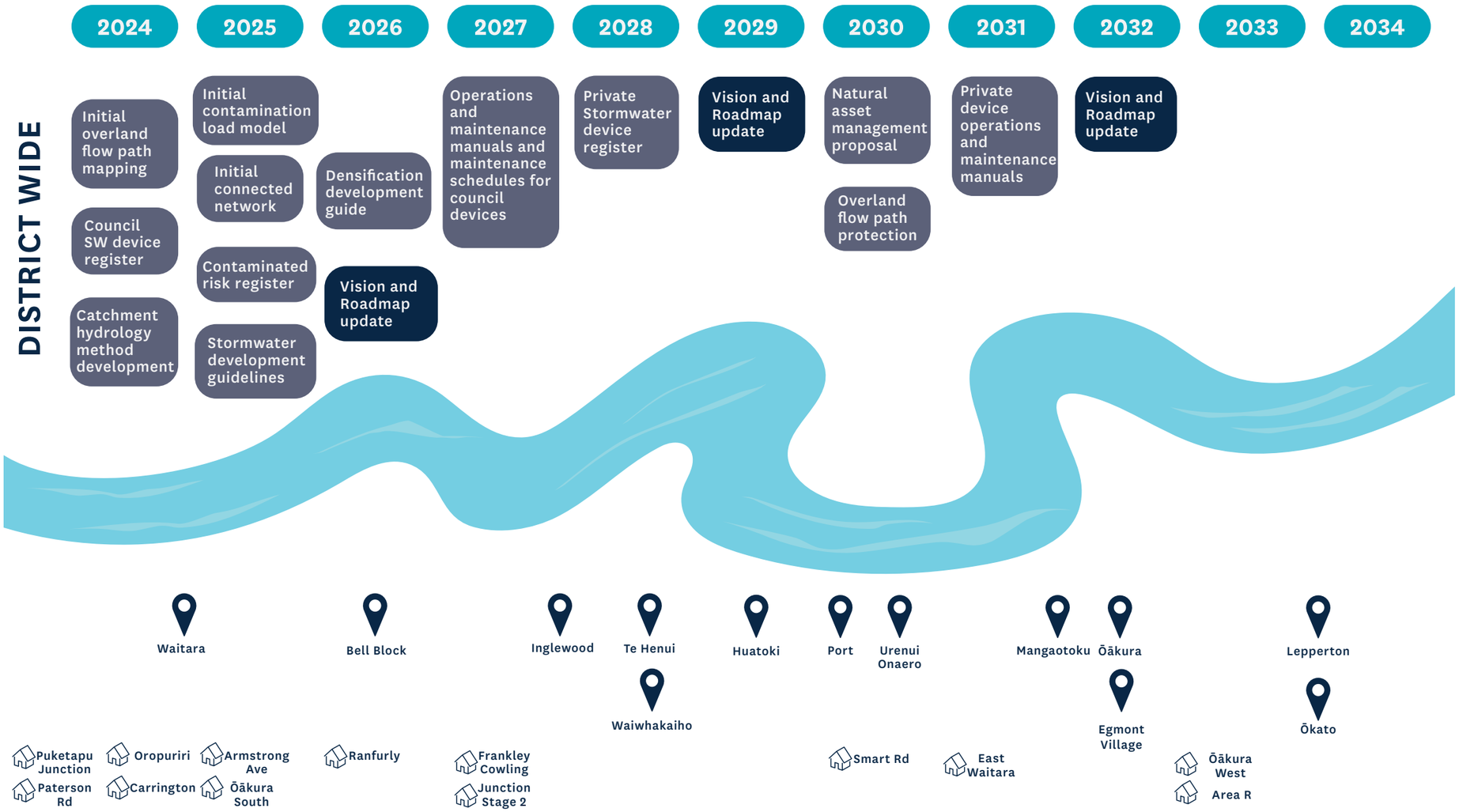
- Development of spatial registers to provide an accurate understanding of location and number of existing (and future) stormwater management elements (including built and natural assets).
- Development of guidelines and technical manuals to ensure consistency and quality.
- District-scale modelling and/or investigations to inform decision-making.
- Catchment management plans. (Section 5.2)

Pre-work for structure plans. (Section 5.3)

In addition there are a number of actions that sit outside the roadmap but are required to achieve the vision. These are grouped into two categories as follows:

- Business as usual activities (section 5.4).

Actions outside the control of the three waters team. (section 5.5).



5. Stormwater Roadmap

5.1 District-Wide Actions

These cover actions that apply at a district scale (such as development guidelines) and/or can be completed more efficiently at a district scale (such as catchment and watercourse delineation). Details of the specific actions is given in Table 5.1

Table 5.1 - Scope of the district wide actions in the Roadmap

Action	Description	Why?
Overland flow path, watercourse and catchment mapping	Mapping of overland flow paths for all of the urban areas based on LIDAR. Mapping of all watercourses and catchments in district. Subsequent refinement and field verification will take place as part of the individual catchment plans. This work is currently underway in conjunction with TRC.	Overland flow path mapping is useful in scoping hydraulic modelling and providing a quick understanding of flood risk until the more sophisticated models can be developed. Current watercourse and catchment data from NPDC and TRC is poor, leading to regulatory and operational issues.
NPDC stormwater device register	Create and populate a register of NPDC-owned stormwater treatment, detention and soakage devices. This work is underway and will also feed into potential future water reforms from the government.	These devices are currently not recognised as assets so do not receive the asset management they require.
Catchment hydrology method development	Create a consistent method for determining how rainfall (including climate change) and hydrology will be approached for hydraulic modelling. This will be used for NPDC's hydraulic models and inform the stormwater development guidelines.	To ensure the approach to modelling is consistent across the district, and informs the development guidelines.
Initial contaminent load model	Set up and run a city-wide contaminant load model. Results to be produced in geospatial form. Subsequent refinement and field verification will take place as part of the individual catchment plans.	A contaminant load model will enable us to better understand the pollution risk and address it in a targeted manner. It is most efficient to develop a regional model then refine it as part of the CMP process.
Initial connected network.	Develop a geospatial connected network by connecting overland flow paths, streams and stormwater assets. Subsequent refinement and field verification will take place as part of the individual catchment plans.	Required to undertake contaminant load modelling. Also useful for operational and educational purposes so staff and public can better understand the network.
Contamination risk register	Set up and populate a geospatial risk register (high-risk areas for contaminated runoff and high-risk activities)	Required as an input to contaminant load modelling and to better understand and address contamination risk.
Stormwater Development Guidelines - Greenfield	Guidelines to support and expand on the stormwater requirements the Land Development and Subdivision Infrastructure Standard for greenfield subdivisions (or large brownfield developments).	The Land Development and Subdivision Infrastructure Standard is currently very vague in a number of areas. These are intended to make it more clear to developers what is expected, thereby simplifying and streamlining the process for all parties.
Stormwater Development Guidelines - Densification	Guidelines to support and expand on the stormwater requirements in NZS 4404 for smaller developments where larger landscape solutions are not applicable.	The solutions for smaller developments (such as cutting off the back of a section, or building a small area of townhouses) are often quite different from large subdivisions. These are intended to make it more clear to developers what is expected in these scenarios.
Stormwater Vision and Roadmap update	Three-yearly update of this document to communicate progress and to plan by: • Providing update of actions completed or underway. • Measure progress on district-scale indicators against goals. • Update Roadmap based on work completed and improved understanding of what is required.	Helps to keep staff and stakeholders on the same page as to how we are going and the way forward. Acts as a supporting document for the LTP/AMP process.
Operation and maintenance manuals and maintenance schedules for all NPDC devices	Preparation of documents that cover the following for each asset or common asset grouping: • Purpose, function and basis of design. • Operational responsibilities. • Maintenance requirements. • Training requirements. • Potential issues and mitigation actions. Note: this will commence much earlier but is expected to take a couple of years to complete.	Required to safely and adequately operate and maintain these assets.

5. Stormwater Roadmap

Action	Description	Why?
Private Stormwater Device Register	Create and populate a register of privately owned stormwater treatment, detention and soakage devices. The scope and scale of what will be captured is TBC.	Private stormwater devices are a critical part of the stormwater network, over which NPDC has little to no visibility. They also typically receive little to no maintenance by the owner. This register is the first step in getting on top of this issue.
Natural asset management proposal	Develop a proposed approach to how we will more actively recognise and support our natural assets to perform their multitude of functions.	Natural assets such as ephemeral watercourses, streams and wetlands form an essential part of the stormwater system but receive little to no attention. This proposal is to look at options to be more deliberate about this.
Overland flow path protection	Review existing protections for overland flow paths and options to improve (if required).	Overland flow paths are a critical part of the stormwater network that are often obstructed by private infrastructure, leading to flooding. This will look at options to manage this risk.
Private device operation and maintenance manuals	Undertake educational programme to inform private device owners of what devices they have and what actions are required to operate and maintain them.	Most private stormwater devices do not receive adequate operation and maintenance intervention. This aims to make the information on what is required more easily accessible and widely known.

5.2 Catchment Management Plans

Catchment management plans (CMPs) capture the current state for each catchment and where the challenges are, and identify opportunities to address these challenges. They are primarily focused on stormwater but take an integrated view where appropriate (e.g. where there is significant inflow to and overflow from the sewer network).

Thirteen 'administrative catchments' have been identified for which CMPs will be developed. To reduce the number of CMPs that need to be developed and implemented, these administrative catchments have been created from one or more separate hydrologic catchments that share the same receiving environment. The locations of the 13 catchments are shown in Figure 5.2.

The exact location of the boundaries might be adjusted as part of technical work to define accurate catchment boundaries. It is expected to take around 10 years to develop the 13 CMPs. As such, they have been prioritised as shown in Figure 4.1. Details on the prioritisation process are given in Appendix C.

Figure 5.2: Catchment boundaries

The scope of the CMPs is restricted to the urban portions of the hydrologic catchments except where small streams extend a short distance beyond the current or future urban boundaries. These are the areas that can be controlled or managed by NPDC stormwater management planning and practice. For some catchments in New Plymouth District, significant parts of the catchments extend upstream into areas dominated by agricultural use and/or the national park where urban development is not expected in coming years.

As a territorial authority, NPDC has responsibility to manage not only the stormwater but also the land use within the urban boundary. Beyond the urban boundary, NPDC does not have regulatory responsibility for either stormwater or land use controls, which are managed by TRC. Whilst it is recognised that actions to improve freshwater outcomes need to be understood from 'mountain to sea' (ki uta ki tai), the ability to control rural land-use is limited for NPDC and therefore the focus for this Roadmap is to improve freshwater outcomes directly related to urban land.

5. Stormwater Roadmap

Each CMP is expected to include the following information:

1. Overview/Intro, Users guide

- General and statutory context, link to SVR.

2. Leading with the Past

- Historical context of the catchment.

3. Present

- Catchment context.
- Stormwater: covering the contaminant load model, condition assessment, critical assets and treatment and disposal devices.
- Streams and water bodies: covering watercourse assessment results and wastewater overflows
- Community: covering areas of cultural significance, amenity values, connections and education and safety.
- Planning: covering engagement and asset management.
- Resilience covering current flood risk and overland flow paths.

4. Future

- Climate change.
- Goals.
- Work underway and opportunities.

The CMPs will be presented in an online interactive format to enable quick navigation to areas of interest and better presentation of geospatial information. For more information on the catchment management process, refer to Appendix D.

5.3 Pre-work for Structure Plans

Structure plans are required to support and guide greenfield development to ensure it is done in a way that is sensitive to the local context. Structure plans typically consider a wide range of attributes in an integrated way, including transport, utilities, three waters, ecological constraints, amenity/landscape and sites of cultural significance.

In order to feed into this process in a timely and efficient manner, a certain amount of pre-work is required. Much of this pre-work is covered by a CMP, with additional information being a high-level options identification of approach to hydraulic neutrality and treatment. However, many of the planned growth areas are expected to be developed before their corresponding CMP will be completed. As such, these areas will require a much higher degree of pre-work. This includes:

- Hydraulic modelling to understand the flood risk from/to the development - upstream, at the development site, and downstream.
- Watercourse assessment to understand the ecological state of the catchment, key features that require protection and opportunities for improvement.
- Cultural context, values and aspirations for the catchment.
- A mix of spatially mapped locations of interest (such as natural waterbodies to be protected or clear localities for future centralised stormwater treatment).
- High-level understanding of soils and groundwater conditions.

Table 2 gives details on what structure plans are required and when. For more detail on the process and what a pre-structure plan will cover, refer to Appendix E.

Table 2: Program for pre structure plans

Growth area	Catchment	CMP completed	Development expected to commence	Pre-work for structure plan ready
Patterson Road	Huatoki	2030	2024	2023
Puketapu	Bell Block	2026	Underway	2024
Junction Stage 1	Te Henui	2029	2027	2024
Carrington	Huatoki	2028	2025	2024
Oropuriri	Waiwakaiho	2028	TBC	2024
Armstrong Ave	Waitara	2024	TBC	2025
Ōākura South	Ōākura	2032	2028	2026
Frankley Cowling	Huatoki	2029	2032	2027
Junction Stage 2	Te Henui	2028	2032	2027
Smart Road	Waiwakaiho	2028	2037	2030
East Waitara	Waitara	2024	2035	2030
Area R	Bell Block	2026	2037	2033
Ōākura West	Ōākura	2032	2037	2033

Table 2 gives key information around the areas requiring structure planning. It should be noted that the dates are indicative and highly likely to change.

5. Stormwater Roadmap

5.4 Business as usual activities

These are actions required to achieve the vision but for which specific actions with a deliverable date are not applicable. Rather they are ongoing activities that should be delivered as part of business as usual. Many of these activities already have limited funding available; however, to fully realise the vision it is likely that this would need to increase.

Technical capacity building with industry: This is currently underway through feedback on development applications and will accelerate with the roll-out of the proposed development guidelines which will include a industry education component. This includes council staff, consultants and developers.

Creation of Three Waters processes: NPDC is currently recording all its existing processes. Once this is complete, work can begin on looking at gaps and potential improvements.

Audits of stormwater devices: Once the asset register is complete and O&M manuals developed, audits can commence. These are expected to be a ongoing BAU activity.

Public education: NPDC has a three waters education programme supported by one FTE role. It is expected this would need to increase to realise the vision.

Technical capacity-building within tangata whenua: There are opportunities for NPDC to support tangata whenua capacity-building around the stormwater space. To date this has been occurring within the Waitara stormwater project and there should be more opportunities as other projects come on-line and with cadetships, etc.

Improving relationships: Relationships will always be key to getting good integrated outcomes. Significant progress has been made in this area with District Planning, open spaces planning and transport within the Council and also with NZ Transport Agency and iwi. However, further work is required to achieve the vision.

Dam safety improvements: NPDC has four flood detention dams. All require updates to their Dam Safety Management Plan and two are expected to require capital upgrades. This work is covered in the Dam Safety Regulation Compliance Strategic Outline Business Case, so is outside the scope of the Roadmap.

5.5 Strategy and process improvements

These are things required to achieve the vision but for which the current action lies outside the NPDC's Three Waters team. They are included here to emphasise their importance and the need for the Three Waters Team to be involved as part of their development.

Update of the District Plan: This could take the form of a plan update or a new Natural and Built Environment Plan to meet the requirements of the proposed Natural and Built Environments Act. This is expected to occur in the next three to seven years

Update of the Regional Freshwater and Land Management Plan: This is currently underway by TRC and expected to be notified in 2024. This will also be replaced by the Natural and Built Environment Plan.

Implementation of the Spatial Planning Act: This Act will require the development of a Regional Spatial Strategy that will assist with integrated planning. will introduce a consistent, formal framework for spatial planning. This is expected to be developed in the next three to seven years.

Stormwater consenting: A decision needs to be made as to whether we move to a global stormwater consent or remain with the current individual consents. It is expected this decision will be made as part of the update to the Regional Freshwater and Land Management Plan or the development of the Natural and Built Environment Plan. Once this decision is made the corresponding actions will move to the Roadmap.

Improvement of erosion and sediment control: There is always opportunity for ongoing improvement in this space. Overall responsibility sits with TRC, but the NPDC has a significant influence in this space. Of note is that there is currently no guidelines for erosion and sediment control in Taranaki; rather, we are defaulting to the Waikato Regional Council guidelines.

Te Mana o te Wai local interpretation: Within the National Policy Statement for Freshwater Management there is the opportunity for local interpretation of the meaning of Te Mana o Te Wai. If developed, this would assist with providing further direction towards achieving the vision.

Mana Whakahono ā Rohe: This is an agreement between councils and iwi that covers how they will work together under the Resource Management Act. The iwi and councils of Taranaki are currently working towards a common agreement for the region.

Council approach or framework for engaging with mana whenua: There is currently minimal guidance on how to engage with iwi at a project level for Council staff. Work is currently underway to develop this guidance.

Funding collaboration opportunities: NPDC's standard approach to funding (i.e. through the LTP process) makes it difficult to source funding for collaboration as they are often not able to be identified until too late in the process. The new P3M process has made significant improvements in this area and should continue to do so as it gets embedded within the Council.

Potential creation of new water entities: This presents both opportunities and risks. Key opportunities are the increased role of iwi built into the design of the organisations and an improved focus on delivery of the three waters activity. Key risks are delay while the new entities are set up, more challenges with collaboration due to the need to work across organisations and a potential change in direction/focus.

Structure plans: The Roadmap covers the pre-work required to input into a structure planning process, but not the development of the Structure plan itself as this is an interdepartmental activity. Currently there is no plan for funding or resourcing the development of these structure plans.

Changes to the Emergency Management Bill: The Government is in the process of revising the emergency management legislation to improve the outcomes in this space.

Creation of Council Processes: NPDC is currently in the process of recording all its existing processes. Once this is complete, work can begin on looking at gaps and potential improvements.

Outcomes from the East Coast and Auckland flooding: The flooding events on the east coast and in Auckland in early 2023 are expected to lead to a review and changes in how we approach these risks. This should lead to improvements in resilience.

Appendix A - Effects of urbanisation on streams and water bodies

Urban waterways are a direct reflection of the land use within catchments. The conversion of forest to modified and impermeable surfaces significantly changes stormwater volumes and flow-rates, and the human activities within catchments increase anthropogenic contaminants. The following provides a summary of the key environmental effects directly attributable to stormwater:

- Effect on the health of freshwater biota from increased temperature of stormwater inputs (particular risk with expected climate change).
- Effect on the health of freshwater biota from changes to dissolved oxygen and pH from stormwater inputs.
- Effect on the health of freshwater biota from dissolved and particulate contaminants including heavy metals, nutrients, hydrocarbons, and micro-plastics, amongst others.
- Effect on the health of freshwater biota from increased sediment (turbidity) in stormwater and from in-stream scour.
- Effect on the health of freshwater biota from increased frequency and duration of elevated flow-rates during small to moderate rainfall events, affecting the ability to feed and move through catchments.
- Effect on freshwater habitats through ongoing scour and bank instability through increased frequency and duration of elevated stormwater flow-rates during small and moderate rainfall.
- Effect on freshwater habitats from scour and collapse of stream banks from increased energy in large, infrequent peak rain events coupled with already unstable banks. Note: this is worsened through works to retain or contain flows within a fixed flow path where natural streams tend towards more dynamic lateral movement.
- Loss of shading and spawning habitat through scour and collapse of riparian margins.
- Obstruction to passage of freshwater fish species through piping of streams (including culverts) and vertical barriers.
- Proliferation of exotic and highly resilient pest species (both fish and plants) in waterbodies affected by stormwater.

The combined outcome from all or some of these effects is typically referred to as ‘urban stream syndrome’ and generally manifests as a reduction in diversity and abundance of biota (with tendency towards highly tolerant taxa), loss of riparian vegetation, and transport of contaminants to downstream coastlines and other waterbodies.

These effects will often be compounding (i.e. contaminants and flows destabilise banks and are lethal to indigenous fish, which are replaced with exotic pest species which prevent re-establishment of riparian margins, contributing to further downcutting of stream inverts and significant slumping of exposed stream banks).

These environmental effects also result in direct impacts on cultural values (such as reduced mahinga kai values) and community connection with water bodies.

Appendix B - Example method of measurement

Objective: 1.2 Areas/activities with high impact or risk are identified and managed

Rating Scale

1. There is no geospatial register in place to document the location, extent and nature of high-risk activities and land-uses. There is no education programme in place a low level of understanding, accountability and limited action towards mitigating stormwater contamination.
2. A geospatial register structure has been developed to document the location, extent and nature of high-risk activities and land-uses. It is sparsely populated, and inconsistently updated. A poorly resourced high-level education programme is in place and is applied inconsistently to a small proportion of high-risk activities. There is a limited influence towards improved awareness, accountability and responsive action across government and private sector role-players. A few remedial interventions have been identified and implemented.
3. A geospatial register is populated for most categories of site-specific and land-use sources of stormwater contamination risk and is updated occasionally. An adequately resourced and comprehensive education programme is in place and applied to a moderate proportion of activities across all risk categories. There is some influence towards improved awareness, accountability and responsive action across government and private sector role-players. A substantive list of remedial interventins has been identified with a low degree of prioritisation and implementation.
4. A geospatial register is fully populated for all categories of site-specific and land-use sources of stormwater contamination risk and is regularly updated. A well-resourced and comprehensive education programme is in place and is applied to most activities across all risk categories. A baseline survey of effectiveness has been undertaken. There is a high level of influence towards improved awareness, accountability and resposive action across government and private sector role-players. A prioritised list of remedial interventions has been established with a moderate percentage of implementation.
5. A geospatial register is fully populated for all categories of site-specific and land use sources of stormwater contamination risk. It is consistently updated. A very well resourced and comprehensive education programme is in place and applied to a high proportion of activities/land uses across all risk categories. A rolling programme and survey of effectiveness is showing good results. There is a high level of influence towards improved awareness, accountability and responsive action across government and private sector role players. A substantive and prioritised list of remedial interventions has been identified with a high percentage of implementation.

Points of consideration

Aspiration supported by a clear understanding of the location of high risk to inform prioritisation of targeted application of remedial measures.

Need to ensure:

- Allocation of appropriate capacity and resource to both develop and maintain the database.
- Develop the register in software/a system that integrates as far as possible with existing systems and processes.
- Spatial reference appropriately reflects the nature of the land use, i.e polygons for extensive land uses rather than points.
- Accessibility of the register to all staff to support engagement/ action with high-risk activities/sites.
- Summarise nature of risk to both water quality and quantity and the relationship between them.
- Education materials developed/available in a range of different methods/materials to ensure access to/use by different land-users/ sectors.

Process

Scale	Catchment
Frequency	When CMP is updated

Inputs and Resources

- Existing geospatial registers
- Existing NPDC education material/ programme
- Feedback from stormwater and regulatory staff, development and iwi
- Feedback from TRC regulatory staff
- Feedback from business groups
- Future proposed natural resources plan for Taranaki, in particular any freshwater management unit relevant limits and targets and any future developed action plans

Definitions

- **High impact/risk activities:** Landuses (e.g. roads) or activities that generate a range of contaminants and/or high pollutant loads. Land uses or activities that discharge high volumes of water or contibute to significant change in the intensity and volume of flow relative to natural conditions.
- **Water quality** - the quality of stormwater with regard to urban contaminants
- **Water quantity** - covers volume and flowrate of stormwater as managed through retention and detention

Appendix C - Current state and goals

4.1 District-Scale Objectives

Below are more details in the discussions that support the scores given in Section 4.1.

Aspiration: Urban stormwater is managed in a holistic way to reduce contaminants and mimic the natural water cycle minimising effects on stream flows.

Objective: District Plan requirements are fit for purpose and appropriately implemented.

2023: 4 2026: 4
2033: 4 2053: 5

The Proposed District Plan - Appeals Version (PDP) was considered to be comprehensive and provide the necessary guidance and tools for holistic stormwater management. Getting to 5 is expected to require a change in national regulations.

Objective: Engineering standards, guidelines and processes are fit for purpose and appropriately implemented.

2023: 2 2026: 3
2033: 5 2053: 5

The Land Development and Subdivision Infrastructure Standard was considered to be generic and require a high degree of interpretation to get good outcomes, making its success highly dependent on the competence of Council staff and developers. This is expected to improve with the creation of development guidelines for greenfields and densification in 2025 and 2026. Further progress is expected to be driven by the new entities once they are established.

Objective: Treatment devices are functional and able to be maintained.

2023: 2 2026: 3
2033: 4 2053: 5

A register of public devices is mostly populated and ownership is currently being allocated to Council departments, after which condition assessments will occur and O&M plans be created. Populating the public register is expected to take much longer.

Aspiration: Our streams and waterbodies, aquatic habitats and coastal environment are protected and restored to support healthy, thriving ecosystems.

Objective: District Plan requirements, engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.

2023: 3 2026: 3
2033: 4 2053: 5

The PDP provides a moderate level of guidance, but the regional freshwater plan has had minimal changes since it became operative in 2001. There is also minimal guidelines or processes in this space. Minimal progress is expected within three years but progress is expected once the Natural and Built Environment Act and potential future water reforms take effect.

Aspiration: Our streams and water bodies are safe and accessible to all and the value of water is recognised and celebrated, empowering communities to connect with awa.

Objective: District Plan requirements engineering standards, guidelines and processes are all fit for purpose and appropriately implemented.

2023: 2 2026: 3
2033: 4 2053: 5

The PDP provides some guidance and there are some informal practices in place to achieve this goal. Key improvement areas are mapping of streams, formalisation of esplanade strip process and better integration with TRC.

Aspiration: In partnership with Tangata whenua we proactively plan and manage our urban areas and assets.

Objective: Tangata whenua are proactively involved in the planning and management of urban stormwater, streams and water bodies.

2023: 2 2026: 2
2033: 3 2053: 5

There has been good progress in this space overthe last five years and if this continues, we are on track for a five in 10 years.

Objective: An interdisciplinary and opportunity based approach supports continuous improvement in stormwater and ensures growth is managed.

2023: 2 2026: 3
2033: 4 2053: 5

There are pockets of good practice but process is still highly informal and reliant on individuals although from a district plan perspective the requirements are there to drive this. Movement in this space will be hard and likely to be slowed initially by reform (local government and potential future water reforms).

Aspiration: Urban communities are resilient to flooding.

Objective: District Plan requirements, engineering standards, guidelines and processes are all fit forpurpose and appropriately implemented.

2023: 2 2026: 3
2033: 4 2053: 5

The District Plan has the required provisions but the current flood maps are out of date and not fit for purpose, and more information is required in the guidelines. Modelling should be completed in 10 years lifting us to a 4. Legislation change is required to reach a 5.

Objective: Flooding incidents are managed tominimise risk and post incident rehabilitationcompleted.

2023: 3 2026: 3
2033: 4 2053: 4

Have complete and up to date incident response plans but are somewhat generic due to a lack of recent experience and hydraulic models. Proactive maintenance does occur but could be improved. Resourcing is for BAU not emergencies but have informal resource sharing with other organisations. Updated models is expected to improve things over a 10-year timeframe.

Appendix D - Catchment Prioritisation

A multi-criteria analysis process was used to prioritise the 13 catchments. For each aspiration, questions were developed that could be scored to provide an indication of how much of a priority a catchment management plan was for each catchment. Guidance on answering the questions, along with supporting information, was also prepared and sent out to the following key stakeholders in October 2022:

- Ngāti Mutunga.
- Te Kāhui o Taranaki.
- Ngā Mahanga.
- Ngāti Tairi.
- Te Kotahitanga o Te Atiawa.
- Manukorihi.
- Ngāti Rahiri.
- Ngāti Tawhirikura.
- Ngāti Te Whiti.
- Otaraua.
- Pukerangiora.
- Puketapu.
- Taranaki Regional Council.
- NPDC - three waters, district planning and development engineers and open spaces planning.

To support this scoring process, one group hui and additional one-on-one hui were held during October and November 2022 with the various stakeholders to:

- Agree the relative weightings for each question/ criteria.
- Agree the proposed final score for each question for each catchment.
- Identify any modifying factors such as specific risks or opportunities that would suggest the prioritisation of a particular catchment should be adjusted.
- Agree on the proposed final catchment prioritisation.

The results of this process were then distributed to NPDC and TRC stakeholders for comment and modification as required.

Criteria Weightings

The final weightings for the scoring criteria are shown in Figure C-1, with the individual criteria weighting proposed by representatives shown in Table C-1.

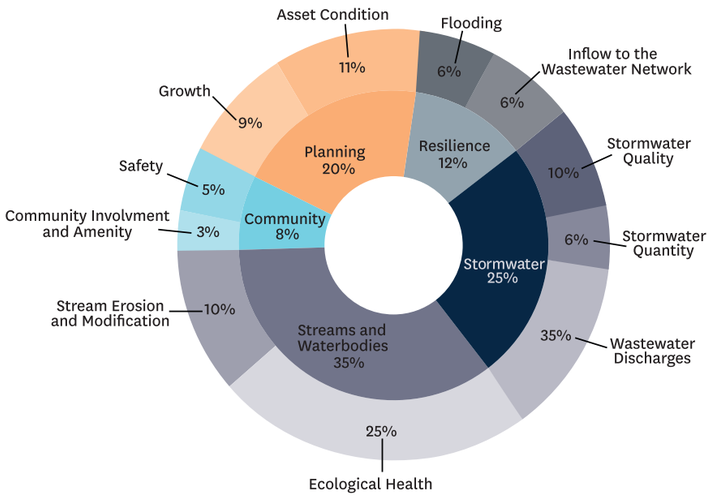


Figure C-1: Final Scoring Criteria Weightings

Aspiration	Stormwater				Streams and water bodies			Community			Planning			Resilience		
Stakeholder	Aspiration Weighting	Stormwater Quality	Stormwater Quantity	Wastewater Discharges	Aspiration weighting	Ecological health	Stream erosion and modification	Aspiration weighting	Community involvement and amenity	Safety	Aspiration weighting	Growth	Asset condition	Aspiration weighting	Flooding	Inflow to the wastewater network
NPDC	20	40	35	25	25	70	30	15	30	70	15	60	40	25	70	30
Otaraua	30	80	5	15	30	90	10	5	20	80	20	30	70	15	40	60
Ngā Mahanga	30	25	25	50	30	75	25	5	20	80	25	40	60	25	50	50
Manukorihi	47.5	50	0	50	47.5	100	0	0			0			5	50	50
Puketapu	25	20	30	50	30	50	50	10	50	50	25	50	50	10	20	80
Puketapu	7	30	50	20	40	50	50	6	50	50	40	50	50	7	50	50
Average	26.6	41	24	35	33.8	72.5	27.5	6.8	34	66	20.8	46	54	12	47	53
Final	25	40	25	35	35	72	28	8	34	66	20	46	54	12	47	53

Table C-1: Criteria Weighting Proposed by Representatives *This table includes two weightings from Puketapu Representatives

Scores

The final aggregated score shown in Figure C-2 was reached using the following approach:

- The final scores were selected using judgement as it was not considered practical to workshop the 143 scores individually. Taking the average was not used as iwi typically had only one or two scores per catchment vs four or five NPDC and TRC meaning iwi opnion would have been under-represented.
- Where there were discrepancies between scores from different NPDC teams or TRC, additional consideration was given to the team that was best placed to speak on that subject (e.g. district planning for growth and three waters for flooding).

In general, there was a high degree of consistency between the scores with broad agreement on the final prioritisation for the development of catchment management plans.

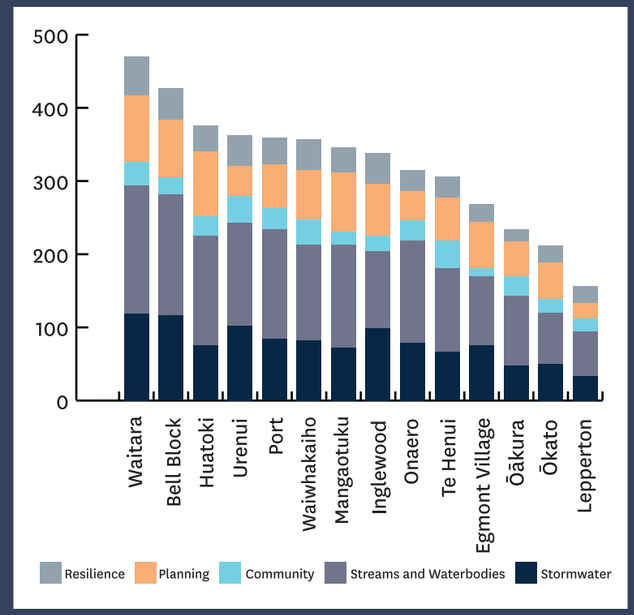


Figure C-2: Final Catchment Scores

Appendix D: Catchment prioritisation

Modifying Factors

Modifying factors were identified for two catchments, Waiwhakaiho and Inglewood, at the hui on 24 November 2022, as follows:

Inglewood – there is a number of issues with overflows from the sewer during wet weather in this catchment that NPDC is currently looking to solve. Solving these is likely to require addressing inflow to the wastewater network caused by stormwater flooding and/or cross-connections installed due to the lack of adequate stormwater system. These issues are highly interrelated to the stormwater system. As a result, this catchment was moved to priority 3.

Waiwhakaiho – this catchment has a large growth area (Smart Road) that discharges to a sensitive and flood-prone stream (Mangaone).Development of this catchment is expected to commence in around 10 years so the CMP for this area should be completed within the next five years to allow adequate planning to occur. As a result, this catchment was moved to priority 5.

These modifications were discussed and received unanimous approval.

The proposed ranking and justification behind it were then sent to TRC and the NPDC three waters, district planning, development engineers and open spaces planning teams for comment. No changes were proposed by any of these stakeholders.

Subsequent to this, a further modifying factor arose as follows:

Te Henui – within Te Henui catchment is a high potential impact classification (PIC) flood detention dam. This dam was designed as an attenuation bund in 2006; however, changes to the guidelines have resulted in it being reclassified to a high PIC dam and therefore subject to more stringent requirements. There is a moderate to high probability that a complete rebuild of this dam will be required to meet the requirements of a high PIC dam at an estimated cost of $5m-$20m. There are also more immediate concerns with the risk posed by inadequate spillway capacity. To address these concerns, it is proposed to take a whole of catchment approach to better understand the need for the dam and if there is a better way to achieve the desired flood prevention outcomes. To do this will require a CMP, which provides opportunities to seek feedback and engage with stakeholders including iwi/hapū, communities and Council representatives. As a result, this CMP has been moved to priority 4.

Final Ranking

Based on the collaborative ranking process, the final order for delivery of CMPs is as follows:

1. Waitara (currently underway, due late 2023).
2. Bell Block.
3. Inglewood.
4. Te Henui.
5. Waiwhakaiho.
6. Huatoki.
7. Urenui and Onaero.
8. Port.
9. Mangaotuku.
10. Egmont Village.
11. Ōākura.
12. Ōkato.
13. Lepperton

Appendix E - Process for developing catchment management plans

CMPs are to be developed sequentially in a process that reflects the unique biophysical, ecological, cultural and development context of respective catchments. The CMP process is intended to develop a plan of actions that reflect the historical (both environmental and cultural) context of the catchments and a well-informed understanding of the existing conditions (in terms of infrastructure and environmental factors), and then use these to develop a plan for long-term actions to protect and enhance outcomes to support progression towards the district-wide vision, aspirations and objectives. The list below provides a high-level summary of the steps required to develop CMPs in the urban catchments of New Plymouth District. Whilst these steps are largely sequential, there will be benefits in undertaking some tasks, or parts thereof, in parallel. These steps are in part based on the ongoing work with the development of the Waitara Catchment Management Plan and may be refined as that process progresses in coming months.

The key steps to deliver a CMP are as follows:

1. Establish interdisciplinary project team and catchment specific iwi/hapū representatives to support the CMP.
2. Facilitate hui and wānanga with iwi/hapū and stakeholder group to discuss process and intent for the CMP process. This is an important step to ensure a shared understanding of what the CMP is/isn't and how a partnership between the CMP development team and iwi/hapū can support a CMP grounded in local context and a sense of place.
3. Undertake modelling and/or compile existing data to provide a stocktake of existing background knowledge relating to stormwater.

This will include:

- Outputs of catchment-wide flood modelling (to be undertaken prior to commencement of the CMP).
- Available digitised stormwater asset data including pipes, outfalls, pump stations and any pre-existing stormwater management devices such as detention, soakage or water quality treatment devices.
- Existing open water bodies including streams/rivers, springs, wetlands and natural ponds/lakes. Any pre-existing information on sites of particular ecological value is important to understand at this stage.
- Mapped overland flow paths (OLFPs) for the existing landform (to be undertaken across the district prior to commencement of CMP).
- Mapped urban land use including land cover (generated as part of flood modelling) and expected urban growth (greenfield and brownfield).
- Any available data on agreed sites of significance to mana whenua.
- Any available data on sites of community significance such as recreation locations, food collection or other.
- Any available data from recent community engagement.
- Available historical maps and/or photographs and, where possible, information on current or historic waterway names.

4. Facilitate series of hui and wānanga with iwi/hapū and nominated stakeholders to provide local knowledge, share stories and get understanding of existing issues and identified opportunities for improvement.

Appendix E - Process for developing catchment management plans

5. Undertake comprehensive watercourse assessment across full reach of all remaining open waterways and headwater springs/ wetlands. Watercourse assessments to be undertaken by combined ecology and engineering team and, where able, should include representatives from mana whenua.
6. Create connected network to link open waterways with piped reaches and outfalls to environment and prepare interactive mapping including stormwater assets, open waterways, overland flow paths and any other key features.
7. Undertake focused on-ground inspection of key 'problem' areas across the catchment including areas of flooding (based on modelling and community input), CMP-specific analysis, and including (but not limited to):
   - Watercourse assessment.
   - Contaminant load modelling.
   - Overland flow path mapping.
   - Connected network analysis.
8. Develop long lists of existing catchment values, issues and opportunities against the five aspiration categories (stormwater, streams and water bodies, community, planning, and resilience). These will be a mix of spatially specific and general catchment-scale items with variable levels of financial or time commitment to implement.
9. Geospatially map (where appropriate) identified values, issues and opportunities for communication and engagement
10. Facilitate hui/wānanga to report back on findings and rationale behind opportunities and alignment with aspirations (noting that many opportunities will respond to more than one aspiration). Feedback to be sought on any gaps or omissions and gain an understanding of the prioritisation of opportunities with consideration of co-benefits (i.e. supports multiple aspirations), ability to implement in timely fashion (such as consideration of land ownership), and financial costs.
11. Based on feedback and prioritisation of opportunities, refine to a synthesised list of itemised actions that can be implemented in short, medium and long term. Actions are not intended to be highly developed and will be a mix of problem statements to be resolved (e.g. develop engineered solution in area to accommodate overland flow paths in a safe manner to alleviate ongoing flood) to more specific projects (e.g. design integrated stormwater treatment, attenuation and ecological enhancement in certain location). Actions may also be non-physical such as recommended policy or planning guidance to provide appropriate protection (such as catchment-specific riparian setbacks in a greenfield development area).
12. Present overall CMP, including background analysis and actions plan, in an interactive web-based format with emphasis on communicating with non-technical audience.

Appendix F: Process for developing pre-structure plans.

The following steps are required to be followed in defining the stormwater aspects of structure plans:

1. Define structure plan area and demarcate natural hydrological catchments.
2. Map all existing natural water bodies including waterways (perennial and intermittent), wetlands, springs and floodplains. Where watercourse assessment data exists or recorded fish surveys are available, they shall be included in the mapping.
3. Engage with iwi/hapū to get an understanding of any cultural sensitivities and values as they relate to the structure plan area and wider catchment. The form of this engagement shall be guided by iwi/ hapū and could involve hui, hikoi or storytelling. Clear agreement on any sharing of cultural information must be sought.
4. Map all existing terrestrial indigenous vegetation areas and remnant ecological linkages.
5. Map all known flood extents and overland flow paths (based on existing landform).
6. Seek understanding of likely development typology including land use (residential vs industrial), density and any major transport or utility corridors.
7. Get early feedback from wider Council teams with vested interest in land development, including parks, transport and three waters, to understand any pre-determined elements to be factored in planning or preferences.
8. Document and seek agreement on structure plan performance outcomes, which shall be prepared to achieve intended outcomes of NPDC vision, aspirations and objectives.
9. Where appropriate, map locations of preferred locations for major centralised stormwater assets such as constructed wetlands, detention storage, consolidated raingardens and significant OLFPs.
10. Map all existing natural features to be protected, including buffers, to protect and enhance ecological and cultural values.
11. Develop and document a suite of standards, rules and performance metrics to be encapsulated in subsequent development planning. This may include (amongst others): variable riparian setbacks, provision of on-lot management (such as soakage and rainwater reuse), required integrated water quality treatment elements, development scale flood detention, ecological restoration objectives, water-sensitive urban design principles, and any other integrated water considerations that need to be factored into subsequent works (such as any development-scale stormwater harvesting or decentralised wastewater treatment).
12. Document any required further works to close knowledge gaps such as ecological health monitoring and working with private land holders.
13. Prepare/update brief technical method documents to detail steps employed to undertake any CMP-specific analysis, including (but not limited to):
    - Watercourse assessment.
    - Contaminant load modelling.
    - Overland flow path mapping.
    - Connected network analysis.