



TE KAUNIHERA-Ā-ROHE O TARATAHI
CARTERTON
DISTRICT COUNCIL

AGENDA

Ordinary Council Meeting

Date: Wednesday, 12 May 2021

Time: 1:00pm

**Location: Carterton Events Centre
50 Holloway Street
Carterton**

Mayor G Lang

Deputy Mayor R Vergunst

Cr R Cherry-Campbell

Cr S Cretney

Cr R Keys

Cr R Stockley

Cr B Deller

Cr J Greathead

Notice is hereby given that an Ordinary Meeting of Council of the Carterton District Council will be held in the Carterton Events Centre, 50 Holloway Street, Carterton on:

Wednesday, 12 May 2021 at 1:00pm

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1 KARAKIA TIMATANGA

Mai i te pae maunga, raro ki te tai

Mai i te awa tonga, raro ki te awa raki

Tēnei te hapori awhi ai e Taratahi.

Whano whano, haramai te toki

Haumi ē, hui ē, tāiki ē!

2 APOLOGIES

3 CONFLICTS OF INTERESTS DECLARATION

4 PUBLIC FORUM

5 COBBLESTONES ACTIVITY UPDATE

6 CONFIRMATION OF THE MINUTES



6.1 MINUTES OF THE ORDINARY COUNCIL MEETING HELD ON 17 MARCH 2021

1. RECOMMENDATION

1. That the Minutes of the Ordinary Council Meeting held on 17 March 2021 are true and correct.

File Number: 127438

Author: Casey Spencer, Democratic Services Coordinator

Attachments: 1. Minutes of the Ordinary Council Meeting held on 17 March 2021

**MINUTES OF CARTERTON DISTRICT COUNCIL
ORDINARY COUNCIL MEETING
HELD AT THE CARTERTON EVENTS CENTRE, 50 HOLLOWAY STREET, CARTERTON
ON WEDNESDAY, 17 MARCH 2021 AT 4:05PM**

PRESENT: Mayor Greg Lang, Deputy Mayor Rebecca Vergunst, Cr Robyn Cherry-Campbell (by video link), Cr Steve Cretney, Cr Brian Deller, Cr Jill Greathead, Cr Rob Stockley

IN ATTENDANCE: Jane Davis (Chief Executive), Dave Gittings (Infrastructure, Services and Regulatory Manager), Geri Brooking (People and Wellbeing Manager), Carrie Mckenzie (Community Services Manager), Paul Crimp (Corporate Services Manager), Geoff Palmer (Accountant), Elisa Brown (Communications and Engagement Coordinator), Casey Spencer (Democratic Services Coordinator).

1 KARAKIA TIMATANGA

The meeting was opened with a Karakia lead by Cr Rob Stockley.

2 APOLOGIES

An apology was received from Cr Russell Keys.

Cr Steve Cretney / Deputy Mayor Rebecca Vergunst

CARRIED

3 CONFLICTS OF INTERESTS DECLARATION

Deputy Mayor Rebecca Vergunst. Item 7.3

4 PUBLIC FORUM

Jude Engel addressed the Council regarding the condition of Borlase Road.

5 YOUTH COUNCIL VIEWS ON AGENDA ITEMS

The Youth Council did not attend the meeting.

6 CONFIRMATION OF THE MINUTES

6.1 MINUTES OF THE ORDINARY COUNCIL MEETING HELD ON 27 JANUARY 2021

MOVED

That the Minutes of the Ordinary Council Meeting held on 27 January 2021 are true and correct.

Cr Jill Greathead / Cr Brian Deller

CARRIED

7 REPORTS

7.1 ADOPTION OF THE CONSULTATION DOCUMENT FOR THE TEN YEAR PLAN 2021-2031

PURPOSE

For the council to adopt the Consultation Document for the Draft Ten Year Plan 2021–2031, and the adoption of the supporting information.

John Whittal from Audit New Zealand attended the meeting by video link to talk to his report.

MOVED

That the Council:

Receives the report.

Notes the Draft 2021-2031 Ten Year Plan budgets do not meet the Local Government Act balanced budget benchmark in the first three years, and this will be recovered over the remaining years of the ten years.

Resolves that the unbalanced budget over the first three years is prudent and is the fairest way to lessen the impact of average rate rises created by asset revaluations and completion of large wastewater capital works.

Adopts the supporting information for the 2021-2031 Draft Ten Year Plan Consultation Document, including the Draft 2021-2031 Ten Year Plan, Draft 2021-2031 Financial Strategy and Draft 2021-2051 Infrastructure Strategy, in Attachment 2.

Adopts the 2021-2031 Draft Ten Year Plan Consultation Document in Attachment 1, with any changes arising from the audit.

Authorises the Mayor and Chief Executive to approve any minor amendments that may be necessary following the Audit Report.

Approves the engagement process set out in Section 7 of this report.

Notes the concurrent engagement process on the Draft Wellington Regional Growth Framework.

Cr Robyn Cherry-Campbell / Cr Jill Greathead

CARRIED

7.3 RANGATAHI TO RANGATIRA REPORT ON ACTIVITIES

PURPOSE

For the council to receive a report on activities of R2R.

Dallas Te Rangi, Simone Grayson and Kasha McKinley-Cross from Rangatahi to Rangatira attended the meeting to speak to this report.

MOVED

That the Council:

Receives the report.

Notes that Cr Steve Cretney will liaise with Rangatahi to Rangatira with the view to a potential future appointment to the Trust.

Cr Brian Deller / Cr Rob Stockley

CARRIED

7.2 WAIRARAPA SOLID WASTE BYLAW 2021

PURPOSE

For the council to adopt the Wairarapa Solid Waste Management and Minimisation Bylaw and Bylaw Controls 2021 (**Attachments 1 and 2**) subject to adoption by the Masterton and South Wairarapa District Councils. In addition to this, Council is asked to agree to recommendations made by the Wairarapa Policy Working Group.

MOVED

That the Council:

Receives the report.

Adopts the final Wairarapa Solid Waste Management and Minimisation Bylaw and Bylaw Controls 2021 (Attachments 1 and 2) as recommended by the Wairarapa Policy Working Group, with the following amendment, and subject to adoption by the Masterton and South Wairarapa District Councils:

"Clause 6 Interpretation

- a) Add the following waste hierarchy definition as an additional reference: *"a list of waste management options with decreasing priority – usually shown as reduce, reuse, recycle, reprocess, treat, dispose."*

Agrees to the following recommendations made by the Wairarapa Policy Working Group, and subject to agreement by the Masterton and South Wairarapa District Councils:

- a) Councils will ensure that the compliance, monitoring and enforcement of the Wairarapa Solid Waste Management and Minimisation Bylaw and Bylaw Controls 2021 are sufficiently resourced;

- b) Councils will consider possible incentives and support for diversion when developing the regional licensing fee structure;
- c) The diversion of resources from landfill operations will be considered when developing the waste operator licensing framework;
- d) Councils will ensure that there is information available and communicated to operators clarifying that the waste operator licensing in the Wairarapa Solid Waste Management and Minimisation Bylaw 2021 is additional licensing to the offensive trade licensing;
- e) Councils will continue to encourage all event managers to consider waste minimisation and will provide advice and assistance with recycling and waste bin hire;
- f) Councils will continue to better promote and educate on the benefits of waste minimisation plans for events of all sizes;
- g) Councils will look at ways in which better waste management and minimisation education and promotion can be targeted at the building/construction sector;
- h) Councils will look at ways to better provide waste management and minimisation education and promotion for businesses and the wider community;
- i) Councils will look at ways to better promote and provide education about recyclable materials for hardcopy advertising/mail;
- j) Councils will encourage residents to use signage on their letterboxes to reduce the receipt of unaddressed mail or advertising mail.

Agrees to the following recommendations made by the Wairarapa Policy Working Group, and subject to agreement by the Masterton and South Wairarapa District Councils, regarding the scheduled Wellington Region Waste Management and Minimisation Plan 2017-23 Review:

- a) that the issue of banning unaddressed mail and advertising material (including inserts in community newspapers) is considered as part of the scheduled Wellington Region Waste Management and Minimisation Plan 2017-23 Review;
- b) that the event definition in Clause 6 Interpretation and Clause 12 Events of the Wairarapa Solid Waste Management and Minimisation Bylaw 2021 be considered as part of the scheduled Wellington Region Waste Management and Minimisation Plan 2017-23 Review, with a view to reducing the number of event attendees required to trigger an event waste minimisation plan and waste analysis report;
- c) that *Clause 2.9 Construction Site and Demolition Waste Management Plans* of the Wairarapa Solid Waste Management and Minimisation Bylaw Controls 2021 be considered as part of the scheduled Wellington Region Waste Management and Minimisation Plan 2017-23 Review, with a view to reducing the value required to submit a Construction Site and Demolition Waste Management Plan.

Deputy Mayor Rebecca Vergunst / Cr Jill Greathead

CARRIED

7.4 DESTINATION WAIRARAPA REPORT OCTOBER TO DECEMBER 2020**PURPOSE**

For the council to receive a report on activities from October to December 2020.

MOVED

That the Council:

Receives the Destination Wairarapa report on activities.

Notes the outstanding work of Destination Wairarapa during the COVID-19 pandemic.

Cr Rob Stockley / Deputy Mayor Rebecca Vergunst

CARRIED

7.5 RE-CLASSIFICATION OF KENT STREET FROM LOW VOLUME TO LEVEL ONE**PURPOSE**

For the council to alter the classification of Kent Street from a Low Volume to Level One.

MOVED

That the Council:

Receives the report

Notes the additional information regarding Kent Street vehicle counts

Agrees to the Classification of Kent Street to be a Level One Road

Cr Robyn Cherry-Campbell / Cr Brian Deller

CARRIED

7.6 CHIEF EXECUTIVE ROLE RECRUITMENT PROCESS

PURPOSE

For the Council to approve the proposed process for recruiting a new Chief Executive, as required by Section 42 and Schedule 7 of the Local Government Act.

MOVED

That the Council:

Receives the report.

Establishes a Chief Executive Recruitment Committee and **adopts** the Terms of Reference for the Committee in **Attachment 1**.

Appoints Mayor Lang, Deputy Mayor Vergunst, Cr Cherry-Campbell (Chairperson), Cr Keys, and Mr Rawiri Smith to the Chief Executive Recruitment Committee.

Agrees the engagement of a recruitment consultancy through a simple and proportionate tendering process.

Notes the opportunities the full Council will have in the recruitment process, including a full Council preferred candidates' interview and final appointment decision.

Cr Steve Cretney / Cr Rob Stockley

CARRIED

7.7 APPOINTMENT OF DEPUTY CHAIR, POLICY AND STRATEGY COMMITTEE

PURPOSE

For the council to appoint a Deputy Chair of the Policy and Strategy Committee.

MOVED

That the Council:

Receives the report.

Appoints Councillor Cherry-Campbell as Deputy Chair of Policy and Strategy Committee.

Deputy Mayor Rebecca Vergunst / Cr Jill Greathead

CARRIED

7.8 LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT REQUESTS

PURPOSE

To inform the Council of the number of requests under the Local Government Official Information and Meetings Act (LGOIMA) 1987 received between 19 January 2021 and 9 March.

MOVED

That the Council:

Receives the report.

Cr Brian Deller / Cr Rob Stockley

CARRIED

7.9 ELECTED REPRESENTATIVE ACCOUNTABILITY REPORT

PURPOSE

To provide a report on elected members' activities since the last Council meeting.

MOVED

That the Council:

Receives the report.

Notes the elected members' activities.

Cr Steve Cretney / Cr Jill Greathead

CARRIED

7.10 CHIEF EXECUTIVE'S REPORT

PURPOSE

To inform Council of officers' activities since the previous meeting (since December 2020).

MOVED

That the Council:

Receives the report.

Cr Robyn Cherry-Campbell / Cr Rob Stockley

CARRIED

8 EXCLUSION OF THE PUBLIC

Nil

9 KARAKIA WHAKAMUTUNGA

The meeting was closed with a Karakia lead by Cr Rob Stockley.

The Meeting closed at 5:51pm.

Minutes confirmed:

Date:

DRAFT

7 REPORTS



7.1 DECLARATION BY ELECTED MEMBER

1. PURPOSE

For the newly elected member to make his declaration, as required by clause 14 of Schedule 7 of the Local Government Act 2002.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

A by-election was held in April 2021, following the resignation of Councillor Bertram. The declaration of the result was made on 4 May 2021. The successful candidate was Dale Williams.

The Local Government Act 2002 requires every member of a local authority, following his or her election, to make a declaration before that person is able to act, i.e. make formal decisions. This declaration needs to be made orally and a written version signed.

The declaration also needs to be witnessed. In accordance with the legislation the Mayor witnesses the declaration by each councillor.

4. DECLARATION

The following is the required declaration which Councillor Williams is to read.

I, **DALE WILLIAMS**, declare that I will faithfully and impartially, and according to the best of my skill and judgment, execute and perform, in the best interests of the Carterton District, the powers, authorities, and duties vested in, or imposed upon, me as a member of the Carterton District Council by virtue of the Local Government Act 2002, the Local Government Official Information and Meetings Act 1987, or any other Act.

5. RECOMMENDATION

There are no recommendations.

File Number: 127336

Author: Jane Davis, Chief Executive

Attachments: Nil



7.2 CHANGES TO THE ARRANGEMENTS FOR MARAE REPRESENTATIVES ON COUNCIL COMMITTEES

1. PURPOSE

For the council to consider full voting rights for Hurunui-o-Rangi Marae representatives on Council's committees, and to consider payments for the representatives.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

The Council has recognised the Hurunui-o-Rangi Marae as the principle mana whenua entity in the District. Over a number of years, the relationship between the Marae and Council has developed and grown. The Council and Hurunui-o-Rangi Marae have a Memorandum of Understanding (MOU) that defines the relationship between the two. The current MOU, signed in 2017, provides for Marae representatives to sit on committees and sit at the Council meeting table. There is also a provision for the Council to provide a grant to the Marae to enable the marae to participate in Council activities and assist the Council with various events, such as citizenship ceremonies and powhiri.

At the start of the 2019-2022 Triennium the Council appointed Marae representatives to the following Council committees:

- Policy and Strategy
- Infrastructure and Services
- Audit and Risk

The appointments did not include voting rights.

Over the past few months, the Council and Marae Trust Board have been reviewing the MOU, with a view to amending it to reflect growth in the partnership. Amongst the provisions the Council is supporting is enhancing the Marae's opportunity to participate in the Council's decision-making. This includes inviting the Marae's representatives on its committees to exercise full voting rights. This cannot be extended to the representatives who sit at the Council meeting table because provisions of the Local Government Act do not allow anyone other than an elected member to vote.

4. DISCUSSION

The two provisions in the draft MOU being negotiated that would support the Marae's enhanced participation in Council decision-making are voting rights and payments to support attendance at formal meetings. While the MOU is still to be finalised, there are benefits of bringing these two provisions forward, ahead of signing.

The Council's relationship with the Marae has developed considerably over the past few years and is now at a point where the Council has a strong desire to extend the formal aspects of that relationship. Extending committee voting rights is a significant statement of the relationship and the commitment the Council has to the partnership.

Providing funding to support Marae representatives to attend meetings is fundamental to enabling those people to participate fully in the Council's committees. Under the current arrangements the Council's grant to the Marae does not fully cover the personal costs of the representatives participating in the Committees. By introducing payments, the Council is recognising the costs to individuals and the value those representatives add to decision-making. The payments would apply to Marae representatives attending both Committee meetings and Council meetings, as well as workshops.

The quantum of payment is recommended to be \$180 per full day (i.e. over 4 hours) and \$90 per half day (or part thereof). These rates have been benchmarked against other Councils' payments and reflect a fair payment for the time and travel involved for individuals, including reading agendas and reports ahead of meetings.

By bringing in these two changes, ahead of the MOU being finalised and signed, the Council is making a statement about the value of its relationship with the Marae.

The Marae also have an ongoing invitation to have representatives attend Council's working party meetings. It is not proposed to remunerate for attendance at those for a. They are not decision-making groups and other community groups have representatives at the meetings, none of whom are remunerated by the Council.

5. OPTIONS

The Council has the option of delaying the new committee meeting arrangements until the MOU is finalised and signed. However, for the reasons outlined above it is appropriate to adopt the changes now.

6. NEXT STEPS

If the Council supports the recommendations then the Chief Executive will make arrangements with the Marae's representatives to action the payments system.

7. CONSIDERATIONS**7.1 Climate change**

N/A

7.2 Tāngata whenua

The proposed changes align with the Council's obligations under the Local Government Act to provide opportunities for Maori to contribute to its decision-making processes.

7.3 Financial impact

There will be a small financial impact of the introduction of metering attendance payments. Provision will be made in the 2021/2022 budgets if the payment is approved. The payments for the balance of the current financial year can be met within existing budgets.

7.4 Community Engagement requirements

The proposed changes are consistent with the Council's obligations under the Local Government Act. There would not be any benefit to the Council of engaging the community on the proposal and there are no obligations under the Act to consult.

7.5 Risks

There are no identifiable risks associated with the recommendations.

8. RECOMMENDATION

That the Council:

1. **Receives** the report.
2. **Notes** the Council and Hurunui-o-Rangi Marae are renegotiating the current Memorandum of Understanding between the parties, reflecting the that relationship has developed since the current MOU was signed in 2017.
3. **Agrees** to amend the Terms of Reference for the following Committees to provide for Hurunui-o-Rangi Marae representatives to have full voting rights:
 - i. Audit and Risk Committee
 - ii. Policy and Strategy Committee
 - iii. Infrastructure and Services Committee.
4. **Agrees** to remunerate Hurunui-o-Rangi Marae representatives attending full Council meetings, Council workshops and meetings and workshops for the following committees:
 - a. Audit and Risk Committee
 - b. Policy and Strategy Committee
 - c. Infrastructure Services Committee.
5. **Agrees** to set the remuneration for Hurunui-o-Rangi Marae representatives at \$180 per full day (i.e. over 4 hours) and \$90 per half day (or part thereof).
6. **Notes** that Hurunui-o-Rangi representatives attending Council Advisory Group meetings will not be eligible for remuneration.

File Number: 125104

Author: Jane Davis, Chief Executive

Attachments: Nil



7.3 CHANGES TO COMMITTEE TERMS OF REFERENCE AND APPOINTMENTS

1. PURPOSE

For the council to amend the Terms of Reference of the Policy and Strategy and Community Grants Committees and appoint the newly elected member (Dale Williams) to committees and other positions.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. CHANGES TO TERMS OF REFERENCE

The Council, at the beginning of the Triennium, established a number of committees and in doing so adopted committee Terms of Reference. The Council reviewed the committee structure at the Council meeting on 28 October 2020. No changes were made to the structure or the committee Terms of Reference at that time.

Elected members have recently reconsidered the Committee Terms of Reference. In **Attachment 1** are the current Policy and Strategy and Community Grants Committee Terms of Reference, with changes proposed.

The change proposed to the Community Grants Committee Terms of Reference extend the committee by one member. This is to enable the committee to more comfortably cover conflicts of interest which often arise with grants requests.

The proposed Policy and Strategy Committee changes amend the Terms of Reference to explicitly state that the Committee can adopt policy changes. There are some statutory policies that the Council cannot, under legislation, delegate to a Committee to adopt. This is provided for in the amended wording for the Policy and Strategy Committee.

In **Attachment 2** is the policy review programme the Policy and Strategy Committee is working through.

4. APPOINTMENT OF NEWLY ELECTED MEMBER

Dale Williams was elected to the Council in the by-election just completed. It is recommended that he be appointed to the following committees, which are currently carrying vacancies following the resignation of Councillor Bertram:

- Audit and Risk Committee

- Rural Travel Fund Committee
- Carterton Community Grants Committee
- RSA Grants Committee
- Wairarapa Library Committee.

I also recommend Dale be appointed to the following advisory groups:

- Economic Development Advisory Group.

All elected members also hold portfolios, and I recommend Dale hold the following portfolios:

- Rural (Deputy Portfolio Leader)
- Finance (Deputy Portfolio Leader).

5. CONSIDERATIONS

5.1 Climate change

Climate change is not directly relevant to the decisions in this report. Climate change considerations will inform any policies being reviewed or developed by the Committee.

5.2 Tāngata whenua

Considerations relevant to tāngata whenua will be considered by the Committee as policies are developed or reviewed.

5.3 Financial impact

There are no financial impacts arising from the decisions in this report.

5.4 Community Engagement requirements

There are no consultation requirements associated with the decisions in this report.

5.5 Risks

There are no identifiable risks associated with the decisions in this report.

6. RECOMMENDATION

That the Council:

1. **Receives** the report.
2. **Agrees** to amend the Terms of Reference for the Policy and Strategy Committee, in **Attachment 1**.
3. **Appoints** Councillor Dale Williams to the following Committees:
 - i. Audit and Risk Committee
 - ii. Rural Travel Fund Committee
 - iii. Carterton Community Grants Committee
 - iv. RSA Grants Committee
 - v. Wairarapa Library Committee.
4. **Appoints** Councillor Williams to the Economic Development Advisory Group.

5. **Agrees** that Councillor Williams hold the following deputy portfolio leader roles:

- i. Rural
- ii. Finance.

File Number: 127393

Author: Greg Lang, Mayor

Attachments:

- 1. Proposed Changes to Committee Terms of Reference [↓](#)
- 2. Policy Review Schedule [↓](#)

Policy and Strategy Committee

Terms of Reference

Purpose

To oversee, co-ordinate and direct the development, ~~and~~ review **AND ADOPT** of policies, strategies and bylaws.

Specific responsibilities

1. Oversee the development of policies and strategies in relation to the four wellbeings as specified in the Local Government Act, **INCLUDING REVIEWING POLICIES AND STRATEGIES AS APPROPRIATE.**
2. **ADOPT NEW AND REVIEWED POLICIES AND STRATEGIES, OR RECOMMEND THEIR ADOPTION BY THE COUNCIL, AS APPROPRIATE.**
3. Provide an oversight of the implementation of the Wairarapa Combined District Plan and any changes to the plan.
4. Develop an urban growth plan for Carterton, for adoption by the Council.
5. Develop, review and monitor policies under the Building Act 2004, ~~including (but not limited to) the approval of the Council's Earthquake Prone Policy.~~
6. Develop new bylaws, for adoption by the Council.
7. Monitor and review existing bylaws and recommend to Council any changes.
8. Develop and approve responses to government legislation proposals and policy issues.
9. Oversee the development of plans and procedures for the Council's responsibilities under emergency management legislation.
10. Monitor the development of Memoranda of Understanding between the Council and other bodies and provide an oversight of other relationships with Carterton groups.
11. Monitor the use of Council grants.
12. Receive advice from the Economic Development and Placemaking Advisory Groups.
13. Monitor and provide input into any Wairarapa-wide policies and strategies.
14. Develop a strategy for the operation of the Events Centre and monitor its performance.

Membership

The Mayor and all Councillors.

Quorum

Five members.

Meeting frequency

Eight-weekly, or as required.

Community Grants Committee

Terms of Reference

Purpose

To allocate grants funding, under the Council's Financial Grants Funds Policy.

Specific responsibilities

1. Consider applications for grants funding.
2. Make decisions on the allocation of grants funding.
3. Monitor the use of grants.
4. Assist in promoting the use of the grants fund to community groups.
5. Advise the Council on any relevant changes to the Financial Grants Funds Policy.

Membership

The Mayor and ~~three~~ **FOUR** elected members.

Quorum

Three elected members.

Meeting frequency

Once yearly, and as required.

Policy review schedule:

Priority for Review	Review Period	Policy Name	Policy Synopsis	Progress
High	Draft updates to be prepared for 9 September Policy and Strategy Committee Meeting	Road Naming Policy	Guidance around how roads in the district are named	Completed 9/9/20
High	Draft updates to be prepared for 9 September Policy and Strategy Committee Meeting	Watering of Civic Gardens Policy	Guidance around the watering of council gardens	Completed 9/9/20
High	Draft updates to be prepared for 11 November Policy and Strategy Committee Meeting	Remission of Water Meter Charges Policy	When water meter charges for water will be remitted	No existing policy – new policy to be developed
High	Draft updates to be prepared for 11 November Policy and Strategy Committee Meeting	Urban Street Tree Policy	Guidance around the ongoing maintenance, selection/siting/planting and removal of trees in the urban area, including protected, historic and notable trees	Completed 11/11/20
High	Draft updates to be prepared for the first 2021 Policy and Strategy Committee Meeting	Commercial Occupation of Footpaths and Public Reserves and for Signboards in Public Places Policy	Framework for decisions on commercial activity on footpaths in the district	For review 2/6/21
High	Draft updates to be prepared for the first 2021 Policy and Strategy Committee Meeting	Dangerous and Insanitary Buildings Policy	Policies relating to dangerous & insanitary buildings, including heritage buildings	Completed 10/2/21

High	To be reviewed by the Water Race Committee with a recommendation coming back to this Committee for adoption	Water Races Policy	Guidance around the use of water races, including rates & charges, exemptions from water race rates, irrigation from the races, cleaning and maintenance, relocation/closure of races, and new races	Completed 7/4/21
Moderate	Draft updates to be prepared for the second 2021 Policy and Strategy Committee Meeting <i>(To be reviewed and combined with the Public Art Policy)</i>	Plaques, Memorials and Monuments Policy	Process to be followed when new plaques, memorials and monuments are proposed in the district	Completed 7/4/21
Moderate	Draft updates to be prepared for the second 2021 Policy and Strategy Committee Meeting <i>(To be reviewed and combined with the Plaques, Memorials and Monuments Policy)</i>	Public Art Policy	Policy to ensure that public art is taken into consideration when decisions are being made about the district	Completed 7/4/21
Moderate	Draft updates to be prepared for the third 2021 Policy and Strategy Committee Meeting	Bond for Road Events/Rally Organisation Bond Policy	Policy for the levying of a bond on rally organisations for road events	For review 2/6/21
Moderate	Draft updates to be prepared for the third 2021 Policy and Strategy Committee Meeting	Smoke Free Policy	Guidance around non-smoking areas across Council facilities	For review 2/6/21
Moderate	Draft updates to be prepared for the fourth 2021 Policy and Strategy Committee Meeting	Rural Water Connections Policy	Guidance around new rural water connections	

Moderate	Draft updates to be prepared for the fourth 2021 Policy and Strategy Committee Meeting	Sewer Connection Policy	Connection requirements for new urban properties	
Low	Review to be completed before the end of the triennium	Cattlestop Policy	Policy for repair and maintenance of cattlestops within the district	
Low	Review to be completed before the end of the triennium	Easter Shop Trading	Guidance around shop trading hours during the Easter period	
Low	Review to be completed before the end of the triennium	Financial Grants Funding Policy	A framework for allocating grants to groups and organisations that are delivering projects, activities and services that benefit the citizens of the district	Completed 10/2/21
Low	Review to be completed before the end of the triennium	Out of District Burial Policy	Guidance around the criteria to assess 'out of district' burials	
Low	Review to be completed before the end of the triennium	Refund of Dog Registration Fees Policy	When dog registration fees will be refunded	
Low	Review to be completed before the end of the triennium	Stock Movement Policy	Guidance around the movement of stock on roads in the Carterton District	
Low	Review to be considered before the end of the triennium <i>(This is a joint policy with Masterton District Council)</i>	Psychoactive Substances Local Approved Products Policy	Guidance around the regulation of psychoactive substances in the district	

Low	Review to be completed before the end of the triennium	Community Engagement Policy	Framework for how the Council will engage with the communities in the district	Completed 10/2/21
Low	Review to be completed before the end of the triennium	External Communications Policy	Framework for how the Council will communicate with the communities in the district	Completed 10/2/21



7.4 ADOPTION OF THE DRAFT RESERVE MANAGEMENT PLAN

1. PURPOSE

For the council to adopt the Draft Reserve Management Plan.

2. SIGNIFICANCE

The adoption of the Reserves Management Plan will not trigger any Council significance thresholds, however consultation and engagement with interested and affected parties, user groups, environmental groups and the general public is required under the Reserves Act 1977. This engagement has now been completed.

3. BACKGROUND

In 2009 Carterton District Council prepared a general policy for all reserves and prepared individual plans for existing reserves.

A review was completed in late 2020 and the community was given an opportunity to make submissions on the draft Reserve Management Plan over a two-month period, ending 13 March 2021.

Three submissions were received as a result of this engagement and these were presented at the Policy and Strategy Committee meeting on the 7 April 2021.

After considering the recommendations, it is now presented to full council for adoption.

4. CONSIDERATIONS

4.1 Climate change

This is a significant issue for this plan and needs to be considered when determining the way in which we manage our parks and reserves, in particular with our water conservation.

This is woven throughout the plan and the operational delivery of the plan.

4.2 Tāngata whenua

Iwi were consulted in the completion of the plan and are supportive of its content.

4.3 Financial impact

Fiscal prudence will be considered alongside safety and industry safety standards when purchasing more equipment for play and recreation.

4.4 Community Engagement requirements

To be at the forefront of considerations when prioritising works within the plan.
Consultation and engagement were carried out in the completion of the plan.

4.5 Risks

N/A

5. RECOMMENDATION

That the Council:

1. **Receives** the report.
2. **Adopts** the Draft Reserve Management Plan in **Attachment 1**.

File Number: 127449

Author: Carrie Mckenzie, Community Services Manager

Attachments: 1. Reserve Management Plan 2020 [↓](#)

CARTERTON DISTRICT COUNCIL DRAFT RESERVE MANAGEMENT PLAN

NOVEMBER 2020

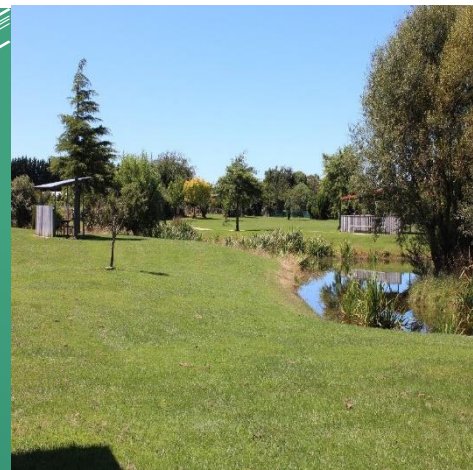


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PART ONE – INTRODUCTION AND BACKGROUND

PREFACE

WHAT IS A RESERVE MANAGEMENT PLAN?

Carterton District Council, as an administering body under the **Reserves Act 1977**, is required to prepare a Reserve Management Plan for the reserves it manages.

Reserve Management Plans provide direction for the day to day management and potential development of reserves. A plan identifies issues and provides objectives and policies for the use, enjoyment, maintenance, protection, preservation, and appropriate development of reserves¹.

LEGAL STATUS OF OUR RESERVES AND OPEN SPACE

Reserves owned, administered, and/or managed by the Council as public reserve have two forms of legal status:

- Land held subject to the **Reserves Act 1977** and classified according to its principal purpose or;
- Freehold land held by Council in fee simple title for reserve purposes, but not held under the Reserves Act.

Only a few of Carterton's reserves and open spaces are gazetted as reserve and classified under the Reserves Act, with most open space recognised and managed by Council as reserve land, currently without formal reserve status under the Reserves Act. This land is generally fee simple awaiting formal classification under the Act or kept unclassified to retain future use options.

Throughout this plan, 'parks' or 'reserves' are used interchangeably.

TE TIRITI O WAITANGI

Te Tiriti o Waitangi - the Treaty of Waitangi - is the founding document between Maori and the Crown. The Council has delegated responsibilities from the Crown to ensure that local authorities observe the principals of the Treaty. Also, under section 4 of the **Conservation Act 1987**, Council is required to interpret and administer the **Reserves Act 1977** to give effect to the principles of the Treaty of Waitangi. The **Local Government Act 2002** also requires Council to engage with Maori in decision-making process relating to a wide variety of issues.

WHY A DISTRICT RESERVE MANAGEMENT PLAN?

Carterton District Council manages over 50Ha of open space as reserve including land in the town centre, neighbourhood parks, sportsgrounds, reserves adjacent rivers and some coastal

¹ Section 41(3) Reserves Act 1977

land. Additional to this is the 350Ha Kaipatangata water catchment area. Cemeteries, town baths and rural halls are also managed as part of Council's [reserves] folio.

Many Council reserves share common management issues and rather than preparing individual plans for each reserve, a district wide approach has been taken, developing General Policies that apply to all reserves. This ensures consistency and transparency of Council intentions for all reserves throughout the district.

The Draft Plan also allows for subsequent Individual Reserve Management Plans or development concepts (including works programming and budgets) to be prepared for reserves of interest. An example is the Carrington Park frontage project.

Individual Reserve Management Plans may provide objectives, policies and actions for issues which are specific to a reserve and in some cases promote a targeted response for an issue which might also be addressed in the General Policy Document. These specific management provisions take precedence over the General Policy Document provisions where they relate to the same issue.

PLAN PREPARATION

This plan has been prepared in accordance with the **Reserves Act 1977**. Plan preparation follows two phases of public consultation, enabling Council to build a sound understanding of relevant local issues from people who are familiar with and use the reserves.

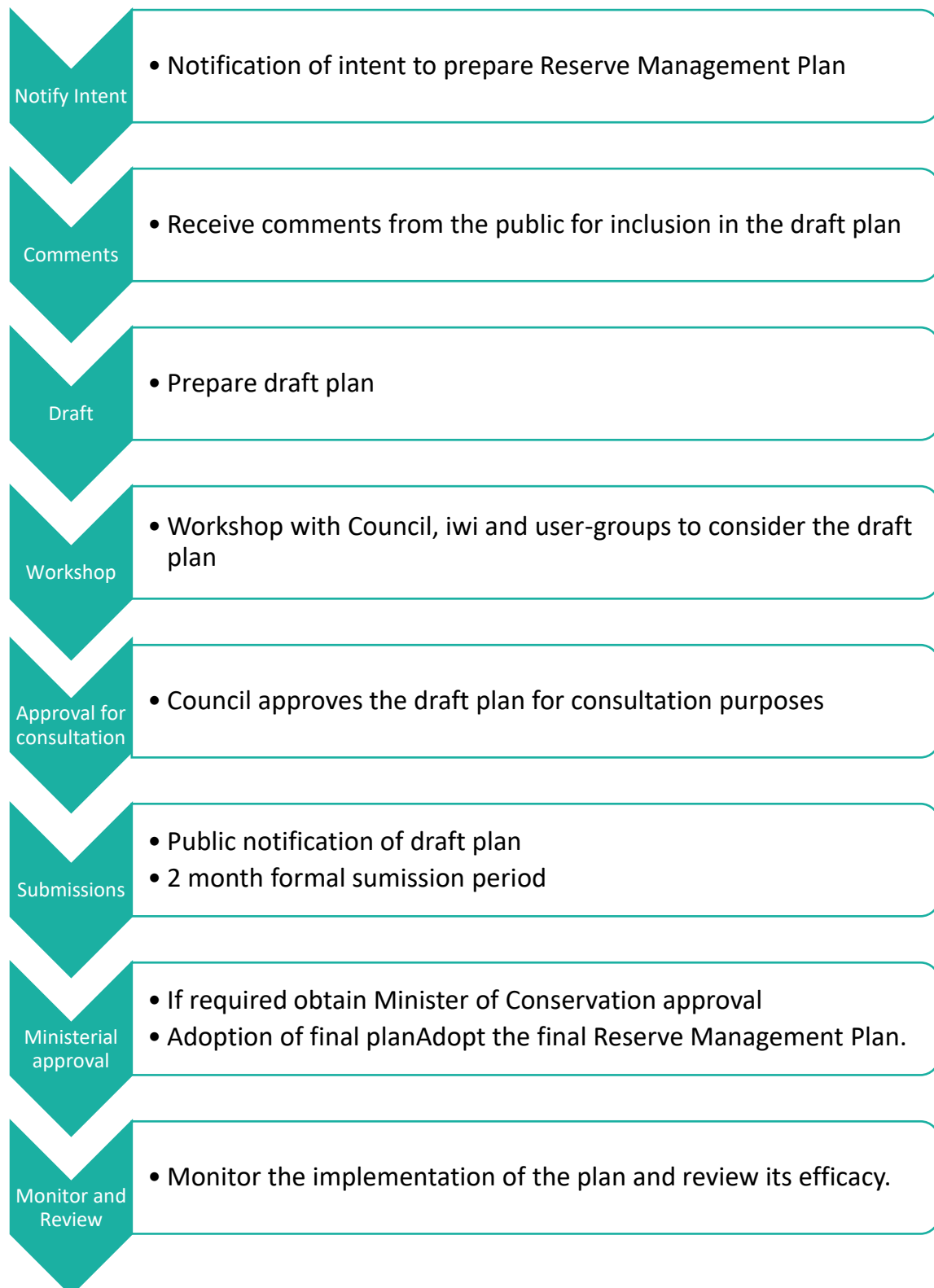
Opportunities for the public to contribute include:

- during the preliminary submission phase, which is publicly advertised,
- at public workshops/meetings,
- during the formal submission phase when the draft plan is notified, and
- at the hearing of submissions by Council Committee

The Draft Plan has been developed through review of the existing **Carterton District Council Reserve Policy and Management Plans 2009 – 2014**, research by Council officers, public consultation, hui with iwi and councillor workshops.



A summary of the plan preparation and review process followed by Council is:



INTRODUCTION

PURPOSE OF THIS PLAN

The purpose of this plan is to provide the Council with a clear framework for the day to day management and decision making for Council reserves and open spaces.

To achieve this purpose the Plan will:

- manage all reserves in a consistent manner by providing consistent objectives and policies;
- ensure appropriate protection and management of important natural, historical, and cultural values on Council owned or managed land and open space; and
- facilitate decision making process by providing a common understanding in the community of how the reserves are managed by Council.

Some issues, like restrictions on the use of public land (e.g. liquor), management of existing Council-owned buildings or development of amenity landscapes are not included in this Plan, as they are better dealt with in bylaws, asset management plans or landscape and development plans.

SCOPE OF THIS PLAN

This Reserve Management Plan incorporates all land that is owned or administered as reserve or open space, regardless of whether it is vested or gazetted under the Reserves Act.

STATUS OF THIS PLAN

This Plan is a reserve management plan in accordance with **Reserves Act 1977**.

For land held subject to the Reserves Act, and classified according to its principal purpose, this Plan will be a *legally binding document*.

For all Council freehold land managed as public open space, it will be a *non-statutory, guiding document*.

The **Carterton District Council Reserve Policy and Management Plans 2009 – 2014** will become non-operative when Council adopts the final draft Reserve Management Plan. It should be noted however, the older plans are still a useful source of information about some reserves, as they gather additional background material about the reserve into one place (e.g. the history of the reserve and agreed levels of maintenance).

Refer Appendix 1: Reserves Administered by Council for a full description of the reserves covered by this plan, including the reserve name, size, category (primary use) and any Reserves Act classification (if applicable).

STRUCTURE OF THIS PLAN

- Part 1: sets the context for a reserve management plan, describes this Councils approach to reserve management and defines the management objectives of this plan.
- Part 2: contains general policy guiding decision making, monitoring and review.
- Part 3: defines the Activity Categories (allowed, managed, requiring authorisation, prohibited). Legislation under the **Reserves Act 1977** and **Resource Management Act 1991** provides some constraints on the type of activities that can occur as of right and others that require a concession (in the form of a lease, licence or easement) or resource consent.
- Part 4: provides the Assessment Criteria for use when considering applications for activities on reserves. Criteria aim to establish a desired mix of uses for each reserve while protecting reserve values.
- Part 5: (in alphabetical order) lists the legal description and the specific outcomes sought for each reserve.

COVID-19 LEARNINGS FOR PARKS & RESERVES

In 2020 we have experienced a worldwide pandemic with Covid 19 virus. The Covid 19 response was led by the New Zealand Government through the Ministry of Health, and Wellington Regional Emergency Management Organisation. During the lockdown period of March through to May 2020 all public facilities were closed (playgrounds, swimming pools, public toilets etc).

Notable throughout New Zealand was the increased use of parks and walkways as New Zealanders chose to exercise in, and enjoy the open spaces, whilst remaining in their “bubbles”.

Outcomes from Covid 19 in relation to parks:

- higher number of users;
- more sign holders placed across the park network to ensure appropriate sharing of information, and status of grounds (open/closed);
- Emergency response plan tested and in place;
- increase in requirements for emptying of dog poo bins, due to increase usage; and
- recognition that users require education on park etiquette.

WHY PROVIDE PARKS AND RESERVES?

The general purpose of the **Reserves Act 1977**, as outlined in Section 3, is:

to provide for the preservation and management of reserves and their values, for the benefit and enjoyment of the public;

to ensure, as far as practicable, the preservation of representative ecosystems or landscapes and the indigenous species of flora and fauna;

to ensure, as far as practicable, the preservation of access for the public to the coastline, islands, lakeshore, and riverbanks and to ensure the protection and preservation of the natural character of these areas.

Reserves and open spaces benefit the community in many other ways, including but not limited to:

- improve our physical and psychological health,
- strengthen our communities, and
- make our district a great place to live and work.



Carterton District Council also has a responsibility under the Local Government (Community Wellbeing) Amendment Act to deliver cultural and social amenities such as events, parks, libraries, and pools which improve the wellbeing of its community.



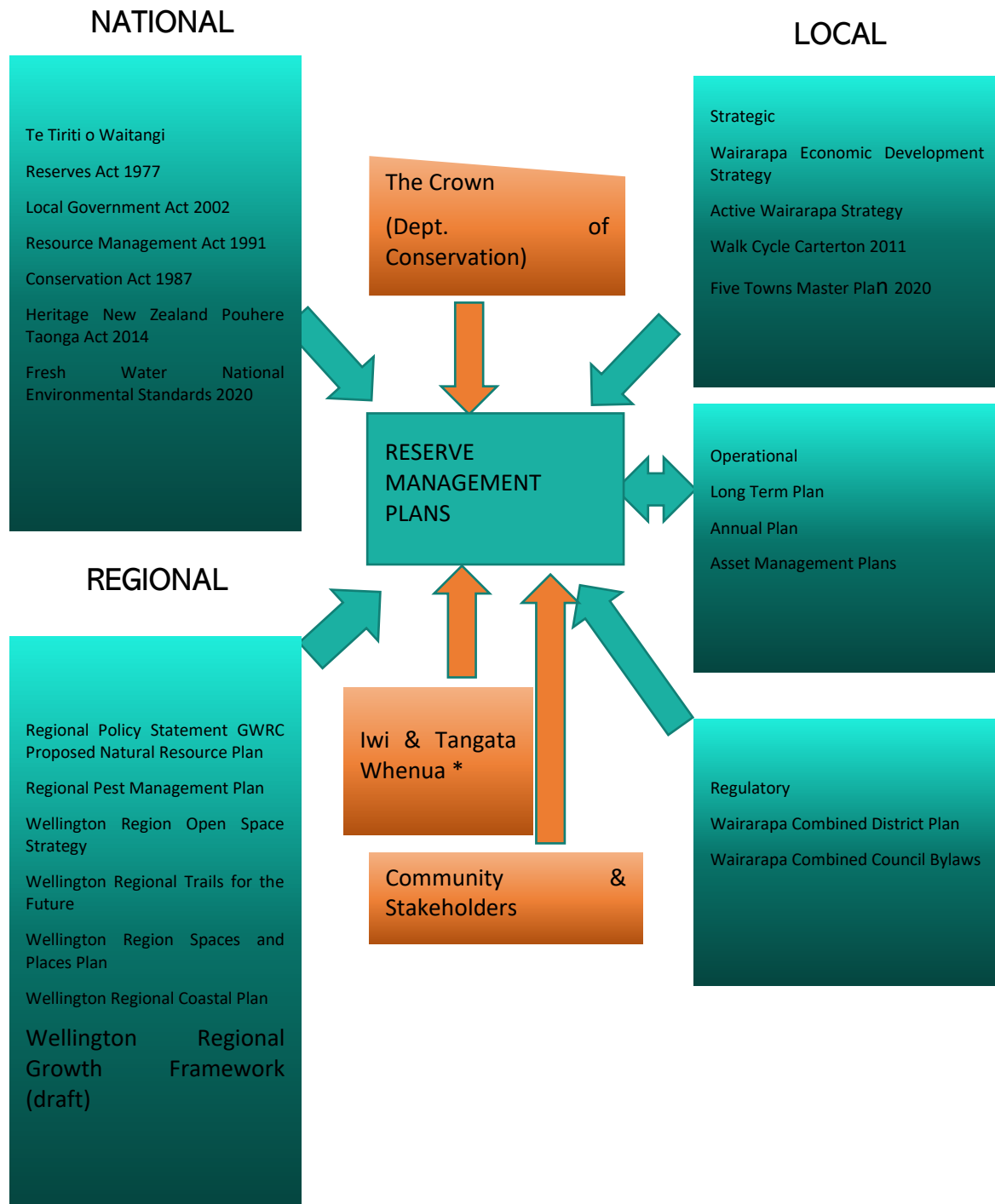
LEGISLATION AND POLICY

The use and development of reserves is subject to wider legislation, statutory and non-statutory policy and bylaws. For example, the **Resource Management Act 1991**, **Active Wairarapa Strategy** and **Control of Dogs Bylaw**. This Plan does not repeat the compliance requirements of these other instruments.

The following diagram shows the statutory context for Reserve Management Plans. It also shows the linkages and relationships to be considered when preparing or reviewing Reserve Management Plans and demonstrates the different roles and functions that Council has in relation to the management of parks, reserves, and open space.

The examples listed in the diagram are not intended to be an exhaustive list as other legislation at the national level can also be relevant, e.g. the ***Property Law Act 2007***.

Figure 1: Statutory context diagram adapted from: Jubilee Park Reserve Management Plan, Horowhenua District Council, 2016.



THE RESOURCE MANAGEMENT ACT 1991

National Policy Statements, Regional Policy Statements and Plans, District Plans and Resource consent are environmental management mechanisms enabled by the **Resource Management Act 1991** (RMA).

The **Proposed Natural Resources Plan** for the Wellington region controls the use and management of natural resources. Reserve management activities such as land disturbance, storm water management, foreshore activities and agrichemical spraying may need resource consent.

The **Wairarapa Combined District Plan** is developed in accordance with the RMA and regulates land use in the Wairarapa, including Carterton. It outlines in general terms how reserves and open spaces in the district(s) should be managed and recognises that open space is a valuable resource for the community that requires protection. The District Plan regulates uses adjacent to (or affecting) reserves, and Council use of reserves that require resource consent.

The following Special Features are shown in the planning maps:

- parks,
- notable trees,
- heritage sites,
- significant natural areas,
- outstanding landscapes, and
- outstanding natural features.

LOCAL GOVERNMENT ACT 2002 (LGA)

The **Local Government Act 2002** is the primary legislation enabling and governing Carterton District Council as a local authority. The Long Term Plan and Annual Plans, Bylaws, asset management planning, and Council policy are all undertaken in accordance with this Act.

The Councils **Ten Year Plan Te Māhere Ngahurutanga 2018–2028**, known as the Long Term Plan, or LTP, is the overarching planning and policy document setting out Council's priorities over the medium to long term and provides a framework and funding for projects associated with reserves. In the LTP the management of reserves falls within the Community Support activity.

The LGA also requires the Council to implement a Development Contributions or Financial Contributions Policy, to fund infrastructure required as a result of growth. These funds are then applied to a range of Council infrastructure including reserve development.

Asset management plans are required by the Local Government Act and they should set out how Council will manage its assets (including recreational assets) to achieve its strategic goals. These plans should include a defined methodology for planned maintenance and asset replacement as well as a forecast of the expected costs to maintain and replace the assets. Carterton District Council asset management processes and systems are being continually improved and there is still work to be done to capture and quantify the condition of Carterton's recreational assets.

Council is empowered by the Local Government Act to make bylaws and schedules. Reserve policies should be read in conjunction with the **Amendment to Liquor Control Bylaw 2005**, **Control of Dogs Bylaw** and the **Wairarapa Consolidated Bylaw 2019**, with particular reference to: Part 2: Public Places (including parks and reserves) Bylaw and Part 3: Sale of Goods or Services in Public Places Bylaw. These bylaws can assist with enforcing plan policies.

BIOSECURITY ACT 1993

The **Regional Pest Management Plan 2019-2039** (rPMP) covers the land, rivers, lakes, and coastal marine area within the administrative boundaries of Greater Wellington, including all reserves in Carterton district. The rPMP is binding on Council, setting responsibilities and priorities for the management of identified plant and animal pests. Greater Wellington Regional Council contributes resources for this and collaborates with the council to implement the strategy.

HERITAGE NEW ZEALAND POUHERE TAONGA ACT 2014

The purpose of this Act is to promote the identification, protection, preservation, and conservation of the historical and cultural heritage of New Zealand. Where reserves include places or sites of historical, cultural, and archaeological significance there is a need to work in accordance with the provisions of this Act (for example when carrying out earthworks).

THE BUILDING ACT 2004

This Act regulates building work and sets standards for buildings. Any building in a reserve is subject to the provisions and requirements of the Building Act.

OTHER LEGISLATION:

There is also other legislation that guides and controls how reserves function. These are adhered to where relevant in this Plan such as the **Conservation Act**, **Dog Control Act**, **Walking Access Act**, **Health Act**, **Health and Safety at Work Act**, **Land Transfer Act**, **Property Law Act**, **Fencing Act**, **Camping Ground Regulations**, **Public Works Act** and **Freedom Camping Act**, and they bind Council in its reserve management role.

STRATEGY AND GUIDELINES

The **Wellington Region Open Space Strategy** is a non- statutory document that provides for a co-ordinated approach for the development, management, and protection of open space across the Wellington region. The Strategy is not binding but helps to guide collaborative planning for the public open space network in the region.

The **Wellington Places and Spaces Plan** (2019) provides a high-level strategic framework for sport and recreation facility planning across the region. It is designed to provide direction on what should be done and crucially, what should not be done. The strategy is designed to focus thinking at a network-wide sport facilities level with emphasis on international, national, regional and sub-regional assets, while also capturing local level facility data.

The **Wellington Regional Trails for the Future Framework** (2017) provides a guide to development of a world class recreational trails network for all users, including trampers and mountain bikers, for the benefit of residents and visitors in the Wellington region. It sets out a strategic approach for consistent planning, development, management and promotion of an integrated, sustainable trail network by the region's trail managers, partners and communities.

OTHER COUNCIL POLICIES AND GUIDELINES RELEVANT TO RESERVES MANAGEMENT

Council has adopted policies and strategies (District or Wairarapa wide) that are relevant to the management of reserves. Including:

- Carterton Urban Growth Strategy (Carterton)
- Active Wairarapa Strategy (Wairarapa)
- Wairarapa Positive Ageing Strategy (Wairarapa)
- Wairarapa Rangitahi Strategy (Wairarapa)
- Wairarapa Biodiversity Strategy (Wairarapa)
- Carterton Town Centre Revitalisation Framework (Carterton)
- Earthquake Prone Buildings Policy (Carterton)
- Guidelines for UAV (drones) Over Council Reserves (Carterton)
- Place Making Strategy (Carterton)
- Smokefree Public Outdoor Areas Policy
- Towards and Arts, Culture and Heritage Strategy (Wairarapa)
- Urban Design Action Plan (Carterton)
- Urban Street Tree Policy (Carterton)
- Wairarapa Local Alcohol Policy (Wairarapa)
- Walking and Cycling Strategy (Carterton)
- Wairarapa Economic Development Strategy (Wairarapa)
- Carterton Civic Garden Watering Policy
- Carterton Lighting Policy
- Five Towns Master Plan
- Carterton Dark Sky Policy

These policies, strategies and plans will remain in force until reviewed, and should be read in conjunction with this Plan.

CARTERTON RESERVES

RESERVE ACT 1977 CLASSIFICATIONS

If a reserve is vested under the **Reserves Act 1977** it must be classified based on its primary purpose. The Act provides for seven different reserve classifications, as defined in Sections 17 to 23, these being:

1. Recreation Reserve.
2. Historic Reserve.
3. Scenic Reserve.
4. Nature Reserve.
5. Scientific Reserve.
6. Government Purpose Reserve.
7. Local Purpose Reserve.

Reserves may be vested under the Reserves Act with more than one classification, particularly if the values requiring protection vary from one part of the reserve to another.

CARTERTON RESERVE CATEGORIES

Reserves are only classified if they are vested under the **Reserves Act 1977**. As very few reserves in the Carterton District are vested, the Council has informally adopted a system whereby reserves are categorised according to their size, type of use and management focus². The categories cater for Carterton Districts' unique character and have been adapted from the **New Zealand Recreation Association Parks Categories and Levels of Service (2011)** and examples from around the country.

While many reserves are multi-use, allocation of a main purpose category for all open space allows for analysis of the network. Understanding 'what we have' as a first step in planning now for effective reserve management and the future development of a reserve strategy.

7 categories of reserve have been introduced, as detailed in Table 1.

² Gazetted reserves still retain their Reserves Act classification based on their original primary purpose and therefore will have both a classification and category.



Table 1: Category Summary

District Reserves	Larger multiple-use spaces with a high amenity value that serve the entire District.
Neighbourhood Reserves	Smaller low-profile spaces for recreation and play. Typically bordered on several sides by houses. Used mainly by the local residential community. Easily accessible. May contain play equipment and other recreation facilities.
Sport and Recreation Reserves	Parks with the primary purpose of providing for team sports and active recreation and may accommodate recreation facilities and buildings. Includes larger spaces for outdoor adventure type activities.
Natural Reserves (open space, coastal, esplanade)	Areas that provide opportunity to interact with nature, through low impact recreation. May be developed (e.g. boardwalks, forestry) or undeveloped natural green areas. May exhibit or provide opportunity to enhance or restore natural environmental values. Includes Coastal and Esplanade reserves.
Cultural and Heritage Reserves / Civic Amenity	Provide for social or community gatherings within the central business area. Often first established to protect the built cultural and historical environment and to provide for commemoration and remembrance.
Community Building Reserves	Dedicated to hosting community facilities such as swimming baths or community halls.
Utility and Linkage Reserves	Land containing link strips, pedestrian and cycle access ways, drainage or other service ways. May be multi-purpose, e.g. a drainage reserve that provides a cycling link between neighbourhoods.

DISTRICT RESERVES

District Reserves are larger multiple-use spaces with a high amenity value and an emphasis on serving both residents and visitors to the District. These are reserves that provide for a range of informal recreational activities for all age groups and may be located near or adjacent to other community facilities (e.g. libraries, halls, suburban or town centres). They are generally developed and maintained to a high standard with facilities to attract and cater for a high level of use. They will typically provide the following features: toilets, playscape, amenity planting, paths, lighting, picnic facilities and developed car parking facilities.

The minimum size of a District Reserve is dependent on the particular purpose, but they are likely to be of a larger size. For planning purposes and for future acquisition the minimum parcel size is three hectares (without sports facilities).

NEIGHBOURHOOD RESERVES

Neighbourhood Reserves are generally smaller in size (ranging from 1000m² to 5000m²), are primarily for use by the local residential community and are typically bordered on several sides by houses.

They may contribute to the character and amenity of the neighbourhood through provision of pockets of open space and vegetation. The reserve will generally be well maintained, free draining, have flat grassed areas. They may provide neighbourhood amenity alongside a specific function (such as a playground or a dog exercise area). Neighbourhood Reserves should provide an open grass area suitable for small scale ball play, children's play equipment, seating, paths and amenity planting.

The reserve should be easily accessible, ideally from more than one road frontage and may form part of a pedestrian/commuting route. Most urban residential properties should have a Neighbourhood Park within 10 minutes walking distance.

SPORT AND RECREATION RESERVES

Sport and Recreation Reserves primarily provide for sport and recreation and are often multi-use. They may accommodate traditional organised sports, social sports, informal recreation, walking, cycling or events. The reserve is likely to have a mixture of grass or artificial surfaces for a mixture of winter and/or summer sports, which are maintained to an appropriate standard for the sports code use. Toilets, changing facilities and car parking are likely to be available and some reserves may have resident sports club facilities.

The scale of these open spaces varies and range from 5000m² for activities requiring less space such as tennis and bowls to greater than five hectares when used for regional or national sporting fixtures.

It is recommended that future provision, while meeting the community's specific needs, consider accommodating playing fields or courts, off-field training grounds, onsite car parking and supporting facilities and buildings. Providing for of several sports at one location creates a multi-function park where a range of activities can occur.



NATURAL RESERVES (OPEN SPACE, COASTAL, ESPLANADE)

Natural Reserves

Natural Reserves allow for the experience and/or protection of the natural environment. Types of use/value include conservation, ecological restoration/enhancement, and access to the natural environment (including rivers and the coast). Activities on this space include walking/cycling, information/education/interpretation, ecosystem management, low-impact recreation, and landscape protection such as some reserve land in coastal areas. Typical characteristics include remnant and regenerating indigenous vegetation, streams and the associated catchment, and coastal areas. This category generally includes informal recreation opportunities and low-key infrastructure throughout. For example, they mainly contain track networks, picnic areas and possibly seats. Generally, these reserves are of District significance and the developed areas may be used by residents from throughout the District and beyond.

There is potential for these reserves to provide a hazard protection zone to mitigate against forecast sea level rise, natural erosion and storm inundation.

Esplanade Reserves

Esplanade Reserves are strips of land alongside waterways, typically 20 metres wide, and typically provided as a result of the subdivision of adjoining land. The decision and ability to acquire Esplanade Reserves is driven by policies and rules within the District Plan. The purpose of Esplanade Reserves is to protect environmental values of the riparian strip and to protect and provide for public access to waterways. At this stage there are no contiguous esplanade reserves in Carterton to provide walkway linkages, but each of these parcels has the potential for ecological enhancement and for this plan come under the Natural Reserve Category.

CULTURAL AND HERITAGE RESERVES / CIVIC AMENITY

Cultural and Heritage Reserves are localities for protection of the built cultural and historical environment to provide for commemoration, understanding, appreciation, and remembrance. These spaces often have multiple values, for example – amenity and ecological value in addition to heritage or layers of historical fabric. The size of these spaces is usually relatively small but can range from a compact town square to a larger district cemetery.

Civic Amenity spaces occur in Central Business District (CBD) areas and provide for pedestrian access to retail and commercial services, rest stops or gathering nodes. These are areas of high amenity value and usually incorporate amenity planting in and around the CBD streetscape, street furniture, sculptures/artwork etc. Civic Amenity Open Spaces are smaller in size ranging from 5m² – 100m². All street side CBD amenity open spaces in the District administered by the Council fit in to this category.

COMMUNITY BUILDING RESERVES

Community Building Reserves are predominately dedicated to hosting community facilities such as a swimming baths or a community hall. In many cases shared use of facilities will occur. The land may have limited amenity or open space value where most of the site has been developed.

The Library and Events Centre are not covered by this plan.

Ideally land for this purpose owned by Council should be either fee simple, which provides maximum flexibility in terms of future use without the restrictions of the Reserves Act, or classified as Local Purpose (Building) Reserve.

Future land size would need to be adequate to ensure car parking provision is met and that any possible new building is not compromised by the size of the site. They should be located within reach of the community for which the facilities intend to serve.



UTILITY AND LINKAGE RESERVES

Utility and Linkage Reserves generally provide a service function and include link strip land, pedestrian and cycle access-ways, drainage or other service ways. There is generally a low level of development in a linear nature in these spaces.

A note about Rural Reserves

Those reserves located in rural areas, generally have a dominant purpose, e.g. sports-hubs, community halls or ecological restoration and therefore have been accommodated within the other categories for funding purposes.

A note about Road Reserves

Road Reserves are typically areas of land adjacent to roads which are set aside for purposes other than transportation - typically for transport safety - clear site lines, laybys, rest areas and amenity/landscape value. These are not generally to provide for open space for recreation. Road Reserves lands within the District are not covered by policies in this Plan.

PART TWO: OBJECTIVES AND POLICY

ADMINISTRATION AND MANAGEMENT POLICIES

ACQUISITION OF RESERVE LAND

Council needs to consider the future acquisition of reserve land whether through actual purchase, reserve contribution funding, or land vested through subdivision approvals. Smaller reserves may be required to service new subdivisions although this needs careful consideration of the availability and relative ease of access to existing neighbourhood reserves. The demand for access, particularly for walking and cycling along stream, river and coastal margins is high. The need to acquire future land areas and linkages will need to be continuously assessed and the key drivers for acquisition are likely to be access and linkages that optimise the use of the current reserves network.

A future Open Space Strategy for the Wairarapa could identify existing reserve resources, analyse future reserve requirements, consider deficiencies and future needs of the community, and recommend how development contributions should be set for future reserve development.

There are several ways in which reserves may be created, including:

Subdivision

When land is subdivided under the **Resource Management Act 1991**, Council may acquire land or cash in lieu in accordance with the **Development Contributions or Financial Contributions Policy 2018**.

Crown land vested in Council

The Council may administer reserves that have been derived from the Crown. Administering is then by 'appointment to control and manage' or 'vested' in Council subject to the Reserves Act. The Council is the reserve 'administering body' under either form of administrative control.

Public Works Act

Land can be acquired as or declared to be public reserve subject to the Reserves Act, under powers contained in the **Public Works Act 1981**.

Purchased Land

Ordinary land owned by Council in 'fee simple' may be declared to be reserve subject to the Reserves Act by Council resolution pursuant to Section 14. Alternatively, it is retained in Council ownership for reserve purposes, but not subject to the Reserves Act.

Gifting of Land

The Council may acquire reserves by way of gift where the land is gifted subject to the Reserves Act, e.g. Sparks Park.

Council may also take on lease of land for the purpose of reserve provision.

- OBJECTIVES

1. To provide a variety of open space settings that meets the needs of the community, for current and future generations.
2. Land acquisition, boundary change, disposal or exchange mechanisms are used to improve the management of reserve values and/or public benefit and enjoyment.

- POLICIES

1. To give primacy when making decisions, to the land tenure and associated provisions in legislation for an area within the park. In particular, the provisions of the *Local Government Act 2002* and *Reserves Act 1977*.
2. To negotiate, where appropriate, the lease, acquisition, right-of-way, caveat, disposal, purchase, or gifting of land under public and private ownership within or in addition to parks.
3. When considering additions or disposal of land, consider how the proposal will:
 - a. address a deficiency in open space within the area or areas of significant projected growth;
 - b. enhance the benefit, enjoyment and use of a park by the public;
 - c. improve public access to or use of open space;
 - d. further protect the character of an existing park;
 - e. enhance or add to existing recreational and sporting opportunities;
 - f. improve the physical, ecological, recreational or landscape linkages between places;
 - g. protect significant historic heritage, outstanding natural features, or significant amenity landscapes;
 - h. secure or improve access to and along water bodies;
 - i. enhance or add to ecological corridor opportunities;
 - j. be the most appropriate approach to addressing an historic encroachment; and
 - k. be able to be met by other needs.
4. To manage any land acquired using the outcomes and policies of this plan alongside relevant legislative requirements.
5. Council may request scaled concept plans for a proposed reserve to be submitted for approval by the Asset Manager, including:
 - a. context of reserve (adjoining streets, lots and other topographical and physical features);
 - b. finished levels of the reserve;

- c. cultural and heritage features;
- d. planting and trees (including size, botanical and common name), existing vegetation and proposed removal;
- e. access;
- f. lighting;
- g. playgrounds and other reserve furniture/structures;
- h. drainage/swales/stormwater
- i. grassed areas;
- j. on street parking or carparking areas;
- k. location of existing or proposed services/easements;
- l. permeable fences adjoining residential property boundaries; and
- m. any other information required under other policies of this Plan, or other relevant planning document.

REVOCATION AND DISPOSAL OF RESERVE LAND

Part 3 Section 24 of the Act describes how reserve classification can be changed or revoked.

There are some reserves in the District which the Council owns and administers.

Reserves vested and classified under the **Reserves Act 1977** must have their classification status revoked before the land can be disposed of. Council may approve a resolution to revoke the status of a reserve, but the Minister of Conservation holds the responsibility of revoking this status for the sale and disposal of formal reserve land.

The Reserves Act 1977 outlines a clear process for administering bodies to follow in revoking reserve status and selling reserve land.

The most common reason for revocation and disposal of a reserve is that the land is surplus to requirements, is no longer serving the purpose for which it was obtained or does not meet the needs of the community.

- OBJECTIVE:

To ensure that the revocation and sale of reserve land follows the process outlined in the Reserves Act 1977.

- POLICIES:

1. From time to time Council may consider revoking reserve status, for reserves which have been vested in Council, where the land:
 - a. is no longer required for reserve purposes, and
 - b. is no longer suitable for the purpose for which it was classified.

2. Council will consider the sale of reserve land, for reserves which have been vested in Council, where:
 - a. it is surplus to requirements,
 - b. it is no longer fit for the purpose for which it was obtained, and
 - c. It no longer meets the need of the community and/or provides no significant long-term benefit to the community.
3. Council will comply with the relevant provisions of the **Reserves Act 1977**, **Public Works Act 1981**, and the **Local Government Act 2002**, as applicable, when revoking reserve status, selling or exchanging reserve land.

NAMING OF RESERVES

Many of the reserves in Carterton are known by informal local names or the nearest street, e.g. Holloway Street Civic Reserve, Moreton Road Reserve. Naming reserves enables identification and can also signal the history of the reserve or the values for which the land is reserved. Section 16(10) of the Act sets out the procedure for officially naming or renaming reserves.

- OBJECTIVE:
 1. The names of reserves in Carterton reflect the district's natural, cultural and historic heritage/value.
- POLICIES
 1. Official names for reserves will be established after consultation with local Iwi and any other identified affected and interested parties.
 2. The name of a reserve should reflect the relevance of the site, its history and use and purpose for which it was reserved.
 3. Reserves may be named after deceased individuals if those people have made a significant contribution to the open space and recreational heritage of Carterton. Preference will be given to naming areas within reserves.
 4. Reserve names will not include sponsor names.
 5. Both Maori and European names (where given) will be used on new signage and in documentation.

CHANGE TO AGREED USE OF RESERVES

The needs of a community and reserve users change over time. Council response to emerging trends in the way parks are being used, or direct requests for a change in use. Council must check if an existing or proposed use fits with the outcomes sought for that reserve.

- OBJECTIVE:
 1. Council can respond appropriately to changes in authorised uses of reserves and reserve facilities.
- POLICIES:
 1. A change in use of a facility or activity that is the subject of an existing Authorisation is an Activity requiring Authorisation and is subject to assessment (in Part 4).
 2. A change in use may be approved by a new Authorisation or by variation or amendment to an existing Authorisation where the effects of the change in use are the same or similar in character, intensity and scale to the existing use, the use is consistent with the purpose and classification of the reserve and protects reserve values.

NETWORK UTILITIES AND UTILITY OPERATORS

Reserves are often seen by Utility Operators as convenient places to locate infrastructure. However, such infrastructure can have an adverse impact on the character of the reserve and its open space qualities. These structures can also make the maintenance of a reserve more

difficult and costly. Providing space for utilities is not the primary function of reserves; any utilities located on reserves should not compromise the primary purpose of a reserve.

Utility providers that seek to install network utilities on reserve land are required to go through a formal process under the **Reserves Act 1977**. It is important that correct procedures are followed and that no future opportunities are lost due to the presence of utilities.

- OBJECTIVE:

1. To minimise the impact of utilities, on the public use, enjoyment or visual amenity of a reserve.

- POLICIES:

1. In general utilities should be located where they will not impact on the use and enjoyment or general amenity of a reserve.
2. No future utilities, other than those required for the servicing of the reserve, will be located on reserves except where required due to the technical or operational constraints of the network utility as identified during the site or route selection process. Where utilities are required in any of these reserves they will be provided underground where practical, and in such a way so as not to affect areas of cultural and archaeological significance.
3. All costs associated with the installation of services under or over a reserve, including costs for making good the affected area during or after construction, any remedial work, or easements will be borne by the utility provider. All new utilities on reserves will require an easement, in accordance with section 48 of the **Reserves Act 1977**.
4. The operation, maintenance and upgrading of existing utilities will be the responsibility of the utility provider, will be undertaken at the cost of the utility provider and shall not adversely affect the function or values of the reserve.
5. Where existing utilities are to be upgraded, the utility provider will undertake early and full consultation with the Council as an affected party.
6. Network utility operators may be allowed to remove or trim vegetation subject to compliance with the Electricity (Hazards from Trees) Regulations 2003 and in consultation with Council.

BYLAWS

There are some matters, such as dog control and alcohol bans, that are more effectively dealt with through bylaws. Where Council controls activities by bylaw this plan refers to the relevant bylaw.

- OBJECTIVE:

1. To provide for controls and penalties for offenses on reserves.

- POLICY:

2. Offences on reserves will be controlled by Council bylaws, and any applicable NZ Government regulation. Refer to appendix 2 for Council bylaws that apply to reserves.

IMPLEMENTATION, MONITORING AND REVIEW

WORKS PROGRAMMING AND FUNDING

The primary mechanism by which the outcomes sought for each reserve in this and Individual Management Plans will be implemented is through the Council's Long Term Plan and Annual Plan processes and more specifically an Asset Management Plan.

The prioritisation and scheduling of works may be informed by reports from council officers and submissions from key stakeholders and the community.

Refer Part 2 for Asset Management and Maintenance.

PLAN MONITORING, REVIEW AND AMENDMENT

This management plan will be kept under continuous review to ensure that the policies are appropriate and relevant for the communities within the Carterton District.

It is intended that this Plan is reviewed and updated every 10 years, unless a review or variation is initiated earlier to adapt to changing circumstance or increased knowledge (e.g. as a result of monitoring). The process for review is prescribed by the Reserves Act (section 41).

- **OBJECTIVES:**

1. To keep this plan under continuous review in accordance with the Reserves Act 1977
2. To maintain this plan as an up-to-date guide for decision making.
3. To undertake regular monitoring and surveys as an essential component of reserve management.
4. To utilise the results of monitoring and surveys to implement revised reserve management and maintenance practices.

- **POLICIES:**

1. Increase understanding of the environment and improve park management through:
 - a. information gathering, research and monitoring; and
 - b. incorporating Māori knowledge and values.
2. Review the plan at least every 10 years, unless a review or variation is initiated by:
 - a. monitoring results that indicate the need for a change or review;
 - b. the identification of new management issues, problems or activities that are not addressed in the plan but for which policy is required;
 - c. changes in national policy including new or amended laws, regulations or other actions which may render the plan inoperable or illegal; or
 - d. policy changes made by Carterton District Council.

ENFORCEMENT

While most activities on reserves generally do not have adverse effects on reserves and reserve users, some activities can be unacceptable. Unacceptable activities fall into four main categories including:

1. wilful damage,
 2. unlawful dumping of rubbish/refuse,
 3. inappropriate use of reserve causing damage or a safety hazard, and
 4. ignoring prohibitions.
- OBJECTIVES:
 1. To reduce the level of offences on reserves.
 2. To maintain reserves to required standards without additional costs from offences falling on to the Council.
 3. To enforce Council bylaws.
 - POLICIES:
 1. Enforcement action will be undertaken in relation to unacceptable activities in accordance with the Council's legislative powers.
 2. Verbal or written warnings will be issued if an individual can be identified as an offender or involved in an offence where this the offence is not considered of a serious nature.
 3. Costs for the repair of damage will be sought through the judicial system where appropriate.
 4. Council will cooperate with any NZ Police initiated projects such to reduce offences on reserves.
 5. Serious complaints will be attended by the appropriate enforcement agency.

NATURAL AND CULTURAL VALUES AND OUR CHANGING CLIMATE

CLIMATE CHANGE

Parks contribute to environmental sustainability by:

- improving air and water quality,
- protecting and restoring biodiversity and wildlife habitats,
- fostering participation in healthy outdoor recreation activities, and
- engagement through events and volunteering.

They also provide valuable carbon sinks through afforestation and revegetation programs.

The effects of climate change are visible across the Wellington region with average annual temperatures and sea levels on the rise. The region is typically dry in the east and wet in the west and this pattern will be enhanced in the future.

Management of parks will require an adaptive management approach that plans for a range of future climate scenarios and takes account of emerging low carbon innovations and technologies. Adaptive management encompasses: being well informed about how the local climate is changing and what it means for parks, being organised in our approach to asset planning and day to day management, and taking proactive measures to manage aspects of the park environment most at risk of the effects of climate change.

- **OBJECTIVES:**

1. To strengthen the long-term resilience and sustainability of Carterton's parks and associated facilities
2. To endeavour to incorporate sustainable practices in the provision, management and development of reserves,
3. Reduce water consumption in our parks
4. Reduce waste and the use of plastics in our parks

- **POLICIES:**

1. Support ecological restoration projects and tree planting and protect carbon sinks from the impacts of invasive species.
2. Where appropriate incorporate water conservation, energy reduction, and waste management and minimisation practices for new and replacement services on reserves.
For example:
 - a. low impact design for storm water management where appropriate by using pervious services, swales or rain gardens;
 - b. installation of low flow and low energy devices;
 - c. adaptive re-use of existing materials or use of renewable or recycled materials;
 - d. use of collected rainwater for supplying park toilets;
 - e. use of drought tolerant grasses on sports fields;
 - f. monitored drip irrigation in gardens, and use of soil moisture measurement methodology;
 - g. replacement of traditional bedding plants with drought tolerant perennial planting
 - h. installation of water fountains/drink refill stations at appropriate parks to minimise use of plastic bottles;
 - i. tree waste chipped and re-used; and
 - j. compostable toilets at freedom camping sites.

Reference and further reading:

Climate Change Strategy A strategy to guide the Wellington Regional Council's climate change response October 2015

EXTERNAL INFLUENCES ON REGIONAL PARKS A supporting document for the Parks Network Plan Review 2018

Options for national parks and reserves for adapting to climate change. Baron JS1, Gunderson L, Allen CD, Fleishman E, McKenzie D, Meyerson LA, Oropeza J, Stephenson N.

CULTURAL SIGNIFICANCE

Some of the Reserves contain sites of Māori or early European use and settlement. Conserving, and enhancing a representative range of these resources will enable current and future generations of the region to continue to appreciate and enjoy the region's unique cultural heritage. Unless historic heritage resources are identified and assessed, strategies for their management cannot be developed. Current records need to be periodically reviewed as new information becomes available.

- OBJECTIVES:

1. To protect areas of archaeological and cultural significance within a reserve.
2. To identify and record any archaeological or heritage areas found on reserves.

- POLICIES:

1. Develop an inventory for each reserve area detailing known and potential:
 - a. archaeological sites,
 - b. cultural heritage sites, and
 - c. historic associations.
2. Prior to any development on a reserve, any known archaeological sites, structures or features will be identified and avoided where possible.
3. During any reserve development, upon the discovery of any archaeological sites, structures or features, the following actions will be adopted:
 - a. All work will cease immediately, and all equipment will be shut down in the vicinity of the site, structure or features where the accidental discovery occurs.
 - b. The site structures or features will be secured, including a 20 metre buffer around the location, to ensure that the possible archaeological site, structures or features are undisturbed and the site is safe in terms of health and safety.
 - c. Heritage New Zealand Pouhere Taonga and tangata whenua representatives will be notified and if human remains are discovered, the police will also be notified.
4. Where a discovery addresses matters of significance to tangata whenua, identification and assessment shall be done in partnership with Māori taking into consideration:
 - a. established protocols, cultural procedures and tikanga relating to the discovery re-burial or removal of taonga and koiwi, and future protection; and
 - b. Tangata whenua determination of the disclosure or non-disclosure of sites.

BIODIVERSITY AND ECOSYSTEMS

Maintaining natural ecosystem integrity is key to biodiversity conservation. Some reserves contain a variety of natural ecosystems that are unique to the area. Some reserves also contain rare ecosystems that either naturally cover very small areas or have little of their original extent

remaining. The enhancement of natural ecosystems can help to maintain a balance between public use and protection

The Department of Conservation plays a major role in providing places for recreation and caring for our open spaces. The Tararua Forest Park is managed by the Department, while QEII National Trust has covenants on several sites on private and public land in the Carterton District. Greater Wellington Regional Council controls the use of riverbeds and the coastal marine area, RMA matters such as air and water quality, and natural hazards such as flooding, and works with landowners on soil conservation, riparian and wetland protection, biosecurity and biodiversity management.

- OBJECTIVES:

1. To safeguard where possible, representative samples of all classes of natural ecosystems which are characteristic of the area.
2. To maintain, protect and enhance biodiversity values.

- POLICIES:

1. Protect all unmodified natural ecosystems within reserves.
2. Where appropriate, natural ecosystems that have high ecological values or are representative of rare ecosystems that are under threat will be enhanced.
3. Enhancement of natural ecosystems may include, but is not limited to:
 - a. the control and eradication of pest plant and animals as identified in the ***Wellington Regional Pest Management Strategy***;
 - b. re-vegetation using eco-sourced plant species, where practical;
 - c. restriction of access to some areas of reserves; and
 - d. where access is difficult or dangerous or where there is a need to protect flora undergrowth or root system, consideration will be given to building steps and/or boardwalks.
4. Council will work with reserve neighbours to establish linkages across ecosystems.
5. Council will support Department of Conservation and Greater Wellington Regional Council in the enhancement and protection of rare and threatened ecosystems.

INDIGENOUS FLORA AND FAUNA

Human development and settlement have had a major impact on indigenous flora and fauna. Some reserves contain areas where indigenous species of flora and fauna survive in their natural communities and habitat. Where possible, public use should have minimal impact on these areas.

- OBJECTIVE:

1. To safeguard, as far as practicable, the survival of indigenous species of flora and fauna in their natural communities and habitats, on reserve land.

- POLICIES:

1. Public use and activities will not adversely affect areas within reserves that provide natural communities and habitat for indigenous flora and fauna.
2. The removal of indigenous flora and fauna is prohibited except for approved operational purposes or where written approval from Council has been obtained.

PEST PLANTS AND PEST ANIMALS

The Council as a land manager is required to meet its obligations under the **Wellington Regional Pest Management Plan**. Where required this may mean eradication of a species or for others this may require boundary control, that is taking measures to ensure that a pest plant established on a reserve does not spread off that reserve onto surrounding properties.

- OBJECTIVES:

1. To manage pest plants identified in the **Wellington Regional Pest Management Plan**.
2. To control other pest plants where required.
3. To control pest animals and pest plants identified in the **Wellington Regional Pest Management Plan**.
4. To control other pest animals as prioritised.

- POLICIES

Pest Plants

1. Introduced plant species that have been identified in the **Wellington Regional Pest Management Plan** will be progressively removed from reserve land areas.
2. Management of particular pest plants in a reserve will be undertaken where identified.
3. Pest plants will be managed as budget and priority are assessed.
4. Council will use alternative weed control measures where cost-effective, and appropriate application methods.
5. Council will use staff trained in the application of herbicides.
6. Exotic plant species will not be removed where they:
 - a. have historical or cultural significance,
 - b. provide a range of amenity values, and
 - c. are not threatening reserve values.

Pest Animals

1. Programmes for the control of pest animals will give priority to where pest species are identified in the **Wellington Regional Pest Management Plan**, and:
 - a. areas that contain significant habitats, ecosystems, or
 - b. where the species detract from visitor use and enjoyment
2. Management of particular pest animals in a reserve will be undertaken where a need is identified

WATER

New rules to protect and restore New Zealand's freshwater passed into law on 5 August 2020. This includes the new National Policy Statement on Freshwater Management (NPS-FM),

National Environmental Standards for Freshwater (NES-FW), stock exclusion regulations, and regulations in the measurement and reporting of water takes. These regulations deliver on the Government's commitment to stop further degradation, show material improvements within five years and restore our waterways to health within a generation.

Council has a legal obligation to protect its waterways, and this includes esplanade reserves, streams and water races through our reserves. In urban areas, debris and contaminants from streets and industrial areas are washed away by rainfall runoff into stormwater drains, which often empty straight into waterways. It is important for everyone to be aware that stormwater drains empty into waterways and to be careful what we wash into them.

- OBJECTIVES:

1. To meet obligations for the National Environmental Standard for Fresh Water in our reserves.
2. To educate community on how to improve water quality in our reserves.

- POLICIES:

1. Reserves containing riverbank margins and riparian strips will be planted with suitable species to reduce the impact of run off on waterways. This is an effective way to:
 - a. provide a buffer to soak up runoff before it reaches the waterway, and filtering out nutrients such as nitrogen;
 - b. stabilise riverbanks, preventing erosion and therefore sediment runoff to the water way; and
 - c. provide shade for the water and keep its temperature lower which makes a better habitat for the plants and animals living in the water way.

AMENITY VALUES - TREES, SHRUBS AND GARDENS

Trees are desirable features of reserves. They contribute to the recreation (e.g. shade), landscape, natural and heritage values of a reserve. Trees, however, can become nuisances over time, particularly leaves blocking gutters, roots affecting drains and footpaths, and dangerous branches.

The Reserves Act 1977, section 42, refers to trees with particular reference to recreation reserves. Thought and care needs to be given firstly to the species selection and placement of trees, and secondly to the long-term maintenance of trees on or near boundaries. As with trees, plantings and garden areas add value and are desirable features of reserves. These planted areas contribute to the aesthetic appearance of a reserve, particularly where the adjoining land is heavily modified with paving or buildings.

- OBJECTIVES:

1. To provide a range of natural shade and shelter opportunities within reserves.
2. To maximise the benefits of trees while avoiding or mitigating adverse effects on reserve neighbours.
3. To provide healthy gardens that make attractive settings for the users of the reserve.

- POLICIES:

Trees and Shrubs

1. Tree plantings on reserves will consider:
 - a. the Urban Street Tree Policy,
 - b. where appropriate and practical the use of eco-sourced native trees,
 - c. the type of reserve and any specific management policies for that reserve,
 - d. the effect trees may have on neighbouring properties,
 - e. the effect trees may have on facilities,
 - f. the effect trees may have on existing underground and overhead utilities,
 - g. the effect trees may have on surface or subsurface archaeological features,
 - h. the desirability of providing food and shelter for native species, and
 - i. ecological and landscape values and considerations.
2. Council will ensure that the type and location of any trees planted on a reserve are selected so that compliance with the Electricity (Hazards from Trees) Regulations 2003 can be achieved.
3. Trees may be planted on reserves to enhance amenity values and provide some shade and/or wind protection.
4. Plantings will generally be developed to be low maintenance in the long term.
5. Where exotic species are planted, these will be selected due to:
 - a. the desire for a deciduous species,
 - b. an historical association,
 - c. a particular connection to a place or an individual,
 - d. the desirability of providing food and shelter for native species and nectar feeding birds, or
 - e. flowering plants for colour.

Tree Removal

1. Tree removal is covered in the ***Wairarapa Combined District Plan***.
2. In general, council will remove or trim trees to ensure health and safety and will not remove trees for the personal benefit of neighbouring residents except where the circumstances are extreme.
3. If necessary, Council may seek a landscape report that assesses the value of the public amenity of the tree that is subject to complaint.
4. Council will consider the following issues when making decisions about trees:

- a. any actual or potential danger to people's health;
 - b. where trees are dead, dying or seriously diseased;
 - c. any undue interference with a neighbour's land, including shading; and
 - d. Māori cultural values, e.g. removal of dead trees for carving purposes;
 - e. whether the tree is listed in the Notable Tree Schedule in the Wairarapa Combined District Plan.
6. Network utility operators may be allowed to remove or trim vegetation, subject to compliance with the Electricity (Hazards from Trees) Regulations 2003 and in consultation with Council.

Gardens

1. Gardens and plantings on Council reserves will take into account:
 - a. management objectives and policies for the reserve,
 - b. values and considerations, and
 - c. use of non-invasive plant species.
2. All plants will be grown in an environment where pruning and cultivation are able to be undertaken to promote a healthy environment.
3. Plant species which are susceptible to pests and diseases and drought will be monitored and where there are no safe or effective methods of control, will be removed.

LANDSCAPE

Some reserves contain areas that are representative of the visual and natural qualities of the district. Development of any kind on these particular reserves will be kept to a minimum, and when appropriate, undertaken and managed to have minimal physical and visual intrusion. Views from some reserves enhance the experience and enjoyment of the visitor. In some cases natural re-growth and re-vegetation programs can diminish and obliterate these views and need to be sensitively managed to retain the recreational amenity of these sites. When planning any development or specific management program, any likely impacts on the reserve and its use need to be investigated and assessed. This will ensure that any potential conflicts are minimised.

- OBJECTIVE:

1. To protect significant landmarks, landscapes and vistas.

- POLICIES:

1. Management and enhancement of the visual and natural quality of a reserve may include, but is not limited to:
 - a. conserving dominant landscape features,
 - b. protecting cultural associations,
 - c. retaining key sightlines, vistas and panoramic views,
 - d. ensuring that any development in a reserve is appropriate to the setting,
 - e. removing any redundant structures and facilities, and
 - f. avoiding any buildings or structures on coastal reserves unless they have been specifically contemplated or provided for in the management plan.



NATURAL HAZARDS

In order to manage the use and development of reserves within the District Council needs to be aware of natural hazards and their potential impact on the use and safety of reserves. Flooding, erosion and land instability are the main natural hazards in the District. While this plan does not specifically address these issues, the emphasis is on avoidance rather than protection. It recognises that hazard events are natural occurrences and that locating activities in inappropriate places creates the risk.

- OBJECTIVE:
 1. To assess the risks of natural hazards to Council facilities and visitors to a reserve.
- POLICY:
 1. Facilities shall be located and sited in areas of acceptable natural hazard risk.
 2. Ensure that the development or use of any reserve does not worsen the adverse effects of natural hazards.
 3. Reserves will generally be left to function naturally in response to flooding and erosion events (i.e. reserve flood plains and/or dunes) with any protective measures being focused on infrastructure assets.

ASSET MANAGEMENT AND MAINTENANCE

Asset Management Plans specify renewal and maintenance programs for reserve facilities. The standards for facilities maintenance are set as 'Levels of Service', as part of asset/activity management planning. As at 2020, Asset Management Plans for Carterton's parks and reserves are to be completed. Until complete, the ***Carterton District Council Reserve Policies and Management Plans 2009 – 2014*** provide guidelines for maintenance levels.

The maintenance of parks and reserves within the Carterton District is carried out by a combination of internal staff and external contractors under service agreements. The operational management of our parks and reserves must consider the objectives, and policies of this Plan and any Individual Reserve Management Plan.

The policies below outline the general intentions of the Council in providing and maintaining reserve assets.

- OBJECTIVES:
 1. To implement the provisions and actions of Reserve Management Plans in a structured and integrated manner through annual capital works programming and Asset Management Planning.
 2. To provide and maintain the reserves of the District to a standard that provides all members of the community access to an environment which meets their recreational needs.
- POLICIES:
 1. Prepare an Annual Capital Works Programme that will identify and prioritise the maintenance and development requirements for reserves within the District.
 2. Monitor and maintain reserve facilities to ensure functionality, safety, cleanliness and amenity.
 3. Clubs and occupants are responsible for the maintenance of their facilities to standards determined by the conditions of the occupation agreement.

4. Limit the trimming, pruning or clearance of native vegetation to the minimum necessary to ensure the effective functioning of reserve tracks, pathways and other existing facilities.

Development, Construction and Earthworks

Development of reserves should encourage usage and enjoyment of reserve land rather than restrict any future opportunities for use of reserve land. It needs to be recognised that the use of reserves may change over time, therefore whilst new development should consider existing use, it should also ensure that there is provision and flexibility to accommodate future changes in demand and use. Development of a reserve must be consistent with the principle purpose of the reserve and consistent with the requirements of the Reserves Act 1977. It is therefore important that Council carefully assess development proposals and ensures that appropriate development of reserves takes place which does not unduly impact on neighbouring properties or the reserve itself.

- **OBJECTIVE:**

1. To ensure that any reserve development meets the needs of approved use and users without significant adverse effects on other users, the reserve, or neighbours.

- **POLICIES:**

1. In evaluating any proposal for a reserve area, Council will consider:
 - a. potential environmental impacts and any ecological, cultural, historical, archaeological or spiritual features of the reserve area;
 - b. the scale of the proposed facilities in terms of the reserve use, foreseeable future use, or the foreseeable demand for the particular activity;
 - c. the materials, siting, design and colour of the proposed structure;
 - d. the protection of existing recreation facilities, except where the displacement of these facilities is in the public interest;
 - e. possible impacts on neighbours;
 - f. the impact on existing network utilities to ensure that activities and development; and
 - g. maintain safe distances from overhead electrical cables, in accordance with the New Zealand Code of Practice for Electrical Safe Distances NZECP 34:2001.
2. Where the potential exists for the use of a reserve to change over time, ensure that new development makes provision for this and does not preclude alternative future uses.

BUILDINGS AND STRUCTURES

Under the **Reserves Act 1977**, any building or structure needs to be compatible with the reserve classification. Buildings and structures have the potential to enhance or detract from the character of a reserve. **The Building Act 2004**, LGA, RMA, the District Plan and relevant bylaws also influence the construction of buildings on reserves. All policies in this section apply to the decision to place a building on the reserve; they do not apply to decisions related to the granting of a resource or building consent.

- OBJECTIVES:

1. To allow only those buildings and structures that are required to meet reserve user needs.
2. To allow for removal of buildings when no longer required.

- POLICIES:

1. The provision of buildings and structures on a reserve will be for sporting, cultural and recreation purposes and to facilitate the appropriate use of the reserve.
2. Buildings and structures will be allowed only where they are necessary to achieve management objectives and policies or are specifically provided for in the individual reserve management plan.
3. Any new buildings or alterations to buildings and structures, will comply with the requirements of the District Plan and **Building Act 2004** and Regulations.
4. Where an occupier-owned building is no longer required by an occupier or has become redundant, the occupier will be required to remove the building from the reserve unless the council resolves otherwise.

SPORTING NEEDS

In providing facilities for sporting needs, Council must consider the potential impact of these facilities on the reserves, reserve users and reserve neighbours, while ensuring that the needs of the community are met.

- OBJECTIVE:

1. To provide a range of sport facilities that:
 - a. allow a community to participate in a variety of sporting activities; and
 - b. consider any district wide needs taking into account the size of the surrounding population.

- POLICIES:

1. Recreational activities, such as active sports codes and recreation activities requiring specific facilities will be grouped to maximise the sharing of facilities.
2. In any development of existing or future active sport or recreation facilities Council may focus public resources and spending on developing a primary active recreation venue for the community

3. Development of sporting facilities will consider the Wellington Regional Spaces and Places Strategy.

REFUSE AND WASTE MANAGEMENT

The Local Government Amendment Act (No4) 1996 requires all territorial authorities to adopt a waste management plan that makes provision for the collection, reduction, reuse, recycling, recovery treatment and disposal of waste in the District. The aim of the plan is to avoid nuisance or injury to public health whilst having regard for the environmental and economic costs and benefits to the District. The Wellington Region Waste Management and Minimisation Plan was adopted in 2017. The dumping of waste on reserves or the inappropriate use of existing waste disposal receptacles can significantly detract from the amenity values and proper functioning of reserves. It is important that reserve users are encouraged to use disposal receptacles. The Council discourages the disposal of inappropriate waste in reserve areas.

- OBJECTIVES:

1. To preserve the recreational, cultural and environmental values of reserves through appropriate disposal and collection of waste.
2. The disposal and collection of waste is to be in accordance with the Local Government Amendment Act (No.4) 1996 and the Wellington Regional Waste Management and Minimisation Plan 2017-2023.

- POLICIES:

1. Waste disposal receptacles and facilities in reserves will be provided where they are considered appropriate and regularly emptied.
2. Waste will be collected and disposed of in accordance with the **Wellington Region Waste Management and Minimisation Plan 2017-2023**.
3. The depositing of domestic refuse, trade waste, garden refuse, rubble or debris on a reserve will not be permitted and any persons doing so may be prosecuted. Council encourage reporting of illegal dumping on reserves via requests for service, or afterhours contact.
4. Where a reserve is used for an event or tournament, user groups or event organisers will be responsible for the collection and disposal of all waste.
5. Reserve users will be encouraged to reduce, recycle and reuse waste generated when using a reserve for functions and other activities. This will be communicated via user signage and documentation and general information on Council websites and in publications.
6. Additional initiatives such as removal of large skip bins, installation of bins with small cavities, on site recycling receptacles, bins that compact, as well as signage to encourage pack it in pack it out will be explored and utilised at various reserve site to reduce waste issues.
7. Reserve users will be encouraged to comply with a "pack in pack out policy" where no waste disposal receptacles are provided - this applies currently to all designated Scenic Reserves under the Reserve Act and additional all-Natural Reserves under this plan.

HAZARDOUS SUBSTANCES

Hazardous substances (chemicals, biological agents) may be needed in the maintenance of reserves. The primary regulation of hazardous substance use is through Greater Wellington's Regional Plan for Discharge to Land. The permitted activity standards include requirements that signage be provided where agrichemical spraying has occurred, or is in progress, in public areas until the re-entry period for that chemical has passed.

- OBJECTIVE:

1. The risk of harm from the use of hazardous substances in reserves is minimised.

- POLICIES:

1. Minimise the use of hazardous chemicals on reserves through use of more environmentally friendly alternatives where practical and feasible.
2. Where hazardous substances are to be used on reserves, the operation shall be undertaken in accordance with current best industry practice, and Regional Plan permitted activity standards or consent requirements.

SAFETY, RISK MANAGEMENT AND PARK CLOSURE

It is important that the parks and reserves within the District remain safe and enjoyable for all, so Council will endeavour to design parks to prevent incidents of anti-social behaviour in these areas.

Regular maintenance inspections are undertaken by Council and its service contractors to ensure that playground equipment and other reserve infrastructure meets safety standards. These inspections also function as risk assessment inspections.

Temporarily closure of part or all of a park may be required for a number of reasons, for example, where wāhi tapu are discovered, where there is a danger to public health and safety or continued access will cause further environmental degradation to a particular area.

- OBJECTIVES:

To create environments where people feel safe or are aware of hazards in their surroundings, as appropriate to the reserve.

1. To identify, measure and manage potential hazards in a timely manner to minimise Council exposure to complaints, compensation claims and litigation.
2. To minimise incidence of vandalism to play equipment and other structures within the reserves.

- POLICIES:

1. Encourage responsible behaviour and good stewardship.
2. All reserve and open spaces will be planned, designed, developed, managed and maintained with the application of CPTED principals at the forefront of thinking (*see text box*).
3. Repair vandalised or damaged reserve infrastructure and play equipment as soon as practicable or remove if damaged beyond repair and dangerous.

4. Carry out an inspection program to identify and eliminate all potential hazards.
5. Remove graffiti as soon as possible.
6. Encourage adjacent landowners and developments to provide passive surveillance of parks.
7. Reserves may be closed intermittently for maintenance, to protect the reserve or reserve users, or for any other reason Council deems appropriate.
8. Ensure that the public are adequately informed regarding closure of reserve or open space, via the Council website and in the local media.

Crime Prevention through Environmental Design (CPTED)

National Guidelines for Crime Prevention through Environmental Design (CPTED) is a crime prevention tool that uses urban design and effective use of the built environment to help prevent crime by reducing opportunities for crime to occur.

CPTED recognises the need for the integration of safety design principles into the planning, design, development, management and maintenance of reserves. The Plan promotes CPTED principles where appropriate.

PUBLIC TOILETS AND CHANGE FACILITIES

Public conveniences such as public toilets and changing facilities support the use of reserves but are costly to construct and to maintain. Council often receives requests from the community to provide additional toilet facilities and changing rooms on reserves. Public toilets and changing facilities may be provided where the use is expected to be high and sustained.

- OBJECTIVE:
 1. To provide public conveniences at appropriate locations where the usage warrants the facility.
- POLICY:
 1. Public conveniences will be provided where necessary and maintained to Council standards.

PLAYGROUNDS

Play is a key part of children's development and more recently has been recognised as important for the wellbeing of seniors; it helps build both physical and social skills. As well as providing informal open space for play (for example, to kick a ball around) reserves may contain playgrounds and play equipment.



- **OBJECTIVES:**

1. To develop and provide for opportunities for play for all.
2. To ensure that structures meet the needs of approved use and users.

- **POLICIES:**

1. Playground equipment will be allowed only where deemed appropriate to the purpose of the reserve.
2. Playground development and structures will meet all required playground safety guidelines (NZS 5828:2015), regulations and have required consents.
3. The provision of play equipment or play areas will accommodate a range of age groups.
4. The provision of play equipment will accommodate a range of accessibility requirements.
5. The playground will be managed within the required service and maintenance guidelines (NZ 5828:2015).
6. Where possible shade will be provided in association with playground structures.

LIGHTING

Lighting within Council reserves can be used on facilities and structures. Lighting may improve the security of facilities, reducing the likelihood of vandalism, and improving surveillance of reserves and facilities. The provision of lighting in public places is, however, no guarantee of improved safety. Lighting should only be provided where there is clear public benefit.

Carterton is part of the Dark Sky Management Area, which plans to make Wairarapa the largest dark sky reserve in the world. This Management Area requires warmer hued street lighting and restrictions on sports field lights, including a 10pm curfew.

- **OBJECTIVES:**

1. To provide lighting only where the costs of developing, maintaining and replacing this lighting is met by the beneficiaries.
2. To support the Dark Sky project.

- POLICIES:

1. The Council will only fund lighting on Council reserve land where there is clear public benefit.
2. Where the Council owns a facility that is occupied by another group based on a landlord/tenant arrangement, it is the tenants' responsibility to provide for lighting.
3. Where any lighting may be provided for on Council reserves it will not unduly impact on affected parties including reserve neighbours.
4. Lighting design should consider the reserve use and lighting purpose, and where possible incorporate efficient downward lighting or solar
5. Ensure lighting provided at Council reserves meets the standard set out in the Dark Sky policy.

FURNITURE

Reserves furniture provides a range of opportunities and settings for users of a reserve, and enhances people's experiences by providing facilities for rest, picnics and services. Facilities such as picnic tables, toilets, drinking fountains, play equipment, bins etc. will be provided and retained where appropriate and/or specified in these policies and in Individual Reserve Management Plans.

- OBJECTIVE:

1. To provide appropriate reserve furniture to ensure that there are adequate facilities for the public.

- POLICIES:

1. Reserve furniture may include, but is not limited to picnic tables and seating, barbeques, rubbish bins, directional or information signage, drinking fountains, park benches.
2. Review the provision of reserve furniture and provide for reasonable public use. Where new reserve furniture or signs are to be provided, their design and location should be in accordance with the Council design guidelines.

SMOKEFREE OUTDOOR PUBLIC SPACES

Council has implemented a Smokefree Public Outdoor Areas Policy (2016) which aims to normalise non-smoking and promote positive role modelling in public outdoor areas, specifically in playgrounds, parks and sports grounds, and at Council supported events. Parks management will support application of the Smokefree Public Outdoor Areas Policy in Council's parks and reserves, namely through signage within parks and by communicating the policy on websites and on all applicable reserve and venue booking/leasing/licencing documents and through installation of appropriate smokefree signage within parks.

- OBJECTIVES:

1. Carterton residents and visitors enjoy the District's reserves with reduced exposure to tobacco use.

2. A reduction in the visibility of tobacco use has a positive influence on the physical welfare and enjoyment of the public of public open space.

- POLICIES:

1. All reserves shall be promoted as Smokefree environments.
2. Council shall work with Regional Public Health to install appropriate Smokefree signs in neighbourhood and recreation and sport parks and near playgrounds.

FENCES, BARRIERS AND GATES

The Fencing Act 1978 sets out the general principle that the occupiers of adjoining land share equally the cost of erecting an adequate boundary fence other than where the property adjoins a legal road.

In addition, fences or barriers may be required to prevent vehicular access to grounds, and where it is desirable to enclose service areas, or the premises of exclusive sports user areas.

The design and location of fences has a major influence on both the use and the appearance of the park. In many cases, fences can be replaced or screened by appropriate planting.

- OBJECTIVES:

1. To erect fences or barriers where necessary to:
 - a. protect park values;
 - b. ensure that the park can be used safely;
 - c. avoid, mitigate or remedy the adverse effects of park use on neighbours; and
 - d. define the boundaries of the park, exclusive use areas or playing surface.
2. To minimise the responsibility of the Council for providing and maintaining boundary fences on reserves.

- POLICIES:

1. Where development or subdivision occurs adjacent to reserves, the Council will seek a fencing covenant to be placed on the title, in accordance with the Fencing Act 1978, to exempt the Council from contributing to fencing costs.
2. Where a fencing covenant is not in place, the Council will meet its boundary fencing obligations under the Fencing Act 1978 by meeting up to a half-share costs of boundary fences in accordance with its current fencing contribution policy.
3. The Council shall in each case determine the type of fence appropriate to the character, use and environs of the park, and follow the procedures prescribed by the Fencing Act 1978.
4. Where, in the opinion of the Council, a standard fence is adequate, an adjoining owner who wishes a non-standard fence shall contribute to any costs in excess of the cost of a standard fence.
5. Where an occupier of a reserve seeks the enclosure of its facilities, the cost of erecting and maintaining appropriate fences to the satisfaction of the Council shall be borne by the park occupier.

6. The erection of pedestrian gates in fences bounding private properties may be permitted with the prior written approval of the Council. The Council will not contribute to the costs associated with pedestrian access gates.

SIGNAGE

Signage enables Council to promote ownership and provide identity. Signs are also essential in aiding identification of hazards that visitors might be exposed to and in providing direction.

Some areas have important or special stories to tell, and the use of interpretive signage in these instances is appropriate.

The use of promotional or advertising signage is one way that organisations with premises on Council land can raise their profile and income. However, this situation needs to be carefully managed so that its presence does not adversely affect the amenity of the park.

- OBJECTIVES:

1. To ensure consistent sign content, style and type on Council reserves.
2. To minimise visual clutter, while maximising necessary and useful information to reserve users.
3. To control the displaying of advertising and sponsorship signs on reserves.

- POLICIES:

1. Provide the minimum amount of signage necessary to ensure the effective communication of park related: public information, identification, directions, rules and regulations.
2. Ensure consistent information, style and type on reserves throughout the District.
3. Prohibit the erection of any sign on a park or reserve without prior Council approval. A resource consent may also be required in accordance with the District Plan requirements.
4. Signs required for advertisement or identification of occupants of reserves, or approved by the Council as part of a naming right, sponsorship of or in conjunction with a specific temporary event shall be kept to a minimum, and be subject to the appropriate provisions of both Bylaw and District Plan rules.
5. Require all reserve occupiers to be responsible for meeting the costs of producing, erecting, maintaining and replacing signs related to their activity and to meet the requirements of the Council Bylaws and the District Plan.
6. Remote advertising will generally not be acceptable, however Council will consider applications on a case-by-case basis.
7. Permit the erection of temporary scoreboards and large format television displays or similar for approved events.
8. Support a preference for bi-lingual signage.

SHARED PATHWAYS

Some of the reserve areas throughout the District are and could be linked with a shared path (walking and cycling) network. This would cater for the enjoyment of the user and provide community health benefits. The shared path network could also be linked together in conjunction with networks provided by other entities such as neighbouring local authorities, the Department of Conservation, and other organisations as well as private landowners. These walking and cycling routes, once established, should be promoted to local residents and visitors for health and tourism benefits.

- **OBJECTIVES:**

1. Provide shared pathways that link the reserve areas of Carterton District Council, neighbouring areas (adjoining Councils), and other organisation's trails taking into consideration the Five Towns Master Plan, and Carterton Walking and Cycling Strategy.
2. Promote walking and cycling for recreation, health and commuting throughout the district.
3. Educate users on the etiquette of using shared pathways

- **POLICIES:**

1. Promote shared pathways to and through reserve areas that are suitable to a range of people's abilities and provide linkages between reserves and local areas of interest. Where appropriate the Wellington Regional Trails Framework should be followed to determine the type of facilities to be provided.
2. Provide appropriate signage as specified in the Wellington Regional Trails Framework.
3. When assessing a shared pathway route cultural values should be considered and known archaeological sites should be avoided
4. When assessing a shared pathway route environmental values should be considered and sites of high unmodified habitat and ecosystem significance should be avoided where construction, presence and use of the pathway will be detrimental to those values
5. Where appropriate provision should be made for shared use cycling in conjunction with walking, and be accessible to all users, including wheelchairs and pushchairs.
6. Install trail counters to capture data on usage
7. Provide secure bike parking facilities where usage warrants.



VEHICLE PARKING

Most recreational uses will generate demand for parking spaces at reserves. The location and design of parking areas should not be at the expense of the amenity of the reserve area, particularly peak parking areas that may only be used on a few days each year. Forward planning in the layout of parking areas can promote their use for other activities when not in use for car parking.

- OBJECTIVE:

1. To provide parking for vehicles and their passengers.

- POLICIES:

1. Vehicle parking will only be provided where the demand and use of a reserve area requires this facility.
2. Provide sufficient car and/or trailer parking to accommodate average yearly use without degrading the amenity of reserve areas.

COMMUNITY

EDUCATION AND INTERPRETATION, TECHNOLOGY, PROMOTION

To ensure our reserves continue to be well used, it is important that Council promotes them and the opportunities they provide. Some reserves are located within the rural area, and locals and visitors alike may not even know they exist. Promotion is therefore seen as important to ensure maximum community benefit is achieved from the provision and maintenance of these reserves.

The promotion can be undertaken a number of ways, such as on the Council's websites, the development of information brochures or providing maps and interpretation panels about reserves.

Information within reserves can enhance user experience through improved understanding of reserve values and may be used to keep visitors to the park informed of events or hazards within the park.

Signage is also an important method to advertise the location and facilities within a reserve.

Technology to promote parks, enhance user experience and gather information to assist management is being developed and applied for use within the industry. Uses can include:

- connecting people to a park and to recreation and education opportunities within the park;
- management efficiency, e.g. indicate when to empty a rubbish bin or alert management to areas of the park that require immediate maintenance or cleaning;
- data collection to establish usage patterns and compare data, "Is the new dog park getting the anticipated use?";
- provision of surveys, application or games for use in parks; and

- social media has become a marketing and promotion channel for our parks.

“Thoughtful use and integration of technology in parks with the aim of enhancing rather than disturbing people’s experience of the natural world could encourage greater usage and enjoyment of our [parks].” (Greater Wellington Regional Council, 2018).

- OBJECTIVES:

1. To increase public awareness of the district wide parks resource.
2. To provide quality information regarding access to and the use of parks across the district.
3. To research and trial technology in parks where it may benefit park users and park management.

- POLICIES:

1. The provision of parks and open spaces across the district will be promoted.
2. Parks, park entrances and shared pathway links to parks will be clearly identifiable.
3. A range of communication methods will be used to engage, inform and educate visitors and park users, which may include information about historic and cultural sites, the history of a reserve, and significant ecological values or biodiversity assets.
4. Signage or technology providing interpretive and educational information will be installed where applicable at reserve entrances and/or other key areas.
5. Reduce barriers in reading of signage, for example include signage in Braille or with sound for visually impaired.
6. Ensure there is coordination between different agencies, e.g. Destination Wairarapa, Iwi, and relevant community groups to research, collate and share information about Carterton’s parks.

TANGATA WHENUA

Many of our local reserves have a level of cultural importance to local Iwi and Tangata Whenua. The cultural values and importance of these reserves can relate to both the features and natural resources within the reserve and the historical activities that occurred at these sites. Council must consult with and have regard to the views of Iwi or hapu before undertaking action and making decisions about reserves for which it is the administering body. It is important Reserve Management Plans makes allowance for Iwi and Tangata Whenua to exercise their responsibilities provided for in the Treaty of Waitangi in a way that is consistent with the Treaty principles.

- OBJECTIVE:

1. To involve mana whenua in reserve management processes in ways which take into account the principles of the Treaty of Waitangi.

- POLICIES:

1. To develop and maintain relationships with tangata whenua through:

- a. ensuring their traditional guardianship role and interests in respect of their lands, forests, fisheries and other taonga are actively recognised and provided for;
- b. providing opportunities to participate in traditional guardianship roles, the maintenance of mauri, and the management and protection of wāhi tapu;
- c. customary use of natural resources within the context of sustainable management;
- d. participation in identification of the cultural importance of areas, the information provided to the public, and the interpretation of tangata whenua history;
- e. promoting awareness of, and respect for, tangata whenua culture, interests, heritage, language and place names within parks;
- f. consulting with tangata whenua on the planning, development and management of parks; and
- g. protection of cultural and spiritual values of reserves.

- EXPLANATION:

Council is required to work collaboratively with tangata whenua, under the Local Government Act 2002, Resource Management Act 1991, Heritage New Zealand Pouhere Taonga Act 2014 and the Reserves Act 1977

Council acknowledges Hurunuiorangi Marae as mana whenua in our District and recognises their unique ties to the Carterton District through their whakapapa and environmental kaitiakitanga. In 2018 Council and Hurunui o Rangi Marae signed a Memorandum of Understanding to make continuous efforts to respectfully work alongside each other.

Note that a number of other parts of this plan have provisions also relating to tangata whenua, both within general policies and park-specific policies.

COMMUNITY ENGAGEMENT AND PARTNERSHIPS

The community has consistently been highly satisfied with the provision of Carterton's many parks, reserves, and open spaces. Not only does park management work to keep the parks well maintained, but they also partner with many community organisations and volunteers to ensure that they are delivering services and facilities that meet the needs of our people.

The management of reserves needs to be responsive to the community, to support:

- a sense of community ownership and civic pride,
- participation in building a resilient, healthy, safe community,
- appreciation of reserves, and
- the development and management of reserves to acknowledge diversity within the District.

- OBJECTIVES:

1. To ensure that the reserves cater for the needs and values of the community in general.

2. Relationships based on good faith, cooperation and understanding to achieve the outcomes of this plan are maintained and enhanced.
3. Community participation and sense of ownership are promoted.
4. Where areas of parks or features are owned or under the control of tangata whenua or other organisations, a joint management regime is in operation.

- **POLICIES:**

1. To promote and provide opportunities for tangata whenua, individuals, volunteers, private sector, businesses and community groups to be involved in park activities that support the objectives and policies in this plan, such as:
 - a. environmental and heritage protection and enhancement, and
 - b. recreational amenity development and maintenance.
2. To encourage and support community group involvement in parks using a variety of mechanism such as:
 - a. park friends groups, volunteer programmes;
 - b. collaboration in running events;
 - c. consultation and engagement over park issues, including development and/or planning.
3. To work with the Department of Conservation, neighbours, and other Councils to:
 - a. together address issues of interest or concern, and
 - b. enhance environmental and recreational amenities across the region.
4. To establish, where appropriate, formal agreements with all groups, volunteers and/or organisations who contribute to parks in an advocacy, restoration and/or education role.

COMMEMORATIVE FEATURES AND PUBLIC ART

Members of the public and community organisations frequently make requests to place monuments, plaques or other memorials on reserves associated with people, traditions or events. While such commemorations can assist in developing community values and mark important historic events, the location and number of such features needs to be appropriate for the site in terms of design.

Public art is one of the more visible and accessible forms of art, and some forms of public art can often be best appreciated if located within reserves. However public art can be controversial, and if located in the wrong place, can conflict with the primary purpose of the reserve.

Commemorative features and public art can also add cost to the ongoing maintenance of reserves, and can cause difficulties when the features are damaged, vandalised or require significant maintenance. Difficulties can also arise where the individual or group having made the gift seeks to influence the management of the wider reserve.

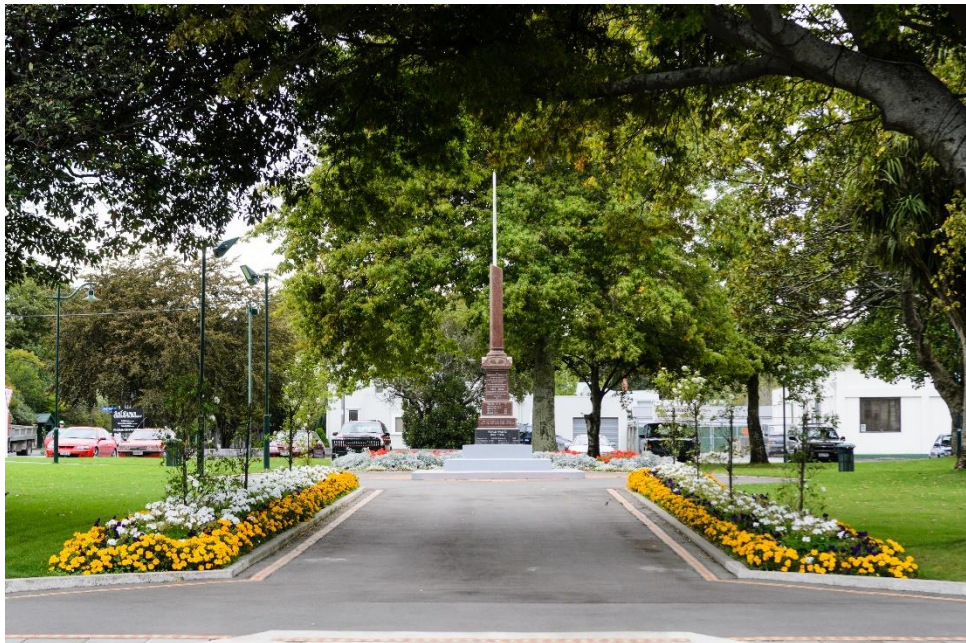
- **OBJECTIVES:**

1. To ensure that any gifts, commemorative features and public art are managed in a sustainable manner and are beneficial to the reserve and reserve users.
2. To ensure personal memorials do not detract from or damage reserve and cultural values.

3. To ensure public art is consistent with reserve values.

- POLICIES:

1. Council will consider on a case-by-case basis any requests from individuals and/or community organisations for the gifting and/or sponsorship of reserve features including the planting of trees or other special plantings, commemorative furniture and public artworks.
2. Public art and commemorative features may only be installed in reserves with the approval of Council.
3. All proposals will be assessed taking into account:
 - a. the compatibility of the proposed feature in relation to the character and use of the reserve;
 - b. the benefit to the reserve users;
 - c. the ease and cost of maintenance;
 - d. the relevance of the feature to the community and its appropriateness;
 - e. the alignment of any artwork with council policy; and
 - f. the suitability of the tree species and planting grade.
4. Any Council approved feature or gift may be acknowledged through the attachment of a small (e.g. 250 x 100 mm) engraved or cast metal plaque associated with the feature.
5. Where a significant gift is involved, Council and the donor group will develop a protocol that sets out the principles of the gift.
6. Where a gift or commemorative feature requires removal, it may or may not be replaced at the discretion of the Council.
7. Council will maintain gifts and/or commemorative features except where maintenance by others is agreed as part of the gift agreement (such as in the case of some sculpture). The benefactor will generally retain no ongoing rights or responsibilities in relation to the feature.



COMMUNITY FOOD GARDENS

Community gardens, where the primary purpose is growing vegetables or fruit for collective use provide opportunity for localised food production, skill development, social interaction and sustainable land use for selected public reserve land, which otherwise may have little recreational or amenity value.

Successful community gardens increase residents' sense of community ownership and stewardship, provide a focus for neighbourhood activities, expose youth to nature, connect people from diverse cultures and build community leaders.

- OBJECTIVES:

1. To support the establishment of new community food gardens as a public amenity.
2. To make available part of selected public reserves for community food gardens throughout the district.

- POLICIES:

1. Applications for community food gardens on reserves will be assessed and approved according to the **Occupation Agreement Guidelines, Reserves Act 1977**, any applicable Individual Reserve Management Plan, District Plan and Council bylaws and/or Policy.
2. Applications will be required to be made by a formalised Management or Community Group. Council will not lease or license land for a community food garden to an individual or allow for individual allotments.

RESERVE OCCUPATION

GENERAL USE

Council parks and reserves are provided and maintained primarily to provide settings for people to enjoy themselves on a casual and unstructured basis.

Traditional activities, such as walking or picnicking, are generally low impact, have little adverse effect on other park users and can be undertaken with minimal restriction. Such use and activities will be permitted and encouraged on reserves within the District.

- OBJECTIVE:

1. To allow and encourage public use of reserves that does not cause damage and is compatible with the purpose of the reserve.

- POLICIES

1. People will be encouraged to use reserves for a range of activities that are compatible with the reserve purpose and do not impact the environment or other users.
2. Users of reserves shall be responsible for ensuring that their use complies with Council Bylaws, see Appendix 2: Bylaws relevant to this Reserve Management Plan.
3. Passive activities may include:

- a. family group picnics and barbecues;
 - b. informal family or group activities including games, recreational activities, and sport;
 - c. walking, running and exercise activities.
4. The dumping of rocks, soil, plant material, wood, hard fill including concrete brick or similar, steel or waste metals, chemicals, food waste, exotic fauna, household waste, building and/or demolition materials is prohibited.
5. Except with prior written approval from Council, the removal of rocks, soil, sand, trees and other plant material is prohibited.
6. The use of firearms, slingshots and projectile firing devices on reserves is prohibited except where authorised in writing, for the purposes of pest animal control by a council approved operator.

ACCESS

Freedom of entry and access to reserves, as far as is practical, is a key principle of the Reserves Act 1977. However, this is subject to any lease or seasonal use agreement over the reserve and any action necessary for the protection of the reserve and its users.

- OBJECTIVE:

1. Open access, where possible, will be provided to all Council reserves.

- POLICY:

1. The provision of access to Council reserves will be provided unhindered, except:
 - a. where degradation may occur to cultural or historical sites through public use;
 - b. where access is unsuitable due to the nature of the terrain;
 - c. where commercial operators have paid a fee to gain private good from the use of reserves (e.g. leases and licences);
 - d. where community groups have been granted exclusive use of a portion or all of the reserve (e.g. leases);
 - e. where necessary for the maintenance or protection of the reserve or the safety of reserve users, part or the entire reserve may be closed for public access; following public notification if required by the Reserves Act 1977; or
 - f. where part or all of a reserve is to be closed to public access for maintenance or any event, notification of this will be made prior to the event; for vehicle access which will be restricted to formed roads and carparks.
2. Private vehicular access across reserve land, to or from private property will not be permitted except where a formal written agreement exists with Council (e.g. an easement)

ORGANISED ACTIVITIES AND SPORT

Any **organised** community, sporting or commercial use of a reserve must be consistent with its purpose and classification under the **Reserves Act 1977**, policies in this Plan or Individual Management Plans, and be approved in writing by the Council. Part Three – Rules for Use and Development identifies the policies for Leases, Licences and Permits and the organised use of reserves.

In granting leases, licences and permits, the Council has a right to charge those who benefit from the reserve and its facilities. The Council sets fees and charges for the short-term use of Council reserves in the form of permits and licences on an annual basis as part of the annual plan process (refer fees and charges). Fees for leases are considered on a case by case basis.

COUNCIL GUIDELINES (COMMUNITY AND RECREATION GROUP OCCUPANCY)

Reserves are regularly leased by community groups for non-commercial activities. Some reserve land is leased by recreational organisations for the use of club rooms and other facilities. The Council supports and encourages leisure and recreational organisations to develop facilities that service the needs of the organisation and enable greater use of the relevant reserve.

Council's preference is for combined use facilities where different organisations can share the same infrastructure (see Multipurpose facilities, page 54)

COUNCIL GUIDELINES (COMMERCIAL OCCUPANCY)

The provision of access to reserve land for commercial activities may be considered in accordance with the **Reserves Act 1977**. Examples of commercial activities includes issue of a licence for reoccurring use of reserves for commercial markets, events, or to private camping ground operators. These leases are subject to stricter criteria prior to approval.

COUNCIL GUIDELINES (OTHER OCCUPANCY)

The Council also issues licences to occupy reserve land as an appropriate management tool. For example, the grazing of certain reserves is encouraged as an inexpensive management tool, a method of generating revenue, reducing fire risk and the control of pest plant species.

Structures associated with leases may have a detrimental impact on the natural, cultural, historic, or landscape values of the reserves. It is essential to monitor and regulate any existing or future leases and licenses to protect and preserve the natural qualities of the reserves, whilst providing an appropriate number of compatible facilities for the enjoyment of the users. Any new buildings or structures, or modifications to existing buildings would be subject to the District Plan and may require resource consent.

- OBJECTIVES:

1. To allow and encourage the public use of reserves within the Carterton District in accordance with Council bylaws and policy and the purpose of the reserve.
2. To allow for the occupation of reserves for approved uses and facilities by the granting of a lease, licence or permit, providing activities are in accordance with all relevant legislation and Council policy and/or any applicable lease agreements.
3. Provide clear application criteria and process.

- POLICIES:

1. Encourage the use of reserves for a range of passive activities that are compatible with the reserve purpose and do not impact on the environment or other users. Passive activities, generally unorganised, may include:
 - a. walking, running or cycling;
 - b. informal family or small group activities such as picnics, games, interaction with nature and sport.
2. Permit organised community events on reserves provided that there will be no adverse effects on other users, the reserve and reserve neighbours and where all statutory and policy requirements are met (See Part 3 for Leases, Licences, Concessions and Easements and Permits and bookings).
3. Require any commercial use of a reserve to obtain the prior written approval of Council (see Part 3 for Leases, Licences, Concessions and Easements and Permits and bookings).
4. Require any organised event or use of a reserve to pay a fee in accordance with Council Fees and Charges Policy, the amount of which will recognise the use of the reserve, its likely impact and any benefits to the community. see Part 2 for Cost recovery).
5. Reserve users shall be responsible for ensuring that their use, activity, or any associated buildings or structures comply with the District Plan and Council bylaws.

MULTIPURPOSE FACILITIES

Some existing reserve facilities could sustain higher levels of use, and the sharing of such facilities would prevent unnecessary duplication and cost.

Sharing of facilities by sports bodies can generate revenue and spread the load of paying for overheads such as power. Such uses must however be consistent with the purposes for which the reserve is held.

- OBJECTIVE:

1. To encourage the sharing of existing facilities to prevent unnecessary duplication or expansion of facilities.

- POLICIES:

1. The multiple use of buildings and other facilities by sports and cultural bodies shall be actively encouraged.
2. Permit the occupation of buildings and other facilities by ancillary uses where these are consistent with the purpose for which the reserve is managed and where such uses will support and sustain further recreational use of the reserve.

SPECIALISED FACILITIES

Specialised facilities may be required for conducting recreation and sport activities on reserves including cricket wickets, tennis courts, skate bowls, pump parks, dog exercise parks etc. and other artificial surfaces. The Council provides or supports provision of these facilities where they promote the development of sport and recreation in the District.

Applications to develop specialised facilities will be assessed to ensure compatibility with the status of the reserve, the **Reserves Act 1977**, and the **Wellington Regional Spaces and Places Strategy**.

CYCLISTS

Many people in the community enjoy cycling and Carterton District Council promotes cycling for recreation and moving about the town. Activities such as this can create conflicts with other users and may, if undertaken in inappropriate areas, adversely affect the reserve environment. Given this, it is important that people are aware of where these activities may be undertaken.

- OBJECTIVE:

To provide for recreational and commuter needs of cyclists while ensuring that other reserve users are not inconvenienced.

- POLICIES:

1. Shared use pathways for pedestrians and cyclists will be encouraged
2. Appropriate signage will identify shared use pathways

HORSE RIDING

Many people in the community enjoy horse riding. Activities such as this can create conflicts with other users and may, if undertaken in inappropriate areas, adversely affect the reserve environment. Given this, it is important that people are aware of where these activities may be undertaken. Restrictions for horse riding are necessary to protect the environment, including the cultural and archaeological values within a reserve, the health, safety and well-being of visitors and reserve operation and management.

- OBJECTIVE:

1. To provide for horse riding on some reserves where the activity does not create undue conflict with other reserve users or have adverse effects on the environment.

- POLICIES:

2. Horses may only be ridden on reserves where these have areas specifically designated for horses.
3. Where access to the beach is through vehicle points and boat ramps that are on a reserve, horses may be ridden on the reserve for the purpose of accessing the beach.

DOGS

Reserves are popular places to walk and exercise dogs. However, dogs can pose a direct threat to people, animals and birds. The **Carterton District Council Dog Control Bylaw 2017** always requires dogs in public places to be kept under continuous and effective control. Owners must also be considerate of other reserve users and remove dog droppings as required by the Bylaw.



- **OBJECTIVE:**

1. To provide for the exercise and recreational needs of dogs and their owners while minimising potential danger, distress and nuisance from dogs to the community generally and wildlife.

- **POLICIES:**

2. The owner of any dog must ensure that the dog is always under control and must remove all droppings from the reserve.
3. Except as provided for in Dog Control Bylaw 2017 the owner of any dog in
4. any public place must secure the dog by an effective leash or similar which keeps the dog under continuous control.
5. Dogs are not allowed to enter any public place as described in **Dog Control Bylaw 2017** as a prohibited area, whether under control or not. Dogs will generally be excluded from the following areas:
 - a. nesting, roosting and feeding areas of threatened bird species;
 - b. playgrounds;
 - c. swimming pools; and
 - d. landfill.

FIRE

Fire poses a threat to life and can severely damage large sections of property. The Council is required (under Section 183 of the **Local Government Act**) to manage the risk of fire to an acceptable level.

- **OBJECTIVE:**

To avoid damage or destruction of reserve land, flora, fauna, buildings and facilities by fire.

- **POLICIES:**

1. The use of open fires, including portable barbecues using solid fuels, will only be permitted in designated areas and when the fire is permitted by controls implemented through the **Fire and Emergency New Zealand Act 2017**.

2. Persons or organisations wishing to have a fire on a reserve will be required to seek prior Council approval.
3. Council will control flammable weed or grass growth and plant more low-flammable native species to inhibit the spread of fire.
4. Council will strategically mow or graze to reduce the fuel loading associated with rank grass.
5. Council will inform and educate visitors about fire risks and impacts via a range of methods and media.

FIREWORKS

Groups occasionally wish to use reserves for fireworks displays. These displays are controlled by legislation other than the Reserves Act 1977 and require an outdoor pyrotechnic display compliance certificate.

- OBJECTIVE:

To allow fireworks displays on identified reserves, subject to all adverse effects on reserve values being avoided, remedied or mitigated.

- POLICIES:

1. Fireworks displays will not be permitted on public reserves except for those identified to allow for public events. These events must have council approval and be fully compliant with relevant legislation, regulations, codes, permits and a licensed pyrotechnic technician must be employed to organise and implement the display.
2. Persons or organisations wishing to hold a fireworks display on a reserve will be required to seek prior Council approval.

VEHICLES

The use of vehicles within reserves raises safety concerns and can be damaging to the reserve. The potential for pedestrian and vehicle conflict increases where vehicles are not limited to designated roadway or parking areas.

Vehicle access on to reserves can cause conflict with how the reserve is used. Vehicles on sports playing surfaces can cause damage to turf, particularly during the winter months. There is however a need for maintenance vehicles and emergency vehicles to be able to access playing fields. Vehicles on reserves can also cause damage to natural, cultural or archaeological features in the reserve area. Physically restricting vehicle access through fences or bollards can be an effective way of restricting vehicle access, under some circumstances, but can reduce the visual amenity and sense of open space.

- OBJECTIVE:

1. That the use of vehicles within reserves is managed in a way that does not result in damage to the reserve or become a danger to reserve users.

- POLICY:

2. Except for emergency services vehicles, approved operational purposes, or where written approval for an event has been obtained from the Council, vehicles are prohibited off road on reserves.

AIRCRAFTS ON RESERVES

While Council has no jurisdiction with respect to overflying piloted aircraft, it has a responsibility to ensure that activities on reserves comply with noise standards and control effects of activities on and around reserves.

Activities involving piloted aircraft (including helicopter landings, landings and launching by parachutists, paragliders and hang gliders and fixed-wing airplane activity) generate noise, may involve safety considerations and may conflict with general reserve use and the quiet enjoyment of neighbouring properties. **The Summary Offences Act 1981** (s13) allows prosecution where such activities might cause injury.

- OBJECTIVES:

1. Reserves may provide for aerial activities where the activities on the reserve comply with noise standards and they do not conflict with other reserve uses and the quiet enjoyment of neighbouring properties.
2. Reserves provide access for emergency services where possible.

- POLICIES:

1. Piloted aircraft may only land on or take off from reserves for the purposes of special events and in emergencies but not as a general practice.
2. Applications for aircraft landings shall be assessed on a case by case basis and subject to adequate public liability insurance, a health and safety plan, approval from Council and the Civil Aviation Authority, or Military
3. Applications for taking off or landing or events involving the use of piloted aircraft, including helicopters must be made in writing to the Council at least ten working days prior to the proposed event and must state how effects on reserve users and neighbours shall be mitigated
4. Any landing/take off strip for piloted use is to be suitable marked and personnel provided to ensure that no member of the public strays on to the strip during landing or take off and that the operations is performed safely

UNMANNED AERIAL VEHICLES (DRONES/UAV)

The recreational and commercial use of unmanned aerial vehicles (UAVs) or drones can have negative effects on neighbours and other reserves users including noise, potential for injury and impacts on privacy. The Civil Aviation Authority regulates the use of UAV including requiring council approval to be obtained to operate drones over council land. Council has approved the use of UAV on council land (including reserves) subject to compliance with Council guidelines on the use of UAV over Council land.

- OBJECTIVE:

To provide for the use of UAV on reserves while ensuring that other reserves users are not inconvenienced.

- POLICY

1. The use of UAVs over Council land is permitted so long as this complies with New Zealand Civil Aviation Authority rules and requirements regarding the use of drones, and Council guidelines.
2. Flyers must:
 - a. be aware of the Office of the Privacy Commissioner guidance on preserving people's personal privacy by flying over other people or adjoining private property;
 - b. obtain the appropriate permit from Council if the proposed flight is for commercial purposes;
 - c. take all practicable steps to minimize hazards to persons, property and other aircraft and give way to crewed aircraft;
 - d. not take photographs of other people without their prior approval;
 - e. not operate the UAV over playgrounds, swimming pools, or a sports field in use by others;
 - f. not operate the UAV within 20 meters of sensitive wildlife habitats or nesting or roosting birds;
 - g. not operate the UAV within 20 metres of any public building; and
 - h. not fly within 4km of any airfield unless as a shielded operation;
3. The CAA rules allow flying within 4km of aerodromes if you are flying as a shielded operation.

MOTORHOMES AND FREEDOM CAMPING

Carterton is a "Motorhome Friendly Town."

Camping may refer to both formal and informal activities. Informal camping is generally referred to as 'freedom camping' and is controlled by the **Freedom Camping Act 2011**.

Section 44 of the **Reserves Act** restricts the "use of a reserve, or any building, vehicle, boat, caravan, tent, or structure situate thereon, for purposes of permanent or temporary personal accommodation" to approved areas only.

- OBJECTIVES:

1. To allow for freedom camping by certified self-contained vehicles such as motorhomes on some reserve areas as identified in Part 5 Reserve Specific Outcomes.
2. The adverse effects of camping on reserves and reserve neighbours are controlled while the opportunity is provided in appropriate locations

- POLICIES:

1. Camping may only occur on reserves in developed and identified camping areas on reserves.
2. Formal camping may only occur in developed and identified camping areas on reserves.

ALCOHOL AND ALCOHOL LICENSES

Refer to the **Wairarapa Local Alcohol Policy 2018**. The Council can place conditions on the use of alcohol in reserves including partial and total bans. The consumption of alcohol on reserves may be associated with clubs and special events, where the relevant alcohol licence has been obtained. However, the consumption of alcohol can, have adverse

effects on reserves, other users and neighbours, arising from noise and damage. These effects may diminish the recreation and landscape values of the reserve. The **Sale and Supply of Alcohol Act 2012** governs alcohol licenses.

- OBJECTIVE:

1. To allow the granting of alcohol licences for premises on reserves where the values of the reserves are not diminished and the effects on reserve neighbours can be mitigated.

- POLICY

2. All alcohol licences on reserve land will be in accordance with Council bylaws and policies and the **Sale and Supply of Alcohol Act 2012** and regulations.

PRIVATE CEREMONIES, INCLUDING WEDDINGS

Although private ceremonies, such as wedding ceremonies are private affairs, when held on a reserve, the ceremony and photography must be conducted in a manner that does not unduly impact or deter the general public's enjoyment of the reserve.

Council can limit activities and restrict numbers to ensure any disruption from a private ceremony is minimised and the reserve is protected. Private ceremonies must also comply with bylaws and District Plan rules and a resource consent or building consent may be required in some cases.

- OBJECTIVE:
 1. To allow for a range of private ceremonies and activities on reserves where the activity does not create conflict with other reserve users or have adverse effects on the environment.
- POLICIES:
 1. Private ceremonies, including weddings and wedding photography may be allowed on reserves subject to permission from Council and provided that the adverse effects on other users, the reserve and reserve neighbours can be avoided or minimised. Bylaws and District Plan rules will also apply and a resource consent and or building consent may be required in some cases.
 2. Requests to hold a private ceremony on a reserve must be made by submitting a permit application to the Council.
 3. Vehicle access is not permitted onto a reserve other than in areas designated as roadway carpark areas or council-approved access routes.
 4. Apparatus such as canopies or marquees must be free standing and may require a building consent.
 5. Rice, birdseed, glitter or confetti (natural flower petals permitted) are not permitted.
 6. Non-amplified music is allowed for a private ceremony.
 7. Private ceremonies cannot restrict other visitors from the reserve nor block access or pathways.
 8. All rubbish and debris generated by private ceremonies must be removed prior to vacating the reserve.

SCATTERING OF ASHES AND BURIAL OF PLACENTA

The scattering of ashes from cremation is a deeply significant experience for a loved one's family and friends, however it can be a concern for people using or working in a reserve to realise they may have inadvertently disturbed such remains. Similarly, the burying of placenta on reserves can also cause difficulties.

- OBJECTIVE:
 1. To ensure the scattering of ashes or the burying of placenta do not detract from or damage reserve and cultural values.

- POLICY

1. The scattering or placement of ashes from cremation and the burial of placenta in reserves is prohibited; except with prior written approval from Council.

HUNTING ON RESERVES

Due to the risks associated with uncontrolled hunting, no casual hunting shall be permitted on land administered by Carterton District Council. Hunting is only permitted on reserves for pest management purposes at reserves specified in individual management plans. Permission is at the sole discretion of the Forest Manager and is granted subject to conditions. Applications will be assessed on a case by case basis.

- OBJECTIVE:

1. To allow hunting for pest control purposes only, on reserves identified in individual management plans.

- POLICY:

1. Applications are at the sole discretion of the Forestry Manager.

BEEHIVES

Permission is required to keep bees in Carterton District Council reserves. Permission is at the sole discretion of the Council and is granted subject to conditions. Additional conditions may also be required by way of a licence or permit and each application will be assessed on a case-by-case basis. Applications will be assessed against the primary purpose of the reserve land, bylaws, and other relevant policies. The Council may review conditions in licences or permits and before making any changes the Council will provide the beekeeper notice of such changes.

- OBJECTIVE:

1. To provide for the placement of beehives on reserves while ensuring that other reserves users are not inconvenienced.

- POLICIES:

1. Hive location to be agreed with Council and must not be changed without Council approval.
2. Council will consider the location of the hive site in relation to neighbours and other users of the public land.
3. Beekeeper must hold a DECA (Disease Elimination Conformity Agreement) or be mentored by a beekeeper who holds this qualification.
4. Beekeeper's name and hive site must be registered with AsureQuality and the hives must prominently show the Beekeeper's Apiary Registration Number.
5. Hive management must be timed as far as possible to minimise disturbance to Council staff and other land users.

6. Beekeeper is responsible for clearance of grass and weeds within 1 metre around each hive. Council management practices, such as weed and animal control, will not be inhibited.

OCCUPATION AGREEMENTS

The term occupation agreement refers to any lease, licence, permit, easement (including right-of-way and telecommunication agreement), exchange of letter, or other agreement reached between the Council and a person, organisation, or company to occupy part of a reserve (including below ground assets). An occupation agreement is also sometimes referred to as a concession.

Council's power to grant leases, licenses, permits and easements over reserves varies depending on the status of the reserve and the rights transferred from the Crown. Each agreement will need to refer to specific sections of the **Reserves Act 1977** dealing with the type of reserve under consideration. A variety of activities undertaken on Council reserves require a specific authorisation for the occupation of space. Leases, licences, permits or easements are the most common forms of authorisation granted by the Council to a person, organisation, or company that is occupying or using part of a reserve, long term.

Applications for a lease, licence, permit or easement on reserve land, held under the **Reserves Act 1977**, must meet the statutory requirements defined in the Act, as well as the objectives and policies in this Plan or Individual Reserve Management Plan.

A **lease** grants a legal right for exclusive possession of reserve land for specified activities.

A **licence** gives a non-exclusive right over the land, for specified activities, and may be granted for commercial activities, grazing or activities contemplated in section 74 of the **Reserves Act 1977**.

A **permit** gives a right to carry out a specified activity on reserve land that does not require an interest in the land e.g. one-off events for 1-12 days (e.g. circus, music concert, weddings).

An **easement** gives a precise right of access, or a right to lay infrastructure (that is, to use the land in a particular way). It must be registered on the land title or Gazette notice for the land.

Details of these different agreements and policies relating to each are detailed below.

It is also important to note that depending on the activity, other permits or consents may be required of the applicant before an agreement can be exercised e.g. resource consent under the RMA, or an alcohol licence.

- OBJECTIVES

1. To allow for the occupation of reserves for approved uses and facilities by the granting of leases, licences, permits or easements.
2. To protect reserve values by minimising the number of buildings, easements and utilities on reserves.
3. To allow the use of a reserve for special activities where that use is compatible with the designated purpose of the reserve area.
4. To recover costs to the Council and community, for processing of applications and managing the reserve.
5. To ensure adequate compensation is provided to remedy or mitigate the adverse effects of all utility, stormwater discharge, drainage rights and underground facilities on reserves.

6. To undertake a case-by-case assessment of activities that are not covered by this plan.
7. To process applications for lease and/or license agreements on reserves in an efficient, consistent and transparent manner.
8. To minimise the impact of easements on the public use, enjoyment or visual amenity of reserves.

- **POLICIES**

1. Activities that require approval, include, but are not limited, to:
 - a. all commercial activities on or across reserve land;
 - b. activities that require exclusive use of, all or part of a reserve, including public and private events;
 - c. telecommunication and radio-communications stations; and
 - d. any other similar activities which are not specifically provided for in this Plan.
2. Written applications for a lease, licence, permit or easement shall be made to Council.
3. All costs associated with leases, licenses, permits or easements are the responsibility of the holder of the occupation agreement.
4. Fees or rent will be payable on all occupation agreements, according to Council policy to:
 - a. cover administration costs, and
 - b. reflect market value.
5. Public notification will be undertaken where the occupation agreement has:
 - a. exclusive use of an area of reserve, or
 - b. the potential for high impact on the environment of surrounding area.
6. Notification will be made in a manner consistent with the requirements of the **Reserves Act 1977**. The applicant will be responsible for meeting any costs of public notifications and hearings if required.
7. Notwithstanding 6 above, the notification of proposed lease agreements, licences, permits or easements will not be required where the lease licence, permit or easement is in conformity with and contemplated by an approved reserve management plan.
8. A bond may be required for using a reserve. The following factors will be considered in assessing the amount of a bond:
 - a. the size of the activity, and
 - b. the possibility of damage to the reserve.
9. A bond will be set at such a level that any possible damage can be repaired at no cost to Council. Amounts in excess of repair costs will be refunded. If a bond does not cover

the cost of repairing damage, the difference will be charged to the occupation agreement holder and/or group using the reserve.

10. Payment of bond to Council is required at the time of making an application.

LEASES

The leasing provisions of the **Reserves Act 1977** emphasise the retention of open space and the public accountability of reserve management. On recreation reserves, leases must be drawn up subject to the relevant provisions of the **Reserves Act 1977**. Under the RMA, an interest in land over 35 years may be subject to the applicant having an interest in that land. As such Council will only issue a lease for a period of 35 years less 1 day (i.e. 34 years, 364 days). The leasing of public land restricts the uses to which it can be put and usually limits use of the land by the general public. Unnecessary duplication of facilities, particularly among organisations that are active for only part of the year, should be avoided.

- **POLICIES:**

1. A lease must be for an activity or purpose which is "compatible" with the reserve's legal classification (e.g., a butcher shop is not compatible, but a café may be).
2. A lease will be issued where Council grants a person, organisation or company exclusive use of a reserve or a building on a reserve.
3. Where current leases allow for a right of renewal, or new leases are being sought, the lease shall incorporate the appropriate provisions of the First Schedule of the Reserves Act 1977, except where the Council's tenure of the land requires otherwise.
4. Council will maintain current lease agreements

LICENSES (OTHER THAN GRAZING) AND PERMITS

A licence to occupy grants the non-exclusive right to use a reserve for a specific purpose. Licences for commercial activities such as events, entertainment, street trading, vending, filming, commercial photography, product launches and personal training may be granted subject to an assessment on likely impacts of existing reserve users and the likely benefits of the proposed activity in terms of recreation and reserve promotion or use.

- **POLICIES:**

1. All applicants who wish to hold an activity on a reserve are required to complete an application in writing on the appropriate form, as approved by Council from time to time. Dependent on the scale or potential impact of the activity there may be additional information and compliance requirements including, but not limited to health and safety plans, traffic management plans, public liability insurance and public notification. Information on these requirements will be available from council.
2. Subject to an assessment of the impacts of the proposed activity a licence may be issued where the use of a reserve is non-exclusive and for a period of 13 days to three years. Such licences may have rights of renewal attached and assignment will be at Council's discretion.
3. Subject to an assessment of the impacts of the proposed activity, a permit may be issued where use of a reserve is non-exclusive and for a period of 12 days or less.
4. Council will maintain current license agreements.
5. Should a licence holder wish to enclose part of a reserve and/or charge an entry fee (including for car parking) for a temporary event, this shall only occur as detailed in the conditions of any licence or permit granted.
6. Where part, or all, of a reserve is to be closed to public access, for an activity, public notification of this will be made prior to the activity causing the closure. Notification shall be made by Council public notice in the local paper circulating in the district at least two weeks before the closure. The activity organisers will be responsible for meeting any cost of public notification.
7. Where there is a possibility of serious damage being caused to the reserve; or disruption to users; neighbouring properties; or property or persons on adjacent public land, Council may require the organiser to have public liability insurance and other

appropriate insurance cover. A copy of this will be required prior to the license or permit being issued.

8. Public Liability Insurance of at least \$1 million is required for all commercial activity on a reserve.

GRAZING LICENSES

Some reserves may not at present be required for the purposes for which they were classified or have inadequate demand to justify mowing and other maintenance activities. Section 72 of the **Reserves Act 1977** enables Council to issue licences to enable parties other than the Council to graze reserves in order to reduce maintenance costs and keep the land in reasonable condition until such time that it is required for recreational use.

Such agreements will include conditions providing adequate safeguards to prevent the destruction of or damage to any natural, scenic, historic, cultural, archaeological, geological, or other scientific features or indigenous flora and fauna.

- POLICIES:
 1. Grazing licences may be granted subject to an assessment of the likely impacts on existing reserve users and effects of grazing on the reserve values.
 2. Grazing licences may include provision for public access (subject to conditions) where this is appropriate and desirable. Such conditions may include a restriction on dogs or seasonal closures.
 3. All grazing licences will include a condition providing adequate safeguards to prevent the destruction of or damage to any natural, scenic, historic, cultural, archaeological, geological, or other scientific features or indigenous flora and fauna.
 4. Grazing licenses may include a condition requiring appropriate fencing of waterways

EASEMENTS

An easement lawfully grants the rights for one person to use another person's land for a specified purpose, in this case the use of reserves for access or utility facilities. Easements, especially for assets above ground, can have a negative effect on reserve values and as such they will be limited and may be declined by Council where alternatives exist or where the impact on the reserve is considered unacceptable.

It is important for Council to know the location and ownership of private utility facilities crossing reserves so that their location can be taken into consideration when development, enhancement or maintenance work is being planned or carried out on the reserve.

- GENERAL POLICIES:
 1. Easements granted will have limited timeframes (e.g. linked to the life of the building or an activity) and annual fees for rental may be required, unless otherwise specified in the agreed terms and conditions of the easement instrument.
 2. Existing easements may be required to pay rental fees, unless otherwise specified in the agreed terms and conditions of the easement instrument.

3. Conditions regarding reinstatement of the site at the completion of the agreement period may also be included with any permission granted. Where easements are not in perpetuity, and requiring reinstatement of the site, the values of the reserves will be re-established.

- **POLICIES - EASEMENTS FOR UNDERGROUND FACILITIES:**

1. Property owners may be responsible for maintaining utility facilities (stormwater, wastewater, sewerage, water and gas pipes, electrical, telecommunication cables) connecting between their property and the main network operator's facilities.
2. Where network operators are not responsible for these connecting facilities, the owner of the private property being serviced by these facilities is responsible for the maintenance of pipes or lines etc. and the reinstatement of reserve following work being carried out on facilities.
3. In general, utilities should be located where they will not impact on the use and enjoyment or general amenity of the reserves.
4. Where existing utilities are to be upgraded, the utility operator will undertake early and full consultation with the Council as an affected party.
5. No future utilities, other than those required for the service of the reserve, will be located on reserves, except where required due to the technical or operational constraints of the network utility as identified during the site or route selection process. Where utilities are required in any reserve they will be provided underground and in such a way so as not to affect areas of cultural and archaeological significance.
6. All costs associated with the installation of services under or over a reserve, including costs for making good the affected area during or after construction, any remedial work, or easements will be borne by the utility provider.

OTHER CHARGEABLE FACILITIES

There are a small number of facilities on reserves that are provided and serviced by the Council for public use and enjoyment including electric barbeques. These facilities are provided for specific users of the reserve therefore the cost of operation and maintenance should be charged to the user who benefits from the facility. Chargeable facilities and the level of recovery will be specified in the Council's Fees and Charges Schedule.

FACILITIES AND CHATTELS ABANDONMENT

Changes in levels of population and participation sometimes result in sports clubs and groups dissolving, amalgamating or falling into recess. This can result in the abandonment of facilities such as playing courts, practice nets and clubrooms.

- **OBJECTIVES:**

1. To ensure buildings or structures that are of benefit to reserve users are retained.
2. To ensure that reserves are always safe and well-presented public places.
3. To seek the adaptive reuse or relocation of buildings where practical.
4. To ensure the owner of a building or structure is responsible for the maintenance and security of a building until disposal has occurred

- **POLICIES:**

1. The owner of a building or structure will dispose of the facility under the terms of the lease.

2. Where a building or other structure is no longer required by an occupier or Council, the following steps will be taken in priority order.
3. The occupier will be required to find a new approved occupier (as permitted by relevant Acts, or policies) or remove the building or structure from the reserve.
4. If the occupier cannot either find a new suitable occupier or remove the building or structure, then Council will take reasonable efforts to find a new suitable occupier or use for the building.
5. If no suitable occupier or use can be found, Council will consider moving the building or structure.
6. If no suitable occupier can be found and the building or structure cannot be relocated and there is no reasonable foreseeable use for the building or structure, then it will be demolished.
7. Council will have the option to tender or sell the building (not the land) as an alternative to demolishing it, providing it can be removed from the site.
8. Where the building or structure is not compatible with the primary function and values of the reserve, it will be removed from the reserve.
9. Where Council does not own the building, feasible costs associated with removal or demolition of the building and or structure and reinstatement of the reserve to Council's satisfaction shall be charged to the owner.

COST RECOVERY

- OBJECTIVES:

1. To recover costs to the Council and community for the processing of applications and management of organised use of reserves.
2. To ensure that all leases on Council buildings are identified and being charged in accordance with Council policy for consistency and transparency.

- POLICIES:

1. Fees and Charges will be applied as detailed in the Council Fees and Charges Schedule for the use of the reserve or reserve facilities.
2. Annual rental will be payable on all leases, licences and permits except where Council:
 - a. has resolved that no or reduced rental is required or appropriate; or
 - b. is constrained by previous long-term rental agreements.
3. All costs associated with leases, licenses and permits are the responsibility of the occupation agreement holder.
4. A bond is required to be paid for using a reserve in certain circumstances, taking into account the size of the activity and the possibility of damage to the reserve. Should the cost of the repair exceed the bond then the applicant will be charged the difference.

SPECIFIC POLICY

This Plan also provides objectives, policies and actions for specific issues, in some cases promoting a targeted response for an issue. These specific management provisions take precedence over the General Policy where they relate to the same issue.

PART THREE – RULES FOR USE AND DEVELOPMENT

This part of the plan outlines the rules relating to the provision and management of all development and activities on suburban reserves. These rules should be read in conjunction with the Wairarapa Consolidated Bylaw 2019.

Within the District's reserve network, several activities and experiences are offered and there is a range of values associated with the network as a whole and with the individual parks and reserves. As activities have the potential to impact on other park visitors and the environment, they need to be managed through Carterton District Council giving approval for each activity.

Each activity is identified as fitting one of the following three categories, and this determines what type of permission applies and what process any activity is subject to:

- allowed activities,
- managed activities, and
- prohibited activities.

Rules for use and development are not intended to preclude day-to-day management by the Council. For example, use of a chainsaw is prohibited, but Council staff or their contractors will be permitted to use them as required for tree management.

Transpower activities are governed by The Electricity Act 1992, Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009, and the Electricity (Hazards from Trees) Regulations 2003. Rules for use and development are not intended to preclude activities that are explicitly permitted by that legislation.

RULES

- OBJECTIVES:
 1. Manage the District's reserves in a manner that recognises and protects their key values: ecological, landscape, recreation, culture, and history.
- POLICIES:
 1. Provide for environmentally sustainable activities and uses that are consistent with the objectives and policies of this plan.
 2. Manage and maintain discretion over activities to ensure appropriate allocation of resource, protection of open space values, and the safety of users.
 3. Maintain discretion over new activities and utilities to avoid or limit impacts on the environment and open space values.
 4. Follow a process for determining whether new activities and development are appropriate for the open space directly affected and the reserves network in general.
 5. Prohibit activities that are inappropriate for the reserves network.
 6. Guide balance decision making when assessing potentially conflicting activities and / or when assessing effects of activity on the range of recreation values.

ALLOWED ACTIVITIES

These are activities that are generally allowed or anticipated on reserves but may be subject to restrictions in order to protect reserve values and provide for the health, safety, and wellbeing of visitors.

Allowed activities are largely informal and unstructured, and traditionally associated with parks and reserves areas. In addition, organised sport is allowed on sport and recreation parks subject to booking. Allowed activities have a low impact on park values and other users and need few restrictions. Members of the public do not need to book these activities or seek approval for them.



Commercial activity is not an “allowed” activity. Commercial use refers to use by an individual, group, or organisation that is carried out for profit or as a means of livelihood or gain. This includes, but is not limited to recreation and sport, tourism, and filming businesses.

Some activities like mountain biking and walking a dog off-leash, will only be allowed on identified tracks or areas. Dog walking for example is governed by a separate Control of Dogs Bylaw. Some reserve areas may be open to horse riding but closed to mountain biking.

The following activities by individuals or groups are permitted for non-commercial purposes and may be subject to certain conditions and temporary restrictions:

- a. walking;
- b. running;
- c. cycling and mountain biking on designated and shared tracks;
- d. dog walking (on leash unless in a specified off leash area, refer to the Council’s Dog Bylaw;
- e. sightseeing;
- f. picnics, barbeques (gas only), informal gatherings and group games and similar activities (restrictions may apply to some locations or activities – see Restrictions to Allowed Activities);
- g. informal games;
- h. painting, amateur photography, and filming (non-commercial);
- i. wildlife spotting;
- j. nature trails;

- k. orienteering;
- l. organised sport on a sport and recreation park (subject to standard conditions for booking);
- m. access for park management and emergency vehicles;
- n. vehicle access to public car parks and leased facilities; and
- o. quiet, sedentary, typically individual activities, e.g. reading, that do not have the potential to offend other park users.

- POLICIES:

1. Activities are allowed subject to the terms and standards of any relevant general policies in this plan
2. Any activity is allowed to the extent that it is being undertaken in accordance with an Authorisation or is consistent with the purpose and classification of a reserve; does not require authorisation in accordance with the Reserves Act; is not inconsistent with other policies in this plan; is specified as an Allowed Activity in part Two of this plan; is specified as (or consistent with) an appropriate activity in the planned outcomes for the reserve in Part Five of this plan
3. Aircraft landing, take-off and hovering, is allowed where necessary for reserve management purposes.
4. Flying of non-commercial UAV is permitted over reserves subject to the Council Guidelines for UAV Flying Over Reserves, except for flights over playgrounds, swimming baths, and sports fields if sport is being played upon by sporting bodies.
5. Dogs are allowed in any Dog Exercise Area identified in the planned outcomes for reserves in Part Five; on leash outside of any area prohibited under Control of Dogs Bylaw 2017; if being used for Council operational purposes; for the blind or deaf; Police, Customs, and Security Services being worked in the course of their duty under the direct control of their handler or owners
6. Animals are allowed where permitted in accordance with the terms and conditions of an Authorisation reached for another activity
7. Essential or emergency actions or events necessary for the purposes of saving or protecting life, preventing serious damage to property, avoiding an actual or likely adverse effect on the environment are allowed, provided the Council is advised as soon as possible
8. Where exclusive use of car parking has been authorised, the Authorisation holder may levy a charge on users, during the time they have exclusive use.
9. Camping is allowed in self-contained vans or caravans at Carterton Holiday Park, Gladstone River Reserve, Kokotau River Reserve, and The Cliffs Reserve. Vehicles must display self-containment certificate. Camping is allowed for a maximum of seven nights per calendar month at any one reserve (except Carterton Holiday Park) if the vehicle is self-contained, and the area has not been closed for operational or safety reasons, or for events or sports use.
10. Signage denoting the name of buildings and premises is allowed, provided that where it includes a sponsor's name this is part of the occupier's name and does not include a logo
11. Temporary name, sponsorship, advertising or directional signage associated with managed or authorised events and sports bookings is allowed, provided that it is specifically allowed in the permission or Authorisation; is subject to the conditions of the permission or Authorisation; is present only for the duration of the event or sports booking. Signage construction and removal must not be fixed to any building or structure, must not interfere with play, cause nuisance to spectators, or cause damage to the reserve.

12. The use of non-motorised vehicles and e-bikes is allowed on any formed and shared paths (except where expressly prohibited by signage) or on any facility provided specifically for that purpose (e.g. Skate Park). Non-motorised vehicles and e-bikes must give way to pedestrians on shared pathways.

RESTRICTIONS TO ALLOWED ACTIVITIES

In order to protect the reserve, the environment, the health, safety and wellbeing of other users and to facilitate park operations, restrictions may be placed on *allowed* activities. The following is a guide of potential issues that may result on restrictions:

- a. group size for informal activities (up to 30 is generally considered allowed, subject to assessment on the impact of what the group is doing);
- b. time of the day and duration of activity (assessed on impact);
- c. location (ensuring there is no user conflict between park users);
- d. day in the week or time of the year (restriction to events during public holidays and considering weekday and weekend activity);
- e. the weather (restriction of activities and use of certain areas or facilities; or
- f. environment conditions (any impact on the land and surrounding environment

Maintenance or management of reserves may limit *allowed* activities at certain times.

MANAGED ACTIVITIES

Managed activities are those that are not specifically “allowed” or “prohibited” and any that are not listed in this plan or require a case by case assessment. These activities are generally undertaken in a specific location and may involve temporary or longer-term allocation of a park area or structure for a specific use.

Each application is considered on its merits, compatibility, an appropriateness to both the reserve in general and the location proposed. Some applications may need to be publicly notified, and all applications can either be approved, subject to conditions, or declined.

They may:

- a. be new activities or developments,
- b. be existing activities or developments that do not have the appropriate approval in place,
- c. involve the exclusive use of an area for an extended period,
- d. require the development of temporary or permanent structures and buildings,
- e. include commercial activities, or
- f. be large scale events and a range of other uses

- **POLICIES:**

1. Managed activities that involve temporary exclusive possession of a reserve (or part of a reserve are allowed, provided that the activity is:
 - a. consistent with the classification and purpose of the reserve;
 - b. is subject to availability;

- c. booked with the Council no later than 10 days before the activity;
- d. may not occupy space or restrict access for more than six consecutive days;
- e. does not involve more than 100 people;
- f. does not involve vehicles outside of the designated road, car parks or crossings
- g. does not adversely impact on reserve neighbours or other legitimate users of the reserve;
- h. does not take place in a site of significant natural value or significant heritage;
- i. does not involve any modification or damage to the reserve land, vegetation or wildlife or to any values identified in Part Five of this plan;
- j. does not involve the erection of signs, marquees or other structures, other than freestanding structures for the duration specified in the permission;
- k. does not require additional services (e.g. water, electricity);
- l. is subject to the removal of all rubbish or other evidence of the activity having taken place;
- m. must specify if liquor is to be offered for sale when booking;
- n. does not exceed the Wairarapa Combined District Plan permitted activity standards for noise in the relevant zone;
- o. will be subject to hire fees, charged and/or bonds as specified in the current Council Fees and Charges Schedule; and
- p. may be subject to conditions (exclusive use of parking is not guaranteed)

2. The following exceptions apply in relation to the above:

- a. Circuses – exempt of limit of number of spectators subject to the activity taking place in a large enough reserve.
- b. Commercial filming – exempt of a duration limit, limit of number of people, natural or heritage reserve limitation and additional service limitation, but provided that associated activities comply with this Plan's provisions (animals, fire, parking), public access restriction/exclusive use is for no more than 30 days per year in total, the activity does not introduce contaminants, smoke, pyrotechnics or explosion effects, or involve aircraft take-off or landing or require an RMA consent, and does not take place in a significant heritage site.
- c. Single or seasonal use of sports fields, courts and parks by sport clubs – exempt of number of people limit and additional services limitation and request for tournament must be booked through Council.
- d. Military, police or emergency services training exercises are exempt of people limitation and additional services limitation.

3. Commercial filming or photography that does not require exclusive use of the reserve is allowed, provided it complies with the terms and standards above

4. Cage, contained, or controlled animals in reserves are Managed Activities
5. Collection of plant material is a Managed Activity and is allowed free of charge, provided that:
 - a. a written request to undertake the activity has been received by the Council no later than 5 days before starting the activity;
 - b. the activity is consistent with the classification and purpose of the reserve;
 - c. the amounts to be collected are small in relation to the abundance of the material;
 - d. there are minimal adverse effects on the reserve, other users or neighbours from collection methods and quantities taken;
 - e. the collection does not affect the viability of the native species at the reserve;
 - f. collection could not practically occur outside the reserve or elsewhere within the reserve where the potential adverse effects could be significantly less;
 - g. the Council may determine the permitted location, amount, method, duration and/or timing of the collection;
 - h. in respect of taking seeds or cuttings of cultural significance to Tangata Whenua, particular species or individual plants may be excluded from the permission, and the view of the local Iwi will be taken into account; and
 - i. in respect of non-commercial research, findings must be made available to Council.

6. Removal of wood from felled, fallen or pruned trees is a Managed Activity, and is allowed:
 - a. on a first-in-first-served basis, free of charge, provided that a written request to undertake the activity has been received by the Council no later than 10 days before the activity;
 - b. the request to remove wood is from non-profit community groups or members of the public where the wood is for personal use only;
 - c. the written request includes the reserve name and address, information on the identity of the applicant;
 - d. if required a safety management plan and evidence of appropriate insurance is supplied to the Council prior to the collection of the wood;
 - e. the reserve is to be left in similar condition as prior to the removal of the wood; and
 - f. all damage caused is to be remedied at the cost of the applicant
7. Temporary access through a reserve to otherwise inaccessible parts of an adjoining property by the landowner is a Managed Activity, and is allowed provided that:
 - a. the activity is not inconsistent with the classification and purpose or the reserve,
 - b. it does not exceed two weeks,
 - c. it does not restrict public use of the reserve except to the extent necessary to ensure public safety or security of property,
 - d. it does not adversely impact on reserve values or neighbours,
 - e. a written request to undertake the activity has been received by the Council no later than 15 days before the activity, and
 - f. the Council may determine the permitted location and form of the access

APPLICATIONS FOR MANAGED ACTIVITIES

Carterton District Council will manage activities through landowner approval as either a:

- permit,
- booking,
- lease,
- licence,
- concession, or
- easement

Other approval from Carterton District Council or other organisations may be required for some activities including:

- resource consent (***Resource Management Act***);
- liquor licence; or
- archeological authority (New Zealand Historic Places Trust).

PERMITS AND BOOKINGS

Managed activities that require a permit or booking will be approved or declined by Council staff. These include:

- conducting events (e.g. multisport) an including, but not limited to, events and activities run on a “cost recovery” or “not for profit” basis;
- camping (for educational purposes only;
- conducting one off activities involving site occupation or use (e.g. weddings, concerts);
- commercial filming and photography;
- temporary access (except for park management, emergency access) e.g. infrastructure maintenance, art installations, vehicle access, construction access;
- parachuting, parapenting, hang-gliding, kite boards;
- aircraft and helicopter landing activity;
- storage of materials or plant (such as gravel in parking areas, or construction lay down sites for infrastructure projects);
- markets and fairs;
- collecting natural materials, removal of living plant material, cultural harvesting;
- planting (unless carried out by Council or its contractors);
- commemorative planting;
- formal environmental education activities;
- total or partial demolition or removal of buildings or structures;
- structures and furniture (including track infrastructure, gates, footbridges, fences, walls, retaining walls, artworks, sculptures, plaques, memorials, seats, interpretation, lighting, sun/shade shelters – does not include utilities); and
- signs in relation to reserve activity only (signs and/or advertising for non-reserve related activity are prohibited).



LEASES, LICENCES, CONCESSIONS AND EASEMENTS

Managed activities that require a lease, licence, concession, or easement will be assessed by Council staff and the Council (or a delegated Committee) will approve or decline. These include:

- a. leasing buildings and/or reserve land;
- b. commercial activities that are either large one-off events or are concessions for six months or more (including but not limited to, multisport events, guiding tours, selling food or drinks or hiring equipment);
- c. community gardens and orchards;
- d. new buildings, building extensions, car parks and hard surfaces, additions and alterations often associated with leases; and
- e. utilities (essential systems and networks that provide the city with water, energy, communications and wastewater removal).

PUBLIC NOTIFICATION

Applications for managed activities will be publicly notified when:

- a. it is required under the **Reserves Act 1977**;
- b. an application to construct or modify a permanent utility would significantly alter the nature, scale, or intensity of the effect on the park or reserve;
- c. the nature and/or scale of the proposed activity has the potential to adversely impact on reserve values, including permanent public access and open space; and
- d. they involve a commercial sub-lease or sub-licence or concession.

COMMUNITY GARDENS AND ORCHARDS

In considering a request to establish a community garden on reserve land, the following criteria will be considered:

- a. Carterton District Council will seek to maintain the public use and values of the land in accordance with the policies in this plan.
- b. The location of community gardens and orchards within reserves should support and complement the primary function of the reserve and its associated users.
- c. Community gardens and orchards should be located to minimise potential conflict with other reserve uses and users.
- d. Community gardens and orchards should not dominate the primary usable area of parks.
- e. Community gardens and orchards must be not for profit.
- f. Community gardens and orchards should not impact on indigenous biodiversity.
- g. Community gardens and orchards must be managed by a collective organisation. Individual allotments will not be permitted.

UTILITIES

Use of the reserve network for public utilities is considered appropriate in some circumstances. This does not mean the utility must be in public ownership, but it must provide an essential service to the public.

PUBLIC UTILITIES

1. New utilities, replacement or upgrades of existing utilities may be permitted by granting leases or easements provided:
 - a. it is an essential service to the public,
 - b. it cannot be reasonably located elsewhere,
 - c. the recreational nature of the reserve is not significantly disturbed, and
 - d. the public benefits outweigh any adverse impacts on the reserve.
2. All new utilities and replacement or upgrades of existing utilities shall comply with the following conditions to the satisfaction of the Council:
 - a. the impact of all utilities on reserve land and its values shall be minimised;
 - b. utility infrastructure shall be as unobtrusive as practicable with forms appropriate for the landscape and finished in low reflective colours derived from the background landscape;
 - c. all utility services shall be placed underground, except where it is not practicable to do so;
 - d. underground services shall be sited to minimise interference with existing features, facilities and vegetation;
 - e. utility services shall be located so as not to restrict areas usable for outdoor activities or require for future facilities or tree planting;
 - f. any disturbance of the existing site during installation of a utility shall be minimised and made good immediately after completion;
 - g. opportunities for the utility structure to benefit the reserve will be explored where appropriate (e.g. an essential maintenance track might provide an alternative walking route for the general public); and
 - h. recorded archaeological sites are avoided and where required an Archaeological Authority is obtained from the Historic Places Trust
3. All utility companies wanting to build new structures or upgrade or replace existing ones on reserve land will need to obtain a lease and/or easement from the Council (as per the **Reserves Act 1977**). Easements shall be granted for utilities that are located underground in terms of Section 48 of the Reserves Act. Leases shall be granted for utilities that are located on or above the ground and shall be for less than 20 years. This period shall include both the term of the current lease and the term of any right of renewal. Leases and easements will require the approval of Council (or delegated committee).

4. For existing utilities, where there is no lease or easement, utility companies will need to negotiate an agreement with the Council setting out the terms and conditions of access for inspection, maintenance and emergency repairs. Landowner approval will be required for any non-urgent earthworks.

PRIVATE DISCHARGE UTILITIES

1. The routing of stormwater or sewer discharges from private houses and businesses across reserve land to connect to main Council networks may be allowed with the granting of an easement by Council provided:
 - a. it cannot be reasonably located elsewhere because of the contour of the land,
 - b. the recreational nature of the park or reserve is not significantly disturbed, and
 - c. the ecological values are not significantly disturbed.
2. Approval from the Council for private discharge utilities will be subject to the following conditions:
 - a. A fee for use of the route and a refundable site restoration bond shall be paid, with the Council to determine the restoration required and the size of the bond to be paid.
 - b. The adjoining property owner shall be responsible for accurately mapping the connection(s) and shall provide documentation of this to the Council.
 - c. The property owner shall be responsible for any future maintenance and repairs (including costs) of the private connection and shall be required to make good any site disturbance on the reserve to the Council's satisfaction. This includes any emergency works being undertaken without the owners' prior consent.
 - d. The property owner shall be liable for removing any redundant materials, structures or utility infrastructure if required by the Council.

ALL PUBLIC AND PRIVATE UTILITIES

1. All existing and future public and private utilities (above and below ground) will be accurately mapped and documented.
2. All costs arising from the application for a new utility or upgrade or replacement of an existing one shall be met by the applicant. This also includes mapping and surveying, resource consent, legal encumbrance, and public notification costs.
3. Subject to the ability of the Council to do so under relevant legislation concerning utilities, the Council shall charge a market rental for any existing installations on a park or reserve if the ownership of the utility service or any of its installations changes (when replaced or upgraded). (Existing utilities do not necessarily have easements and/or leases.)
4. When a utility is no longer required, that utility – including all related services, structures and materials – shall be removed and the site reinstated as necessary. This will be required at the utility operator's or private owner's expense.

COMMERCIAL ACTIVITIES

1. Any approval to carry out commercial activity will only be permitted to the extent that the:
 - a. activity is necessary to enable the public to obtain the benefit and enjoyment of the park or reserve or for the convenience of people using the park or reserve, and
 - b. commercial activity does not require a new permanent building or structure.
2. In addition, where the activity is related to an existing sporting or community club or group:
 - a. the commercial activity must complement and be ancillary to a group's primary community or recreational activity, and
 - b. excess funds generated by the activity are in the first instance applied to any maintenance obligations the group has under its lease and then to the group's community or recreational activity.

PROHIBITED ACTIVITIES

These are activities considered to be inappropriate because of the permanent adverse effects on the environment or those that are incompatible with open space values, characteristics and/or management focus or other approved activities. Prohibited activities include all those activities prohibited by Carterton District Council bylaws or prohibited by the **Reserves Act 1977**. The Council will prohibit activities that would have a permanent adverse effect on open space values or would significantly detract from the enjoyment and safety of other park users. Enforcement of all activities will be through the Carterton District Council Consolidated Bylaw 2019, and the Reserves Act 1977.

ACTIVITIES THAT ARE SPECIFICALLY PROHIBITED

The following list of activities is not exhaustive but covers activities that are specifically prohibited:

- a. spreading of ashes or placenta;
- b. construction of private dwellings or landscaping;
- c. all mining;
- d. commercial resource harvesting;
- e. permanent vehicle access for private purposes;
- f. firearms and weapons use (unless specified in a lease, or as approved for police training);
- g. fireworks and/or amplified sound (not associated with an approved event);
- h. use of motorised trail bikes;
- i. Hunting (except for pest control purposes);
- j. use of a chainsaw (except for maintenance carried out by Council staff or Contractors);

- k. grazing horses (unless specified in a lease or licence);
- l. keeping of pets or livestock (including but not limited to chickens, pigs, sheep, goats, and cattle – unless specified in a lease or licence);
- m. open fires (except as approved by permit for special events);
- n. gaming machines; and
- o. camping (except for educational purposes, or at sites identified in Part 5).

ENCROACHMENTS

Encroachments into open space are a significant issue for the management of reserve land. The use of public reserve land by private property owners effectively alienates the public from use or enjoyment of that land. This is contrary to both the Reserves Act and the purpose of provision of public open space. The cumulative effect of encroachments (even those that seem very minor if considered in isolation) results in considerable reductions of public open space and the potential values of that open space are compromised. Parks and reserves are recognised as a very valuable area of open space in Carterton and require protection against encroachment.

ENCROACHMENT POLICY

1. Encroachments are a prohibited activity.
2. The Council will resolve the existing encroachments with a view to regaining lost land.
3. The Council will protect reserves from new encroachment.

Encroachments range in scale and effect, from the minor and easily removed without effect (such as washing lines and children's play equipment), to access driveways and, in the more extreme cases, to parts of dwellings or landscaping. Encroachments include access encroachments.

Encroachments must be authorised under the provisions of the **Reserves Act** and not the **Resource Management Act**.

ENCROACHMENT MANAGEMENT

1. The Council will keep a record of all known encroachments.
2. The Council will require removal of all encroachments either immediately or as a managed process. Managed removal will require issuing a letter of understanding, and a licence or agreement to formalise the removal process.
3. Managed removal of encroachments will result in a signed agreement between the property owner concerned and the Council and will detail:
 - a. a description of the encroachment,
 - b. a process for removal,
 - c. a timeframe for removal,
 - d. responsibilities of each party for particular actions,
 - e. the payment of any one-off or ongoing fees, and
 - f. any other matter the Council deems necessary to manage the encroachment removal.
4. If the encroachment can be practically removed or stopped (it might be a garden fence, a shed, a path, an area of garden, part of a deck, a clothesline, or a private vehicle access) it will be removed with full reinstatement of the land generally within 12 months or sooner. This type of removal will be managed by way of a signed letter of understanding including details as listed above

5. If the encroachment is associated with private vehicle or private pedestrian access and immediate removal is complicated by long-term historic use, then a longer-term removal agreement such as a fixed-term licence may be negotiated. This will allow agreement of reasonable terms while also ensuring that the access encroachment is removed. The maximum period for this type of agreement will be until there is a change of ownership or occupation in the property associated with the encroachment. The Council may limit access to manage the removal process by, for example, installing gates, specifying access hours and days, limiting numbers of people and/or vehicles.
6. If the encroachment cannot be removed because of ground stability (such as a retaining wall or part of a building) then a longer-term removal agreement may be negotiated unless it is deemed unsafe.
7. Emergency retaining and/or land stabilisation will be managed by way of a licence and only where there is no alternative remedial action available. This clause is only intended to apply to unforeseen stability issues (it is the landowner and their contractor's responsibility to carry out appropriate investigation before starting any work) and where there is an immediate need to retain the land and a public benefit to doing the work.
8. If an application is received for a new retaining structure on a reserve boundary, the applicant will be required to provide a survey of the boundary and the completed structure. The completed structure must be built on the applicant's side of the boundary and not on the reserve. The applicant can apply for a temporary access permit to build the wall. The completed structure must be contained on the applicant's property and will be the responsibility of the owner, so no encroachment licence is needed.
9. If the encroachment is part of a house or other building, the timeframe for removal is likely to be longer and an encroachment licence may be negotiated (unless it is new and can be immediately removed) to manage long-term removal. The agreement will generally link removal of the encroachment to a specified situation, such as where there are renovations done to that wall or if the house is removed, demolished or falls down.
10. Any managed removal agreement does not run with the land. Any new owner will have to apply for an agreement. It is expected that change of property ownership will often be the point at which a licence will end and the encroachment is removed or access stopped.
11. The removal of all encroaching features is the responsibility of the owner concerned. If the owner fails to comply with the immediate or managed removal as specified by the Council, the work will be carried out by the Council after consultation with the owner and the owner will be charged for the work.
12. All costs associated with immediate or managed removal, including survey and legal costs, shall be met by the owner of the encroachment.
13. Reserve land will not be sold to resolve encroachment issues.
14. Formalisation of managed removal through a licence may be publicly notified if the Council deems the effects of the agreement to be of a nature and scale that public notification is in the public interest and/or if required under the **Reserves Act 1977**.
15. All encroachment easements and licences require approval by the Council or a delegated committee.

BOTANICAL ENHANCEMENTS

“Botanical enhancements” are small areas of land that are maintained and/or enhanced by a neighbour through planting or vegetation management in keeping with open space values and character. These are managed by way of a “letter of understanding”, which must be obtained by anyone who has or proposes to undertake “botanical enhancement”. For the purposes of managing encroachments, botanical enhancements are not considered encroachments and therefore are not by default prohibited. Letters of understanding to permit “botanical enhancement” will only be issued if all the following conditions are met.

The botanical enhancement:

- a. is vegetation only (i.e. no paths, steps, walls, fences or structures of any kind are permitted);
- b. is in keeping with the values and character of the particular park or reserve;
- c. does not include any plant species considered weeds or that may result in unwanted maintenance issues;
- d. must provide a level of public good;
- e. must not prevent or discourage public access; and
- f. must be adjacent to the applicant's property (i.e. you will not be permitted to carry out botanical enhancement on reserve land that affects or is adjacent to your neighbour's property).

There is no formal right of occupation associated with a botanical enhancement and responsibility of the ongoing maintenance of the area will be negotiated

PART FOUR - GENERAL DECISION-MAKING GUIDELINES

This part outlines the assessment criteria or principles that will be applied to applications for Authorisation.

In case of inconsistency between any of the assessment criteria and the applicable statute, the statute prevails.

Where the Council does not have delegated authority to make a decision, these policies will inform recommendations that will be made to the Minister of Conservation.

INFORMATION REQUIRED WITH AN APPLICATION

All applications are required to include the following relevant information:

- a. a description and/or plans of the proposal with enough detail for Council staff to determine all potential effects;
- b. an assessment of the impacts the development/activity will have on the immediate and wider environment;
- c. the purpose of the proposed development/activity and why it needs to take place on the reserve;
- d. an explanation of how the development/activity is aligned with the objectives and policies of this plan;
- e. details of other approvals or consents required (e.g. if consent is required under the **Resource Management Act**);
- f. consultation with affected parties;
- g. identification of health and safety issues and how these will be managed; and
- h. where required, a business plan for concessions, leases, and licence applications.

GENERAL DECISION-MAKING GUIDELINES

Carterton District Council will consider the following when assessing applications for landowner approval:

- a. the proposal must not be for a prohibited activity as defined in this plan, with the exception for an application to authorise an historic encroachment;
- b. if the activity and/or development could be co-located, in particular when associated with formal sports facilities;
- c. whether the proposal could reasonably be undertaken in another location, e.g. on non-reserve land, or another park, or at another location where potential adverse effects would be less;
- d. the degree to which the proposal is consistent with the relevant objectives and policies of each part of this plan, and how it complies with the provisions of the **Reserves Act**,

- e. the compatibility of the proposal with the community outcomes expressed in the Long Term Plan;
- f. effects (positive and negative) on park infrastructure, approved activities, the surrounding environment, and the enjoyment of other park users (limits may be placed on the frequency of the proposed activity and the need for temporary closure);
- g. the extent to which the proposal complements the wider network of open space opportunities available in the wider Carterton area;
- h. how the proposal will meet a demonstrated (existing or projected) demand;
- i. recognition of the need in the Carterton community for low cost access to recreation opportunities;
- j. how the proposal favours local, or Carterton wide benefits;
- k. the level of any additional benefits, enjoyment, and opportunities for park visitors, local and regional community and mana whenua;
- l. the extent to which the proposal affects current or future public access;
- m. assessment of the effects of the location, extent, design and cumulative effect of infrastructure (such as earthworks, lighting, fencing, car parking, access roads, and so on) associated with the development or activity proposal;
- n. the potential to mitigate effects of the development or activity in a way that is in keeping with the reserve landscape character and values; and
- o. the degree of risk associated with any activity.

PART FIVE RESERVE SPECIFIC OUTCOMES

RESERVES INVENTORY

Information and policy that is specific to individual reserves. They are ordered alphabetically.

RESERVE INFORMATION

Each reserve is described using the legal status, size, classification and District Plan zoning, along with any easements or occupation agreements applying to the reserve.

This is supplemented by information on:

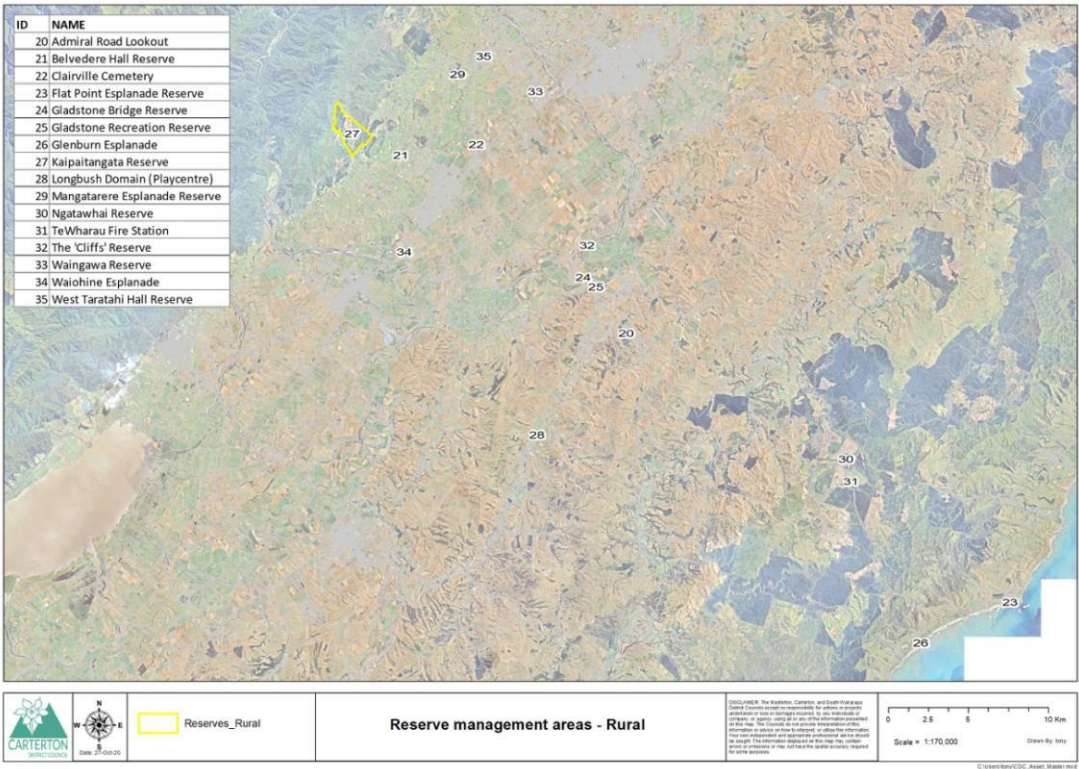
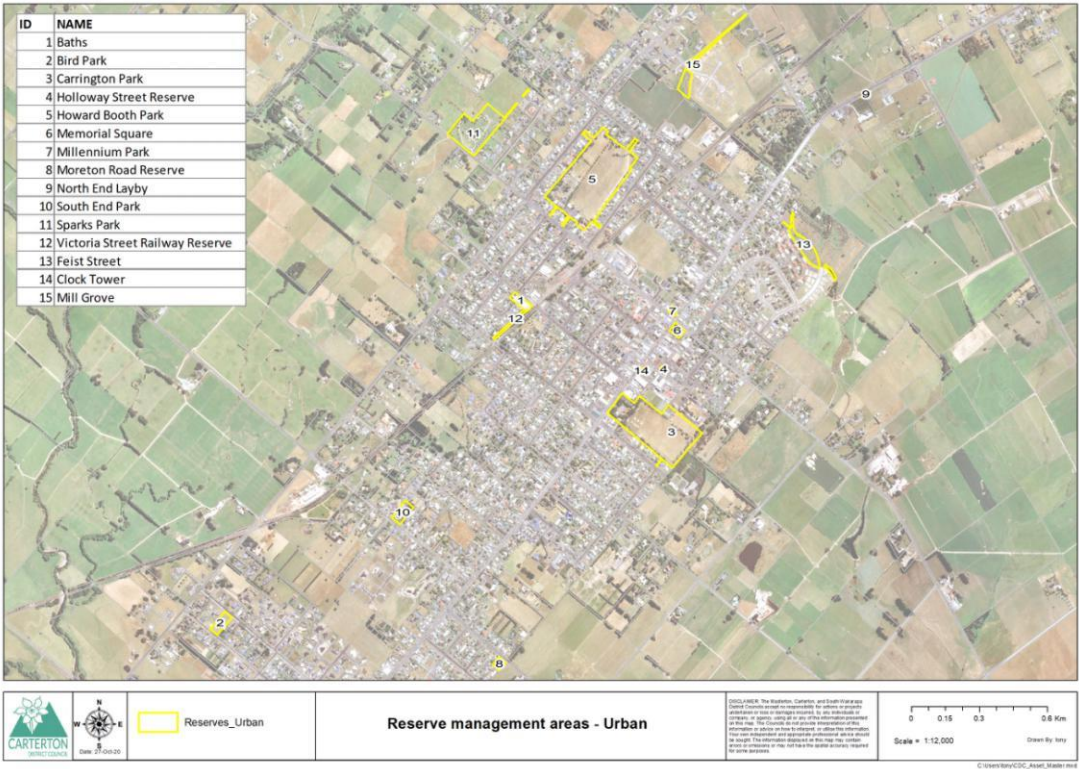
- the heritage values of the reserve (including any Heritage Register references or commemorative features present);
- the natural values of the reserve (including descriptions and references to any significant vegetation sites);
- the recreation values and uses of the reserve; and
- other values or uses of the reserve, such as utility values for stormwater management, value as a connection between streets, or amenity landscape values.

RESERVE OUTCOMES

Specific outcomes have been planned for reserves, based on the values of each reserve, consistent with the purposes for which it is held, which need to be preserved and protected.

The outcomes planned for reserves combine management of natural resources, historic and cultural heritage values, recreational opportunities, and appropriate longer-term development for individual reserves.

The ultimate purpose of the policies within this plan is to achieve the planned outcomes across the range of reserves. The planned outcomes form the basis of both the general and specific reserve policies in [Part Two](#).



ADMIRAL ROAD LOOKOUT

- LOCATION

328 Admiral Hill Road

1817015003

- PRIMARY PURPOSE OF RESERVE

Scenic



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

LOT 1 DP 305260	NO CLASSIFICATION
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CT 21256

Category: Natural Reserve

PARCEL AREA (HA): 0.1178

SCALE: REGION

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS: NONE

LEASES/EASEMENTS/LICENCES: Grazing Agreement With Neighbour

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Low

RECREATION VALUES

Walking, picnicking.

OTHER VALUES AND INFORMATION

Fantastic panoramic views over the Wairarapa and Tararua.

Utilities: Picnic table with seats.

OUTCOMES SOUGHT

1. Safeguard open green space and amenity landscape values.
2. Protect natural values to achieve healthy ecological functioning, through animal and weed pest control.
3. Enable informal recreation, encouraging opportunities for walking.
4. Continue to consider grazing Agreements as potentially appropriate for this reserve, provided that grazing is only permitted outside of any significant vegetation areas.
5. Improve car parking along the site for better access to the site.
6. Introduce interpretive signage on the site.

BATHS

- LOCATION

Pembroke Street

1821006200

- PRIMARY PURPOSE OF RESERVE

Recreation



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

PT SECTION 207 208	NO CLASSIFICATION
--------------------	-------------------

CT D1/197

Category: Community Buildings Reserve

PARCEL AREA (HA): 0.3490

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL

NATURAL HAZARDS: Earthquake prone building (Eastern Consulting assessment report from 2012)

LEASES/EASEMENTS/LICENCES: Indoor pool owned and operated privately

- VALUES AND OUTCOMES

HERITAGE VALUES

Baths opened in 1911 but no heritage status assigned.

NATURAL VALUES

None

RECREATION VALUES

Swimming.

OTHER VALUES AND INFORMATION

Utilities: Changing rooms, Filter plant room, unheated swimming pools (main pool, learners pool, toddlers pool), shade structures, ticket box, toilets and showers, staffroom, slides, diving board, tables and umbrellas, bike stands, floating equipment.

OUTCOMES SOUGHT

1. Enable active recreation, including competitive swimming.
2. Strengthen earthquake prone buildings on the site.
3. Recreational enjoyment and the public benefits of the Baths are continuously enhanced by infrastructure and amenity improvements.
4. People of all ages and abilities have access to the Baths.
5. Appropriate measures (e.g. provision of lifeguards) are in place to ensure safety of users.

BELVEDERE HALL RESERVE

- LOCATION

583 Belvedere Road

1814030400

- PRIMARY PURPOSE OF RESERVE

Local Purpose (Public Hall)



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

LOT 1 DP 15039 BLK VI	LOCAL PURPOSE TIFFIN SD RESERVE
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CT 403/35

Category: Community Buildings Reserve

PARCEL AREA (HA): 0.1258

SCALE: LOCAL

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS: NONE

LEASES/EASEMENTS/LICENCES:

Administered by the Belvedere Public Hall Board

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

None

RECREATION VALUES

Indoor Bowling.

OTHER VALUES AND INFORMATION

Utilities: Community (Country) Hall. Electricity infrastructure owned by Powerco (HV Overhead Line, Poles, Distributions Transformer, Pole Mounted Fuses, LV Overhead Line), Carpark

OUTCOMES SOUGHT

1. Provide a meeting place for the local community, for functions, informal recreation.
2. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

CARRINGTON PARK

- LOCATION

High Street South

1821048500

- PRIMARY PURPOSE OF RESERVE

Recreation



- INFORMATION

APPELLATION RESERVE ACT CLASSIFICATION

LOT 1 DP 14056 NO CLASSIFICATION

LOT 1 DP 59134

PT LOT 2 DP 1024

PT SECS 4 5 350/229 467/236

Category: District Reserve

PARCEL AREA (HA): 5.8224

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL

NATURAL HAZARDS: earthquake prone building – Band Rotunda

LEASES/EASEMENTS/LICENCES:

Parts leased to Carterton School and Carterton Tennis Club

- VALUES AND OUTCOMES

HERITAGE VALUES

Historic Band Rotunda

NATURAL VALUES

Mature English Oaks around the Rotunda, amenity planting around reserve boundaries.

RECREATION VALUES

Active and informal recreation.

OTHER VALUES AND INFORMATION

Well used space by different clubs and organisations (Carterton Athletic Club, Fire Brigade, junior soccer, general public).

Utilities: Public toilets, Kids playground, historic Band Rotunda, skateboard ramp, AstroTurf – all weather cricket pitch, fitness trail, changing rooms, wicket block, long jump pits, discus/shot- put launching pad, skating ring/basketball court, sealed carparks, tree lighting, litter bins, tables and seating, signs, drainage, electricity utilities owned by Powerco (LV Underground Cable, Pole, LV Overhead Line, Duct, HV Overhead Line). Solar lighting

OUTCOMES SOUGHT

1. Provide a high quality venue for active recreation (day and night) for people of all ages and abilities.
2. Enable informal recreation.
3. Provide a well-equipped playground.
4. Provide a high quality pleasant open space (green oasis) in the town centre appreciated for its open space values.
5. Define park entrance by improved amenity.
6. Maintain high amenity of reserve.
7. The historic Rotunda will be maintained for future generations.
8. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

CLAREVILLE CEMETARY

- LOCATION

138 Chester Road

1814024400

- PRIMARY PURPOSE OF RESERVE

Local (Cemetery Reserve)



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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PT SECTION 300 348	GAZETTED 1926 AS
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CT	PUBLIC CEMETERY
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Category: Culture and Heritage, Civic Amenity

PARCEL AREA (HA): 16.2889

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS: earthquake fault line hazard areas cut through the Site (surveyed, mapped and assumed)

LEASES/EASEMENTS/LICENCES

Paddock of 10.58 leased for grazing, part of cemetery leased to funeral directors for cremations

- VALUES AND OUTCOMES

HERITAGE VALUES

First funeral in 1866.

NATURAL VALUES

Picturesque park-like setting, mature trees, avenue of Kanzan cherries along North/South axis, 1.5ha of wetland.

RECREATION VALUES

Informal recreation

OTHER VALUES AND INFORMATION

Utilities: Crematorium, Chapel, Sheds, Lawn Cemetery, Pet Cemetery, Toilets, Seats and Tables, Ash Internment Plots, Pump and Well, litter bins, water containers, amenity planting.

OUTCOMES SOUGHT

1. Maintain high amenity to create a welcoming place to visit.
2. Ensure the reserve meets the need of the community.
3. Facilitate the development of an easy to use on-line application for finding individual burial plots/graves.

CLOCK TOWER RESERVE

- LOCATION

High Street

1821041100

- PRIMARY PURPOSE OF RESERVE

Local (historic), road



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

LOT 1 DP 81767	NO CLASSIFICATION
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CT 48B/481

Category: Culture and Heritage, Civic Amenity

PARCEL AREA (HA): 0.1788

SCALE: DISTRICT

DISTRICT PLAN ZONES: COMMERCIAL

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES

- VALUES AND OUTCOMES

HERITAGE VALUES

Historic clock mechanism within the Clock Tower listed in the District Plan.

NATURAL VALUES

Open Space in centre of town

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

Utilities: Clock Tower with historic clock, electricity infrastructure owned by Powerco (LV Underground Cable), Phone Booth, amenity planting, lights, carparks, seat.

OUTCOMES SOUGHT

1. Provide high amenity unique open space in the centre of the town.
2. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.
3. Consider re-establishing informative signage (map) on the site..

FIEST PARK (NAME TO BE CONFIRMED)

- LOCATION

Road 2, off Fiest Street

- PRIMARY PURPOSE OF RESERVE

Recreation

- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION	No Classification
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Lots 34-35 37

DP 531620 -

Local Purpose

CT: 890184 & 890185

Category: Neighbourhood Reserve

PARCEL AREA (HA): 0.89

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES

- VALUES AND OUTCOMES

HERITAGE VALUES

NATURAL VALUES

BOOTHS CREEK

RECREATION VALUES

WALKING, BIKING

OTHER VALUES AND INFORMATION

Utilities: Access for cleaning and managing Booths Creek

OUTCOMES SOUGHT

1. Enable informal recreation.

FLAT POINT ESPLANADE RESERVE

- LOCATION

Flat Point Road

1818017501

- PRIMARY PURPOSE OF RESERVE

Local



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 4 DP 86496	ESPLANADE RESERVE
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CT 54A/804

Category: Natural Reserve

PARCEL AREA (HA): 0.4800

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL, FLOOD ALERT AREA, SIGNIFICANT NATURAL AREA (SNc001), COASTAL ENVIRONMENT MANAGEMENT AREA

NATURAL HAZARDS: Coastal flood

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

Significant history and heritage value to the Ngai Tumapuhia A Rangi hapu, who are established in the area and call it Te Unununu from “Te Matamata a te Unuunu”(canoe launching site). It is possible that the site is waahi tapu.

NATURAL VALUES

Coastal dunes – significant coastal habitat. Boundary Stream (Arawhata).

RECREATION VALUES

Walking, Fishing, Swimming, Diving.

OTHER VALUES AND INFORMATION

Utilities: Fence, Style, Toilets.

OUTCOMES SOUGHT

1. Enable informal recreation by providing public access to the coast.
2. Prevent coastal erosion by restoring and protecting the dunes in partnership with the community and Greater Wellington Regional Council.
3. Include interpretive signage
4. Continued recognition of cultural and heritage values.

GLADSTONE RIVER RESERVE

- LOCATION

Gladstone Road
1816020400

- PRIMARY PURPOSE OF RESERVE

Local



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 1 DP 45125	ESPLANADE (gaz 64-
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LOT 1 PT LOTS 2 6	568) D P512
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CT 18D/1338

Category: Natural Reserve

PARCEL AREA (HA): 6.2112

SCALE: DISTRICT

DISTRICT PLAN ZONES:

RURAL (SPECIAL), FLOOD HAZARD

NATURAL HAZARDS: Flood

LEASES/EASEMENTS/LICENCES:

VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

None

RECREATION VALUES

Camping, Swimming, Fishing, Jetboating.

OTHER VALUES AND INFORMATION

Utilities: Electricity Infrastructure owned by Powerco (HV Overhead Lines).

OUTCOMES SOUGHT

1. Enable active recreation by providing access to the river.
2. Develop facilities to support seasonal camping.
3. Improve the amenity of the reserve by controlling weed and pests, and planting new, possibly native trees.
4. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.
5. Improve/Define access to the reserve.

GLADSTONE RECREATION RESERVE

- LOCATION

Gladstone Road

1817009000

- PRIMARY PURPOSE OF RESERVE

RECREATION



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 1 DP 10273	NO CLASSIFICATION
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CT 4C/115

Category: Sport and Recreation Reserve

PARCEL AREA (HA): 3.0470

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (SPECIAL), FLOOD HAZARD

NATURAL HAZARDS: Flood

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Some riparian vegetation is part of this reserve.

RECREATION VALUES

Rugby field.

OTHER VALUES AND INFORMATION

Utilities: Lawn Rugby Field with goal posts, Flood Lights, all other utilities are part of the Gladstone Sport Complex.

OUTCOMES SOUGHT

1. Enable active recreation.
2. Manage boundary closest to river as riparian planting

GLENBURN ESPLANADE RESERVE

- LOCATION

Glenburn Road
1818018900

- PRIMARY PURPOSE OF RESERVE

Local



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 2 DP 72334	ESPLANADE RESERVE
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CT

Category: Natural Reserve

PARCEL AREA (HA): 0.4400

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION), COASTAL ENVIRONMENT
MANAGEMENT AREA, FLOOD HAZARD

NATURAL HAZARDS: FLOOD

LEASES/EASEMENTS/LICENCES

- VALUES AND OUTCOMES

HERITAGE VALUES

The general area is rich in historic heritage and might be waahi tapu site.

NATURAL VALUES

Coastal environment.

RECREATION VALUES

Walking, enabling access to the coast for fishing.

OTHER VALUES AND INFORMATION

There might be un-recorded historic sites/waahi tapu in the reserve.

Utilities:

OUTCOMES SOUGHT

1. Enable access to the coast.
2. Continued recognition of cultural and heritage values.
3. Consider informative/educational signage.
4. Contribute to coastal amenity by suitable planting along stream and coast.

HOLLOWAY STREET CIVIC RESERVE

- LOCATION

50 Holloway Street

1821044800

- PRIMARY PURPOSE OF RESERVE

LOCAL



- INFORMATION

APPELLATION RESERVE ACT CLASSIFICATION

PT SECTION 2 NO CLASSIFICATION

CT 51/273

Category: Culture and Heritage, Civic Amenity

PARCEL AREA (HA): 0.0451

SCALE: DISTRICT

DISTRICT PLAN ZONES: COMMERCIAL

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None.

NATURAL VALUES

Amenity planting.

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

This reserve was redeveloped and improved as part of the third stage of the CBD redevelopment.

Utilities: Bench seats, replica gas heritage lights, amenity planting.

OUTCOMES SOUGHT

1. Enable passive recreation.
2. Provide high quality urban open space close to the civic centre of the town.
3. Consider further improvements – provision of artwork/sculptures, “linger node” activities.

HOWARD BOOTH PARK

- LOCATION

198 Belvedere Road

1819033200

- PRIMARY PURPOSE OF RESERVE

Recreation



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 1 DP 409854	NO CLASSIFICATION
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LOT 2 DP 3254

LOTS 32 33 34 35 36

DP 23600

CT 436146

Category: District Reserve

PARCEL AREA (HA): 8.6474

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL

NATURAL HAZARDS contaminated site SN07/027/02 LEASES/EASEMENTS/LICENCES:
paddock leased for sheep grazing

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Periphery planting of mature trees.

RECREATION VALUES

Informal recreation.

OTHER VALUES AND INFORMATION

Utilities: 12 holiday homes (cabins), ablution block (showers, laundry, kitchen), gazebo, 16 powered caravan sites, tent sites, picnic tables and seats, shared pathway, well and pump, electricity infrastructure owned by Powerco (LV underground cable, duct, service box, LV overhead line, poles, HV overhead line).

OUTCOMES SOUGHT

1. Enable active and passive recreation.
2. Provide a safe and pleasant place for holiday stays.
3. Improve signage relating to the reserve.
4. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

KAIPATANGATA WATER COLLECTION

- LOCATION

Kaipatangata Road

1814036200

- PRIMARY PURPOSE OF RESERVE

Local



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

SECTION 12 PT SEC 1	NO CLASSIFICATION
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SO 26541

CT 13B/1046 284/78

Category: Natural Reserve

PARCEL AREA (HA): 350.6196

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES:

MOU with Dalefield Horse Park Club

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Forestry.

RECREATION VALUES

Mountain Bike track. Horse riding park

OTHER VALUES AND INFORMATION

Utilities: Water Treatment Plant, Mountain Bike tracks, horse riding tracks, forestry.

OUTCOMES SOUGHT

1. Enable active recreation.
2. Ensure continuous water supply to the town, in accordance with relevant standards.
3. Manage forestry for the benefit of the town.

KOKOTAU RIVER RESERVE

- LOCATION

Kokotau Road
18160

- PRIMARY PURPOSE OF RESERVE

Recreation



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

PT SECTION 8 AHIARUHE	NO CLASSIFICATION
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BLK PT LOT 4 DP 5269 CT

Category: Natural Reserve

PARCEL AREA (HA): 0.1012ha

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (SPECIAL), FLOOD HAZARD

NATURAL HAZARDS: flood

LEASES/EASEMENTS/LICENCES

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Riparian plants – including willows, alder, poplars.

RECREATION VALUES

Passive, providing access to river for swimming, fishing.

OTHER VALUES AND INFORMATION

Parcel missing from LINZ dataset.

Utilities: Electricity infrastructure owned by Powerco (HV Overhead Line).

OUTCOMES SOUGHT

1. Enable access to the river for active and passive recreation.
2. Prepare plans for linking this reserve with the Cliff Reserve as walking access and wildlife corridor.
3. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

Longbush Domain

- LOCATION

1135 Longbush Road

1817020800

- PRIMARY PURPOSE OF RESERVE

Local (Playcentre)



- INFORMATION

APPELLATION RESERVE ACT CLASSIFICATION

SECTION 20 BLK VIII RECREATION

HUANGARUA RESERVE (gaz. 84 PG

CT 4688)

Category: Community Buildings Reserve

PARCEL AREA (HA): 0.7284

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Amenity landscaping.

RECREATION VALUES

Active and passive.

OTHER VALUES AND INFORMATION

Utilities: Play centre, toilet block, swimming pool, play equipment, community facility, electricity infrastructure owned by Powerco (HV overhead line).

OUTCOMES SOUGHT

1. Enable informal recreation.
2. Provide a play centre for the rural community.
3. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

MANGATARERE ESPLANADE RESERVE

- LOCATION

108 Mangatarere Valley Road
1814019801

- PRIMARY PURPOSE OF RESERVE

LOCAL



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

LOT 7 DP 86041	ESPLANADE RESERVE
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CT 53D/274

Category: Natural Reserve

PARCEL AREA (HA): 0.7430

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS: FLOOD

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Riparian vegetation, some exotic some native.

RECREATION VALUES

OTHER VALUES AND INFORMATION

Utilities: Electricity infrastructure in ownership of Powerco (LV overhead line).

OUTCOMES SOUGHT

1. Improve biodiversity values of the reserve.
2. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 Mand NZECP 34:2001.

MEMORIAL SQUARE

- LOCATION

Park Road

1821042800

- PRIMARY PURPOSE OF RESERVE

Local (historic)



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 22 DEEDS PL 414	NO CLASSIFICATION
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CT 436/38

Category: Culture and Heritage, Civic Amenity

PARCEL AREA (HA): 0.2322

SCALE: DISTRICT

DISTRICT PLAN ZONES: COMMERCIAL

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

Historic Memorial from 1921 added on in 1949 – remembering the local victims of the two great wars.
Notable trees.

NATURAL VALUES

Open green space with mature trees and amenity planting

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

The Memorial Square was the first stage of the CBD redevelopment. Some notable trees have been removed due to storm damage, and ill health.

Utilities: Memorial, seats, amenity planting, lights, colonnade, flagpole, litter bins, tree lightning, irrigation, electricity infrastructure owned by Powerco (LV Underground cable).

OUTCOMES SOUGHT

1. Preserve historical value of the Memorial.
2. Maintain high amenity open space in centre of town.
3. Enable community events to take place in and around the Square (local markets, festivals, ANZAC ceremony).
4. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

MILLENNIUM PARK

- LOCATION

115 HIGH STREET NORTH

1819058800

- PRIMARY PURPOSE OF RESERVE

LOCAL



- INFORMATION

APPELLATION RESERVE ACT CLASSIFICATION

PT SECTION 206 NO CLASSIFICATION

CT 6B/626

Category: Culture and Heritage, Civic Amenity

PARCEL AREA (HA): 0.0928

SCALE: DISTRICT

DISTRICT PLAN ZONES: COMMERCIAL, CARTERTON CHARACTER AREA

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES: part leased to adjoining cafe

- VALUES AND OUTCOMES

HERITAGE VALUES

The original park was created to commemorate the millennium – this will have a historic value in years to come.

NATURAL VALUES

Amenity planting.

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

The Park was redeveloped in February 2016, the paved courtyard was replaced with a deck that has been added onto the Café, and a bronze sculpture of Charles Carter was erected facing the Main Street.

Utilities: Deck, seats, sign, bronze statue, amenity planting, lighting.

OUTCOMES SOUGHT

1. Enable passive recreation.
2. Maintain a high quality green open space in the centre of the town with historic interest.
3. Informative signage could be placed close to the Main Street.
- 4.

MORETON ROAD RESERVE

- LOCATION

32 MORETON ROAD

1822063700

- PRIMARY PURPOSE OF RESERVE

LOCAL



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOTS 1 2 DP 29444	NO CLASSIFICATION
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CT 8C/826

Category: Neighbourhood Reserve

PARCEL AREA (HA): 0.1826

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL, CONTAMINATED SITE SN07/028/02

NATURAL HAZARDS: contaminated site, subsidence

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Some trees, mostly grass.

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

Utilities: Shed, planting.

OUTCOMES SOUGHT

1. Enable informal recreation.
2. Maintain a tidy open space for passive recreation on the edge of the urban area.

NGATAWHAI RESERVE

- LOCATION

Ngatawhai Road (off Te Wharau Road)

1818012000

- PRIMARY PURPOSE OF RESERVE

RECREATION



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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PT LOT 3 DP 10170	NO CLASSIFICATION
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CT

Category: Natural Reserve

PARCEL AREA (HA): 0.7841

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Some mature trees – mostly native.

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

A remote rural reserve.

Utilities:

OUTCOMES SOUGHT

1. Enable informal recreation
2. Support the growth of native vegetation for indigenous biodiversity values.
3. Investigate linking this reserve with other accessible high value natural sites.

NORFOLK ROAD ESPLANADE RESERVES

- LOCATION

Norfolk Road (by 428 and 1006)

1814008502, 1814001701

- PRIMARY PURPOSE OF RESERVE

Recreation



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 3 DP 74294	ESPLANADE
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LOT 1 DP 12846	RESERVE
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CT 505/8

Category: Natural Reserve

PARCEL AREA (HA): 0.6550 1.2571

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (SPECIAL), FLOOD HAZARD, EROSION HAZARD

NATURAL HAZARDS: FLOOD AND EROSION

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Riparian ecosystem.

RECREATION VALUES

Walking, access to river.

OTHER VALUES AND INFORMATION

Utilities:

OUTCOMES SOUGHT

1. Enable public access to river.
2. Enable walking along the river, and water related activities.
3. Maintain and enhance native riparian ecosystem in the reserves.
4. Formulate a strategy of linking these esplanade reserves either by esplanade strips or new reserves.

SOUTH END PARK

- LOCATION

60 Brooklyn Road

1822007002

- PRIMARY PURPOSE OF RESERVE

Recreation



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 2 DP 489351	NO CLASSIFICATION
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CT 703965

Category: Neighbourhood Reserve

PARCEL AREA (HA): 0.4540

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL

NATURAL HAZARDS: contaminated site (SN 07/022/02)

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Some trees.

RECREATION VALUES

Active recreation (BMX biking)

OTHER VALUES AND INFORMATION

Utilities: BMX biking track, electricity infrastructure owned by Powerco (LV underground cable, duct, HV underground cable, LV overhead line, HV overhead line, pole, distribution transformer, pole mounted fuses).

OUTCOMES SOUGHT

1. Enable active recreation.
2. Investigate the possibility of adding play equipment to the park.
3. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.

SPARKS PARK

- LOCATION

Belvedere Road

1814047103

ADDITION 181902400

- PRIMARY PURPOSE OF RESERVE

LOCAL



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 1 DP 89362 NO CLASSIFICATION

CT 57A/189

PT SECS 173 TARATAHI PLAIN BLK X

CT 191/232 403/41

Category: Neighbourhood Reserve

PARCEL AREA (HA): 2.2155 ADDITON 0.4937

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL AND RURAL (PRIMARY PRODUCTION) AND RURAL (SPECIAL), FLOOD HAZARD

NATURAL HAZARDS; flood

LEASES/EASEMENTS/LICENCES: managed by Sparks Park Trust

- VALUES AND OUTCOMES

HERITAGE VALUES

Iris society planted a lot of iris bulbs in memoriam of Carterton local Francie Love, internationally respected Iris breeder.

Park was funded in part as a Millennium Project.

NATURAL VALUES

Wetland. Amenity planting – spring bulbs and irises

RECREATION VALUES

Walking, jogging, dog walking

OTHER VALUES AND INFORMATION

Duck habitat, well used dog waking area. A new area of 0.4973 adjoining the Park has been donated to Council recently, this to be incorporated with the Park.

Utilities: Lake, fence, entrance gate, shelter planting, landscaping avenue of pin oaks, bridge, spring bulbs, electricity infrastructure owned by Powerco (HV overhead line, poles, distribution transformer, pole mounted fuses, LV overhead line).

OUTCOMES SOUGHT

1. Maintain a pleasant open space for a multitude of purposes – informal recreation, storm water management, biodiversity (wetland).
2. Investigate the possibility of maintaining some water level during the dry summer months.
3. Investigate the possibility of educational use or the reserve – e.g. arboretum, small botanical garden.
4. Investigate the possibility of establishing a small sculpture park accommodating the work of local artists.
5. Provide for the continuous operation and maintenance of existing network utilities, in accordance with the Electricity (Hazards from Trees) Regulations 2003 and NZECP 34:2001.
- 6.

THE CLIFFS RIVER ESPLANADE

- LOCATION

Dakins Road

unknown

- PRIMARY PURPOSE OF RESERVE

RECREATION



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 3 DP 51389	ESPLANADE
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CT

Category: Natural Reserve

PARCEL AREA (HA): 0.3490

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (SPECIAL), FLOOD HAZARD

NATURAL HAZARDS: flood

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

NATURAL VALUES

Mature Totara trees. Riparian vegetation.

RECREATION VALUES

Walking, Swimming, Camping

OTHER VALUES AND INFORMATION

Popular picnic spot. The Wairarapa Harvest Festival is being held in this Reserve every autumn.

UTILITIES: Toilet block, barbeque sites, litter bins.

OUTCOMES SOUGHT

1. Enable informal recreation.
2. Enable public access to the river.
3. Enable community events to be held in the reserve.
4. Work with Greater Wellington Regional Council on erosion control and weed and pest control.

UPPER TARATAHI HALL RESERVE

- LOCATION

715 Chester Road

1814015500

- PRIMARY PURPOSE OF RESERVE

LOCAL



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
-------------	----------------------------

SECTION 434 TART DIST	NO CLASSIFICATION
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CT

Category: Community Buildings Reserve

PARCEL AREA (HA): 1.0319

SCALE: DISTRICT

DISTRICT PLAN ZONES: RURAL (PRIMARY PRODUCTION)

NATURAL HAZARDS:

LEASES/EASEMENTS/LICENCES: land is grazed, the house on the site rented, and the hall is managed by the West Taratahi Hall Board.

- VALUES AND OUTCOMES

HERITAGE VALUES

The Hall used to be the Country Women's Institute meeting place.

NATURAL VALUES

Some boundary planting.

RECREATION VALUES

Passive.

OTHER VALUES AND INFORMATION

Utilities: Hall, house, paddock.

OUTCOMES SOUGHT

1. Maintain reserve as meeting place for community activities.

VICTORIA STREET RAILWAY RESERVE

- LOCATION

Victoria Street

1821011900

- PRIMARY PURPOSE OF RESERVE

RECREATION



- INFORMATION

APPELLATION	RESERVE ACT CLASSIFICATION
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LOT 35 DP 49240	NO CLASSIFICATION
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CT

Category: Linkage

PARCEL AREA (HA): 0.1872

SCALE: DISTRICT

DISTRICT PLAN ZONES: RESIDENTIAL

NATURAL HAZARDS :

LEASES/EASEMENTS/LICENCES:

- VALUES AND OUTCOMES

HERITAGE VALUES

None

NATURAL VALUES

Trees as screens on the boundary with the Railway Line.

RECREATION VALUES

Walking, biking.

OTHER VALUES AND INFORMATION

Utilities:

OUTCOMES SOUGHT

2. Enable informal recreation.
3. Provide pedestrian/biking link to the Baths and Railway Station.

NOTES

Since Council Notified its intention to review its Reserve Management Plan, some changes occurred.

A neighbourhood reserve in Fiest Street has been developed as part of the subdivision. This is yet to be formally named, for the purposes of this plan it is known as Fiest Street Reserve.

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APPENDIX 1: RESERVES ADMINISTERED BY COUNCIL

Titles	Legal description	Near Road	Notes	Ha
21256	Lot 1 DP 305260	Admiral Road	Admiral Rd lookout	1.178
WND1/197	Part Section 208 Taratahi DIST	Pembroke Street	Swimming Baths	0.153
16909	Lot 46 DP 304199	Beach Road	Subdivision reserve	14.308
WN54A/804	Lot 4 DP 86496	Beach Road	Subdivision reserve	4.8
WN403/41	Part Section 173 Taratahi DIST	Belvedere Road	Sparks Park	4.937
WN57A/189	Lot 1 DP 89362	Belvedere Road	Sparks Park	22.155
436146	Part Section 206 Taratahi DIST	Belvedere Road	Howard Booth Park	0.913
436146	Lot 35 DP 23600	Belvedere Road	Howard Booth Park	20.859
436146	Lot 2 DP 33958	Belvedere Road	Howard Booth Park	0.275
436146	Lot 32 DP 23600	Belvedere Road	Howard Booth Park	3.602
436146	Lot 31 DP 23600	Belvedere Road	Howard Booth Park	3.377
436146	Part Lot 1 DP 19472	Belvedere Road	Howard Booth Park	1.616
436146	Lot 2 DP 19472	Belvedere Road	Howard Booth Park	0.438
436146	Lot 1 DP 409854	Belvedere Road	Howard Booth Park	0.177
WN403/35	Lot 1 DP 15039	Belvedere Road	Belvedere Hall	1.258
WN328/189, WN496/125	Lot 3 DP 7389	Broadway	Behind 55 High St North	0.066
737820	Lot 84 DP 126	Charles Street	Bird reserve	1.012
737820	Lot 82A DP 126	Charles Street	Bird reserve	1.012
None	Section 348 Taratahi DIST	Chester Road	Cemetery	161.368
WN402/28	Part Section 300 Taratahi DIST	Chester Road	Cemetery	1.26
None	Section 434 Taratahi DIST	Chester Road	Taratahi Hall	10.319
WN377/251	Lot 1 DP 8104	Clifton Grove Road	Road section	0.442
None	Lot 3 DP 51389	Dakins Road	Road reserve	4.15
WN25B/824	Lot 2 DP 56470	Dalefield Road	Cnr Lincoln & Dalefield	4.493
WN13A/116	Lot 2 DP 30724	Dalefield Road	WWTP & Landfill	81.01
WN13A/115	Lot 1 DP 30724	Dalefield Road	Landfill	8.769
WN13B/1046	Part Section 3 Block V Tiffin SD	Dalefield Road	Forestry	507.88
WN284/78	Section 2 Block V Tiffin SD	Dalefield Road	Forestry	2023.428
WN44A/853	Section 12 Block V Tiffin SD	Dalefield Road	Forestry	961.128
WN57A/713	Lot 2 DP 89642	Dalefield Road	WWTP - Daleton Farm	656.22
None	Lot 2 DP 24549	Dalefield Road	WWTP	39.406

None	Lot 1 DP 24549	Dalefield Road	WWTP	34.44 9
333216	Lot 2 DP 383510	David Lowes Lane	Waingawa wetlands & pond	37.13 8
751836	Lot 83A DP 126	Frederick Street	Bird reserve	1.012
751836	Lot 85 DP 126	Frederick Street	Bird reserve	1.012
WNC3/905	Part Section 14 Tauweru DIST	Gladstone Road	Metal pit	23.00 9
WNC3/905	Part Old River Bed Survey Office Plan 25605	Gladstone Road	Metal pit	23.00 9
WN18D/1338	Lot 1 DP 45125	Gladstone Road	LP reserve	8.33
WN18D/1339	Part Lot 6 DP 512	Gladstone Road	LP reserve	30.77 3
WN18D/1339	Part Section 101 Ahiaruhe DIST	Gladstone Road	LP reserve	30.77 3
WN18D/1339	Part Lot 2 DP 512	Gladstone Road	LP reserve	30.77 3
WN18D/1339	Lot 1 DP 512	Gladstone Road	LP reserve	30.77 3
Unknown	Unknown	Gladstone Road	Road reserve – O/S 'Middlerun'	0
WN427/93	Lot 1 DP 10273	Gladstone Road	Gladstone complex	29.82
WN44C/115	Lot 3 DP 76782	Gladstone Road	Gladstone complex	0.65
None	Lot 2 DP 72334	Glenburn Road	Esplanade	4.4
WN6B/626	Part Section 206 Taratahi DIST	High Street North	Millenium Park	0.845
WND4/935	Part Lot 5 A 2261	High Street South	Carrington Park	2.286
160104	Lot 2 DP 338849	High Street South	Carpark next to Carters	1.451
WN350/229	Part Section 4 TN OF Carterton	High Street South	Carrington Park	20.95 6
WN350/229	Part Section 5 TN OF Carterton	High Street South	Carrington Park	57.70 6
WN467/236	Part Lot 2 DP 1024	High Street South	Carrington Park	5.311
WN48B/481	Lot 1 DP 81767	High Street South	Clock tower	0.337
WN18C/760	Lot 1 DP 48163	Holloway Street	Library - Events Center	0.941
WN18C/761	Part Sbdn 2 Sec 3 TN OF Carterton	Holloway Street	Operations Depot	6.394
WN23C/973	Section 160 TN OF Carterton	Holloway Street	Scout Hall (now Events Center)	0.847
WN596/296	Section 149 TN OF Carterton	Holloway Street	CDC office	0.632
WN67/184	Part Section 2 TN OF Carterton	Holloway Street	Holloway Reserve	0.228
WN565/133	Part Sbdn 5 Sec 3 TN OF Carterton	Holloway Street	Library - Events Center	0.847
WN21B/326	Lot 2 DP 51763	Kaiwhata Road	Metal pit	1.2
436146	Part Lot 4 DP 16570	Kent Street	Howard Booth Park	1.238
436146	Part Lot 2 DP 16570	Kent Street	Howard Booth Park	0.953
436146	Lot 1 DP 32102	Kent Street	Howard Booth Park	2.097

WNB2/1094	Part Lot 1 DP 16570	Kent Street	Howard Booth Park	0.933
WN26C/210	Lot 217 DP 126	Lincoln Road	Supplementary water supply	1.012
WN26C/299	Lot 73 DP 126	Lincoln Road	Supplementary water supply	1.012
WN26C/299	Lot 72 DP 126	Lincoln Road	Supplementary water supply	1.012
WN26C/210	Lot 216 DP 126	Lincoln Road	Supplementary water supply	1.012
None	Section 20 Block VIII Huangarua SD	Longbush Road	Longbush play center	7.284
WN53D/274	Lot 7 DP 86041	Mangatarere Valley Road	Esplanade	7.43
WN415/228	Part Lot 19 DEEDS 414	Memorial Square	Was Public Toilets	0.155
WN250/37	Part Lot 1 DP 3680	Moreton Road	Metal pit	3.24
WN8C/826	Lot 1 DP 29444	Moreton Road	Park - was Metal Pit	0.913
WN8C/826	Lot 2 DP 29444	Moreton Road	Park - was Metal Pit	0.913
WN51/273	Part Section 2 TN OF Carterton	Nelson Crescent	Holloway carpark	0.223
WN59A/745	Lot 3 DP 91292	Nelson Crescent	Shops - 29 Holloway	0.735
WN241/279	Part Lot 3 DP 1070	Ngatawhai Road	Land at end of roadway?	7.84
WN505/8	Lot 1 DP 12846	Norfolk Road	Intake area for water race	12.57
WN436/38	Lot 22 DEEDS 414	Park Road	Memorial Square	2.322
WND1/197	Part Section 207 Taratahi DIST	Pembroke Street	Swimming Baths	3.332
422966	Part Section 81 Taratahi DIST	Perrys Road	Metal pit	4.046
WN19A/878	Part Section 171 Taratahi DIST	Somerset Road	Metal pit	4.046
WN58C/869	Lot 1 DP 90956	State Highway 2	Information & layby	0.389
566971, WN13D/520	Part Section 133 Taratahi DIST	State Highway 2	Esplanade - Metal Pit	11.27
WN536/159	Lot 1 DP 14020	State Highway 2	WWTP - Daleton Farm Cottage	12.14 1
436146	Lot 34 DP 23600	Taverner Street	Howard Booth Park	18.67 9
436146	Lot 25 DP 23600	Taverner Street	Howard Booth Park	4.414
436146	Part Lot 2 DP 3254	Taverner Street	Howard Booth Park	3.526
None	Lot 24 DP 23600	Taverner Street	Howard Booth Park	0.923
WN21B/327	Lot 3 DP 51763	Te Wharau Road	Rural Fire Depot - Not used	0.418
WN403/80	Part Section 31 Pahaoa DIST	Te Wharau Road	Metal pit	4.654
WN403/80	Part Section 31 Pahaoa DIST	Te Wharau Road	Metal pit	4.654
WN403/80	Part Section 239 Pahaoa DIST	Te Wharau Road	Metal pit	4.654
WN448/207	Part Lot 1 DP 10838	Te Wharau Road	Metal pit	3.728
WN639/9	Part Section 239 Pahaoa DIST	Te Wharau Road	Metal pit	3.186
WN639/9	Part Section 31 Pahaoa DIST	Te Wharau Road	Metal pit	3.186
None	Part Section 115 Tupurupuru DIST	Te Wharau Road	Metal pit	4.532
None	Lot 35 DP 49240	Victoria Street	Walkway to Pembroke St	1.872

WN29B/667	Lot 1 DP 59134	Wakelin Street	Walkway to Carrington Park	0.078
436146	Lot 33 DP 23600	Wyndham Street	Howard Booth Park	2.555
436146	Part Lot 5 DP 16570	Wyndham Street	Howard Booth Park	1.268
436146	Lot 36 DP 23600	Wyndham Street	Howard Booth Park	20.487

APPENDIX 2: BYLAWS RELEVANT TO THIS RESERVE MANAGEMENT PLAN

1. Wairarapa Consolidated Bylaw 2019
2. Control of Dogs Bylaw 2017
3. Amendment to Liquor Control Bylaw 2005

APPENDIX 3: POLICIES AND PLANS RELEVANT TO THIS RESERVE MANAGEMENT PLAN

1. Wairarapa Local Alcohol Policy
2. Smokefree Outdoor Areas Policy
3. Guidelines for UAVs over Council Reserves
4. Urban Street Tree Policy
5. Civic Watering Policy



7.5 ADDITIONAL IRRIGATION TO LAND INVESTIGATION

1. PURPOSE

For the council to approve an unbudgeted expenditure to investigate the suitability of additional land for wastewater irrigation.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

In September 2014 Carterton District Council submitted the Assessment of Environmental Effects (AEE) to accompany the application for the Carterton Wastewater Treatment Plant (WWTP) discharge consents to Greater Wellington Regional Council (GWRC).

The AEE re-iterated the community's, Council's, and GWRC's wish to divert treated wastewater to land in preference to continued discharge to surface water. The Council's long-term vision was stated below:

"Carterton District Council's long-term vision for the Dalefield Road WWTP is to discharge all treated effluent to land, except during saturated ground conditions or other unfavourable or unusual circumstances, for the purpose of improving social, environmental and cultural outcomes. The Council's aim is to achieve this in partnership with the wider community and in particular with landowners in the vicinity rather than the Council having to acquire all the land for the purpose. The rate of progress towards achieving this vision will be governed by the practical realities of achieving suitable arrangements and the ability of the Carterton community to pay for the improvements."

The stated intention was for Council to work toward this goal over the lifetime of the consent.

Council officers have been progressing this goal and there is now an opportunity to investigate the use of nearby land to extend the irrigation capacity of the wastewater treatment plant.

4. DISCUSSION

At the time of the planned upgrade to the Wastewater Treatment Plant, the total amount of land required to ensure no discharge to the Mangatāre Stream was double that of the exiting Dalefield Farm capacity (approximately 40 hectares).

However, the true amount of land required will not be known until the expanded wastewater plant is fully operational.

There is a potential option for long term lease of 21 hectares of land near to the existing irrigation area. Prior to entering discussions, suitability of land for irrigation needs to be established.

Some land analysis has already been conducted with those results indicating the land is likely to be suitable for irrigation however, wide ranging test pit work has not been undertaken.

Officers will need to present to Council a robust analysis of cost beyond land suitability and include the variation to consent estimations, pump and pipework costs, operational costs, and any potential income offsets from crop sales.

Once this information is known lease arrangements can be discussed with the landowner and the final option presented to Council for a decision.

The investigation work has not been budgeted for and officers are requesting an unbudgeted expenditure of up to \$100,000 to complete this work.

If approved, the investigative work will commence immediately and aim to be concluded in the next couple of months.

5. CONSIDERATIONS

5.1 Climate change

There are no climate considerations for unbudgeted expenditure.

5.2 Tāngata whenua

No considerations at this time.

5.3 Financial impact

The additional expenditure will be loan funded.

5.4 Community Engagement requirements

None for the investigation. If the current resource consent conditions are to change, or a new consent sought, that may result in the requirement for consultation.

5.5 Risks

There are no risks associated with undertaking the investigation, although if the land is proven to be unsuitable the expenditure will not result in the discharge area being expanded.

6. RECOMMENDATION

That the Council:

1. **Receives** the report.
2. **Agrees** to the unbudgeted expenditure of up to \$100,000 to investigate the suitability of additional land near Daleton Farm for wastewater discharge.

File Number: 127517

Author: Dave Gittings, Infrastructure, Planning and Regulatory Manager

Attachments: Nil



7.6 WAIRARAPA WATER RESILIENCE STRATEGY

1. PURPOSE

For the council to receive the Wairarapa Water Resilience Strategy.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

In 2018 a group of water users initiated the development of a water resilience strategy for Wairarapa. This arose as a consequence of the work of the Wairarapa Whaitua and the Wairarapa Economic Development Strategy. It also reflected the water availability issues climate change will have for the Wairarapa.

A Wairarapa Water Resilience Strategy Group (WWRSG) was formed in late 2018 to prepare the strategy. This was a large group representing many interests including councils, iwi, land users, commercial interests, sector and advocacy groups. Development of the Strategy was coordinated by the Greater Wellington Regional Council, funded by the Provincial Growth Fund, project oversight was done by WellingtonNZ and the WWRSG was chaired by Dame Margaret Bazley.

4. DISCUSSION

A copy of the Wairarapa Water Resilience Strategy is in **Attachment 1**. The essence of the strategy is based on:

- Adaptive solutions
 - Diversified land use
 - Seasonal adjustment
 - Land use management to enhance water reliability
 - Improved water use allocation procedures
 - Good management practice
 - Tactical seasonal use
 - Reducing soil compaction
- More available water solutions
 - Water use efficiency
 - Water re-use or multiple use

- Managed retention
- Natural attenuation
- Groundwater augmentation
- Storage.

The strategy identifies governance arrangements for the implementation of the strategy (Chapter 14). The Water Resilience Strategy group identified the Wairarapa Committee of the Regional Council should provide this role. It has a suitable mandate and representation to perform this function. The purpose of the Wairarapa Committee is to consider matters of importance to the Wairarapa and make recommendations to the Regional Council on these matters.

The Wairarapa Committee comprises eight members, with GWRC providing its administration. The members are the GWRC Wairarapa elected member and two other regional councillors, the Mayors from South Wairarapa, Carterton and Masterton District Councils and one member each from Ngāti Kahungunu ki Wairarapa and Rangitāne ō Wairarapa.

5. NEXT STEPS

All four Councils (the three Wairarapa Councils and Greater Wellington Regional Council) will be considering the strategy and either noting it (District Councils) or adopting it (Greater Wellington). Once that process is complete the strategy will then be included on future Wairarapa Committee agendas for decisions regarding implementation and monitoring actions.

6. CONSIDERATIONS

6.1 Climate change

Climate change impacts were one of the key considerations during the development of the strategy.

6.2 Tāngata whenua

Mana whenua entities were part of the WWRSG and will continue to be involved with its implementation.

6.3 Financial impact

No financial impacts have been identified to date with the implementation of the strategy. Any future funding impacts will be the subject of decisions of the Council.

6.4 Community Engagement requirements

Through the development of the strategy the WWRSG undertook community engagement. This is outlined in the strategy document.

6.5 Risks

There are no risks identified related to the decisions in this report.

7. RECOMMENDATION

That the Council:

1. **Receives** the report.

2. **Receives** the Wairarapa Water Resilience Strategy, in **Attachment 1**.
3. **Notes** that the two other Wairarapa District Councils will also be receiving the strategy, and that Greater Wellington Regional Council will adopt the Strategy.
4. **Notes** that the Regional Council's Wairarapa Committee will provide governance oversight of the strategy.

File Number: 127571

Author: Jane Davis, Chief Executive

Attachments: 1. Wairarapa Water Resilience Strategy 2021 [↓](#)



WAIRARAPA WATER RESILIENCE STRATEGY 2021

Image: Lake Wairarapa



He puna manawa, he manawa whenua!
He manawa whenua, he manawa ora!
He manawa whenua, he manawa tū!
He manawa whenua, he manawa tangata!



*A spring of water from the heart of Papatūānuku
An eternal spring of water, unfailing
An eternal spring supports life
An eternal spring supports longevity
An eternal spring supports eternal well-being*



Joint Statement by Ngati Kahungunu PSGE ki Wairarapa and Rangitāne Tū Mai Rā Trust (Wairarapa Tamaki Nui Ā Rua) PSGE

Water is the blood of the earth mother Papatūānuku and the rivers are her veins. It is her who has given us life from time immemorial and it is with her that solutions to climate change lie.

All things animate and inanimate have mauri. Mauri is an innate life force that requires balance. We have disrupted the balance of the natural world. We have altered the natural way of things such as the rivers and the streams and as a result the earth mother is less able to nurture us in the face of climate change.

Climate change will affect our whole region, the land and rivers, lakes and coastal areas. We need to restore the natural processes that sustain them. We recognise that we live in a changed world. Restoring natural processes involves repairing, freeing up and empowering natural processes by cleaning rivers, supporting river flows, encouraging the flow of natural springs and retaining water in the natural ecosystem. We can do that with the benefit of both modern and traditional knowledge and practices.

Our role in resource management is now set down in Acts of Parliament and that is a good first step, but we as iwi of Wairarapa see that real progress is possible when we are in equal partnership with the Councils and the Crown, respecting our contributions and for the benefit of all. We want to be equal partners not only in law but in the quest to restore water resilience including, but not limited to, the co-management and co monitoring of water and active in the environmental restoration together. Restoration of the mauri of the water will lead to restoration of the mana of our people.

Our mission is to restore the healing power of Papatuanuku through the restoration of as many natural processes of water resilience as possible. We welcome modern methods and technologies especially where they strengthen the catchment-wide reach of the earth mother and her natural processes that will be the difference between success and failure.

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Foreword

The October 2018 Wairarapa Economic Development Strategy and Action Plan said that “an optimum and integrated view of water is required” when referring to water use in Wairarapa. It said: “The opportunity is to address these issues in an integrated manner now while there is time, to avoid being forced into urgent action when time is compressed”.

Climate change is arguably the major threat of our age. It also presents significant opportunities, but we will only grasp those if we address the climate change challenges head-on.

It was with this thinking in mind that the idea of this Wairarapa Water Resilience Strategy (WWRS) was initiated by a local water user group who convened a meeting of farmers, industry users and local council representatives at a meeting in November 2018 and another in January 2019. The group was joined by the local council mayors, the Chair and Wairarapa members of Greater Wellington Regional Council and Iwi leaders of the Rangatāne and Kahungunu Settlement Trusts. Later, members with an environmental interest and the Chair of the Whaitua joined.

Concurrently funding was made available to Wairarapa Water Ltd by the Provincial Growth Fund for a feasibility of a storage scheme at Wakamoekau. It was believed by those involved that a broader catchment-level resilience strategy was required to address the broader climate change issues. The WWRS Group was

formed - a large group representing many interests including councils, iwi, land users, commercial interests, sector and advocacy groups. WellingtonNZ acted as the overseeing agency and I was pleased to be asked to chair the WWRS Group, extending from my role as chair of the Wairarapa Economic Development Strategy.

It was clear to me that successful water resilience would only happen if all interests in the community worked together. As a result, we took an inclusive approach and while it resulted in much intense debate, the result is a broad consensus about what needs to be done. The direction and approach pointed to in the Strategy provides an effective vehicle which will evolve over time. The important thing is to get started.

I would like to thank all those involved in the Strategy Group for their contribution and patience, their openness and willingness to discuss and debate. The patronage of the mayors/chair and councils has been vital and all have stayed the course. The iwi contribution has been significant and have actively assisted us reflect their views and priorities. I hope a co-governance management model will ensure their full participation over the years to come. This could not have been completed without the funding and in-kind support from the PGF and the councils, including the Greater Wellington Regional Council.

It's a big read, but a worthwhile one. The Executive Summary overviews the thread of the Strategy and the Addenda contain a lot of background information that helped build the arguments. The result is a piece of thinking of the scale required to address an issue as complex as climate change. The journey now begins.

Dame Margaret Bazley ONZ, DMNZ
Chairperson of the Wairarapa Water
Resilience Strategy Group
May 2021



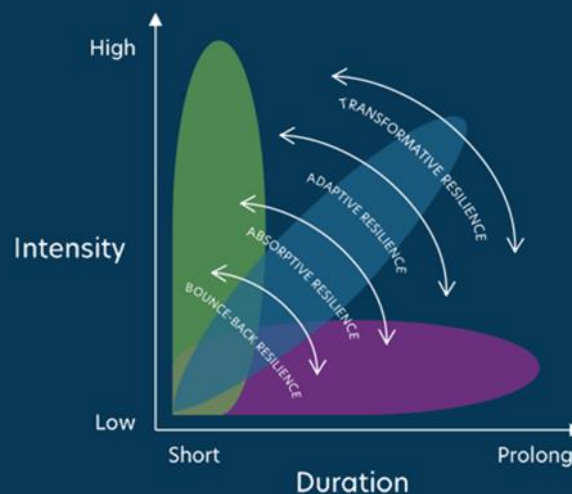
Executive summary

The October 2018 Wairarapa Economic Development Strategy and Action Plan said that "an optimum and integrated view of water is required" when referring to water use in Wairarapa. It said, "The opportunity is to address these issues in an integrated manner now while there is time, to avoid being forced into urgent action when time is compressed".

There is no resource more fundamental than freshwater and yet we often don't appreciate its importance until the supply is threatened. Climate change is the primary threat, aided and abetted by our 'traditional' approach towards water: that there are supposedly infinite volumes available and that where there is scarcity, infrastructure solutions will save the day. That will simply not be the case. Climate change effects will be experienced most along the New Zealand's eastern margins, including Wairarapa, and overtime they will be severe.

What is resilience?

Resilience is often regarded as the ability to "bounce back" after a shock, or alternatively the ability to absorb shock without changing the structure, identity or function of the structure or system. A third conception of resilience is 'positive adaptability' capacity in anticipation of, and after a shock. This definition is more akin to robustness and is often termed adaptive resilience. There is transformative resilience. This is where significant change is required to adjust to



Source: Adapted from the Handbook of regional Economic Resilience

the shock and prosper. All three definitions are relevant to our task.

Climate change is not a sudden event. It will be a **progressive, cumulative, long term, destructive and perhaps irreversible**, process that will define the next 100 years of human existence. In this context, resilience is less about bouncing back and more about springing forward to a new and more sustainable reality. The quicker we spring to a new reality, the better, and how we define that new reality and what actions we take to achieve it are the subject of this report. It is also about building a new robustness to resist the negative impacts of climate change.

That more sustainable reality will only be realised by a **progressive, cumulative, constructive, unrelenting and collaborative** response where a whole community works together at a whole-of-catchment level for a common goal. The

robustness of the response must match the scale and complexity of the challenge. Success- whatever that ends up being, and that will only become apparent as we move forward- will only be achieved by all parties staying together and staying the distance.

The iwi idea of mauri regards everything as being in balance and where it is out of balance, that that balance is returned. Reversing many of the impacts of climate change will be impossible. Instead, iwi will need to be involved in the decision-making around what the "bounce forward" balance might be. Climate change challenges all of our mindsets.

There are other resilience challenges such as ageing infrastructure, earthquake and other natural events, but the climate change challenge is the single dominant and integrating consideration in resilience for the next 20-30 years.

What is the climate change "shock"?

Less water in an economy that is highly dependent on water (especially for agriculture and tourism) will likely lead to fewer jobs and static or falling prosperity¹. The economy could adapt by moving away from water-based industries and there is evidence of this, but it is not the focus of this Strategy. It could do more with less water and this is the primary focus of this Strategy.

There are five aspects of the "shock" that add up to a significant impact on our community and economy:

- **Water deficit** - by mid-century, it will take 15% more water just to continue with our present day activities, due to less rainfall and increased evaporation.
- **Restrictions at low flows** - increasing some minimum flows and some restrictions on groundwater users recommended by the Ruamāhanga Whaitua will significantly reduce water that is available for abstraction in the hot, dry summer water deficit period.
- **Accommodating growth** - there is already demand pressure on freshwater and Wairarapa is growing. Even at 1% a year (current estimates) this involves significant extra demand for water over 20 years.
- **Loss of mauri** - mauri is likely to be further degraded and restoration and protection of the mauri of the water is likely to require more water directed to the environment (the amount is unable to be specified at this time).
- **Infrastructure challenges** - the local councils are already facing a hefty bill for the upgrade of ageing water infrastructure meaning that limited public capital funds may be available for investing in other resilience priorities.

This problem statement is a crude estimate to illustrate the scale of the "shock", which is potentially substantial. Work will be required to more accurately detail the impact.

¹ This is assumption and has not been modelled.

How do we find our way through this conundrum? There are some short-term relievers. For example, there are potential efficiency gains as towns reduce their losses due to current high levels of leakage from piping systems. This could result in a 5-10-year demand plateau in the towns as a result of improved efficiency. There is also a positive gap between what water is consented and what is used, meaning there is still some capacity available, but this may only help in the shoulder seasons and similar to the urban situation, is probably temporary.

The real problem is that the water deficit period on average experienced from January to March, will intensify and even expand with climate change and that will be the pressure point. Already water consumption increases significantly in this period in both town and country. Why? Because it is hot and will become hotter. As minimum flow regulations progressively tighten throughout January to March (the peak growing, tourism and visitor season) then availability will become severely constrained. Nonetheless, if we act over the next 10 years, and resilience needs to be viewed over a 50-year horizon, then we have some hope of managing the impact of the shock and bouncing forward to a new equilibrium. In fact, it may precipitate 'systemic' changes that have been needed for a long time.

The value and the "values" associated with water

² Examples of co-governance around water are emerging around the country, most notable examples are Te Waihora in Canterbury where there is a true 50/50

Not only do we need to come together on changed approaches to the management and use of water, but we need to come together with a common mindset about how we view and value water. If we look after the water, the water will look after us. If we manipulate and modify the water without careful thought and shared values, we could create unintended consequences we will come to regret. Accordingly, this Strategy recognises the Treaty of Waitangi, and the importance of co-governance² with iwi entities and seeks to understand how these apply to water resilience (Error! Reference source not found. - Te Mana o te Wai). It also seeks to incorporate the Māori world view contained in the opening statement of this Strategy document and to introduce co-governance with Maori for the management of water resilience. It recognises that water has mauri and that needs to be maintained. It also seeks to understand the world view of all interests and find points of common agreement from which we can launch our response to protecting this fundamental asset in an era of progressive climate change.

The essence of the Strategy?

The key threat is the loss of water through evaporation as a result of higher temperatures and a longer dry period. The counter is essentially two-fold:

- i. To manage or temper demand by doing more with less (efficiency) such as urban use and land use changes.

partnership approach and a Hawke's Bay Regional Council Water management Committee.

- ii. To enhance supply by retaining water in the total Wairarapa ecosystem from the surplus periods (primarily winter) to the deficit period (high summer) through as many means as possible.

The supply problem is more nuanced. Climate change predictions postulate that there will continue to be rainfall events through the October to April period, though they may be more frequent but of less volume. Known as “freshes”, they have the potential to enhance the Wairarapa water ecosystem if that water can be slowed and retained in that system for longer and provide both societal and environmental benefits.

How could we manage or temper demand?

- Broadening water use throughout the year, particularly in shoulder seasons (November/December).
- Facilitating its availability to encourage innovative resilience-conscious uses.
- Changing land uses towards lower water using ‘crops’, deeper rooting and more resilient plants.
- Educating residents about wise water use to reduce the currently very high per capita consumption.

How could we enhance supply?

- Slowing flows in rivers, lakes and streams – holding/retaining water in the catchment for longer.
- Sequestering water into groundwater and/or surface storage such as reservoirs and tanks for later use.
- Holding moisture in soils and vegetation and by providing shading to reduce evaporation.

The Strategy seeks to harness all these activities into a comprehensive, integrated and well-orchestrated programme of action.

Equal to the physical challenges involved is the change of mind-set required to manage the water resource much more effectively than we have previously. Much progress has been made, but there is much to do. It requires a transition to new ways of managing our water resource. Amongst the options, each has strengths and weaknesses. The Strategy seeks to take advantage of the strengths and offset the weaknesses of multiple solutions operating together.

Green and grey

Historically our go-to solutions have tended to focus on built or “grey” infrastructure: various types of storage solutions and irrigation systems. They have been favoured because generally they can deal with large volumes of water and can be controlled to achieve reliability of supply. But the challenges of climate change require a much more comprehensive response.

At the very least, stand-alone grey solutions are simply not sufficient to deal with the scope of the problem. They tend to be focused on specific geographic

areas – such as irrigation command areas³ or specific municipal supply locations. They are generally focused on a single or small number of uses and those which have a direct economic return. They are often expensive making them less suitable for medium or lower value activities or extensive application. They also can sometimes have significant environmental impacts which can be mitigated in many cases, but at a cost. Their greatest limitation is the narrowness of their focus. They do not address water scarcity at a catchment level which has become necessary given the diverse and severe effects of climate change which impact on the whole catchment.

Nature-based solutions involve working with nature rather than against it, yet they also have their limitations. Many are relatively untried (such as retrofitting them to existing solutions), especially at a whole-of-catchment scale, but this does not mean they won't work. Their development time can be longer simply because of the natural growth cycle. They themselves can be vulnerable to climate change impacts. Their intrinsic benefits are significant. They are often simple to introduce and operate. They often cost less. They are often within the scope of a single farmer or small group of farmers or a small town. They address a complex of needs from economic to social and environmental. Most importantly, they are strongly supported by iwi because they take advantage of the huge resource of

the natural resilience of nature. Nature-based solutions provide huge benefits in providing ecosystem services such as increased biodiversity and improved water quality.

Optimisation

No one solution will do the job. A bundle of solutions will be required. Most solutions are, in fact, combinations of grey and green where each enhances the other, and where a cluster of solutions generates sufficient scale and effect to address the substantial impacts of climate change. In simple terms green solutions would be ideal for holding water in soils and vegetation, providing shade, directing water into groundwater for later use, broadening production to the shoulder seasons and squeezing the climate change effects out of the shoulder seasons. Grey solutions may be required to offset the intense water loss during the water deficit period by augmenting supplies, providing reliable water for high value activities. Green solutions are vital in retaining and restoring the mauri of the water. They are not simply an optional ingredient of the final mix of solutions.

Systemic solutions are also required. Significant inefficiencies in water allocation are identified and the vulnerability of urban storage capacity is similarly identified. The "shock" of climate change will have the effect of de-locking some of the practices and pathways of

³ Irrigation command area is the gross area that could be supplied with water from an irrigation scheme. It therefore includes the areas applied with water, plus the broader

area such as roads, tracks, buildings, rivers, hedge rows and so forth.

water management that are simply no longer fit-for-purpose.

The task of this Strategy is to optimise the combination of grey/green solutions using a wide range of criteria. For example, simple structures like water retention bunds (grey) could be used to direct surface water into groundwater (green). Water from storage can be used to augment rivers and streams to offset low flows. Constructed and restored wetlands can be used to retain water and moisten the surrounding soil (besides their capacity to process nitrogen). Where do we best direct our scarce investment resources?

The challenges

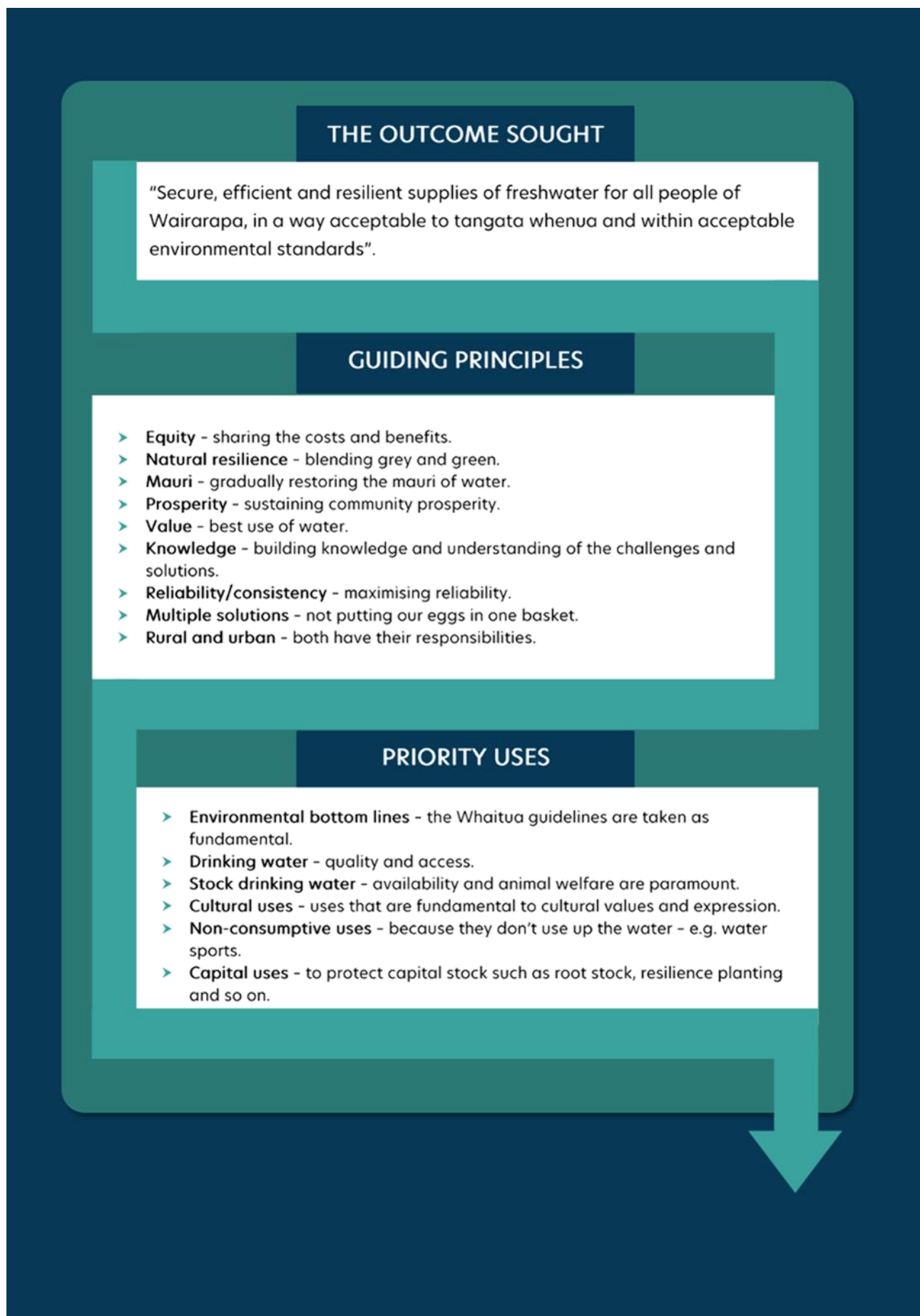
There are challenges at every turn. If we direct water into groundwater for storage, in many situations there is no guarantee that the water will be recoverable for use, although it will still enhance water ecosystems. If we contemplate land use change will there be a market for different types of products and farmers willing to grow them? Will residents be prepared to be more water-conscious and reduce their per capita use? Is the Wairarapa community up for these challenges, or is it all too hard? All these matters are worked through in the Strategy and solutions sought.

From another angle, we may need to be innovative – trial and potentially use technologies or concepts that have yet to be proven at catchment scale. Likewise, the Strategy has identified the need to increase our knowledge of the water resource from a resilience perspective.

Setting a course

The WWRS established a range of outcomes, principles and priority uses to guide them in the optimisation challenge.

These underpin and validate the Strategy. Priority uses are particularly important. They recognise that there are some uses that take precedence or that some are low-hanging fruit with respect to water resilience.



Resilience solutions

The list of possible resilience solutions – grey and green – is very long. The current state of knowledge, their value and how inter-operable they are in a total package of responses to climate change was assessed. A set of criteria was established and a multi-criteria analysis was undertaken using five different stakeholder groups comprising a mixture of technical and informed people and others with an active interest but not necessarily a high technical understanding – a combination of expert and common sense opinion.

The range of resilience solutions used fell into two broad categories – adaptive solutions (which are on the demand side) and “More Available Water” (MAW) solutions (which are on the supply side). Adaptive solutions include those that reduce, diversify or spread demand for water. MAW solutions include those that create more usable water through techniques such as capture, retention, storage and efficient use.

➤ Adaptive solutions

- Diversified land use
- Seasonal adjustment
- Land use management to enhance water reliability
- Improved water use allocation procedures
- Good management practice
- Tactical seasonal use
- Reducing soil compaction

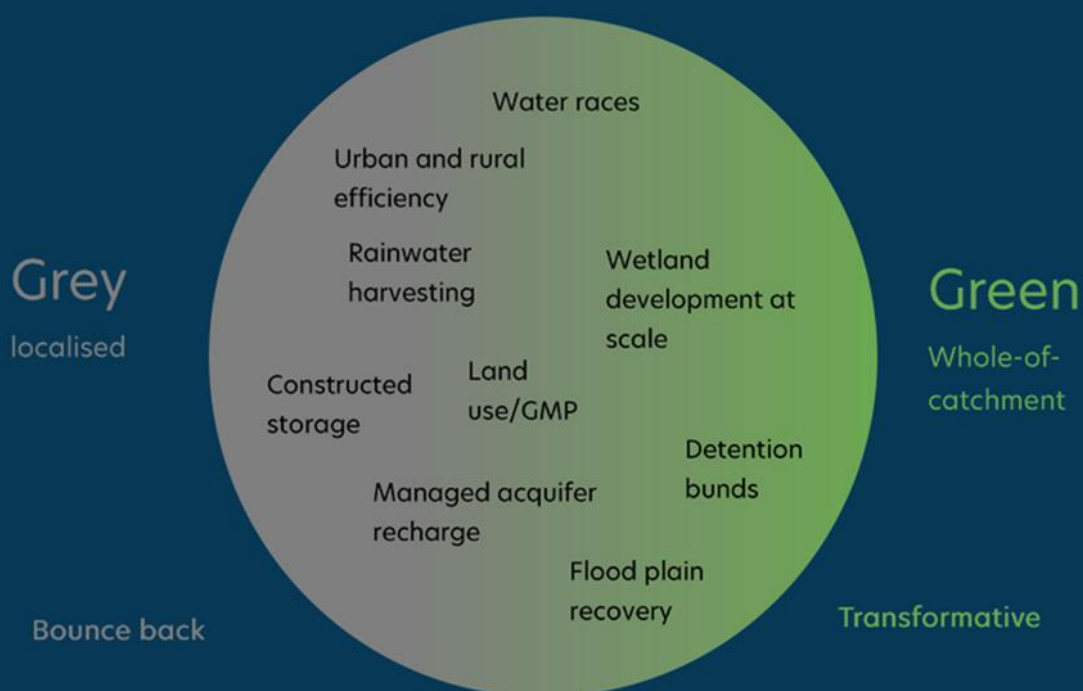
➤ More available water (MAW) solutions

- Water use efficiency
 - Public education

- Rural water use efficiency
- Urban water use efficiency
- Seasonal water rationing
- Seasonal public education
- Water re-use or multiple use
 - Domestic wastewater
 - Industrial wastewater
 - Grey water
 - Farm drains
- Managed retention
 - Detention bunds
 - Accessing natural flood plains
 - Nano dams, leaky dams and straw dams
 - Repurposing water races
- Natural attenuation
 - Land cover and afforestation
 - Wetlands regeneration
 - Riparian planting
 - Lake enhancement
 - Water sensitive towns
- Groundwater augmentation
 - Managed Aquifer Recharge
 - Deep groundwater identification
- Storage
 - Bulk storage
 - On-farm storage
 - Rural stormwater collection
 - Rainwater harvesting.

Placing the solutions into the Framework

An integrated view of the context of the resilience and grey/green framework with the solutions placed within it is presented in the diagram below.



The way ahead

Setting firm priorities was hampered by the variable technical knowledge across the solutions. Another complicating factor was the need for an integrated approach where solutions are mixed and blended to achieve an overall effect. Success will come from the cumulative effect of a range of interventions, not just one or two.

Accordingly, the WWRS agreed that parallel initiatives on four key 'fronts' were required. These are termed "focus areas" and the four that should form the nucleus of a strategy and action plan are identified and described below.

Of these four key focus areas, two fall into the each of the categories of adaptive (demand-side) and MAW (supply-side) solutions:

MORE AVAILABLE WATER (MAW) SOLUTIONS

1. Water capture focus area

Within this focus area we identified three solutions worthy of priority attention:

- **Managed retention**

Though largely experimental in nature to date, this was viewed as having potential because of its whole-of-catchment reach and relatively modest cost versus benefits. However, the concept and the economics need to be proven.

It is considered that a programme of experimental sites is required to trial these solutions and once approved, devise how best to roll them out more generally across the region.

- **Constructed storage**

Multiple storage sites have been investigated over the last few years and in-depth feasibility is being done on the Wakamoekau site. While suffering many of the limitations of stand-alone grey developments, it is seen as a provider of reliable water when reliability is critical. There is consideration to mitigate adverse effects.

The Strategy recommends that storage at a range of scales is continued to be explored and that constructed storage projects are considered on their merits as part of the spectrum of solutions. No recommendation is made on the Wakamoekau project because it is a separate project undergoing its own feasibility, with its own management and resourcing. A set of principles is developed in this report to evaluate storage proposals.

- **Hill country attenuation**

The eastern hills in particular, are going to be hard hit by climate change. The economics

of water capture in the hills may be challenging, but there is a range of solutions that can be considered, together with adaptive solutions.

The Strategy recommends that a programme of experimental sites is developed associated with those for managed retention and with the same objectives.

2. Natural attenuation focus area

Of all the nature-based solutions, those in this category are the most developed. There are already many examples of restored wetlands, riparian planting, woodlots and afforestation. We know these solutions retain moisture in the ecosystem and while they are very localised, when developed at scale they have catchment-wide implications such as water quality and sediment control. They also have multiple benefits including social, cultural and aesthetic benefits. However, they will likely take time to become fully effective at scale so early action is required.

An important goal of natural attenuation is to contribute to the restoration and protection of the mauri of water, by improving both quality and quantity. Natural attenuation also provides ecosystem services such as biodiversity. The Strategy recommends that a co-ordinated package of natural attenuation initiatives is encouraged and that

shared cost initiatives are sought to support them.

ADAPTIVE SOLUTIONS

3. Allocation focus area

Reduced availability of water with climate change and the cost of MAW initiatives will mean that the whole question of who gets the water and how much, needs to be revisited. The current allocation regime does not adequately recognise the increased "competition" for water and the equity and access issues that come with it. There are periods where there is limited use but high need, but the water is tied up in existing allocations.

The initiatives that have been considered in the strategy process are:

- **Moving water allocations and maximising beneficial use**
This involves establishing policies that encourage transfer of allocations or a more complex allocation system rather than a simple "annual allocation" system. It may include developing a set of criteria for allocating water based on benefits, resilience outcomes and availability. This would also consider allocation efficiency.
- **Using planning rather than consenting instruments**
This is an approach that is used for allocation of water in the Waitaki where substantial amounts of water are used for irrigation.

The Strategy recommends that a review of the allocation system is undertaken by Greater Wellington, taking into account the broader statutory and regulatory context.

4. Land use adaption focus area

De-intensifying demand in the water deficit period by spreading demand across the year, particularly into the shoulder periods and changing land use patterns will have the benefit of transitioning productivity (and therefore prosperity) through the climate change shock.

The initiatives that have been considered are:

- **Introduction of adapted crops**
Introducing crops that take advantage of an expanded growing season, require less water or root more deeply.
- **Encouragement of mixed farming models**
Using changing farming regimes and systems that are better adapted to changed climatic conditions and water availability.

The Strategy recommends that a land use adaption programme is developed in the region to draw on science and practice knowledge to support and advocate land use adaption.

Making it work

This is a complex programme of work which would require well-developed leadership and management systems and skills. It will inevitably fall on existing entities such as Greater Wellington and the local councils to provide funding and support. Yet this must be a total community and stakeholder effort with contributions from central government and active involvement of local people in rural and urban settings. In particular, engagement with river management groups, catchment management structures and sector groups will be vital.

With regard to governance and oversight, a "four rooms" configuration is recommended, connected through a central coordinating entity. The central coordinating entity would comprise the regional and local councils, iwi and central government (in association).

The four "rooms" would comprise the following interests:

- i. **Water capture** (the store room - creating a hedge against periods of scarcity) - Wairarapa Water Ltd, irrigators and irrigator collectives (where they exist), GWRC and river management groups.
- ii. **Attenuation** (the waiting room - holding water in the environment) - River management and catchment groups, town advancement groups, GWRC, local councils and sector groups, DOC.

- iii. **Allocation** (the engine room – optimising the distribution of water) – GWRC, local councils, sector advocacy groups.
- iv. **Adaption** (the classroom – applying science to achieve more with less water) – Farm sector groups, farm advisors, processing companies, river management and catchment groups.

Iwi may be involved in any or all of these focus areas.

Planning and scheduling

The priorities would be scheduled over an extended period with a base of a 10 year programme (to coordinate with council Long Term Plans) but also with a 50-year horizon.

There would be an emphasis on “getting ready” for when the shock of climate change impacts more strongly, so experimentation and development work on managed retention, land use adaption and allocation would be encouraged to create a framework for the future. In parallel, ongoing implementation in water capture and natural attenuation would continue.

The WWRS Group believes that a progressive, cumulative, constructive, unrelenting and collaborative response of this scale is required to address the progressive, cumulative and destructive impact of climate change. Anything less will result in fragmentation, vulnerability, blaming and worst of all, adverse impacts on the prosperity, wellbeing and

attractiveness of the Wairarapa region. By taking early action there will be more options; late action could mean that some options could be compromised.

Recommendations

The following recommendations are submitted for consideration. They represent a long journey and the sooner that journey is commenced the stronger we will be as climate change intensifies.

Adoption

1. That the direction set by this Strategy forms the basis of water resilience planning in Wairarapa over the next 10 years.
2. That a goal is set to have all the fundamentals of a resilience strategy in place within 10 years so that development is keeping pace with the impacts of climate change.
3. That the local councils of Wairarapa and the Greater Wellington Regional Council adopt in principle the intent and general direction outlined in this Resilience Strategy.
4. That the iwi of Wairarapa are invited to adopt in principle the intent and general direction outlined in this Resilience Strategy.
5. That the various advocacy and interest groups are invited to adopt in principle the intent and general direction outlined in this Resilience Strategy.

Leadership

6. That all parties who subscribe to the intent and general direction of the Resilience Strategy consider the

leadership model proposed, which involves the formation of a Wairarapa Water Resilience Committee (or similar entity) drawing on specialist capability in each of the four focus areas.

7. That subsequently, business and project planning is undertaken including governance, partnerships, priorities, funding and resourcing.

Councils and alignment

8. That councils consider how current activities, and their timing and associated budgets in the current draft council LTPs could align with a catchment-wide water resilience work programme e.g. water storage, metering, water re-use, the future of water races.
9. That there is a commitment in principle in the current LTPs currently being consulted to water resilience.
10. That councils ensure LTP planning for the management of three waters, and operations is integrated with water resilience, not stand alone, with improved catchment-wide water resilience.

Iwi

11. That any outstanding issues raised by iwi are considered for inclusion or amendment in the strategy.
12. That the synergy of mātauranga Māori and 'western science' are used to identify and refine future strategies and actions.

Evaluation of resilience solutions

13. That a multi-solution approach is taken including both supply and demand side solutions.

14. That a scientific and systematic approach is taken to the evaluation of resilience solutions using the criteria highlighted in this Strategy and with strong reference to Te mana o te wai and Māori values.

Alignment with the WIP

15. That in all activities associated with the Resilience Strategy that the WIP recommendations and any underlying information remain a basis for determining the principles regarding water management, especially in regard to future resilience, in the Ruamāhanga catchment.

Success Statements

This strategy document does not itemise KPIs for the implementation of the Strategy. This is a function of the governance of the project once it is underway. We have created some success statements that reflect the key milestones that are required to successfully execute the Strategy.

High level outcome success statements

There is a series of high-level long term strategic outcomes or impacts that the Strategy is trying to achieve. These include:

- Making water resilience a community wide concern and priority
- Confining the worst impacts of climate change to the January to March period and protecting the shoulder seasons.
- Harnessing and holding in the environment/ecosystem, significant

quantities of water from periodic “freshest” and rainfall events.

- Slowing water down throughout the catchment and improved moisture retention in soils
- Retaining adequate river flows in the shoulder seasons and satisfying the requirements of Te Mana o Te Wai.
- Strategic protection of nature-based assets (such as planting) from the adverse climate effects.

Operational level success statements

Water monitoring and availability

1. That facilities and systems are created to obtain, on an ongoing basis, further information about the nature of Wairarapa's water resource through monitoring, analysis and interpretation of data, surveys and investigations.
2. That in effect, the region is continually tracking its water balance (demand v supply) as foundation information for refining the implementation of the Strategy.
3. That this information becomes a vital evidential base to inform progress towards water resilience KPIs and is transparent to all users and organisations.

Land use adaption

4. That a land use adaption programme is developed in the region drawing on science and practice knowledge and to support and advocate land use adaption.
5. That a sector and community-based entity is established broadly as outlined in the Resilience Strategy to give direction and leadership to

consideration and implementation of land use adaption practices – referred to in the Strategy as the “Classroom”.

6. That this entity has a watching brief on similar developments locally and internationally and progress regarding the Sustainable Food and Fibre land use diversification proposal especially in respect of how this would fit into the rest of the water resilience package.

Piloting and experimentation with managed retention

7. That a programme of trials for managed retention is developed to potentially ground truth the various proposals. The viability of managed retention techniques, such as detention bunds, is established to test and build knowledge on the efficacy of these.
8. That a schedule of ‘innovative’ solutions especially for managed retention is created, that is, solutions that need to undergo proof of concept in principle or in the Wairarapa setting and prioritise these in terms of effort required to develop them further.

Natural attenuation

9. That a coordinated package of natural attenuation initiatives is established with a shared cost approach across public and private sector stakeholders.

Rainwater harvesting

10. That the current process of consideration by councils in their combined district plan of rainwater capture tanks for new houses is

taken to completion for consideration as a long term resilience measure.

11. The voluntary installation of rainwater tanks for non-potable uses such as water gardens should be encouraged with a view to formalising compliance in the long term.

Storage

12. That storage at a range of scales continues to be integrated into a catchment-wide water resilience package for various urban and rural water activities.
13. That a 'watching brief' is kept on any large and medium scale constructed water storage project proposals, especially in respect of how they would fit into the catchment's water resilience package.
14. That the set of principles developed in this report to evaluate storage proposals are applied in all cases and refined as a result of practice and experience.

Allocation

15. That a review of the current allocation system is undertaken by Greater Wellington Regional Council, taking into account the broader statutory and regulatory context.
16. That analytical work is put in place to further ascertain the differences between actual water and consented water use in terms of how this information would inform allocation processes and decision making.

Water races

17. That targeted investigations are completed on each of the water races and the potential role for them in the future including previous GNS modelling for the Whaitua considerations, landowner issues, how and who will manage them. That this be done with a view to settling the future of these assets so that this can be taken into account in other considerations.



Introduction

The importance of water

It goes without saying, and yet has to be said, that water is fundamental to life on our planet. Planets without water are without life. The water cycle whereby water evaporates from the oceans, falls on the land and nourishes animal and plant life is also the life cycle. A healthy water cycle is the ultimate form of resilience and the one we have relied upon for millennia. Human induced climate change is disrupting that cycle.

The Te Moari Project, a Rangitāne o Wairarapa initiative, makes the point "We all come from water". *"When we are pure potential within our mothers and fathers, we are water. When they come together to create us water is present. When we are growing in our mother's womb water is present. When we are born water is present. Water is essential in our whole lives and will be used when we die. Our descendants will be the same. They are called mokopuna because they spring (puna) from a blueprint (moko) modelled by you and created by your ancestors thousands of years ago."*⁴

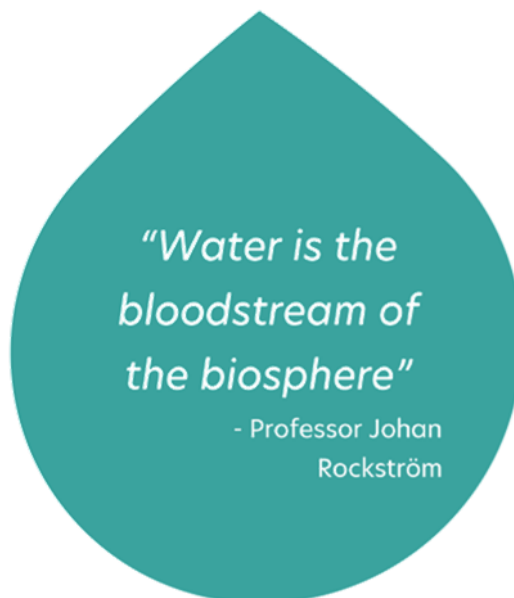
We are entering a period of severe global-scale resource depletion and freshwater is the earth's greatest resource. Seventy percent of the earth is covered in water. Two thirds of our body is comprised of water. Our origin as a species is from water. We are water and water is us. This "truth" is recognised in the Māori whakatauki- "Ko au te awa, ko te awa ko

au" meaning "I am the river and the river is me". This implied personal relationship with the natural world is in contrast with the more functional views we have allowed to evolve in the last few hundred years and which, with resource depletion, we are having to review and rethink.

The resilience challenge

"The climate's number one victim is always water," says Professor Johan Rockström of the Stockholm Resilience Centre. *"Water is the bloodstream of the biosphere and the determinant of our future. As it dries out, water can induce tipping points."*⁵

The simplest definition of resilience is resistance capacity to shock. This is the ability of a system, in this case a freshwater system, to rebound after an abnormal, generally external, event, or absorb the impacts of a shock, yet retain its fundamental integrity. A shock could be



⁴ Pontangaroa, J Te Moari Project 2018-2019 "Rangitane o Wairarapa Cultural Health Monitoring Report" pp9

⁵ Quoted in Workman, j, "Why Understanding Resilience is key to water management" Source IWA April 2017

a one-off event such as an earthquake that could damage aquifers and block rivers with land slips, or it could be a "slow-reveal" shock like climate change whose effects are progressive and possibly non-reversible.

Rebound or recovery is one way of looking at resilience, but in the case of environment-related shocks where tipping points have been passed, then no amount of restoration is going to reverse that situation. In such situations resilience is more about building a new balance. This is well summarised in the following quote from a Boston Consulting Group article: *"Much has been said about resilience in recent times, but people often overlook its duality. It isn't just about springing back from a crisis, as commonly understood; it is also about springing forward into a new reality".*⁶

This adaptive resilience is predicated on the idea that while a system may change as a result of a shock, it should still maintain its core functions which in this case is the ability to allocate a resource efficiently – that is, water. This pre-supposes that the current system is efficient, which many would contend it is not, particularly with regard to externalities such as protection of the environment. This suggests that this Strategy is not just about protecting from the climate change shock but reviewing a system that already has some significant

flaws. We are involved in a programme of evolutionary resilience⁷. It may require revised systems and processes as well as individual solutions. This Strategy addresses both individual solutions and the system as a whole.

The rebound may require natural or artificial solutions or combinations of both. We shouldn't forget that it is nature-based processes that have protected us in the past and our growing demand for water is competing with the environment for water. We cannot allow this competition to happen because there is no winner. We need these natural processes to protect us in the face of the current climate emergency.

Water resilience is also human resilience. Māori see restoration of the mauri of water contributing to the restoration of their mana as people. To address water resilience we must all 'own' the challenge and continuing the Māori world view we must be the environment and the environment must be us. If we compromise the environment, we compromise ourselves. We must be resilient, and resilience must be us. If we don't adopt this mind-set, we will face an uncertain future. Solutions that fundamentally respect the environment are vital in retaining and restoring the mauri of the water which makes them a vital not optional ingredient of the final mix of solutions.

⁶ 'The Path to Business Resilience' by Karalee Close, Michael Grebe, Phillip Andersen, Varun Khurana, Marc Roman Franke, and Roelant Kalthof (6 July

2020) <https://www.bcg.com/en-au/publications/2020/digital-path-to-business-resilience>

⁷ Martin R, Sunley p: "On the Notion of Regional Economic Resilience: Conceptualisation and Explanation" pp6

Finally, this Strategy is a water resilience strategy, not a climate change resilience strategy. It has a more specific focus than the broader adaption focus of, say, the Ministry for the Environment. It does not focus on reforestation for carbon sequestration or coastal impacts of rising sea levels. It does not look at climate change prevention through reduced carbon release (although it is mindful of this in recommending solutions). Nor is it a broader community or economic resilience strategy. The focus is directly onto freshwater resilience, but we will need to be mindful of these other connections.

A water resilience strategy is urgent in Wairarapa because the area is very susceptible. The characterisation of Wairarapa and the NIWA research contained in the appendices illustrates this point. With an early response to climate change more options will be open, leading to better outcomes, than a late one. This Strategy is a call to action now, not when it is a choice between poor options, which may be the case in 10-20 years when the better options may have been closed out.

Three key pieces of work together provided a background and direction to the development of this strategy, namely: Climate change and variability - Wellington Region by NIWA, August 2017; Ruamāhanga Whaitua Implementation programme, August 2018; Wairarapa Economic Development Strategy and Action Plan, October 2018. In addition, many other documents and stakeholder discussions were used. The Strategy has

relied on existing investigations and data; it did not involve any new work. In short, it is a Strategy, not a Study.

The go forward

The Strategy is the product of multiple contributions. The WWRS Group has involved a large number of people from iwi, councils, rural sector and interest groups, industrial enterprises, advocacy interests such as the environment, former participants in the Whaitua work and others. ([Appendix 6: The Wairarapa Water Resilience Strategy Group](#)) This Strategy sets a foundation for future action.

The widely disparate resilience group agreed on the importance of establishing a resilience strategy and the direction set by this Strategy. The Strategy points a general approach and identifies a governance structure to go forward. There is much research and policy development work to be done, but the document has created a framework within which it can take place.

The WWRS Group noted that the obvious agency to provide leadership is the Greater Wellington Regional Council, but it was also acknowledged that they could not carry out that role without the full support and active involvement of all the other agencies and interests. This has to be a whole-of-community effort, partly because the impacts of climate change affect the whole community, but also because if ever there was a need to be joined up, this is it.

Section I: The water resilience challenge

Chapter 1: Understanding water resilience

As an idea, water resilience is deceptively simple. As a set of policies and actions, it is very complex. Getting from the idea to action is the challenge for this Strategy and eventually for the community to implement.

What is the problem we are trying to solve?

There are five main factors at the heart of the resilience challenge and they illustrate its complexity:

1. Water deficit

By mid-century it will take an estimated 15% more water to maintain current supplies and an estimated 30% by 2090 as a result of reduced rainfall and evaporation loss⁸ assuming we continue with our present day activities.

2. Restrictions to low flows

Low flows to protect the environment will reduce available water for other uses. The Whaitua Committee recommended minimum flow requirements for the upper Ruamāhanga and Waipoua Rivers be raised (and a small increase for the Kopuaranga). Further

constraints on groundwater takes that are linked to surface water are also recommended. These changes, if they are successfully implemented via a plan change, will significantly reduce water volume and reliability for a number of water users. It is quite possible that they will be refined by the time they have gone through the full planning and cost/benefit analysis, but they will have a significant impact nonetheless.

3. Accommodating growth

Climate change is likely to boost population and economic growth over the coming years. More people will consume more water. Population increases of 1% a year, a conservative estimate, quickly cumulate, as does water usage. The Wellington Regional Growth Framework anticipates significant population growth.⁹

4. The mauri of water

There is a cultural shock (for Māori and Pākehā alike) involved in climate change that means that life and values will be changed, and in some cases non-recoverable. The more climate change progresses, the more acute this will be. The iwi view is that the first priority of water management should not be

⁸ Effects of Climate Change and Water Resource Limits on Valley Floor Water Resources – Aqualinc/Andrew Dark 22/05/2018, pages 2 and 47

⁹ Draft Wellington Regional Growth Framework 2021 pp29. Also refer Addendum 9 pp176 of this document.

the use of water, but the health of the waterway itself. The volume and flow should be sufficient to sustain the biodiversity and health qualities of the waterway. This is a further step beyond the low flow protections of the Whaitua Implementation Programme (WIP) and what this might mean in terms of the requirement for water is not known.

5. Infrastructure challenges

Local councils already face hefty bills for the upgrade of ageing water infrastructure meaning that only limited funds may be available for investing in other resilience priorities. There will be an affordability problem.¹⁰

The combined effect of these factors can only be speculated on and will need to be regularly tracked over the coming years, but it could mean that talking in rough order of magnitude, by 2040/50 Wairarapa could have as much as 40-50% less available water in the water deficit period. The concern here is not solely the amount of water for use but the protection and integrity of waterways and water, whilst enabling use. There is not a free hand here to manipulate the water and the water system at will.

This, of course, is in a “do nothing” scenario, and there will be adaption, but the scale of these impacts is

consequential, and act like a pincer, because they will have their impact at a key focal point - the January to March peak water deficit period, which is also the peak growing, visiting and events period in the Wairarapa calendar.

By 2040, in the peak water deficit season, the current one-year-in-ten drought will likely become the average summer and the revised one-year-in-ten drought event will be much more severe. A scenario of two one-in-ten-year droughts in succession is not far-fetched and could produce tipping points. It is these extreme periods that are the greatest early threat. In the worst case, trees might die. Whole forested areas like the Tararua ranges, which are already being damaged by animal and plant pests, might suffer unrecoverable damage, perhaps even those we may have planted to enhance resilience. Streams might dry with consequent loss of biodiversity. Once we are into this type of tipping point scenario, we begin to lose control of the outcomes. This is to be avoided if at all possible.

Creating a resilience framework

We need a simple framework to think about resilience and to apply to our situation. From the literature we have brought together the adjacent diagram. In this Strategy we work our way through the stages with a problem definition, context, adaption options, prioritisation, optimisation and implementation (including governance), followed by success measures (KPIs) and monitoring.

¹⁰ Refer Addendum 8 pp 166 of this document

The framework as presented appears rather linear. In fact, it can be characterised as a series of feedback loops that gradually build the capability and capacity of the system to address that portion of climate change resilience that



concerns us.

The common theme across these frameworks is that they address three main actors: agents (those who will take the action – residents, farmers, council officers), institutions (the arms of governance – decision-makers) and systems (the system of hydrological study, water management, distribution and allocation). To change attitudes and practice all three have to be addressed. This Strategy does that.

Building community resilience

Water has to be seen in a context of community resilience, which involves human and attitudinal challenges, not just infrastructure challenges. Hearts and minds are as important as built assets. "Soft infrastructure" – building adaptive capacity in people involves building equity in public attitudes, governance and

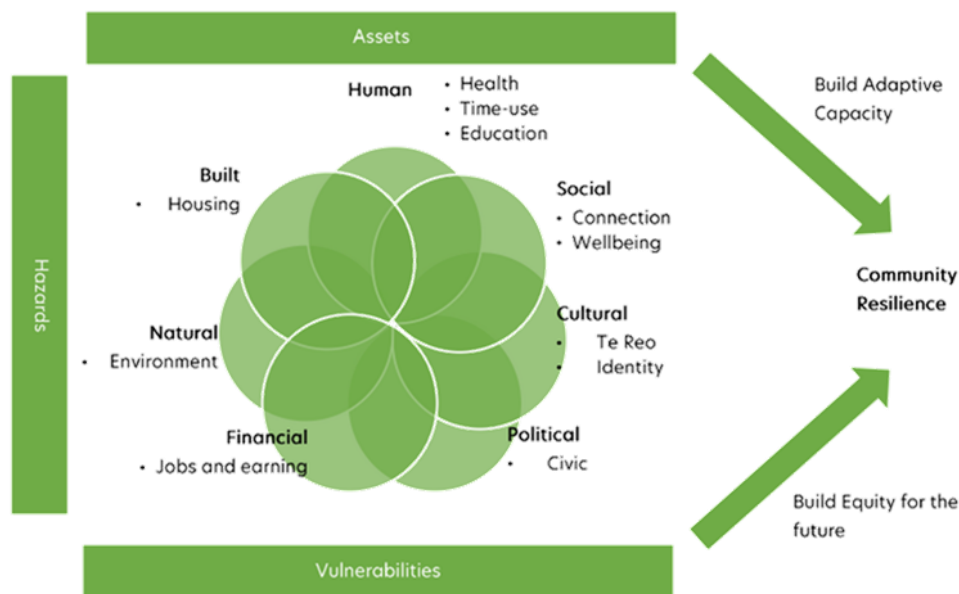
management structures. Water resilience can only be seen in the context of overall community resilience.

The diagram over the page illustrates the web of complex considerations that are required. It draws on the Treasury Living Standards Framework, but is somewhat simplified for the application to water. It emphasises building adaptive capacity to shocks and equity for future prosperity and wellbeing. All these "capitals" – human, social, cultural, political, financial, natural and built – are relevant to water, though not all to the same extent. Water resilience is one part of the broader community resilience equation.

We know that water demand, left to its own devices, will continue to increase, in fact, accelerate, especially in the absence of a community resilience mind-set. Water users, whether they be rural or urban, have an expectation of enough good quality water when they need it. Similarly, there is a built-in reluctance to invest in any mitigation unless the need is clearly established. In short, resilience consciousness is probably low. Yet, attitudes have been changing. The Ruamāhanga Whaitua process has challenged a solely functional resource-use approach to water. Iwi have forcefully restated their commitment to the integrity of the water itself as evidenced in the opening statement to this Strategy document. There has also been a trend towards placing a much higher value on mana whenua meanings and significance as we move into a different era in our relationship with the natural world.

It now has to impact on our behaviour. For example, Wairarapa residents are big water consumers compared to New Zealand's urban areas.¹¹ There are high levels of wastage through single use (use and discard) practices, excessive use and leakage. International best practice aims

for below 15% loss of water¹². The norm is about 18 to 23%. Losses of urban water in Wairarapa are much higher. So there is a long way to go. This is discussed in the chapter on urban water usage.



Water policy

A resilience mind-set has been promoted through regulation. The idea of protecting the environment was first captured in Section 2 of the RMA. The environment was defined as including:

- "(a) ecosystems and their constituent parts, including people and communities; and
- (b) all natural and physical resources; and
- (c) amenity values; and

(d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) or which are affected by those matters"¹³.

In other words, it was far-reaching in its definition.

The protection of water found its expression with the National Policy Statement on Freshwater (NPS-FM), introduced in 2011 (and which was

¹¹ Wairarapa Township Water Supply Demand Forecasting by Tonkin & Taylor Ltd for GWRC, December 2017

¹² Radio New Zealand link

[https://www.rnz.co.nz/news/ldr/420937/greytown-losing-](https://www.rnz.co.nz/news/ldr/420937/greytown-losing-39-percent-of-water-through-infrastructure-leaks-wellington-water)

[39-percent-of-water-through-infrastructure-leaks-wellington-water](https://www.rnz.co.nz/news/ldr/420937/greytown-losing-39-percent-of-water-through-infrastructure-leaks-wellington-water)

¹³ Resource Management Act 1991, Part 1 – Interpretation and application, Clause 2 (1)

updated in 2014, 2017, and again in 2020)¹⁴. The Ruamāhanga Whaitua Implementation Programme (WIP) commenced in 2012 and concluded in 2018 as a response to the NPS-FM¹⁵. As required by the RMA the regulatory aspects of the WIP are implemented through a regional plan.

To be effective, consciousness in policy and law need to become behaviour practices in our daily lives. The WIP has drawn a line for water's use and integrity, ensuring enough water is available for protection of the environment. Hence its work on minimum flows and groundwater levels can be seen as resilience measures. It has also established bottom lines regarding water quality with its recommendations around water contaminants and land use. The Whaitua is supported by the package of freshwater regulations currently emerging from Central Government under the title of "Essential Freshwater"¹⁶.

The requirements in the WIP are therefore non-negotiable bottom lines for this Water Resilience Strategy. There is no need to revisit these matters because the work has been done. The post WIP challenge has been to implement its findings and if creating the WIP was tough, implementing it is proving a lot tougher and progress has been very slow. If the Whaitua process was stage one of water management in

Wairarapa, this Strategy is initiating thinking and planning around a second implementation-focused stage.

Essential versus discretionary

In the minds of many users almost all water uses (especially their own) are essential, so fundamental is water to contemporary life. If pressed there would be recognition that there are some uses such as drinking and hygiene which are absolutely fundamental, whereas recreational uses might be seen as somewhat more discretionary. However, what was once discretionary is now seen as essential. For example, wellbeing values have risen in significance. The provision of water to sustain the natural environment has become fundamental as formalised in the WIP. Agricultural uses to boost productivity and output, not just protect against drought, are being seen as essential to regional and household prosperity, particularly in the age of COVID-19 where agriculture has been classed as an "essential industry" by Government.

Managing finite water resources

The total amount of freshwater from the hills and rainfall is often quoted as an illustration of the almost infinite supply of the resource, but this is misleading. Available water is the net amount available after all contingencies are

¹⁴ <https://www.mfe.govt.nz/fresh-water/freshwater-acts-and-regulations/national-policy-statement-freshwater-management/history> and <https://www.mfe.govt.nz/fresh-water/national-policy-statement/about-nps>

¹⁵ [https://www.gw.govt.nz/assets/Whaitua-Te-Whanganui-a-Tara/REPORT-Whaitua-Te-Whanganui-a-Tara-River-and-stream-water-](https://www.gw.govt.nz/assets/Whaitua-Te-Whanganui-a-Tara/REPORT-Whaitua-Te-Whanganui-a-Tara-River-and-stream-water-quality-and-ecology.pdf)

[quality-and-ecology.pdf](https://www.gw.govt.nz/assets/Whaitua-Te-Whanganui-a-Tara/REPORT-Whaitua-Te-Whanganui-a-Tara-River-and-stream-water-quality-and-ecology.pdf) and <http://www.gw.govt.nz/assets/Ruamāhanga-Whaitua/Final-Ruamāhanga-WIP-August-2018-Pdf-version.pdf>

¹⁶ <https://www.mfe.govt.nz/essential-freshwater-new-rules-and-regulations>

considered such as environmental requirements, landscape and environmental impacts, community and cultural values and cost. Water is certainly not infinite in the water deficit period of summer.

The international literature has extensive discussion on water scarcity.¹⁷ Lorenzo et al refer to the “hydraulic mission” of the 20th century as unable to deal with the fast-changing socio-hydrological conditions we are now experiencing which are a mixture of reducing natural water availability and issues such as the political ecology of water and water justice which highlight the relationship between access, restriction, possession and dispossession of water resources.

Scarcity brings competition. Water resilience is no longer simply about boosting supply. It is about access, priority and multiple uses. There are indications that these “externalities” to hydrological solutions are having, and will have, a progressively greater effect on water availability.

Thinking whole-of-catchment

Whole-of-catchment thinking is returning as a central idea in water management and is fundamental to this Strategy. Not only is the catchment a natural entity, an ecosystem, with its own natural processes, but it is an integrating idea. As we consider blending natural and built responses to climate change and enlist the support of surrounding communities, then

the catchment is the ideal unit of management. Whole-of-catchment also expresses Te mana o te wai and integrates Maori ideas of mauri and kaitiakitanga. Part of understanding a catchment is understanding its hydrological cycle.

Statutory versus non-statutory

This Strategy does not recommend specific statutory interventions though it acknowledges that regulation is likely to be part of the mix such as with water allocation. Regulation has the advantage of minimising the free-loader problem and regulation can be an effective method of public education and behaviour change. It is also necessary to protect the inherent nature of water. It also has the potential disadvantage of shifting responsibility for resilience from the water user to the regulator. Effectiveness demands that all stakeholders own the problem and seek solutions each in their own domain coordinated through over-arching leadership and governance. It is anticipated that the mix of actions required will emerge as work within the Strategy progresses.

¹⁷ “Global Agricultural Economic Water Scarcity” Lorenzo Rosa et al, Science Advances 29 April 2020.

Chapter 2: Climate change effects in Wairarapa

Wairarapa is projected to experience some of the more extreme effects from climate change in New Zealand in respect of water – at times severe and highly variable. In Appendix I there is a detailed assessment of the effects drawn from a range of data, especially that supplied by NIWA. Those effects include:

- Higher temperatures
- Decreasing rainfall
- Increased number of consecutive dry days
- Greater evapotranspiration
- Decreasing mean river flows

Much is still speculative, which makes planning difficult. Apparent contradictions abound such as record cold temperatures as a result of polar vortices.

Contradictions will be evident in Wairarapa too and the effects may be quite variable, benefitting some and disadvantaging others, varying from year to year.

The contradictions of climate change

We know that the already hot summer will get hotter and drier. High temperatures will drive people into air conditioning as a necessity, dry out crops and grasslands and cause distress for stock. What is now “nice and warm” will become “unbearable” with consistent plus 30C and even plus 40C days. Unwelcome ‘visitors’ will appear such as more animal and crop diseases and changes of land use (towards de-intensification) are likely. An increased fire risk is inevitable. Some crops like grapes

and olives may thrive in hot dry conditions. Higher water temperatures may seem a boon for swimming but they may produce cyanobacteria making waterways unswimmable.

The shoulder seasons will be warm and dry, potentially punctuated with storm conditions and rain, but likely providing pleasant living. Rain events may be more common but of lesser quantity. Heavy rain will be more common in the upper catchment. Lifestyle residents and visitors could be attracted to this Mediterranean-style climate and bring with them greater demand for water (and land).

The impacts on rural people and enterprises will tend to be more adverse. The balance of the economy will continue to move towards urban rather than rural activity, which will significantly change the character of Wairarapa

(Addendum 10: Characterising the future of Wairarapa). Competition for water supplies between rural and urban uses could intensify, and the rural community is likely to lose out due to its small proportion of the voting population.

Anticipated changes could also include:

- Crops that require water during the hot dry period such as most types of vegetables and horticultural products will not prosper unless they receive significant added water or their growing period is successfully shifted (which may not be possible for market and other reasons) or they are grown indoors (under glass).
- Stock will need to be supplied with stored/imported food as grass growth will be zero in the water deficit period. Stock water supplies may have to be extended or stock removed during the summer dry.
- Many types of vegetation including indigenous biodiversity could suffer with prolonged drought periods because they are not naturally adapted to it, resulting in loss of natural resilience.
- Winters will be warmer and drier opening up the opportunity for crops requiring longer growing seasons and low risk of frost. This could include orchard crops which already have a small foothold in Wairarapa. In fact, an increase in acreage of fruit trees is highly conceivable with lower frost risk.
- While growing conditions may improve in the valley (although water will be a critical factor), conditions in the eastern hills will be exceptionally dry which might incentivise alternative land uses including forestry.
- A stronger move to exotic and indigenous forestry for carbon sequestration in the eastern hills is likely unless nature-based solutions including regenerative farming are implemented. We could see diminishing rural communities in the hills and more concentrated settlement them onto the valley floor.

- Drier conditions and sharp rainstorms are likely to trigger greater erosion in the eastern hills in particular. Unless controlled, this will take the form of sediment in the streams (similar to Hawke's Bay) flowing into the Ruamāhanga exacerbating water quality issues.
- The "shock" that COVID-19 represents has hit unevenly and there is concern amongst policy makers and community leaders that this will exacerbate inequalities. Climate change, as a "slow reveal" shock is likely to have a similar effect except more prolonged and progressive.

What does water resilience mean in these various scenarios? Is it rebounding back to the status quo and holding on to what the region has, or is it bouncing forward into a very different scenario - a new status quo?

To answer this dilemma, we have to remind ourselves that climate change is progressive. Even if we reach the targets set out in the Paris Accord, which seems increasingly unlikely, how long will the lag factor be of continued warming even after emissions are controlled. Hanging on as long as possible, especially if the Paris commitments are not attained, does not seem productive. We know that for all this uncertainty and variability, we are going to have a lot less available water, especially in the water deficit period. We are going to have to spend time and cost on mitigation and, without doubt, we are going to have to **do more with less**.

A resilience strategy will, therefore, need to act on the demand and supply side of the ledger simultaneously and is going to

have to achieve several things at the same time including:

- **Greater efficiency** - minimising wasteful use; doing more with less.
- **Water capture** - storing and slowing the progress of water through the catchment to transfer availability from times of plenty to times of scarcity.
- **Minimise evaporation** - through protection and shading of water and groundwater storage.
- **Protect natural resilience assets** - so that they can continue to work for us and maintain the mauri of the water.
- **Adapt land use** - changing seasonality; introducing new land use.
- **Plan for population growth** - increase urban water storage and capacity.

Most importantly, all options have to be open and more options have to be available than is currently the case. We need existing solutions, and we need new solutions. We need to keep all the possible tools in our toolbox available to respond to circumstances as they arise, within the context of a broad strategic direction.

Chapter 3: Water use in the catchment

Water use patterns in Wairarapa are a product of history as land and water use has evolved, often in a haphazard manner.

For example:






- Consented water and actual use are very different.
- Currently, actual use is generally well below consent levels suggesting that there is an element of free-board in terms of available water.
- The catchment is significantly over-allocated, though exactly by how much is not known.
- Over-allocation is not a problem in a stable water situation because it allows for flexibility of use within an

envelope. It becomes a significant when climate change drives rising demand and falling supply.

The following tables show the proportion of water consented for various uses within the Ruamāhanga Whaitua. Note, this is not water actually used, but just the volume that has been consented for use.






The first table illustrates the amount of surface water used and the second table the amount of groundwater used. Seventy percent of the water consented is sourced from surface water.

Allocation of surface water in Wairarapa.¹⁸

Activity	Percentage of total consented	Total volume	Number of consents
 Irrigation	26.78%	50,880,461 m ³	133
 Industrial	0.1%	199,766 m ³	4
 Stock	37.84%	71,902,080 m ³	15
 Town Supply	18.39%	34,950,936 m ³	7
 Other	16.89%	32,104,271 m ³	15
Total	100%	190,027,514 m³	174

¹⁸ Source: LAWA web site lawa.org.nz

Allocation of groundwater in Wairarapa¹⁹

Activity	Percentage of total consented	Total volume	Number of consents
 Irrigation	89.44%	67,946,089 m ³	310
 Industrial	0.65%	495,945 m ³	7
 Stock	0.54%	406,059 m ³	2
 Town Supply	5.39%	4,092,469 m ³	9
 Other	3.98%	3,026,762 m ³	8
Total	100%	75,972,324 m³	336

When the two tables are considered together, the following highlights emerge:

- Agricultural purposes are by far the most dominant.
- 'Irrigation' is the largest single water use, being sourced from ground and surface water.
- 'Town supply' is predominantly sourced from surface water reflecting the scale of the Masterton take compared with the other smaller towns which largely draw from groundwater.
- 'Stock' is the largest user of surface water but is predominantly used for stock water races. Overall, 27% of all the consented water is allocated to stock water races.
- 'Town supply' comprises only 15% of the total allocated volume.

- "Industrial" use appears low and it is, but this is exaggerated by several of the large plants sourcing their water from town supplies.

The 'Other' category, which appears quite large combined includes frost protection, recreation and sports fields, such as golf courses, and Masterton's two lakes and other non-reticulated uses.

Despite the high volume allocated to agriculture, large areas of agricultural land are not irrigated and will still not be irrigated even if the Wakamoekau storage proposal goes ahead. Significant areas of the region and all those on the eastern coast and hills will continue to practice dryland farming.

➤ ¹⁹ Source: LAWA web site lawa.org.nz

Current amounts of water used

As discussed above, there is a significant disparity between consented use and actual use. Most years, many water users – rural and urban – will not use their full allocation. It has been assumed that there are significant differences between the maximum consented allocation and actual use across seasons and consented activities. More robust indications²⁰ of the scale of these differences have not been evident until sufficient data from relatively recent metering has become available.²¹

Seasonal and annual variation in water demand is driven by many factors, both at the local scale – soil conditions, water use type – and the regional scale – climate. To capture this natural variability and the difference between allocation and actual use, data was used from 2013-2018²².

Water use by activity

Excluding public water supply and water race usage:

- Daily water use consistently peaked at 50% to 60% of maximum allowance

across all years i.e. around 50% in average summers and about 60% for dry summers.

- In four out of the five years, no significant abstraction occurred before December.
- Across all years, abstraction was largely concluded by mid-March or early April.

Obviously, the differences between the consented and actual water use are significant and the bulk of this usage is confined to just three months (January and March inclusive).

When public water supply and water race consents are included, the peak daily use in summer is about 20% higher than when these takes are not considered.

The graph below depicts this difference between the two 'sets' of water take uses. Of course, public water supply and water race uses occur all year, but at approximately half their summer volumes over the winter months (April to November). This obviously varies from year to year.

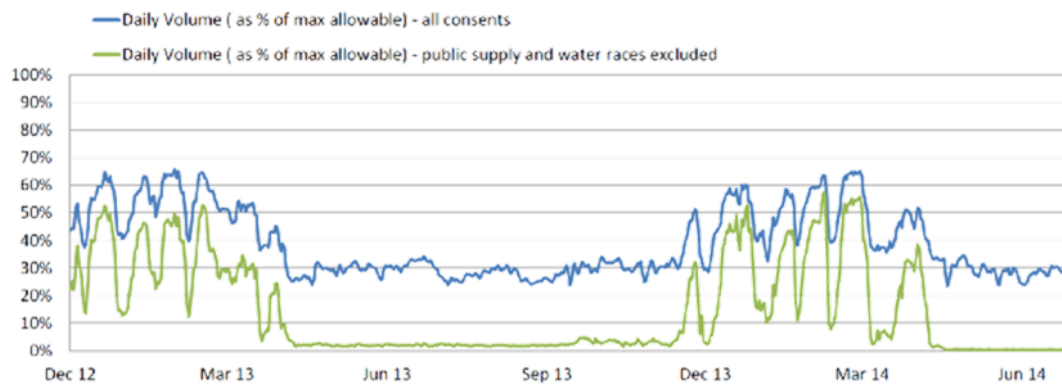
²⁰ Pers comm Mike Thompson, Senior Hydrologist, GWRC

²¹ Estimating this difference is based on 68 (13%) of 520 ground and surface water take consents representing about 25% of the allocated total daily volume, including public water supply and water race consents but over a more limited period. They are geographically spread throughout the Ruamāhanga Valley. Nonetheless it's a relatively small sample, taken over a relatively short period.

²² In terms of water deficit, the five years examined can be broadly described as follows:

- 2013/14 was a normal year;
- 2014/15 and 2015/16 were dry summers, resulting in substantial irrigation season deficits;
- 2016/17 was a much wetter summer than normal;
- 2017/18 was variable, but overall wetter than average.

Broadly speaking, water users responded to a relatively 'normal' range of climate conditions over the past five years.



This suggests there is a degree of elasticity in demand or in water scarcity terms: there is a level of 'flex' suggesting we are not yet hard up against supply limits. There are many factors at work here including regulation. How much flex is available in real terms is difficult to know but doesn't matter for our analysis.

Water use by source and type

Excluding public water supply and water race consents, in dry years, water use is, of course, higher so actual daily use of water is higher as a proportion of the consented allocation. In addition, the irrigation season is longer, that is, generally it starts earlier and finishes later.

Over the 'dry' 2015/16 summer for instance, Martinborough received just 30% of its normal rainfall. In terms of actual daily water use as a proportion of maximum consented allocation, the following occurred:

- Category A groundwater peak use was consistently higher (60 to 70%) than other categories of ground and surface water take (50 to 60%) during times of unrestricted take (above minimum flows).

- Category C groundwater use peaked in early February (around 60%) through until the end of March.
- Surface water and Category A takes reduced significantly during the same period, presumably as restrictions took effect.

This data suggests that in a sudden change in climate, the sort of change that we can expect in the next 20 years, demand soars and severe supply pressures come into play. Make a scenario like this a regular annual occurrence and you have the basis of a cumulative and severe water deficit.

Water use by activity in a dry year

Excluding public water supply and water race consents, in dry years, when comparing dairy, vineyard and other irrigation, plus non-irrigation water use activities, the following resulted:

- Peak use for non-dairy pasture irrigation tended to be higher (up to 80% of maximum allowable) than for dairy pasture irrigation (peaked at about 65%).
- Water use for both forms of pasture irrigation occurred over a seven-

month period (from early November until mid-May) especially in the peak summer months (December, January, February).

- Vineyard irrigators' usage peaked at around 40% of the maximum consented allocation.
- Other (non-irrigation) use increased a little during summer but was always well below maximum consented available.

This data tells us that targeting particular land uses to save water is unlikely to do so in any quantities and that the irrigation demand period would likely be extended at times of scarcity, driving further scarcity.

Phasing of peak water use

Another important aspect to consider is the extent to which irrigators using 80% or more of their maximum consented allocation, use water at the same time, that is, on the same days. About three quarters of sampled consents exceeded 80% of their daily water allocation at some time in the in the 'dry' summer of 2015/16 - the ones that didn't being mainly vineyard irrigation and 'other'.

During that year, the coincidence of irrigators using 80% or more of their allowable water take on the same day peaked at about 25%, meaning a considerable proportion of 'high volume' irrigators are not using their water on any one day. This means that pressure on the resource is less than one might think if the majority of users were taking water at the same time, again indicating that there is some flex in the system.

Implications

This flex is a cushion of unused water in a normal year in current conditions. That appears to rapidly diminish in dry years which will be the norm by 2040. We have a short term opportunity and a longer term threat.

This analysis does not provide us with a definitive water balance, only an indication. It's important to recognise that the above are 'averaged' figures for the entire Ruamāhanga valley floor. In reality, different parts of the valley will experience different water needs depending on proximity to the Tararuas, the water demands of the crop(s), soil type, constructed storage capacity, their access to water (as with water use restrictions) and the state of their respective water sources at the start of the summer period.

This data is scheduled to be updated in 2021 as background for the Ruamāhanga Plan Change; the possibility always exists therefore that the nature and scale of the mismatch between actual and consented water takes could change. The updated information will be used to inform the allocation and actual use picture.

If there is a significant mismatch between consented allocation and actual use it would significantly reduce allocative efficiency. This has potential implications for efficient and sustainable management of groundwater and surface water resource, namely:

- Where fixed volumes of groundwater or surface water are available, allocation to individual users in excess of their 'reasonable' needs can

prevent additional users accessing that water.

- The potential environmental effects of groundwater abstraction (such as potential stream depletion effects) may be significantly over-estimated when based on consented volumes.
- As water resources approach or reach full allocation, incentives may increase for existing users to transfer the unused portion of their allocation in accordance with s136 of the RMA.

These variations also make it difficult to construct a water balance for the region as the water is technically in a water take consent 'lock-up', even though it may not be used. This is a task that is well beyond the scope of this Strategy document but needs to be undertaken early in the roll out of the Strategy to strengthen the evidential base to policy. A water balance will help with the detailing of policy but is unlikely to challenge the fundamentals of what we already know. The particular focus of this work needs to be on summer availability because that is the critical season.

Section II – The value of water

Chapter 3: The meaning of water

We associate water with many positive connotations such as growth, fertility, freshness, scenery, relaxation, exercise and economic productivity. Moisture implies fertility, dryness is associated with barrenness. People in Wairarapa are never more aware of this than when struck by drought. Drought-stress is stress for people, for livestock as well as the environment, and in the case of fire, complete destruction. This is an issue for everyone because it diminishes their enjoyment of the environment and of life itself. Swimmability of rivers, recreational enjoyment of lakes and ponds have become cultural markers of enjoyment of water.

Te Mana o te Wai

To ensure that a Māori view of water was enshrined into our thinking and planning, Government developed a policy position called Te Mana o te Wai in 2014. In 2020 Government announced a set of changes to the NPS for Freshwater Management. In it, clarifications were made about what Te Mana o te Wai and how the concept applies to freshwater management. The policy of national significance requires that regional councils and their communities, including tangata whenua, should work together to understand what values are held for freshwater in their area or rohe. All decisions about freshwater management should be made putting the health and wellbeing of the water at the front of their discussions.

The Statement of national significance in the Freshwater NPS describes the concept of Te Mana o te Wai as the integrated and holistic wellbeing of the water. It is up to communities and councils to consider and recognise Te Mana o te Wai in their regions.

Te Mana o te Wai imposes a hierarchy of obligations. This hierarchy means prioritising the health and wellbeing of water first. The second priority is the health needs of people (such as drinking water) and the third is the ability of people and communities to provide for their social, economic and cultural wellbeing. The hierarchy does not mean, however, that in every case the water needs to be restored to a pristine or pre-human contact state before the other needs in the hierarchy can be addressed, nor that fundamental needs for water will be ignored to protect the environment. Picking a pathway through these priorities is what “springing forward” to a new reality means.

The six principles of Te Mana o te Wai in the NPS-FM 2020 inform its implementation and include:

1. **Mana whakahaere:** the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and wellbeing of, and their relationship with, freshwater.

2. **Kaitiakitanga:** the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations.
3. **Manaakitanga:** the process by which tangata whenua show respect, generosity, and care for freshwater and for others.
4. **Governance:** the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and wellbeing of freshwater now and into the future.
5. **Stewardship:** the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations.
6. **Care and respect:** the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

Ki uta ki tai

The Natural Resource Plan delivers “Ki uta ki tai”. This can be translated as “mountains to sea” and refers to the holistic management of natural and physical resources. It recognises the interconnected nature of these resources and is the cornerstone of integrated catchment management. It also highlights important Māori values in the protection of land and water. It recognises the connections between:

- Surface water and ground water
- Land use and water quality
- Water quantity and water quality
- Fresh water and coastal water
- People and communities

This leads to the idea of integrated catchment management and adaptive

management which are important concepts in water resilience. It brings into play iwi preferences that catchments are not broken and that public entity boundaries (and our solutions) take this into account.

Iwi want more collaborative opportunities to design a holistic system. Thoughts around this involve iwi, hapū and Māori bringing mātauranga Māori and mātauranga ā iwi into the design and practices to better care for the water and the environment. Incorporating mātauranga into the design allows for the voices of whanau, hapū, iwi and marae to be present throughout the process.

Iwi want to see protections against privatisation of water services and hope to see roles for iwi and hapū being woven into these protections. As reflected above, there were calls from iwi and hapū who want to be involved in the water quality monitoring system to weave cultural indicators and whakapapa of a water body into the process of testing the sources of water. This will require significant working through as it is unlikely that the challenges of climate change will be able to be met through public investment alone.

Cultural impact

Two cultural impact reports have been prepared in recent years by each of the iwi – Rangitane and Ngāti Kahungunu. They both detail cultural sites and cultural practices which are reflected in the above text. These provide frameworks for us to apply cultural considerations to a broader

resilience framework. It is anticipated that once the work of this Strategy is put in place then these cultural frameworks will guide it. There is a strong emphasis in these frameworks on training and engagement to build understanding. They also provide practical schedules and worksheets for use in water management activities.^{23 24}

The value of water to tangata whenua

We sought statements from people in Wairarapa to capture the value of water in their lives. The following is a statement provided by Rawene Smith of Ngāti Kahungunu:

"The river's place in our lives as tangata whenua defines who we are. When Māori ask, Ko wai? Or, who are you? It can literally be translated as, the water? What is the water that is you? The descriptor of our lives as tangata whenua is defined through pepeha that refers to an awa tapu or a sacred river. While tohi or baptismal rites occurred in rivers and this is sacred, rivers are sacred because moments of connecting occurred comprehensively throughout the life of tangata whenua. One marae in Wairarapa would spend four months as a community in tents on the banks of the river.

The water for the essentials of life, drinking water, washing water and recreational water shows the importance but this does only partly define the river's influence. The endearing part of the river is because life's most beloved memories are here. It is cousins swimming every summer day. It is poupou or grandfather teaching mokopuna or grandchildren to swim, to eel, break in horses, read river flows, listen to what rivers are saying, know the dangers of the rivers, to respect our awa tapu and all of these end up defining tangata whenua. There are so many other events that means we know the smell of our river; we know the taste of the river; we know the sound of the river; we know the feel of the river; we know the sight of the river; yet the sense of the river is more than this, it is the love for our place. It is home. Wherever else we might travel to, when we remember home, we include our awa tapu because it is who I am."

This statement was provided by Jo Hayes (GM) and Sonia Rimene (Chair) of Rangitāne-o-Tub Mai Ra Trust Wairarapa and Tamaki Nui ā Rua PSGE:

Mauri is the life force or essence of all living things. From the people to the land (whenua) the water (he

²³ Smith, R Te Kahu cultural Health monitoring Plan for the Ruamāhanga Catchment, 2019

²⁴ Potangaroa, J Rangitāne o Wairarapa cultural Health Monitoring Report 2019

wai) and the air (te ha) we breathe. if the mauri of one of those things is depleted, or disturbed then it will impact on the others because they are all connected.

As Rangitāne we support the importance of sustaining and enhancing the mauri of all living things of which water, fresh or coastal figure prominently. In order to sustain the mauri of the water human actions, on our natural resources and processes requires strict management and planning because history has shown us what happens when mauri is neglected.

The relationship between Rangitāne and its resources is one of paramount significance to the very being of Rangitāne as people. It has sustained our people since time immemorial and is resultant of who we are. 'Tina te pū, Tina te aka, Tina te more i Hawaiiki' which means 'fixed are the people, like the roots of a tree, fixed at the parental source of Hawaiiki' is a part of an ancient karakia from the Kurahaupō waka. The karakia goes on to say, 'kia kotahi ki te kahui Ariki, kia kotahi ki te kahui Tauria, kia kotahi ki a koe e Io e,' meaning, 'to be one with the universe, to be one with our surroundings, to be one with you, our creator.'

To that end, our resources/environment are taonga that have equal importance to us as

people and there is no hierarchy between the two as it is a constant balancing act to ensure the survivorship and preservation of both, creating a relationship underpinned by reciprocity, bearing on or binding Rangitāne and the environment equally.

Despite the current law that includes some of our concepts to manage and protect the natural environment we still do not see our values and tikanga given the necessary weight or consideration and this must change and we must be part of ensuring the change happens.

The value of water to the rural community

A statement was provided by a farmer group:

"There is rarely any reticence when members of the rural community meet for whatever reason. Invariably the first and immediate item of discussion is the weather. Not just the weather, but the rain – has it rained (and how much), is it raining (for how long) and is it going to rain (when)?

Rural communities depend on water in a manner which could be hard to appreciate in town. We depend on it for drinking, recreation, as part of a beautiful place to live, for stock water and helping our crops and pasture to grow, to earn a living and for mental wellbeing. With reliable water rural life is made possible.

More than that, rural inhabitants are keenly aware of the importance of ensuring the reliable availability of water. We connect to the source (bore or pipe), install the pumps and tanks and delivery systems and develop the farming systems to create an income for their families. And we worry and fix and/or adapt when supplies are under threat, pumps and delivery break down threatening family and economic health.

We turn the tap off on time in case the tank runs dry, monitor soil moisture and pumping rates to make the most of irrigation water, enjoy swimming in clean water, watch with pleasure when good crops and stock grow and most of all take pleasure in the development of our most important crop - our families.

In rural communities water raises spirits and dampens spirits. It is essential to life. There is therefore a human resilience in the rural community in regard to water but hand in hand with the creation of this resilience is stress. For human resilience to be bearable resilient systems need also to be in place. That is our challenge.”²⁵

An urban perspective was not sought. This chapter illustrates just how important the “human” and cultural dimensions are to water resilience and these need to be part of the cluster of solutions that make a holistic whole.

²⁵ Group of farmers led by Leo Vollebregt, 2020

Section III – Building resilience

Chapter 4: Green and grey solutions

Water resilience challenges are being faced in other parts of the world that are hit a lot harder than Wairarapa and often with fewer resources to combat them. Building natural as well as artificial defences against climate change is widely supported by the Wairarapa Water Resilience Group and aligns strongly with mana whenua values. Nature-based solutions are not just a vital ingredient in building natural resilience, they are essential.

Nature-based solutions are favoured not only because they are natural, but because they work. International practice indicates that while artificial solutions have an important role to play, they can have significant limitations such as cost, narrow geographical reach and adverse environmental impacts.

Nature-based solutions are deemed an essential part of achieving sustainability goals such as the 2030 Agenda for Sustainable Development by the United Nations (UN). The comprehensive UN Report on Nature-based Solutions for Water²⁶ suggests that the investment in nature-based solutions is currently less than 1% of total investment in water

resources management infrastructure worldwide²⁷, but this is rapidly changing,

The UN report talks about two types of infrastructure – green (natural) and grey (built). It makes the point that there are real opportunities for optimisation when grey and green infrastructure operate together. The UN report says: “There are a few examples where either nature-based solutions or grey infrastructure is the only option to improve water availability, but usually both should be considered, designed and operated in harmony.”

²⁸Green versus grey is not a narrative about heroes and villains, but about building resilience with the best techniques and resources at our disposal, within a sustainability frame.

In an extensive public consultation in Canterbury in 2009, when the public was asked whether the priority for water management should be to advance environmental protection as a sole priority or advance storage infrastructure as a sole priority, they supported neither and opted decisively for the “parallel development” development of both – green and grey together.²⁹

²⁶ The United Nations world water development report 2018: nature-based solutions for water
<https://unesdoc.unesco.org/ark:/48223/pf0000261424>
²⁷ Pp3

²⁸ Pp242

²⁹ “Canterbury Water Management Strategy”, Canterbury Mayoral Forum, 2009, pp35

Ecosystems, soil and water

Nature-based solutions focus around ecosystems which are the building blocks of natural resilience. Where artificial solutions are generally associated with the storage of water in lakes and ponds, nature-based solutions involve the retention of moisture throughout the environment, in soils, wetlands and vegetation. Nature-based solutions can play a vital role in maintaining the quality of those soils and their ability to sustain biodiversity which in turn retains moisture. Retention of water in soil also helps retain nutrients in soil, providing a double benefit. Indigenous biodiversity of all kinds, but particularly vegetation, plays a significant role in moisture retention within the vegetation and by providing shading and when done at scale can create micro-climates. Water bodies shaded by vegetation, especially during summer months when water would otherwise be too warm also aid natural resilience. Nature-based solutions are about retention of moisture and minimisation of water loss.

Productivity and sustainability

The UN Report makes the point that agriculture will need to meet projected increases in food demand. The BBC in a recent (February 2021) item by Lou Del Bello entitled "Why our food needs to use less water" made the point that farmers around the world are having to address water shortages with innovation. In northeast Italy, which is the largest rice growing region of Europe, drip irrigation is being introduced to rice farms that were previously flood irrigated. In India an

innovation called "Bhungroo" involves pipes directing water underground during monsoons to porous soils 20 metres below, instead of it washing away into channels. In effect it is a low-cost variant on what we know as managed aquifer recharge using the resources of nature to assist nature.

"Tomorrow's agriculture will need to grow more with less, whether it's through high-tech solutions like drip irrigation or simple innovations such as Jain's Bhungroo. And in a water-scarce world, smarter agriculture is about more than just food – it can help build a more sustainable economy for all".

- Lou Del Bello

Water resilience is about innovation and about working with nature, not against it. The farmers of the Wairarapa, as expressed at farmer meetings, are quite clear that they too are focused on improved resource use and efficiency, in all its aspects. The piping of stock water and their focus on better productivity per animal or per hectare and per litre of water applied, not just product volume, are all illustrations of doing more with less.

This way of thinking leads us into less invasive methods of agriculture such as

minimising soil disturbance (drilling seed not ploughing), maintaining soil structure and integrity, rotating land uses to average out impacts and allow recovery. The UN report says: "Agriculture systems that rehabilitate or conserve ecosystem services can be productive and intensive, high-input systems, but with significantly reduced externalities." ³⁰

The report makes the point that nature-based solutions such as forestry, wetland development and well-managed grasslands can assist water quality objectives by reducing sediment loads, capturing and retaining pollutants and recycling nutrients. This effect is only possible if there is sufficient green infrastructure to support the natural water cycle and ecosystems.

What does this mean for Wairarapa?

The significance of this for Wairarapa is the need to consider a "working with nature" mindset which involves building back ecosystems rather than just compensating for their loss with more and more grey infrastructure. The role of grey infrastructure then becomes a type of partnership with nature-based solutions, rather than an end in itself, where each enhances the effectiveness of the other.

A larger proportion of our future resilience will come from green infrastructure as it has far more scale than grey infrastructure, and nature along with time, pays for much of the 'building' cost.

Whereas grey infrastructure is more prone to diminishing returns over time. The hard testing of nature-based solutions is at an early stage, whereas the benefits and costs of grey infrastructure can be more easily calculated. This Strategy argues that testing and experimentation with green and green/grey solutions needs to be undertaken promptly so that green nature-based solutions can begin to take their rightful place in the spectrum of solutions.

Wairarapa is especially well placed to do this. There is the burning platform - Wairarapa is going to be hard-hit by climate change. Doing nothing is not an option. While river and groundwater systems are complex, they are active and amenable to smaller scale non-invasive solutions. Geographically the region is relatively small so that effects can be observed more immediately and whole-of-catchment solutions are achievable. There is a tight knit and supportive community with a propensity for innovation and modernisation.

The question of how long it would take to establish green solutions at a whole-of-catchment level is open to conjecture with varying points of view. Progress over the last decade would indicate a slow pace but as the pressure of climate change mounts the pace may quicken. In addition, it may take several decades or even longer for many green solutions to show their full benefits as they rely on nature to grow a forest canopy or establish wetland species at scale. Some green solutions may be

³⁰ Pp44

potentially vulnerable to adverse impacts such as animal browsing, drought, weeds, disease, fire, flood damage and so on. Because of the timeframe to establish green and green/grey solutions, the effects of climate change could take hold during the intervening years. Grey solutions may have to play a role or part-role to assist with accelerating nature-based developments and compensating for them while they emerge. For example, ensuring higher river levels throughout the year can assist natural features such as wetlands to remain active and watered.

In summary, some nature-based solutions will be slow to show their full benefits, others will be much faster. Multiple solutions will be needed to optimise effectiveness over time. Water reservoirs that top up water supply can protect natural resilience from tipping points provoked by climate change. They also have limited geographical reach.

Wetlands can help retain moisture levels in surrounding land. Replacement of some of the forest cover that formerly bounded lakes and rivers could provide cooling shade and limit excessive phytoplankton growth. Trees also support birds and other animals that eat phytoplankton which are now a contaminant in our rivers. There are examples where we need nature to help do the resilience job for (and with) us.

Many farmers are covenanting native forest lots with the QEII Trust. Others are re-inventing and restoring wetlands and riparian margins and reconfiguring drainage channels to spread and slow

water flow rather than simply channelling it away. The potential for encouraging nature-based solutions is considerable and a lot could be achieved with a concerted effort, and at scale.

The urban challenge

While the largest use of water by far is rural water, building water resilience applies to all uses of water – personal, cultural, urban, rural, industrial. The partnership of natural and artificial management of water has great application for domestic use in the towns just as readily as the rural hinterland.

Currently, urban supplies could be described as low resilience. Even now, during the summer months, some urban storage reaches critical levels. Action is being taken by councils and this is dealt with in this Strategy, but it is and will continue to be vulnerable to the effects of climate change.

There is no doubt that infrastructure improvements and storage and disposal technologies upgrades are required and relatively urgently, but with much of the source from surface water the potential for nature-based solutions that involve holding and delaying water at source – in the Tararua ranges – has real potential. Protection of these headwaters so that they retain and gradually release water, contributes to consistency of supply and maintenance of soil and vegetation moisture levels.

Capture of urban run-off, such as rainfall harvesting, particularly in the shoulder and

dry season can become important. Wetlands can have an urban function because they can retain and 'clean' water, but they can also have an amenity contribution.

In parts of the world purposeful programmes of "watering" urban areas are underway as greater moisture availability contributes to lifestyle and wellbeing during the hot dry periods. The Chinese have pioneered the idea of the "urban sponge" which collects and retains water in urban environments through deliberate greening policies, and the Australian concept of 'Water Sensitive Cities' (currently applied in Melbourne), are examples of the application of natural water resilience in an urban environment.

Essence of a water resilience strategy

Rounding off this section of this report we need a clear statement of the Strategy. It comprises two main streams of work:

i. **A strategic focus:**

- Temper demand** Doing more with less
 - Pushing amenable land uses to the shoulder seasons
 - Encouraging greater efficiencies, including allocation
 - Encouraging greater good management practice
 - Public education about volume use in dry periods
- Enhance supply**
 - Retaining water through constructed storage (rural and urban)
 - Sequestering water by directing it to, and retaining it in, the whole ecosystem
 - Augmenting groundwater, surface water, lakes and wetlands
 - Holding water in streams, soil and vegetation

ii. **A tactical focus:**

Targeting **demand** in the water deficit period:

- Land use change
- GMP/public education
- Efficiency/allocation

Targeting **supply** in and around the water deficit period:

- Capturing water from freshes in spring and summer
- Directing that water into groundwater (using primarily green/grey solutions with green bias)
- Using the holding/delaying capacity of the groundwater system to build/retain groundwater volumes (rural and urban use)
- Operating at a whole-of-catchment level to achieve the volumes and ease access
- Compressing the water deficit period into January to March (and holding it there)

Section IV – Our water resilience assets

Chapter 4: Surface Water

Addendum 2: Characterising the physical geography provides a detailed characterisation of the river systems of Wairarapa. Dominated by the Ruamāhanga which flows down the spine, the rivers and streams are many and complex, though of relatively small scale. In this chapter we concentrate particularly on rivers rather than lakes, because they are the key source of water for human use.

Due to the different catchment characteristics of climate, geology and elevation, the western and eastern

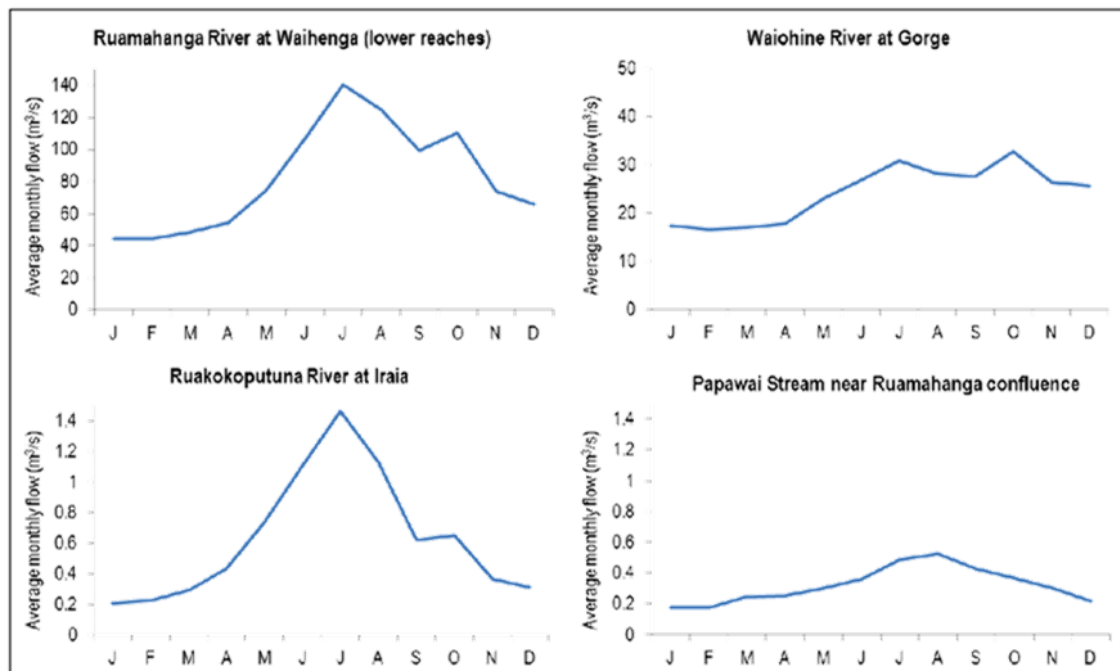
tributaries of the Ruamāhanga tend to have quite different flow regimes. The western tributaries have higher base flows, are less prone to extreme low flows, than the eastern tributary rivers. As an indication of the relative flows of the different rivers and streams, mean annual low flow estimates for the major tributaries, and the Ruamāhanga River itself, are shown in the table below. The most significant tributaries, in terms of average flows, are the Waiohine and Waingawa rivers.

Estimated 7-day mean annual low flow (MALF) statistics for main Ruamāhanga River tributaries, at the point they enter the Ruamāhanga, and at three locations on the Ruamāhanga River.

Category	River	MALF (L/s)
Western tributaries	Waipoua River	490
	Waingawa River	1,720
	Waiohine River	3,550
	Tauherenikau River	310
Eastern tributaries	Kopuaranga River	605
	Whangaehu River	100
	Tauweru River	500
	Huangarua River	310
Lowland streams	Makoura Stream	150
	Parkvale Stream (including Booths Creek)	210
	Tilsons Creek	150
	Papawai Stream (including Tilsons Creek)	360
	Otukura Stream (including Stonestead Creek)	600
Ruamāhanga River main stream	Ruamāhanga River at Wardells (near Masterton)	3,836
	Ruamāhanga River at Waihenga (near Martinborough)	12,875
	Ruamāhanga River at Lake Ōnoke	14,800

The highest flows in the Ruamāhanga River and its major tributaries tend to occur during winter, although rivers with headwaters in the Tararua Ranges tend to have sustained high monthly average flows through spring, when frequent westerly frontal systems bring rainfall to the range. Climate change modelling

indicates that these fronts will continue but their volume will decrease. The lowest flows tend to occur between January and March. The eastern tributaries tend to have a larger variation in flow between the seasons, as illustrated in the figure below:



Monthly average flows in the Ruamāhanga River and some of its tributaries. The Waiohine River represents the western tributaries, and on average has a high baseflow during summer and sustained flows through spring. The Ruakokoputuna River represents the eastern tributaries and has large seasonal flow variation. Papawai Stream represents the lowland streams and has little seasonal variation in flow. Source: GWRC Hilltop database, flow data for 1980 to 2013.

The flow characteristics of the lowland streams that enter the Ruamāhanga River are different to both the eastern and western tributaries. As shown in the above graphs, there is not a large seasonal variation in flow in these streams, due to their predominant source of flow being springs and seeps. However, some of the streams do experience severe low flows, due to abstraction and low groundwater levels affecting spring discharge rates during summer.

The severity of low flows in the Ruamāhanga River is strongly linked to rainfall in the Tararua Range and flows in the western tributary rivers, as these are the dominant flow contributors to Ruamāhanga River. The most severe low flows on record in the Ruamāhanga River and its western tributaries occurred in March 2013, following a period of unusually low rainfall in the Tararua Range.

The Ruamāhanga River can experience large floods due to heavy rainfall in either the Tararua Range or the eastern hills, although historically the largest floods in the Ruamāhanga River have been due to heavy rainfall in the Tararua Range. However, extensive surface flooding in the central valley (including in the small lowland streams and the lower reaches of the eastern tributaries) can occur following south easterly (often ex-tropical cyclone) rainfall events.

The frequency of 'flushing flows', that is, small flood flows that allow accumulated algae to be flushed from the river system, is an important aspect of the hydrological regime. In general, the western tributaries tend to experience flushing flows more frequently than the eastern tributaries. On average, the Ruamāhanga River experiences a flushing flow, of equal to or greater than three times the median flow, every 20 days. However, the longest period on record between flushing flow events in the lower Ruamāhanga River is four months. The frequency of these flushing flows will likely diminish, though not substantially, with climate change.

Availability and allocation

Broadly speaking, core surface water allocation in the Ruamāhanga Valley is at, or close to being fully accounted for by current consents (paper allocation). There is much more availability of supplementary allocation as it has not been historically taken up in large amounts. Volumes of water available for supplementary allocation are generally determined as a function of a 1:1 flow sharing arrangement with the river above median flows (and described in more detail in Schedule V of the Natural Resources Plan).

The two tables immediately below show the allocation limit and status for rivers and stream catchments under the Natural Resources Plan. It also shows how the status is expected to change under recommendations made by the Ruamāhanga Whaitua Committee. Allocation status for each sub-catchment is determined by both the availability of water within that sub-catchment **and** the availability within the parent catchment.

Allocation status at sub-catchment and valley scale changes on an almost weekly basis as hundreds of current consents are renewed on a rolling schedule, some conditions are changed, and numbers recalculated. As of January 2021, there is minor surface water availability in some of the larger river sub-catchments. However, the amount equates in total to less than 5% of that which has already been allocated across the valley and, more importantly, even this minor 'headroom' is expected to be removed in response to the Ruamāhanga WIP recommendations.

Surface water allocation amounts in the Ruamāhanga catchment (upstream of Lake Wairarapa outlet)

Catchment management unit	Allocation amount/limit (L/sec)	Further allocation currently available under NRP provisions	Further allocation expected to be available under WIP plan change
Ruamāhanga River and tributaries, upstream of (but not including) the confluence with the Lake Wairarapa outflow	7,430	Minor	No
Kopuaranga River and tributaries	180	Minor	No
Waipoua River and tributaries	145	Minor	No
Waingawa River and tributaries	920	No	No
Ruamāhanga River and tributaries upstream of the confluence with the Waingawa River	1,200	Minor	No
Parkvale Stream and tributaries	40	No	No
Booths Creek and tributaries	25	No	No
Mangatarere Stream and tributaries	110	No	No
Waiohine River and tributaries (excluding Mangatarere Stream and tributaries)	1,590	Minor	No
Papawai Stream and tributaries	105	No	No
Ruamāhanga River and tributaries upstream of the confluence with the Papawai Stream	1,240	Minor	No
Huangaarua River and tributaries	110	Minor	No
Lower Ruamāhanga River and tributaries upstream of (but not including) the confluence with the Lake Wairarapa outflow	1,370	No	No

Surface water allocation amounts/limits in the Lake Wairarapa catchment

Catchment management unit	Allocation amount/limit (L/sec)	Further allocation currently available under NRP provisions	Further allocation expected to be available under WIP plan change
Lake Wairarapa and tributaries above the confluence of the Lake Wairarapa outflow with the Ruamāhanga River	1,800	Minor	No
Otukura Stream and tributaries above (but not including) the confluence with Dock/Stonestead Creek	40	No	No
Tauherenikau River and tributaries	410	Minor	No

Surface water represents 70% of the water used in Wairarapa but with the limited "headroom" it is not likely to be a significant future provider unless that water is stored, diverted or attenuated such as in wetlands. Surface water is prone to evaporation and as that increases, supplies will diminish, especially in the hot months. Wairarapa is significantly modified for flood control

meaning that water makes its way to the sea very rapidly. This lack of attenuation also reduces the available water. Unlike Canterbury and Otago, Wairarapa does not have snow melt through to December so that this form of 'storage', which is very significant in the south, is not available in Wairarapa. In short, there is flex in surface water availability, but it is limited.

Chapter 5: Groundwater

The growing pressure on surface water means that attention turns to groundwater to make up the deficit. The difficulty is that the behaviour of water in aquifers in Wairarapa is the great unknown that lies behind this water resilience strategy. There are expectations amongst many stakeholders that it could play a significant future role in resilience against climate change impacts.

The aquifers of the Ruamāhanga are contained in the mainly gravelly deposits of the valley floor. These are quite extensive and geologically complex. The deposits comprise former river channels and flood plains and are disrupted by numerous faults and folds at depth. Thus, groundwater flows are complex and variable.

Groundwater in Wairarapa is variable and uncertain in location and not the extensive underground reservoir often associated with groundwater in Canterbury or Hawke's Bay, and other parts of the world. The total amount of groundwater available or accessible is relatively limited, although that cannot be said definitively because of uncertainty in our geological understanding, particularly of the deeper groundwater system; for example, there is some evidence of previously unidentified supplies.

Water bores that are close together can sometimes behave quite differently indicating the complexity of the substrata. On the other hand, groundwater has

significant advantages in that the water is accessible and is protected from evaporation while it is in the ground, which will be a major consideration when high temperatures prevail as a result of climate change. Groundwater not linked to surface water is generally not subject to the same level of summer restrictions as surface water itself. In general, therefore, groundwater, particularly deeper groundwater, is a more reliable source than surface water.

Groundwater quality and characteristics vary. Some deeper groundwater is very old; some is up to hundreds of years old, whereas water closer to the surface can move between rivers and groundwater over a short space of time. Much groundwater is supplied from the main rivers and as it moves through the aquifers it then resurfaces in the same rivers or associated streams and waterways. This latter portion of groundwater plays an important role in the watering of the environment and therefore in supporting natural resilience.

Groundwater is important as it supplies 30% of the allocated water in the region. All three councils draw at least part of their domestic supply from aquifers. For Masterton it supplements their surface water source, while for Carterton and South Wairarapa it is their main supply.

Similarly, groundwater is an important part of the supply for rural irrigation across all three council areas with the groundwater

supply highly allocated (shallow groundwater that is connected to rivers is fully allocated). Demand for groundwater has significantly increased over the last decade. A large portion where it is close to the surface may be subject to low flow restrictions and rises and falls with flow levels in rivers and streams.

The key point is that there is considerable interaction between surface water and groundwater at depths shallower than 20-30m. In places, rivers lose water to the ground and in other places the opposite is true. These interactions are becoming better understood. Much shallow

Addendum 5: Characterising the groundwater allocation regime outlines allocation of Category C water.

Some aquifers are inter-connected, but many aren't. Because the aquifers are geologically complex and their flow lines are unpredictable, it cannot be assumed that groundwater will either stay where it is or simply flow down the valley unimpeded. Often it returns to the surface back into rivers. This is a relevant point when considering the question of what the respective roles are of aquifer-sourced water and artificially- stored water. It also raises questions around water resilience solutions that rely on groundwater such as Groundwater Augmentation.

A further consideration is the availability of deep groundwater. Current research indicates that there are deeper aquifers in the Te Ore Ore, Parkvale and Lake Wairarapa and Ōnoke areas. The deeper productive pockets in the lower valley

groundwater is really an extension of surface water so that bores that are highly connected to surface water are now more restricted than they have been because shallow groundwater abstraction can significantly affect river flows. These restrictions come into play when the connected surface water body reaches its minimum flow and especially once 100%, rather than 50%, cease takes take effect.

To manage the abstraction of groundwater, the valley floor is divided into 14 groundwater zones and the allocation of water uses an A, B, C system. A chart in

contain water in excess of 180 years old meaning it moves very slowly in its natural state. One very deep bore (178m) near Lake Wairarapa has a water age of 6,000 years. But this is the only bore abstracting to this depth. The 180 year example is more typical.

It is becoming evident that down in the Ōnoke area there appear to be productive aquifers in much older formations than previously realised. This is an example of how knowledge of these deep aquifers is evolving, as previous modelling assumed all useable groundwater was in younger formations. It may be possible to open up deeper aquifers elsewhere. This is a question that might be answered once the proposed aerial electromagnetic survey has been completed.

Some localised areas experience increasing drawdowns as the season progresses – relating to deeper groundwater, which may impact surface

waters – whether this is unsustainable is dependent on the magnitude of depletion effects and the vulnerability of waterways affected. Greater Wellington is currently undertaking a trends analysis to understand and identify if there are particular places where abstraction rates are unsustainable.

Greater Wellington is also in the midst of revising/reviewing the limits for the pending regional plan change which may change this. The trends analysis and limit revision will be carried out conjunctively.

There is local evidence that after a dry winter, some aquifers do not entirely replenish and can commence an irrigation season not fully recharged. In a climate change scenario where a dry winter is followed by a dry spring, supplies could be significantly stressed during the water deficit season.

Groundwater as storage

There is some serious doubt as to whether aquifers can be regarded as a method of storing water beyond the current natural processes. Mark Gyopari, a groundwater scientist with Greater Wellington has made the point that: “if we put water into the Parkvale aquifer, we may never see it again”, so uncertain is it as to what happens deeper under the ground. Aquifers like Parkvale are likely very “leaky”, but all aquifers can be erratic in their behaviour due to the geological complexity of deeper aquifers. They are certainly not a tank that can be filled or emptied at will. The Ruamāhanga Whaitua Committee saw potential in the aquifers

and recommended that further investigations and even trials be undertaken. Other trials are being conducted in New Zealand with variable success at this stage; it’s quite a costly process and there is no guarantee that the geology will facilitate this process.

There are significant spatial differences in water availability and cropping locations may have to reflect those differences. For example, in the “fan areas” which are up towards the western hills, there are generally no high-yielding aquifers (however, localised higher yields do occur) but storage in these formations is possibly not insignificant. These Category C areas would only be able to support a modest demand, in some cases lower than typical irrigation takes. A large number of low yielding wells is feasible as long as it is matched to low-demand land use.

Aquifers towards the eastern side of the valley tend to be shallow, high-yielding and directly connected to the Ruamāhanga River (Category A). There are some deeper high-yielding aquifers along the Ruamāhanga corridor and in the south around Pirinoa and Ōnoke which have a more attenuated connection to the river. These aquifers probably offer limited storage opportunities. Due to orographic warming, the eastern side of the valley experiences the highest temperatures and evaporation rates which drives demand for water.

On the eastern side there are also limestone formations that hold water. The Kourarau spring and the aquifers in the

Wainuiouru area are examples. These water sources are being used very effectively. There may be others.

Conclusion

While we would like groundwater to be a significant panacea for urban or rural water availability, with limited deep aquifers that we know of, groundwater behaves much like surface water, in fact they are an extension of each other. They are both short and plentiful at the same time. Regrettably, they are not counter-cyclical.

The potential of deeper or more productive aquifers are yet to be fully understood and it could produce some interesting outcomes. While the quantum of water may not increase, further investigations may highlight areas where well yields may be higher. This may be useful for land use change and adaption and water reliability. The SkyTEM survey³¹ scheduled to be flown in 2022 could be very helpful in extending understanding of groundwater resources and patterns.

A key conclusion is that groundwater storage needs to be seen as "passing through" rather than static storage. Water could be retained in the ecosystem as it passes through the aquifers (and drawn off for irrigation), but only a limited amount could be regarded as "stored until used". This makes natural storage very dynamic and reinforces the value of being able to capture water from freshes

³¹ This is an aerial survey using magnetic imaging to ascertain groundwater reserves.



Chapter 6: Water races

Water races are an enigma. They are both a constructed and now natural water features of the region. Some races were constructed pre-1900 and are therefore subject to the Historic Places Act 1993. This legislation will create an added consideration to the use of any water races that were in existence prior to 1900.

As a manmade feature they were established primarily to supply water for stock and are still used mostly for this purpose although other uses that are currently permitted include a few specified takes for irrigation and a vineyard, frost protection, domestic uses, wetlands, fire-fighting and other minor industrial purposes, including supply to a piggery. They also have aesthetic, recreation and ecological values.

Many farmers now source stock water from their groundwater takes for reasons of convenience (river water is generally better for stock due to high levels of Fe and Mn, but cannot be used for dairy due to the presence of sewage from urban discharges) and have developed piped infrastructure to do so. A few still use the races for stock water, especially higher up the catchment. Over the years, stock races have taken on a different character. Some have become biodiversity habitats in their own right. They also supply water to wetlands and springs.

The races are, by and large, on private land, and responsibility for their maintenance and upkeep rests with

farmers under the guidance of local councils, making them a cost with little immediate obvious benefit. Of all the water that is allocated in the Wairarapa, 27% is consented for use in the water races and is taken from rivers.

It is thought that only a very small percentage of the total volume of water within the races is actually used. In any case, far more significant amounts are either 'lost' through evaporation and/or seepage or returned to natural surface water downstream. An estimate by Greater Wellington is that up to 50% is 'lost' to groundwater. There are also unquantified losses to evaporation. During wet conditions and at certain locations, significant quantities of water from surface runoff also enter the water races.

One estimate of loss to groundwater is for Taratahi and Carrington at 50%, but this has not been formally quantified. While this is a high percentage of water in the races going into groundwater, it represents a tiny fraction of total water going into groundwater, perhaps less than one percent on Greater Wellington estimates.

Groundwater modelling undertaken by the Ruamāhanga Whaitua Committee indicated that closing off some water races may result in significant lowering of groundwater levels. This indicates that the hydrological system associated with water races has, over an extended period, moved to a new equilibrium. Changing the

management of races should only be undertaken with full knowledge of the consequences. For example, a background report³² for the Ruamāhanga Whaitua concluded:

"The extensive Taratahi water race network appears to be a long-established and important recharge source to the shallow groundwater environment. It helps to sustain the flows in natural spring-fed streams during dry periods. If the races were closed down, significant adverse effects on natural streams would be experienced."

The races take water from the Ruamāhanga, Waingawa, Waiohine and Tauherenikau Rivers, and the Mangatarere Stream. Together they cover a significant part of the Wairarapa Valley from north of Masterton to the head of Lake Wairarapa and are a long-established and integral part of the environment.

Races in themselves are a considerable asset. They provide a channelled, carefully engineered gradient spanning hundreds of kilometres unlikely to be replicated today. If the current situation was to change, each of the races would need to be considered on their own merits as their

characteristics are by no means uniform. Existing in-stream ecology of the natural streams linked to water races, and the existing hydrological system, is another consideration as some, such as the Taratahi race, are directly linked to the stream network.

Ruamāhanga WIP stock water race recommendations

As the Ruamāhanga WIP states:

*"... the water races of Wairarapa are very inefficient from the perspective of losses to groundwater and evaporation. However, their leakiness to groundwater has benefits for local groundwater users and to puna/freshwater springs. In this sense, an analysis of the efficiency of a system needs to sometimes be nuanced by allowing for recognition of the value of less efficient systems. Careful analysis is needed to determine the appropriateness of such systems in a water-constrained environment."*³³

One of the key WIP recommendations was to reduce water race takes at minimum flows to only the water required to provide for people's domestic needs and stock drinking needs.

³² Summary Paper: Managed Aquifer Recharge (MAR) Exploration Scenario Modelling, Earth in Mind & GNS Science July 2017

³³ PP51



Stock water races

For the last century, the Wairarapa has had an extensive network of water races. Established primarily to supply water for stock, they are still used mostly for this purpose although other uses are currently permitted: a few specified takes for dairy and vineyard irrigation, frost protection, domestic uses, wetlands, firefighting and other industrial purposes, including supply to a piggery.

Conclusions

The races divert a significant amount of water and have past their usefulness in the supply of stock water, accepting that there is a small minority of farmers who still use them for that purpose. They are also a relatively inefficient method of transferring surface water to groundwater, given the small volumes involved. Their role in terms of indigenous biodiversity needs to be considered, but like stock water, a very large amount of water is required to maintain this asset.

The WIP suggests a process to consider the future of races which should be pursued to define the future of these assets. The WIP states among other comments that;

"... the efficiency of water use in Wairarapa water races has not been adequately assessed. Overall there is a lack of information on the values and biophysical characteristics of water races to assess their efficiency."

Further, it states;

"Overall, assessments of the efficiency of water races are needed for individual water races because of their unique influences and physical states."

Before decisions can be made regarding their future role, governance etc., these need to be guided by the actions recommended in the WIP's on this matter:

Recommendation 107

Greater Wellington works with territorial authorities and landowners to collect information and develop long-term management options (in conjunction with Recommendations 9 and 11) for all water races in the Ruamāhanga whaitua. The information should be collected and assessed in the order that water races come up for consent renewal.

Recommendation 108

Greater Wellington develops a policy indicating that water races requiring resource consent before appropriate long-term management options have been developed shall get short-term consent until the long-term status of the water race is decided. Appropriate information for developing long-term management options for each water race may include, but is not limited to:

- *The hydrology of the water race and the interaction with surrounding groundwater and*

surface water (how much water is in the water race, how much is lost, how much is discharged)

- *How much water is used and what it is used for*
- *Water quality*
- *Social values, ecological values, mana whenua values, heritage values and economic value*
- *The efficiency of water use and options for increasing efficiency*
- *The areas of management overlap and opportunities for better integration (regional consents and district bylaws).*

Chapter 7: Can our current assets and attitudes do the job?

Especially following European settlement, many of the modifications to rivers and waterways were undertaken to claim land for agriculture and then protect it from flood. These modifications were made at a time when planning systems were primitive and understanding of the ecology of rivers and lakes was formative. Times have changed.

The legacy is that many of the modifications have impacted the ecology of the region. There is no doubt many of the facilities of natural resistance can be restored or recovered, but not wholly so. The resilience task is one of "springing into the future" with a different mindset more characterised by natural resilience and the need to sustain our communities in a future of climate changes and other hazards.

What are some of the legacy issues that history has left us to deal with in this resilience strategy?

- **Modification of river channels**
This has resulted in less and less water being retained in the 'system' (in the land and vegetation and water systems) as its pathway to the sea is accelerated. We now need more of that water held back in the 'system'.
- **Diversion from rivers**
An increasing volume of water is being diverted from the rivers, the Ruamāhanga and its tributaries, for other uses adding pressure on flow volumes at critical times. This water is diverted for rural and urban purposes.

- **Pressure on groundwater**
Expectations of supply from groundwater have increased as the availability of water in rivers has diminished at critical times, and yet the dynamic of groundwater-surface water connectivity is complex, and groundwater and surface water cannot be regarded as separate resources.
- **Inefficient use**
Management systems often use old technology, and in some cases require upgrade as a result of low levels of efficiency and high levels of wastage. Such systems have often been tinkered with to make do, rather than being updated.
- **Historical allocation**
The limits on water supply are being reached, but allocation is still based on historical use and the limited understanding of the water resource at that time. It has to be acknowledged that current arrangements support considerable investment in infrastructure, knowledge and processes meaning that any change has to be gradual. But apart from the fairness issues surrounding historical use which exclude new users, this approach tends to favour outdated uses or inefficient practices. It does not sufficiently encourage innovation and the principle of best value uses, especially as actual use is often substantially less than annual allocations; this raises the distinct possibility of locked up consented, but unused water.

In short, the region has experienced significant pressure on its freshwater resources from growing use, to the extent that it is bumping up against the limits of that resource and now it is faced with a new and even greater challenge, that of climate change. Climate change means we have to move to another level of sophistication in our water management.

Climate change pressures are emerging at a time when resilience in the catchment is already compromised. MAW availability issues as a result of evaporation are tumbling over the top of unresolved historical use issues, creating a challenging resilience scenario for the next 10-20 years and beyond.

The inevitable conclusion is that some significant rationalisation is required:

- Water conservation needs to be top of mind for all users and expectations need to adjust to reality.
- Land use patterns including residential location and water systems need to be modified for a changed reality.
- Mana whenua values need to be factored into water planning.
- Technology needs to play a much larger part in water management.
- Water races need to be critically evaluated so we are fully cognisant of their characteristics before any decisions are made as their future, but their high water use has to be addressed.
- Allocation of both surface and groundwater requires ongoing review and a shift towards a more sophisticated framework as greater pressure comes on the resource. This will help us do more with less.
- The storage capacity of rivers, streams, lakes, wetlands and constructed reservoirs needs to be considered as a whole picture.
- The natural resilience capability of water bodies, waterways and lakes needs to be boosted.
- Greater efficiency in water use is essential to make every drop of water go further.
- Water demand needs to be in close proximity to supply such as land uses related to groundwater supplies
- Storage and reticulation needs to be cognisant of population of the location and scale of future developments that draw on water.

It is absolutely clear from the assessment in this Strategy that single solutions, will simply not do the job. Unless water resilience enhancement is a strong focus for the community of Wairarapa over the next 10-20 years. We have the opportunity to reduce the adverse effects of climate change, but it will take a focused effort.

Section V - Demand

Chapter 8: Rural water use

Land use and water use are two sides of the same coin in the rural setting. Wairarapa Water Limited commissioned a non-profit group from Canterbury called Leftfield Innovation to work on a road map that would enable land use change from current practice to higher value and more environmentally sustainable use by initially identifying near-use for land use with access to reliable water. The Leftfield report identifies a broad range of existing temperate climate land uses:

- intensive horticulture (apples, grapes and small areas of fresh vegetables and berryfruit)
- less intensive horticulture (olives), high value seed production (e.g. sweetcorn, maize and onions)
- broadacre seed production (e.g. peas, grass seed, red clover)
- broadacre vegetables (e.g. squash)
- broadacre grains for food and feed (e.g. wheat, barley, maize and some specialist crops)
- forage crops for silage and feed (e.g. maize and brassicas)
- irrigated pasture for dairy, lamb, beef finishing, sheep milking, and hens for egg production
- dryland pasture for sheep, beef and some dairy
- apiculture (manuka and other honey)
- plantation forestry, plantation hard woods, conservation, indigenous forests³⁴

The array of land uses reflects the wide variety of conditions encountered in the Wairarapa such as soils, water availability, shelter, exposure to frosts, topography etc.

Leftfield makes the point that most of the horticulture, higher value cropping, finishing and dairy properties utilise some degree of irrigation to ensure production, with sheep and beef being the predominant land use on the dryland areas. This type of farming has increasingly become dependent on irrigation to raise production levels but also to offset climate change impacts that are already with us.

It is generally conceded that significant land use change will be initiated by climate change effects. Land use change is not new to the Wairarapa but upcoming changes are likely to be significant in their impact. The introduction of the wine industry to Martinborough transformed the landscape and the prosperity of what was formerly best described as a “sleepy little town”. The expansion of dairy in the 1980s and 1990s is another good example of significant change. Forestry took over much of the eastern hills in the post-war period and some parts of the region are into their third and fourth rotations. There are strong indications of a renewed resurgence of forestry for timber and carbon. In the other direction, the loss of horticulture and fruit growing has been significant and surprising, although indications from other regions are that

³⁴ Leftfield, “Near-term Opportunities for Value” 202 pp19

industries like this do best when there is critical mass and the fear of frost in Wairarapa was enough to discourage some production. Wairarapa's representation in these industries was probably sub-scale. The backbone of farming has been and remains, sheep and beef, with the addition of deer.

Climate change effects may change this balance noting that data shows that climate change has already commenced. These changes are already being experienced in the Wairarapa as indicated by warmer average temperatures, warmer nights, less frost etc. Not only will these changes attract horticulture and farming of other high-value crops, but also perhaps enhanced urban settlement. Non-grazing activities for instance are now forecast to increase more than seven-fold, leading to a gradual shift away from traditional pastoral farming practices. A longer growing season, fewer frosts and more benign climatic conditions through much of the year make this possible but in some cases this will require reliable access to water, whether urban or rural.

Climate change adaptation may involve tactical, strategic or transformational change. Though it is not the intention to provide an exhaustive list of these, some examples of potential changes are highlighted here as we try to characterise the future of land use in the region.

The greatest challenge to all types of water users in the region is increasing variability and extremes in weather encountered. Farmers in particular are driven by reliability. Super-wet events are

no better than super dry ones. Crops don't grow as well in saturated soils where they are more prone to stock damage or suffering from disease.

Consistency is everything and if climate change brings inconsistency then farmers will be looking to smooth out the variations. The less consistent their inputs, the more conservative they have to farm. Conservative farming is less productive farming, but reduced productivity is traded off against mitigating the risk of heavy losses in adverse events.

Trends in production

The trend in agriculture production is to produce more from less, but not at the expense of the environment. There is a trend to adding value by moving up the value chain into processing, but there is also a trend towards more profitable crops or more particularly, growing crops (including stock), better.

It might include growing prime beef without checks and achieving the required grades. Consistent meat quality is determined by the ability of the farmer to feed the animal well throughout its growing life, on a rising plane as opposed to a maintenance plane. To feed it consistently requires reliability of feed quality in all seasons and therefore reliable water to grow feed in the peak-dry season as well as to water crops for winter feed. Being able to precisely fatten lambs on the irrigated valley floor that have been produced on the hills, consistent milk quality without the detrimental effects of Palm Kernel Extract

(PKE) supplementation, producing specific grades or types of apples, A2 milk, all of which require reliable and exact growing conditions.

Besides these added-value opportunities, there is the range of potential new products that are referenced elsewhere in the document and have been proposed through the work of the Leftfield team.

Chapter 9: Urban water use

Water demand in urban areas has been gradually increasing over recent years in line with population increases and greater economic activity in the region. Continuing population increases of the scale of recent years are not expected by local councils whose projections are very modest.

The challenges in urban areas are somewhat different from those in rural areas. Especially since the Havelock North event and the "Government Inquiry into Havelock North Drinking Water", quality of drinking water and quality of water infrastructure has come under the microscope nationally and it is likely the councils of Wairarapa will be subject to pending outcomes of government policy on these matters.

Urban centres are big water users especially in the sense that they supply the bulk of the area's population with water with a 24 hour water reliability; without that water they have little other choice, therefore its supply is strategically

important. Councils don't have a statutory responsibility to supply water to the rural population; they generally source their own water.

Urban Wairarapa, with regard to water, suffers from its own history. All the towns of the region have a history as rural service centres in a region that has historically been relatively well supplied with water. Settlement is also widely spread being made up of a series of moderate to smaller towns (each with their own water infrastructure), rather than, for example, one very large town and small settlements. The situation for each town is somewhat different and is set out below.

Wairarapa has a population of approximately 46,917. The table below depicts Wairarapa's currently urban/ rural population split between the three districts. The urban portions are on reticulated water networks supplied by the respective councils.³⁵

	Urban population	Rural population	Total population
Masterton DC	21,400	4,157	25,557
Carterton DC	5,800	4,160	9,960
South Wairarapa DC	6,700	4,700	11,400

³⁵ Care needs to be taken in the interpretation of these tables. The table for urban water areas includes water leaks and other industrial users in the average daily water consumed in the different towns. The NZ Urban average

figure does not include leaks and other users, so the comparison is slightly misleading. Directly comparative data was not available at the time of publication.

Projected populations for each township³⁶

Township	District	2013 census population	Mid-range projected 2040 population ³	Mid-range projected 2090 Population ³
Masterton	Masterton district	18000 ¹	22692 ⁴	37216 ⁴
Greytown	South Wairarapa district	2199	2435	2494
Carterton	Carterton district	4850 ²	5504	5699
Featherston	South Wairarapa district	2253	2494	2548
Martinborough	South Wairarapa district	1470	1628	1667

¹Masterton population connected to water supply in 2017.

²Carterton population connected to water supply in 2016/17.

³Stats NZ estimates of district-wide population for 2018, 2023, 2028, 2033, 2038 and 2043 have been used to develop predictions for 2040 and 2090 for each town.

⁴Masterton population projections based on anticipated 1% growth per annum.

The following table puts Wairarapa's urban water consumption into perspective:

Urban areas	Average daily water consumption (litres per person per day) ³⁷
Napier	570
Wellington average ³⁸	357
NZ urban average	227
Masterton urban area	655
Carterton urban area	396
South Wairarapa (average of all 3 urban areas)	569
Greytown	743
Featherston	472
Martinborough	678

Wairarapa's per capita urban usage is high, verging on excessive.

³⁶ Tonkin and Taylor

³⁷ Wairarapa Township Water Supply Demand Forecasting by Tonkin & Taylor Ltd for GWRC, December 2017 which in turn is taken from each Council asset Management plans or their equivalent.

³⁸ Source: Blyth, JM & Williams G 2020. Overview of the Wellington metropolitan water supply network and consideration of future pressures on infrastructure. Prepared for the Whaitua To Whanganui-a-Tara Committee on behalf of Greater Wellington Regional Council and Wellington Water Limited.

Potable water demand forecasting

Tonkin + Taylor undertook a high-level water demand forecast³⁹ for five Wairarapa townships: Masterton, Greytown, Carterton, Featherston and Martinborough. The forecasts took into account current and predicted populations, historic water use, and potential impacts of climate change for the five townships. They were based on per-capita consumption (PCC) values derived from bulk-metered historical data.

The principal conclusions and implications were:

- Summer months generally had mean PCC demand approximately 20% higher than the annual average in all towns other than Martinborough, with a PCC demand approximately 50% higher than the annual average.
- Carterton's projected 2090 PCC is approximately 470l/p/d, an increase of approximately 20% from that presently. As forecast population increases, the annual bulk supply is projected to increase to approximately 1,000,000m³ by 2090, an approximate 40% increase from current levels.
- Featherston's projected 2090 bulk supply requirement is 510,000m³, which is approximately a 30% increase when compared to 2016 levels.
- Greytown's projected 2090 bulk supply requirement is 760,000m³, which is approximately a 20%

increase when compared to 2016 levels.

- Martinborough's projected 2090 bulk supply requirement is 540,000m³, which is approximately a 40% increase when compared to 2016 levels. Significant seasonal fluctuation is noted.
- Masterton's projected PCC reduces over the short term due to leakage improvements and then increases slightly over the longer term. However, significant population increase is projected – which results in a bulk supply increase to approximately 9,500,000m³ by 2090, an approximate 115% increase when compared to current levels.

These projections provide only a broad view of the future water demand as there's significant uncertainty in each of the inputs and assumptions concerning the population projections, future per capita consumption levels, the influence of climate factors on demand, future efforts to improve (reduce) leakage and changes in non-residential usage. We describe these estimates as conservative because they take a long-term averaged view. We know that hot temperatures drive up urban as well as rural demand as instanced in the 2013 Martinborough dry period.

These figures demonstrate that the challenges of the urban areas are similar to those of the rural areas. The combination of both is a growing demand for water during a period when supply will be significantly constrained.

³⁹ Wairarapa Township Water Supply Demand Forecasting by Tonkin & Taylor Ltd for GWRC, December 2017

What does this mean?

The issues that the councils are facing in their towns have a common theme and can be summarised as follows:

- **Water use efficiency**
Metering has uncovered the extent of the leakage problem. While in the big picture, the amount of the water loss is modest, in terms of the volumes treated and the associated costs it is more significant. The loss is not just water, but also the investment capital that could be used elsewhere on other water resilience measures. It also represents early wins for water availability.
- **Storage**
All three councils currently have very slim storage both for managing high variable water demand especially in the summer months, but also as a hedge for pressure on surface and groundwater that might arise with climate change. All three councils will have to consider the storage question immediately so they can be implemented in the medium to long term. It is noted they have schemes to help resolve these issues.
- **Supply**
All councils essentially draw from the same ground and surface sources as rural users, and while they will have some priority because domestic use gets priority, they will not want to be seen to be competing for water with rural users who in many cases will be their own ratepayers.
- **Stormwater**
All three councils have very limited stormwater facilities. They certainly don't see it as a source of supply in the short or long term. Capturing some of

this water for non-potable uses is a possible direction of the future. Technology and unit costs will determine that.

- **Rainfall harvesting**
All three councils are considering the application of rainfall harvest in tanks associated with dwellings. Serious questions need to be asked about this approach because while the unit cost is high, it may play an increasing role in the water deficit period and reduce (even by degrees) competition for water in this period. It could also have the effect of transferring some costs to residents allowing rates income to focus on whole-of-system challenges.

In summary, there are significant incremental gains that urban users can achieve, which cumulatively can make a tangible difference. The first priority needs to be water efficiency improvements and short term storage to minimise the shocks of extended dry spells. Capture of stormwater needs to be considered in the future especially once technology advances allow.

The urban areas also have the opportunity to set an example with natural resilience. There are extensive opportunities for water sensitive developments such as planting, wetlands and greater use of vegetation in and around the town centres. It would be fair to say that the towns of the Wairarapa are not particularly "water sensitive". There is plenty of room for improvement. The example currently being set in our region of the world is Victoria, Australia and it could be emulated. Besides natural

resilience gains, it will also enhance quality of living values, particularly in the hot dry period. The urban areas need to be setting a strong example on natural resilience and could do so at reasonably moderate cost.

The situation with urban water will be further complicated if the Wairarapa joins a larger regional entity under the Three Waters Initiative. This could make it more difficult to reconcile localised urban and rural water use with decisions on urban management to some extent taken out of the hands of the councils.



Section VI – Other resilience considerations

Chapter 10: Human resilience and leadership

While this Strategy is primarily about the ecology of water resilience, because water is a key building block of life, it is also about human resilience. Climate change will not just affect production and vegetation. It will affect lifestyles, quality of life indices, mindsets and value systems. The tempting mindset is to “stave off” its effects, but actually, it is here to stay, in fact to extend, and adaption is required.

The question is what do we mean by climate change adaption? As long as adaption really means having to make a series of reluctant concessions to the inevitability of climate change, adaption is going to be charged with tension and conflict arising from denial and competition for scarce resources. This is a very real issue because these negative attitudes will not help human resilience and it is strength of human purpose that will be required to adapt effectively.

A rich and sustaining environment is part of human resilience. The positive impacts of an attractive environment are known to be causative in human happiness and contentment. The impact of the recent (2019) drought in Wairarapa on the contentment of farmers is a very good illustration. It produced anxiety and fear as the drought caused family incomes to tumble and destroyed long-nurtured

natural assets such as grassland and crops. The relatively high level of suicide amongst farmers during economic downturns is testimony to the pressure drought causes.

Doug Avery, in his book *The Resilient Farmer*,⁴⁰ describes his approach to resilience, having farmed in the drought-prone areas of southern Marlborough for a generation. He went from near failure to winning the South Island Farmer of the Year in 2010. He describes how, in highly adverse conditions, he increased his land holdings, massively increased output and profitability while being environmentally friendly.

“We are the same family”, he says, “with the same farms in the same valley in the same climate. The world hasn’t changed, but the story has changed. We turned our system on its head and we became a success story.” He goes on to say: “Learning to farm differently – to farm with nature, rather than against it – is the heart of that success.... But even more than that I had to change my thinking processes. I became emotionally resilient.”

TUITUI KAKAHU, TUTUI TANGATA
Weaving the cloak, weaving people

⁴⁰ Doug Avery, (2017), “The Resilient Farmer,” Penguin 2017

Avery's example illustrates the importance of human adaption. He makes the observation: "I thought my problem was drought, end of story. It wasn't. Until I fixed my thinking, I was never going to fix any problems."⁴¹ He recognised the importance of land use adaption as well as sourcing more water. He illustrates an important consideration in Wairarapa that whether or not MAW is available, many farmers are going to have to farm with less water in the future and they are going to have to adapt their farms and their minds to this changed situation. The same is true of urban dwellers. Their excessive consumption is difficult to justify.

This Strategy demonstrates that the actions and regimes required to improve water resilience will likely involve significant changes in farming and water use practice in urban areas. We are facing a period that requires high levels of innovation and change. For some this is exciting and energising, for others it is challenging, or perhaps threatening and intimidating.


The idea of water efficiency, that is, paying for water and/or reducing consumption, can cause stress for rural and urban communities who have previously been used to unfettered access. A requirement that urban residents should store water on their property for use during high summer might be challenging and cause cost stress, but it is an example of people taking responsibility for their own situation.

⁴¹ Pp93 and 96

If we are going to succeed in building water resilience, we have to build human resilience. We do that through leadership and much of this Strategy is about leadership structures. Leadership is also people, and structures need to attract people who can give the leadership required.

Measures that demonise, marginalise and criticise farming communities, for example, will likely succeed in building anxiety and resistance in those communities. Measures that damage or diminish the relationship between Māori communities and the environment will also diminish resilience. A successful resilience strategy will require unity and cohesion, not fragmentation and blaming.

For this reason, water resilience is a team game rather than an individual sport. The best results arise from scale, especially with natural resilience solutions which involves parties collaborating together to create catchment-wide solutions. We have to consider building sound organisations and entities to support resilience so that all types of communities in the Wairarapa have the will, energy and motivation to make the changes required to enhance water resilience.



*KIA MURA TONU NGA AHI KAA
MO TE MATEMATEAONE
Keep the home fires burning so
loved ones will always return*

The example of fires illustrates the impact of water scarcity on people's confidence. The impacts of fires, particularly bush fires resulting from climate change, can be considerable. Wairarapa has yet to experience fires on the scale of other parts of New Zealand and particularly Australia, but if bush and forest areas dry out to dangerously high levels, then this is likely to become a problem. The Australian bush fire experience demonstrates the impact of climate change on human resilience and it is both dramatic and traumatic and on a smaller and local scale the way fire

decimated the small town of Ohau in Otago in 2020 is illustrative. Fires fuelled by natural vegetation that has succumbed to drought illustrates just how important it is to keep our environment as well as our farms and population well-watered.

To date, relatively small-scale fires are occasionally experienced in Wairarapa and it's expected that climate change will add to the risk. The 2019 Nelson fires demonstrates this risk at a larger scale. The photo below is of the 9 February 2021 Cape Palliser area fire.



What is the resilience capacity of Wairarapa? If the community response to the COVID-19 downturn is anything to go by, then the collaborative ethic is alive and well in Wairarapa. The COVID response is a practice run for climate change.

Communities of interest

Leadership is a product of cohesion within and between the various communities of interest in Wairarapa. Here we make a cursory assessment of those communities and their leadership potential:

➤ Farmers

To the external observer the farming sector might appear integrated and cohesive and in many respects it is. Sector groups are active and strong with notable leadership, but some context is required:

- The rural community represents about 16% of the Wairarapa's population, and 10% of its output⁴². Wairarapa is predominantly urban.
- Rural communities are diminishing and losing critical mass. Communities like Tinui and Gladstone work hard against the trends.
- Rural industries are far from stable. Besides climate change they subject to fluctuating market conditions and labour shortages.
- The exodus of young people from rural communities is simply a way of life.
- Water quality measures contained in the WIP and upcoming regulation from central government will have significant impacts and

⁴² Infometrics

farmers have been given time to adapt and change.

Sector leadership such as Federated Farmers, Dairy NZ, Beef+Lamb and the water users groups will be a vital ingredient of a resilience strategy.

➤ Regional and Territorial Local Authorities

All three TLAs are amongst the smallest local authorities in the country with very small ratepayer bases on which to develop their district. There is a growing level of collaboration between them on matters such as economic development and public transport, but much less so on water resilience. This is going to have to change because many of the solutions are Wairarapa-wide and require the combined heft of their resources to achieve.

The Three Waters proposals from central government are likely to see municipal water and wastewater management taken over by a larger organisation potentially comprising the whole of the southern part of the North Island. This will have the effect of separating an important part of the water resilience mix from local control. South Wairarapa has already delegated the management its Three Waters responsibilities to Wellington Water Ltd⁴³.

⁴³ Note, SWDC still owns the three3 water infrastructure assets.

The role to be played by Greater Wellington will prove vital, not only because it has statutory responsibilities for water and environment, but because it has scale in its resources and capability to address the resilience challenges.

➤ **Iwi**

Water resilience is a high interest issue for iwi and hapū in the region. As tangata whenua they have a high level of interest in the region and its resources because they descend from these places. Iwi act on behalf of tangata whenua have a strong interest in the integrity of water and in, as much as possible, restoring and protecting the natural mauri of the water. They will be an important touchstone as we all adjust mindsets. Some iwi members have a very high level of knowledge of water and have been actively involved in prior planning such as the Whaitua. Iwi have their own issues in terms of the sustainability and resilience of their own communities and this needs to be recognised in the context of water resilience.

➤ **Catchment communities and environmental interest groups**

There is a high level of environmental interest in Wairarapa linked to the quality of life values that are shared by many in the community. Many farmers who use water and have water quality challenges on their own

properties are also fishermen and advocates for the natural environment, and therefore understand the importance of clean water. Māori are also farmers and landowners. Concern about the quality of the environment is widespread creating a strong base for cooperative and collaborative action.

Catchment communities/river management groups are a growing feature of the Wairarapa scene. They generally comprise a group of local farmers along a road or within a sub-catchment. As opposed to care groups, catchment groups generally have a plan or are in development of a catchment plan of some sort. Their mission is to improve water quality and biodiversity on a catchment scale, with some wanting to get ahead of regulation. Examples of catchment community groups formed to date are⁴⁴:

- Wainuioru Community River Care Group
- Ahiahuhe EcoZone
- Upper Waipoua Kaitiaki Group
- Parkvale Catchment Group
- Ruakokapatuna Catchment Group
- Ponatahi EcoZone
- Waiohine Action Group (more flood protection related, rather than emergent community led action)
- Mangatarere Group (more flood protection related,

⁴⁴ Pers comm Tash Styles, Land Management Planning, GWRC

rather than emergent
community led action)

There is also the Wairarapa Pukaha to Kawakawa alliance which is a community-led alliance which brings different groups together to focus on the health of ecosystems and waterways. In terms of local leadership the role of all these groups is likely to take on much greater significance, because effective resilience will often need to be implemented (and partially funded) at a catchment level.

➤ **Industries and enterprises**

The number of large water users in Wairarapa is few. With the exception of about five or six notable enterprises (several of which are described in Addendum 8: Characterising industrial water use), most others are relatively small users. Further development of the region seems almost inevitably to involve increased food production ratcheting up the food value chain. Such enterprises can be significant water users and reliability of a clean water supply is usually important to them. How these enterprises “fit” in the future Wairarapa economy is unclear. There is an extent to which they are seen as an anomaly and their focus is largely on securing their current position.

➤ **Urban residents**

There is no current research on urban or public attitudes generally, so we can only surmise. In the sense that quality of lifestyle is a region-wide priority, most residents are environmentally sensitive. With regard to water resilience, their behaviour current wasteful behaviour does not reflect that priority. The felt need to act on water resilience in urban areas is likely to be much weaker than in cities and so urban leadership is likely to be less forthcoming.

The key external players are:

- **Central government** – have just released a regulatory package about freshwater⁴⁵, central government is a key player and probably even more so in the future. Local resources and leadership will not be sufficient to mount an effective resilience Strategy. Central government involvement is essential.
- **Tourism/visitor interests** – tourism businesses and the overarching organisation Destination Wairarapa have a direct interest in the state of the environment and its attractiveness to visitors and use for tourism activities. Leadership from this sector would be expected.
- **Food and product purchasers** – notably the large organisations such as Fonterra and meat processing companies.

⁴⁵ <https://www.mpi.govt.nz/funding-rural-support/environment-and-natural-resources/protecting-freshwater-health/>

Current governance

The key players in the governance of water management are:

- **Greater Wellington Regional Council**
- regulatory obligations, especially under the RMA. Greater Wellington also has a cross-council region-wide responsibility. Greater Wellington also has a series of functions including science, flood, biodiversity, land management and environmental.
- **Territorial local authorities** - the primary focus of these councils is domestic supply of water (to towns) and disposal of storm and wastewater (from towns). Their engagement with rural water is minimal except for their interest in the water races management and the rates generated from rural properties as a contribution to overall funding requirements.
- **Wairarapa Regional Irrigation Trust (WRIT)** - originally formed as a vehicle to accept development grant monies from government is now the single shareholder of Wairarapa Water Limited. The trustees (seven) represent environmental, industry, local government and farmer interests.
- **Wairarapa Water Users Society Incorporated (WWUS)** - a collective representing approximately 60% of the irrigators in the Wairarapa catchment area.

The question remains whether there is sufficient connection and clarity around where leadership for resilience would come from among the current arrangements. Certainly, the collective effort is not sufficiently robust to support this Strategy. There is a great need for structure and focus.

Section VII – Building a Strategy

Chapter 11: Principles and preferences

In this chapter we seek to establish a framework for resilience management, then in the following chapters we apply this framework as best we can to the current situation in Wairarapa.

High level outcome

The high-level outcome chosen for this Strategy to be:

"To develop secure, efficient and resilient supplies of freshwater for all people of the Wairarapa, in a way acceptable to the tangata whenua and within accepted environmental standards."

The use of the word "supplies" is not meant to imply that the Strategy only addresses supply issues, but the more holistic view of the Strategy is challenging to capture into words without becoming very vague.

The Wairarapa Water Resilience Group sees resilience both as an end in itself (retaining the integrity of the natural environment) and as a means to ensuring human prosperity and wellbeing.

Principles

The Group determined a set of principles to guide their thinking. Nine core principles were identified:

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- **Equity** – the load of improving resilience needs to be widely shared across the whole community, though not necessarily equally in terms of geography, seasons or use type. Access to water and the benefits of resilience need also to be widely shared. This includes rural and urban communities, enterprises and industries.
- **Natural resilience** – any measures taken need to blend natural and constructed solutions. There needs to be a strong emphasis on the enhancement of ecosystems that support natural resilience – that is, the capacity of the environment to renew and sustain itself. This includes ideas such as natural character and indigenous biodiversity. On the other hand, towns are an artificial concentration of people requiring specific, predominantly constructed, solutions.
- **Mauri** – the integrity of the water as water is vital to Māori. The gradual restoration and protection of the mauri of Wairarapa water is both a principle and an objective.
- **Prosperity** – actions that might emerge from the Strategy need to be measured with regard to contribution to community prosperity and the viability of businesses and enterprises, mindful of other principles such as equity and natural resilience.

- **Value** – the focus of the use of water needs to be on best value, though value needs to be assessed not just in economic but social and cultural terms.
- **Knowledge** – increasing and improving our knowledge and understanding of water and water resilience where knowledge includes scientific and cultural understanding such as Mātauranga Māori. This includes public understanding of water resilience through information and education.
- **Reliability/consistency** – contemporary urban communities and farming enterprises rely heavily on reliability and consistency of the availability of water. The importance of this principle is increasing, while reliability, as a result of climate change, is abating. The gap is widening.
- **Multiple solutions** – no one solution is going to do the job. Multiple solutions add a security factor in that where one fails or partially succeeds, another might succeed. This principle also draws on the collective effect of multiple interventions which might act as multipliers of each other.
- **Rural and urban as one** – water resilience applies in both rural and urban areas and is a challenge in both settings. Solutions are favoured that add value in both settings.

Priority uses

The Wairarapa Water Resilience Strategy Group went on further to establish some priority water uses. It is recognised that real world situations are not clear cut and

that there are generally many extenuating or genuine circumstances, but these preferences are a guide we can use to order our thinking.

The following uses are preferred ahead of others because of their role in sustaining life and environment. They are regarded as “givens” and in that sense can be removed from further prioritisation of water uses:

- **Environmental bottom lines** –The Whaitua established numerical bottom lines for some attributes and more of a firm sentiment for bottom lines elsewhere but until all their recommendations have passed through the various planning tests to an Operative Plan Change, it is likely numbers relating to bottom lines will change in, as yet, unknown ways. Nothing is a given in the policy/planning space until all appeals are exhausted.
- **Drinking water** – the quality of and access to drinking water is a priority both for urban areas on town supply and rural areas from rainfall, surface and groundwater or other forms of supply.
- **Stock drinking water** – the availability of water for stock in all situations is paramount.
- **Cultural uses** – these are uses that are fundamental to the social and cultural cohesion of communities including but not limited to tangata whenua. Example of cultural use are baptism and cleansing.
- **Non-consumptive uses** – especially those that add to the quality of life of the region and involve minimal

interference with the quality, location or availability of the water for other uses.

- **Capital uses** - this applies to the protection of root stocks, resilience planting and key natural assets from water shortages, which if lost due to lack of water would have long-term adverse impact on the economy and community. For example, protection of root stock for key crops, protection of new and experimental crops designed to achieve land use adaption or protection of resilience planting designed to maintain resilience values.

The Wairarapa Water Resilience Strategy Group believes these priority uses reflect the sentiment of the broad community of Wairarapa and support the principles of Te Mana o Te Wai.

Water resilience practice standards

The Wairarapa Water Resilience Strategy Group also identified a number of what have been termed practice standards. They are like another tier of guidelines beneath the principles outlined above:

- **Maintenance of natural integrity**
Water has integrity in its own right. It deserves to be treated with respect.
- **Water quality protection**
The issues of water quality were addressed by the WIP. Regulation creates a platform of fairness for everyone to contribute to the resilience of water quality. Resilience actions should not compromise water quality.
- **Best and responsible water use**

Water is a common. The actions of one user affects other users. All uses of water are not equal. In a situation of pressure on the water resource, prioritisation of uses becomes important. There is already much careful assessment of best use and very good experience, but scarcity will drive best use even harder.

- **Reduced vulnerability to natural hazards**
There are many threats to water resilience. It should be noted that protection from one hazard may result in vulnerability to another. Thus, narrowing river courses to protect against flood diminishes the opportunity to attenuate water through the use of river-based wetlands or flood plains. Trade-offs informed by science and technology will be required.
- **Adoption of technology**
The water management situation in Wairarapa -and in the wider New Zealand context - is highly modified through generations of human activity. While strategies to restore natural processes can be used where possible, technologies to assist water management will become increasingly important. There is a responsibility on users to adopt technologies and practices that boost resilience.
- **Multiple resilience solutions**
Avoiding dependence on a few favourite solutions. Nature is diverse and so must we be.
- **Adequate redundancy**
Avoiding overworking particular solutions which could result in vulnerability if they happen to fail.

➤ **Robustness**

We will under-estimate the power of climate change with high and prolonged temperatures, at our peril. Our solutions need to be strong, of scale, well designed and carefully managed.

➤ **Sound and enduring governance**

To ensure all elements are well integrated and all parties are engaged. A key to resilience is having everyone involved as a contributor and a beneficiary.

➤ **Sophisticated practices**

Well-conceived and delivered water management practices including more sophisticated dynamic forms of allocation than are currently enabled within the regional planning framework⁴⁶.

➤ **Culture of compliance**

Adequate compliance strategies to ensure the integrity and confidence in the system. Many resilience measures need high participation levels to make them viable.

Identifying preferred solutions

A multi-criteria analysis of uses has been employed to help build preferences around solutions. A set of criteria was developed to do this. These criteria were then run against the various solutions to establish preferences. Five stakeholder groups were used for this exercise – the Wairarapa Water Resilience Group itself

⁴⁶ The regional allocation framework as currently conceived (and unlikely to differ much under the WIP plan change) is quite blunt and probably not fit for medium to longer term where climate change will require such an approach.

undertook the exercise and so did a group nominated by the Wairarapa councils, a group of scientists and experts from Greater Wellington, Ngāti Kahungunu iwi and a group of community stakeholders selected by the Wairarapa Water Resilience Strategy Group.

To undertake this assessment, the following criteria were developed:

i. **Multiple positive impacts**

This criterion recognises resilience solutions that have multiple and wide-ranging beneficial effects:

- a. Flow recession curve – measures that attenuate the flow of water and encourage moisture retention in soil and groundwater
- b. Low flow augmentation – measures that augment low flows, particularly in dry periods
- c. Evaporation reduction – measures that prevent or slow evaporation
- d. Peak flood flow reduction -- measures that slow or spread peak flows, especially in dry period, thereby retaining water

ii. **Support for land use adaption**

- a. High value uses – land uses with sufficient value to enable water resilience management measures

The current regime relies heavily on single numbers (minimum flows, allocation limits, annual volumes etc) whereas the future will require much more nuance and flexibility. Also, our knowledge of the hydrological environments/hydrosphere is not static, it is constantly evolving and therefore our resilience practices need to be as agile.

- iii. **Cultural and lifestyle uses**
 - a. Community cohesion – measures that have broad community benefits
 - b. Cultural – measures that enhance cultural uses, building cultural trust and confidence
 - c. Recreational – measures that enhance recreational uses, leading to happiness and wellness
- iv. **Water quality**
 - a. E-coli reduction
 - b. P reduction
 - c. Surface water N concentration reduction
 - d. Sediment reduction
- v. **Cost efficiency**
 - a. Cost/scale efficiency and capacity – measures that have significant impact and benefits from critical mass savings
- vi. **Productivity**
 - a. Horticultural, agricultural and industrial production
 - b. Volume for abstraction – measures that produce additional water for productive enterprise

- vii. **Access**
 - a. Equity of access – measures that broaden the range and type of access to water
 - b. Spatial access – measures that respond to particular spatial characteristics such as landforms
 - c. Water reliability – measures that supply specific amounts of water at water-critical times
- viii. **Environmental improvement**
 - a. Habitat protection – measures that support indigenous biodiversity
 - b. Water temperature – measures that control water temperature and prevent excessive periphyton growth or algal bloom
 - c. Te mana o te wai – measures that recognise the spiritual context of water and support natural resilience

The following (over page) identifies the potential benefits related to the criteria to help clarify why these criteria were used. They are not presented in the same order as above.

Influences (unranked)	Desired outcome
Community integration/cohesion	Community prosperity
E-Coli reduction	Trend towards limits
Equity of access	Access to water for new users and uses, throughout the valley
Evaporation reduction	Moderation of climate-driven evaporation
Flattening water demand curve	Retaining moisture levels longer into water deficit period
Flow Recession Curve Shape	Looking to flatten the curve
Habitat protection	Maintain and/or enhance
High grade supply (potable urban water)	Water security all year around
High-value uses	Improving the economy/prosperity through water
Land use change	Enable more profitable farming; support water availability
Low flow augmentation especially in water deficit period	Enhance low flows
Water deficit period enhancement	Shifts seasonal water requirements
P reduction in surface water	Trend towards limits
Pasture production	Enhances pasture and removes imported feeds
Peak flood flow reduction	Mitigates
Prevention from algal blooms	Mitigates
Productivity gain	Improves business revenues, production reliability and jobs (where applicable)
Recreational river use	Does not impede at a minimum
Sediment reduction	Does not increase
Strategic availability i.e. known water volumes	Reliability and consistency
Surface water N concentration	Trends towards limits
Surface water temperature	Maintains and moderates
Unit cost	Affordable for users
Volume for abstraction	Sits within allocation rules
Water security	Enhances the environment and productivity
Water efficiency	Drives efficient use and less water 'banking'
Scale - cost-efficiency	More affordable water
System approach	Working together
Water for animal health & welfare	Welfare maintained
Water use transfer - from wet to dry periods	Maintaining access to water throughout the peak-dry period

The water resilience solutions that these criteria were used to measure are outlined in the next chapter.

Chapter 12: Water resilience solutions

We have identified two high level directions to enhance water resilience. The first is through Water Resilience Adaptive Solutions which comprises changes to water and land use practice. The second is MAW Availability Solutions which increases the availability of water through a wide range of improved water management practices. Both practices have application in urban and rural settings and are inter-operable.

Increasing resilience with adaptive solutions

Adaption asks the question what changes are required to our land use, to production systems and lifestyle practices to improve resilience? To make every drop of water count as water scarcity increases, consideration will have to be given to uses and water management practices that are less 'thirsty', especially at critical supply times. Uses that require water in dry periods will need to be producing the value we are looking for from the investment required in MAW availability and the amount of MAW actually available. That value is not just financial but environmental, social and cultural.

High value uses are vital for the future because it is from the revenue of these uses that investment in adaption and MAW must flow. This must apply to land use and land management both in a rural and urban setting.

For Wairarapa this could mean a number of significant adaptive solutions:

a) Diversified land use

The move from monocultural land use practices to more diverse land uses with different water and nutrient profiles is gaining momentum in Wairarapa. Adaptive measures of this nature will be required and the Leftfield recommendations already discussed (p22) have current relevance.

Another element of land use is a move to lower volume higher value land uses. If crops are attracting more market value, then there is potential investment to be turned back into resilience measures. In Canterbury, seed crops have been very successful in this regard.

A variant which is beginning to appear in Wairarapa is the use of more resilient and deep rooting grasses. Substituting conventional rye grass for crops like chicory.

b) Seasonal adjustment

A situation of scarce water supply during the water deficit period is a powerful incentive to, where possible, plant at different times to the traditional growing season. Climate change should be an asset in this regard. It could involve winter crops or simply shifting summer

crops gradually towards the shoulder seasons when water is more plentiful from rainfall or irrigation rights. Some farmers are already adjusting the seasonality of some crops in response to climate change. This could lead to a prioritisation regime for scarce water in the water deficit period, preferring some crops over others at certain times.

This type of thinking is more evident in northerly areas of New Zealand such as Waikato and Northland. In these areas there is a noticeable increase in agricultural production in the pre-summer window. As the frost risk falls in Wairarapa in those months, the potential for it as an extended growing season will increase.

Land use changes

The Leftfield report outlines a wide range of different crops and land uses that have different water demand profiles and different value propositions. Their contention is that gradual changes to land use, driven down from a market lens, will use existing water more efficiently and gain greater value from MAW, particularly water from storage.

Changed land uses also open up the possibility of combining land use and natural resilience strategies in ways already discussed in this paper. Farmer meetings conducted by Leftfield have generated

significant interest as their ideas address mainstream, not just fringe farming concerns. Their work is continuing.

The advantage of off-peak water deficit migration of economic activity is that the development costs may not be as high as some other strategies such as storage that require expensive infrastructure. Shifting farm growing practices to that period can be done incrementally whereas accessing reliable irrigation requires a major capital development. The judicious use of both strategies is conceivable. By moving crops earlier, rainfall may provide enough water at planting and through much of the lifecycle, with additional water required only for finishing. The availability of water through storage can also be used as an incentive to change.

Changes to other industries

The Wairarapa tourism and visitor season is tightly packed into the summer months. Climate change will likely result in more pleasant weather across a wider spread of the year enabling events and activities that normally rely on the settled months of January-March, to broaden their potential operational period, thus spreading water demand associated with the tourism and visitor peak.

Current practices in Wairarapa

It is very difficult to assess to what extent seasonal adjustment is being and actively pursued without surveying farmers. We assume that the pressure for water hasn't yet become so acute that farmers are being forced into this strategy although many farmers base their operations of a drought occurring every summer, i.e. stocking levels and supplementary feed. Timing of growing for products and crops is probably more determined by markets and prices than climate, but this will change.

c) Water reliability and land use management

Reliability is a key consideration in resilience. Some crops or land uses, for example, have very exacting requirements where a period without water of more than a week can stress them. Others need adequate water at a particular moment in their life cycle. Carefully calibrated reliability can make water very productive.

Reliability can be a trade-off for quantity and is a key consideration in this Strategy. This involves the right amount of water just at the right time. Reliability lifts farmer confidence, uncertainty depresses it. If farmers know the exact amount of water that will be available to them they can farm to that level. If they don't, they will farm defensively, mindful that water might be short.

Productivity and efficiency suffers as a result.

d) Allocation

As part of its statutory obligations, water allocation is undertaken by the Greater Wellington as prescribed in the regional plan, and is done on a first-in first-served basis. This historical use approach is practiced around much of the country based on the RMA. This type of allocation system has been used in other arenas such as the establishment of the quota management system for fish species.

There are several weaknesses of this approach:

- It is inflexible and difficult to adapt to changed circumstances such as climate change.
- It makes it difficult for the entry of new users where all the available water is already allocated, but not necessarily used.
- It doesn't differentiate between high and low value uses.

There is a further complication. The current system evolved from an era when water was a 'common' and was plentiful. Water is still a 'common' although there is a national debate around rights and interests (including such concepts as management) of water, particularly by iwi. The outcome of this debate will be crucial to the future

management of water. We know that water is becoming less plentiful in certain locations at particular times. Scarce resources need to be wisely allocated. The current system is a blunt instrument. The Government has a work programme for water allocation reform, including resolution of rights and interests. It is unlikely allocation issues can be totally resolved at a regional level without further statutory intervention, which makes it important to start the thinking process early.

How we allocate water in a more general sense (surface and ground) is a really important part of future resilience and optimisation of water use. Without the right flexibility and innovation in the regulatory allocation framework, many of the other resilience solutions may be thwarted. One of many reasons, by way of an example, for reconsidering allocation is that in the future the re-charging of groundwater aquifers is likely to be done artificially to augment the current natural processes. Practices such as Managed Aquifer Recharge and Managed Retention could be part of the future, particularly the latter. This will mean, without change to the consenting regime, that the current beneficiaries would gain an added benefit at no cost to themselves. Appendix 3: Water banking and Payment for Environmental Services (PES) deals

with the question of payment for environmental services.

These types of requirements are placing new demands on existing practices. A re-think of allocation practices is becoming more and more inevitable if a well-worked resilience programme is to proceed.

Allocation is handled differently in the Waitaki River. There, it is based on a plan, not consents. The plan allocates a quantity of water to, say, an irrigation scheme or a collection of irrigation schemes as with the Waitaki Irrigators' Collective (WIC). The quantity cannot be altered without a plan change or a review (which happens about every 10 years) which helps overcome the problem where consents are extended and increased resulting in incremental over-allocation. Neither is there a hierarchy of consents which we have at present. One key difference is that the hydro schemes of the Waitaki unlike the situation in Wairarapa virtually guarantee a year-round supply of water.

One final point which came up in the section on groundwater, is that there is no guarantee that water directed into groundwater will be available for productive use (that is, for farming). It may not be recoverable in the amounts that it is directed into the ground. The balance, however, may have

significant environmental benefits, such as maintaining rivers and streams above low flows for longer. Who pays for that benefit and how, is another question.

e) Good Management Practice

There are many practices farmers can use to optimise water supply and protect their plants and animals. These bring together a wide range of traditional and new practices. Precision agriculture involves the exact application of nutrient and water to minimise loss into groundwater and runoff. Rotational farming allows recovery periods for soil and vegetation and combinations of uses help build soil profile and moisture retention capacity. Variable rate irrigators (using soil moisture sensing technology) can save up to 20%⁴⁷ of water compared to traditional pivot irrigators.

In other parts of the country, Good Management Practice (GMP) incorporates a range of farming practices that control the release of contaminants, particularly nitrogen with the objective of improved water quality. Regenerative agriculture is gaining interest and draws on the practices of natural resilience. It involves using natural processes such as mulching and

composting to retain moisture in the soil. Urban GMP applies to gardening and public amenity practices that retain water through protection from evaporation. Highly interesting work is being done in Melbourne and throughout the state of Victoria to retain water through good practice. Known as Water Sensitive Cities, it is a highly innovative programme of urban water resilience.

Current practice in Wairarapa

The idea of GMP evolved in the WIP where it is outlined in some detail and this provides a sound basis for the resilience strategy. Many farmers practice aspects of GMP. It is not, however, universally practiced as a discipline in the region and arguably should emerge more strongly in the future.

f) Other aspects of seasonal use

We know that demand for water in the Wairarapa will continue to rise sharply in the summer, usually starting in January. There are tourists, and prized gardens, to water. Some parts of the country have been successful in spreading the tourist/visitor load into the shoulder seasons. Besides helping the water situation, it also spreads the season for hotels, restaurants and other hospitality services.

⁴⁷ Mark Guscott, South Wairarapa breeding, finishing and cropping of cereal, feed and small seeds farmer with 150ha irrigated

In the report by the consultancy organisation Leftfield Innovation⁴⁸, commissioned by Wairarapa Water Limited there is an extensive range of suggested adaptive approaches for the best use of water in agriculture. Many of these are dealt with in later chapters. The core of their argument centres on reliability rather than volume of supply. *"Reliable water provides the opportunity to rethink land use in the Wairarapa by taking a holistic look at potential land use in the future and to design land use systems, predominantly farming systems, that are diversified and integrate a range of complementary land uses within a parcel of land suited to the soil type, water availability, climate, location and community."*⁴⁹ Improvements in the reliability of water can be achieved through storage and changes to the consent regime.

The purpose of the Leftfield report is to identify the best use of water from irrigation, but the principles that they are applying are just as relevant to resilience for the whole valley. The report outlines those land uses that currently exist, where more value can be captured through a redesign of the value chain and more enabling collaboration

between farmers, local processors and food companies.

They go on to identify ten value capture opportunities including grapes, olives, wheat, peas, ancient grains and pulses, eggs, meat and indigenous plantings. They also identify a further four value creation opportunities including hops, pipfruit and summer fruit, vegetables for export, sheep and goat dairy.

Leftfield make the point that *"the viability of the proposed water storage scheme will depend on the stakeholders across the proposed uses seeing the potential of the Scheme to establish a resilient environment for the Wairarapa community to the extent where stakeholders commit investment to build and operate the Scheme"*. It would be through adaptive land use enabled by reliable water that a storage scheme can contribute to the water resilience of Wairarapa as well as its productivity.

g) Soil decompaction

Less compacted soil allows the leakage of water into the soil and possibly into groundwater, thereby holding water in the ecosystem. Compaction of soil is a direct result of land use, particularly stock; it is

⁴⁸ 'Near-Term Opportunities for Value - Wairarapa Land Use Evaluation Study' - Leftfield Innovation Limited 2020
https://www.wwl.net.nz/web/documents/library/Land-use-Opportunities-Report_-17-June-2020.pdf

⁴⁹ 'Near-Term Opportunities for Value - Wairarapa Land Use Evaluation Study' - Leftfield Innovation Limited 2020
https://www.wwl.net.nz/web/documents/library/Land-use-Opportunities-Report_-17-June-2020.pdf

also a function of the particular soil properties in an area.

Decompaction can be achieved by changes in land use. Decompaction also allows plant roots to penetrate deeper, and oxygen to get into the soils by providing an enhanced habitat for organisms such as earthworms to aerate the soil.

The potential scale of contribution of soil decompaction to water supply is not known and any estimate would be speculative. Similarly, the cost and loss of revenue involved is not well understood. Nevertheless, soil decompaction strategies need to enter our considerations over the next 10-20 years.

These adaptive measures largely apply to rural activities, but the same thinking can be applied to urban areas. We have already referenced the "Sponge City" idea, which is adapting urban infrastructure and practices that retain soil moisture and create microclimates. Activities include increased green spaces to complement sealed areas such as in carparks, use of permeable surfaces in urban areas to allow soakage of rainwater, use of artificial shading to retain soil moisture, and indoor/outdoor structures that reduce the evaporation effects of hot sun.

The Chinese have developed extensive roof and vertical gardens. They have also developed water features to retain moisture levels in the air at critical times of the year. Some of these adaptive measures may be a bridge too far for Wairarapa, but illustrate the potential of

lateral thinking when it comes to climate change adaption. The idea of domestic tanks for rainfall harvesting was recently considered (and rejected on the basis of cost) by South Wairarapa District Council, while more in the "MAW" category, is an example of creative thinking around adaption.

Domestic adaptive gardening practices including strategic tree planting and ground cover, together with mulching and similar practices to retain soil moisture both to protect vegetation but also to create microclimates especially during the water deficit period.

Increasing resilience with more available water ('MAW')

The idea of 'new' water has been developed to help us think about resilience. MAW is simply a way of describing more available water (MAW); this doesn't include water that is already allocated which may or may not be used. We can ensure more available water by, for example, re-allocating previously (unused) allocated water, using less to achieve the same outcome, or using water more than once, minimising wastage or storing it during high supply periods for use in low supply periods. Generating MAW will be vital with high rates of water loss due to climate change-induced evapotranspiration. MAW can also include newly discovered water sources such as deep groundwater sources.

Potentially we can use this MAW to trigger or support natural processes of resilience

as well as augment functional applications such as rural and urban supply. 'New' water is not without cost. It sometimes requires infrastructure, treatment processes and active management. There is also a challenge to ensure that it does not come at the cost of the environment (such as high energy costs), biodiversity loss and water quality deterioration or unintentionally cause detrimental effects on connected water bodies.

The most important methods of 'generating' MAW are:

1. Non-consumptive use

Some uses consume water, reducing its utility for other uses, some don't. This is the difference between consumptive and non-consumptive water use. Essentially, whether it's considered as a non-consumptive use takes into account the volume used (if any), maintenance of water quality, the distance between water abstracted and then discharged (if any) and the net ecological benefits of the water use.

Non-consumptive uses are those where the water is "used" but the nature of the activity or the access to it is not diminished. It is used but not "used up". Tourism is an obvious example of non-consumptive (or low consumption) use where we look at it, swim, paddle or ski on it, but do not consume it. Hydro-electric generation is another example of a largely non-consumptive use, although it's very limited in Wairarapa. Water comes out of the electricity generator in the same form as it goes in. There is modification to the

environment to create the facility to generate electricity, but the water itself is not modified and could be used again.

Most uses in Wairarapa are consumptive, and in many cases, single-use consumptive, meaning the water, once used, is not available for any other use, or if it is available there is a significant cost in restoring it to sufficient levels of quality for other uses.

In looking at the future economy of Wairarapa, which is likely to be in the tertiary and quaternary sectors, then ideally that economy should be giving higher priority to activities that are non-consumptive, if at all possible.

Recreation, wellness, tourism and visitor activities score highly on non-consumptive applications, but also economies that have increasingly high levels of tertiary and quaternary activity (services and technology) apply less pressure on water than others such as manufacturing, industrial and primary industries. The point needs to be made that tourists might not consume water when swimming in it, but they do consume it back at the motel, in the restaurant and at the car wash. Non-consumptive use is a 'net' rather than 'absolute' measure.

The point is that water can create value without being consumed.

2. Water use efficiency

Water use efficiency is a key resilience idea. Too often we use far more water than we need whether that is in the rural

or urban setting. Where water meters have been introduced around the country⁵⁰ they have demonstrated that simply making people aware of their water use (and attributing a cost to it) makes them more careful and reduces volume use provided that the costing structure reflects that to occur.

We have shown per capita water use rates are high in Wairarapa. Modern spray irrigation systems support efficient use as do water regulators on toilets and showers.

Some uses produce far greater benefits than others. For example, different land uses require different amounts of water. The water required for horticultural products is generally greater than for arable products and so on. What can be produced from natural water supply (i.e. rainfall) and what is only possible with augmented supply such as irrigation, may be different. This formula will change with climate change, and between years i.e. wet and dry summers.

More efficient use potentially increases the amount of available water for other uses depending on what has been consented. The nature of that availability will vary depending on how the available water is 'captured'. For example, if more efficient domestic supply systems are achieved, less water would be required

and the balance could be left in the river to support minimum flows, or it could be directed into wetlands during dry periods or for managed aquifer recharge. It could be held in storage for domestic supply to increase the resilience of that supply. In this case, resilience is maintaining supply during periods without rain.

There are examples from Asia and particularly India where halving water for rice growth, done well, does not impact production.⁵¹

Summary of available efficiency solutions:

- **Public education and water conservation including metering**
 - Metering is currently being introduced across Wairarapa and is expected to have a significant impact on public and consumer awareness of water use. All three councils are advanced in the installation of metering.
 - They are not generally using metering as a basis for charging, but that is the intention and is likely to happen soon and it is expected to reduce water consumption. One of the great benefits is that meters help detect leakage from the network.
 - Public education is practised by all the local councils, particularly in the summer dry periods,

⁵⁰ For example, Whangarei, Western Bay of Plenty, Nelson, Far North District Council, Hauraki, Selwyn, Kapiti Coast, Tasman, Auckland, Tauranga, Christchurch, Whakatane, Waipa and Central Otago councils have also installed water meters.

<https://www.newsroom.co.nz/water-meters-the-awkward-question#:~:text=Metered%20areas%20are%3A%20Whangarei%2C%20Western,Whakatane%2C%20Waipa%20and%20Central%20Otago.>

⁵¹ BBC ibid

sometimes leading to rationing. At present public education is around curtailing use temporarily during 'crisis' periods rather than long-term behaviour change.

- **Rural water use efficiency**

- Irrigation infrastructure upgrades are happening all the time as irrigation technology improves.
- The irrigation technology used in Wairarapa could be described as advancing, but somewhat behind industry best standards. Techniques such as border dyke (flood irrigation), and roto-rainers are no longer in common use; K-Lines are still quite commonly used - all have the common problem of over-watering as they are essentially static and/or deliver bulk water. Centre pivots are commonly used, but the variable rate pivots are still uncommon. One Wairarapa farmer who has recently installed such a system (together with soil moisture sensing technology) has reported a 19% improvement in efficiency, or to put it differently a 19%⁵² increase in water availability from his consent.
- Both carrots and sticks can be used through farm environment planning and education to educate rural users and this can be delivered through existing or anticipated structures such as is done through Fonterra and other bodies.

⁵² Mark Guscott, Wairarapa farmer - verbal estimate

- **Urban water use efficiency**

- Each of the councils is involved in a programme of infrastructure upgrades with improvements to municipal piping to reduce leakage. It is likely that there are some easy wins but part of the problem will be aged infrastructure requiring substantial upgrade and involving substantial cost.

- **Seasonal water rationing**

- This is practiced in crisis periods and is a relatively crude and cheap method of improving efficiency. It is also short-lived. It is crude because it doesn't differentiate (except to a small extent) between uses, some of which may be more important than others. Other methods of efficiency are better than rationing, but they involve significant improvement to water management.

- **Seasonal public education programmes**

- Wairarapa people are sensitive to water scarcity and awareness levels are high. Public education is most effective at times of crisis, but, like rationing, it is generally crude and can result in irrational behaviours. For example, irrigators, knowing that water availability is to be rationed, may deliberately over-water before

access to water is curtailed. Some urban gardeners are known to be midnight waterers.

3. Water re-use or multiple use

Once water essentially becomes sewage, it has too often simply been disposed of. Yet practices are changing. There are trends to re-use of treated wastewater where it is treated and sprayed onto land to water trees or grass for agricultural use. This method has become necessary because of restrictions on releasing treated sewage into waterways, not specifically for the purposes of re-use. If utilised correctly, re-use of treated effluent is a windfall benefit. At this point, the amount sprayed to land is relatively small (around 10%) as it is largely done in the summer low-flow period rather than winter when there are higher rates of dilution in rivers and soils are generally saturated. This percentage will increase as more infrastructure comes on stream such as the treated effluent ponds south of Carterton.

Re-use is particularly applicable to large water users or uses, but also has micro applications. The big users are the councils through domestic supply which generate sewage waste. Large industrial users face similar problems and are forced to treat their waste water to quite high levels or even re-use it in their processes. Water treatment is a cost of doing business for these types of enterprises and, given that many are large users, the ability to re-use becomes essential if they are going to have a place in a future-resilient Wairarapa.

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Re-use has significant health, hygiene and contamination limitations depending on the nature of the previous use and the level of treatment applied. Some used and re-used water, such as that from farmland, can also be passed through wetlands that have significant filtration capability – an example of using natural resilience to strengthen overall resilience. Generally though, constructed wetlands are expensive to build and require knowledge how to operate them efficiently.

Water re-use as a result of sewage mining cannot be used for crops that lead directly to human consumption – at least not without significant controls and restrictions.

Summary of available re-use solutions

- **Domestic wastewater**
Treatment and use for spray irrigation on land or for specialist uses such as nurseries (not groundwater augmentation) is being practiced by all three Wairarapa councils and the practice is expanding. Its use advantage is protection of rivers which would otherwise receive treated wastewater. Carterton in particular is currently significantly expanding its re-use capacity.
- **Industrial wastewater**
In Addendum 8: Characterising industrial water use there is information on industrial use. Treatment and re-use by industrial plants is well-established. Several Wairarapa enterprises engage in re-use or treatment notably JNL, Premier

Beehive, Breadcraft and others. Enterprises that add value to primary products are likely to be a feature of the future economy and with that will come greater re-use.

- **Grey water**

Grey water use is not common in Wairarapa. This involves the re-use of wastewater from washing machines and kitchen applications and applies in particularly water-short urban areas. The practice is promoted by the Council in Kapiti and is used to water gardens, but experience has not been wholly satisfactory with the build-up of contaminants in some soils.

- **Farm drains**

Collection of water from farm drains and storing it in tanks for later use has been explored in Wairarapa. This has the advantage of recycling nutrients with the water. It involves the building of significant infrastructure, yet there are indications that in some circumstances it could be viable.

4. **Managed retention**

We can increase the availability of water simply by slowing its progress through the catchment system by directing a greater quantity of water into groundwater. This is consistent with a major thrust of the WIP. There are several advantages of this approach. It slows the water making it available for a longer period of time. It cools the water so that when it comes back to the surface it is less likely to spawn algal blooms and such biohazards

that damage waterways. Groundwater is also protected from evaporation.

Managed retention solutions have a particular strategic role to play in a resilience strategy besides the advantages already listed. It has already been explained that "freshest" through spring and summer will continue to be a feature of climate change. These freshest have the ability to capture water in larger quantities than current practices would allow. This means that groundwater can be regularly replenished allowing it to be more available into the water-deficit period.

Retention can be practiced in all manner of locations: across the valley in suitable places; in hill country use of traditional dams (generally for stock water) is common. Leaky dams, nano dams (or mini-dams) that slow the runoff of water can also be used. Use of contour channels in hill country can have the same effect.

Water can be held (though for how long is not well understood) in groundwater, so the more water that passes into groundwater the better. Water can be held in rivers and more especially in the fringes of rivers such as in wetlands, associated streams and even constructed water races.

Summary of managed retention solutions:

- **Detention bunds**

These are mini dam-type structures that delay the passage of water in streams and waterways, but do not totally obstruct it. For example, in a

moderate “fresh” streams will be obstructed by bunds and water will be held to pond for several days and leak into the aquifers. In this way it is retained. The temporary nature of the detainment of the water means that there is a low-level of damage to the farmland that is temporarily flooded.

Anecdotal evidence from farmers practicing this solution is that while few are doing it, it is neither difficult nor expensive. The problem is seen as motivating farmers to incorporate this type of activity into their practice.

There are some questions to answer:

- Is in-stream obstruction allowable under current planning rules?
- How will bunds stand up to severe flood events; do they risk getting washed out so tidy up works are required as well as constructing replacement bunds?
- How are they maintained on an ongoing basis?
- Would they require easements on private land and how would this be done?
- Will the bunds make a discernible difference to water infiltration i.e. does the cost benefit stack up?
- What cost structures would be required to reward farmers who build bunds but derive no benefit for themselves?
- What charging regimes for the downstream water users?

- Will their construction and operation require resource consent?

None of these is a game-breakers but they need investigation and proof of concept given that there seem to be very few live examples in New Zealand. Part of the reason for this, if Wairarapa is an example, is that the use of such bunds is not permitted and this would need to change if they are going to be recommended.

- **Accessing natural flood plains**
Flood management efforts over the years have resulted in a network of stopbanks built to narrow river courses and speed the pathway of water to the sea. Their purpose was to capture river fringes (generally flood plains) for agriculture and to protect those areas and human settlement from flood. Natural flood plains were a valuable source of natural retention as water soaked into groundwater. Managed systems of using old flood plains are potential resilience solutions. For example, gates could be installed in stopbanks to allow controlled flooding of specified areas during freshes, or wider channels could be allowed for rivers. There is a proposal to allow the Ruamāhanga to empty once again into Lake Wairarapa which would involve using flood plains for water retention. This could involve some sort of managed retreat or

partial retreat, a technique that is used extensively in the UK.

Without identifying particular locations and assessing viability and cost, it is difficult to know the potential of this solutions. Anecdotal evidence suggests there is moderate and worthwhile potential to investigate this option.



Detainment or detention bunds

There are many forms of detainment or detention bunds (DB) in terms of scale, their exact purpose (target role), effectiveness, volume of water held, storage time, design, and their effect on farm productivity. They are not dams, as their purpose is to intercept and impound water only for a temporary period. They're also known as dry ponds as they are dry between storm events.

Detention bunds need fairly porous soils or subsurface drainage to assure that the bottom stays dry and live with vegetation between storms. They are not suitable in areas with high water tables or shallow depth to bedrock or on fill sites or steep slopes unless geo-technically checked.

Generally, they would fill when sufficient overland flows are created as indicated by the number of occasions ephemeral streams flow over farmland, i.e. only a few times a year. This gives an indication of how often soakage into groundwater would actually occur.

They can be used to control or mitigate sediment, nutrients, erosion prevention, and diversion of surface water into groundwater. A smaller scale of these are most commonly used as a means on control on projects involving earthworks. Numerous trials have been conducted over the past decade mainly by the Phosphorus Mitigation Project. In their experience, only one proposed DB site for every three sites investigated is actually suitable. The following link details the studies conducted by Phosphorus Mitigation Project:
<https://atlas.boprc.govt.nz/api/v1/edms/document/A3539038/content>

There are no known full catchment scale, purpose-built detention bunds in New Zealand, although some structures (e.g. road or rail embankments) or natural landforms may inadvertently perform or operate in this manner; they are usually drained by small culverts which eventually drain any water backlog.

Issues such as cost to construct, land tenure/legal status, maintenance responsibilities, how they perform under extreme (flood) conditions would need to be assessed, i.e. could they structurally withstand such conditions, etc.

- **Nano dams, leaky dams and straw dams**

These are similar to bunds, but in hill country. They inhibit water flow, allowing it to pond and soak away into the soil and groundwater. They also have the advantage of inhibiting the flow of sediment off hills and into rivers, thereby enhancing water quality. These can be associated with the contouring of sloping land to retain soil moisture.

These are not common practices in the region (nor in New Zealand more generally) in part because many parts of Wairarapa hill country are too steep. Maintenance issues and

failures can lead to sediment problems. The geology has to be suitable for them to work.

Traditional stock water dams also have a role to play in slowing water down and collecting sediment.

- **Repurposing water races**

The issues surrounding water races are dealt with in its own chapter. In respect of the future of water races this is a nettle that needs to be grasped because of their high water usage in times of scarcity. The WIP recommended (Rec 12):

"The Committee recommends that water use efficiency be improved among all water users in the Ruamāhanga whaitua, including by: Greater Wellington and territorial authorities working together to develop long term plans for the management of water races in the Ruamāhanga whaitua that meet the objectives of this WIP and provide for the values of the water bodies and communities".

5. Natural attenuation

Another method of holding water within the catchment is natural attenuation which comes in many forms. Water can be held in soil at different levels of the soil structure and in vegetation growing in the soils. Vegetation can protect soils from evaporation and enable them to carry more water longer. Water is also filtered and cleansed through natural attenuation such as wetlands, so there are multiple benefits. Natural attenuation practices are vital in restoring and protecting the mauri of the water because they both retain and cleanse water.



E KORE A REPO KI TE KORE A RAUROI

The potential of wetlands to the potential of organisms

Summary of natural attenuation solutions:

- **Land cover and afforestation**
This involves planting of vegetation to retain water in the soil, shade pastures and protect headwaters and is well accepted as a means of retaining water and soil moisture. This is different from forestation for timber or for carbon, although the uses could overlap.
- **Wetlands regeneration**
The restoration and development of wetlands has multiple benefits of 'cleaning' and retaining water. Wetlands provide habitat and areas of public amenity interest. Interest in wetland development is expanding in Wairarapa, though it is still limited to a relatively few farmers. There are benefits in "cleansing" farm run-off, improving aesthetics, supporting indigenous biodiversity, game bird habitats, flood protection, climate change mitigation and dealing with problem areas on farms and all that with relatively little loss of productivity.



Kaiwairai constructed wetland, South Wairarapa

The construction of this wetland cost of \$55,000 – 25% paid by the landowners, the rest by a diverse group of funders – the 0.75 ha wetland. It's a controlled wetland with 10 litres of water per second going through it every day of the year, providing an opportunity to monitor its effect through changing temperatures. Up to half a tonne of nitrates a year were being removed by this wetland. At times the discharged water contained no nitrates.

- **Riparian planting**

Planting streams and rivers retains soil moisture, moderates water temperature and slows the progress of water through the catchment. In these respects, it plays an important function. Riparian development also provides shading to reduce evaporation and periphyton and algal bloom growth and has many of the advantages of wetlands. Riparian planting comes at a significant cost of averaging about \$60,000 per linear kilometre to plant and fence both

sides; this doesn't include the balance of the land 'lost' to production versus the value gained by the environment.



Wairarapa Moana riparian plantings

The Wairarapa Moana Project is incrementally restoring the wetland habitat around the edge of Lake Wairarapa and Lake Ōnoke, collectively known as Wairarapa Moana. As in the above photo, the works includes fencing and plantings.

- **Lake enhancement**

There are a number of lakes in the Wairarapa, with the most notable being Lake Wairarapa itself. Enhancement of the edges, redevelopment of wetland and transition zones all contribute to retaining moisture. There is significant wetland activity around Wairarapa Moana in a partnership involving Greater Wellington, DOC iwi and landowners.

- **Water Sensitive Towns**

This would involve an active programme of natural resilience development in urban areas including extensive tree planting on public and private land, wetlands and planted areas in and around town centres, all with the purpose of retaining moisture in the environment.

6. **Groundwater augmentation**

There are established technologies for directing water into aquifers. Known as groundwater augmentation or Managed Aquifer Recharge (MAR) it

involves either passively directing or actively pumping surface water into aquifers.

There are no known full-scale operational examples in New Zealand, but there are in other countries. At a minimum, MAR relies on a reliable water supply and suitable geology; the combination of both in the Wairarapa has yet to be determined, so its efficacy is unknown.

Summary of groundwater augmentation solutions:

- **Managed Aquifer Recharge (MAR)**

MAR is the deliberate transfer of surface water into aquifers; the two main approaches to achieve this are by surface infiltration or deep well injection. Sometimes, the water is recoverable and this is discussed in the next chapter on groundwater.

In New Zealand, three pilot projects are being investigated using both options, namely:

- i. The Gisborne Makauri aquifer project aims to inject water from the Waipaoa River into the Makauri aquifer to ensure its ongoing use for irrigation of 3,000

hectares of horticultural farmland.

- ii. Hawkes Bay Regional Council trials will capture surface water from streams or rivers during winter high flow periods, settling and filtering that water and then recharging it into the aquifers below the Ruataniwha Plains.

- iii. The Hekeao Hinds scheme in mid Canterbury is in its fourth year of trials now involving 12 active recharge sites. Goals for the scheme are to:
 - Reduce or maintain groundwater nutrient levels to the community desired levels
 - Increase groundwater levels and storage
 - Enhance lowland stream flows and biodiversity
 - Ensure that the Scheme is affordable and cost effective to the community, and
 - Establish and maintain community acceptance for the Scheme.

The attractiveness of MAR may be that reliance on water naturally soaking into the groundwater such as through retention solutions is too slow and the volumes too small. Drilling reverse bores and pumping water into the aquifers is costly

and there is no guarantee that the water can be recovered. This water may have to be pumped into deep aquifers to be recoverable, of which there are few. If it were pumped into shallow aquifers the water could be lost as part of the dynamic groundwater profile and likely rise back into the rivers it has just been taken from.

To further complicate matters, the advantages of aquifer recharge is not necessary in the winter months because the natural processes are replenishing the aquifers. Artificial

replenishment, if it is to be effective, is required immediately before and into the water deficit period at a time when the supply of water for Managed Aquifer Recharge is rapidly falling (unless it is drawn from stored water).

Finally, MAR can transport contaminants directly into the aquifers, which creates issues for human use. Environmental monitoring will be a large cost for any MAR project to consider.

If it is to be used it is likely to be very tactical in nature rather than as a region-wide solution.



Managed Aquifer Recharge - The Hekeao/Hinds Managed Aquifer Recharge (MAR) Project

The Hekeao/Hinds Managed Aquifer Recharge (MAR) pilot project on the Canterbury Plains aims to replenish and improve the health of the aquifer and water quality by injecting alpine river water supplied by local water races. Such schemes can also be utilised when surface water storage is not an option. Trials are also underway for a MAR schemes in Poverty Bay, Gisborne. It is also being considered for Hawke's Bay's Ruataniwha aquifer.

The concept has been used all over the world with various forms of success and outcomes. As such, a pilot usually needs to be tested for specific sites to determine, amongst other things, that it works in that area.

Closely aligned to MAR is the Kapiti River Recharge scheme. As the KCDC website reports: the River recharge with groundwater scheme allows more fresh water to be taken from Waikanae River while maintaining the river's ecological balance and required minimum flow.

Rainwater is filtered through sands and gravels and seeps into the deep Waimea aquifer, which provides natural underground storage. In times of low-river flow, water from the aquifer will be pumped and discharged into the river downstream of the Waikanae Treatment Plant intake.

This means the taste and quality of the water that comes out of taps will not be affected by groundwater being added to the river, as it will not enter water supply.

As well as enabling consistent high quality water, the consented extra extraction allowed secures supply for future growth in the Waikanae, Raumati and Paraparaumu areas until 2048.

- **Deep groundwater**

Although the 'discovery' and/or utilisation of deep groundwater is not the same as groundwater augmentation or managed aquifer recharge detailed above, it is discussed here because of the obvious linkage. To be clear, the presence of deep groundwater is natural; it does not involve an artificial direction of water to these depths.

It is well known that there is natural deep groundwater in some areas of Wairarapa, though it is not well mapped due to the complexity of groundwater reserves. The proposed electromagnetic survey of the region will likely identify the extent of deep groundwater and whether it is useable and retrievable.

7. Storage

Water can be stored naturally and artificially. Groundwater is a major natural storage facility. Groundwater is vital to resilience

and is relevant to both storage and attenuation.

Bulk constructed storage such as that proposed at the Wakamoekau site is intended for agriculture, industrial, municipal, amenity purposes. The proposed facility is small by New Zealand standards and smaller than the Opuha water storage reservoirs in South Canterbury (photo). Towns in Wairarapa currently have very limited storage for domestic supply, largely to control fluctuations in demand; future demands created by climate change especially means that larger or storage buffers may have to be considered by the councils; the councils have signalled need for further storage in their future budgets. Another option is for the councils to consider an integrated approach, or build their own storage.

Smaller constructed storage facilities are also used such as on-farm storage ponds in rural areas or rainwater capture tanks in urban areas or on lifestyle blocks remote from domestic supply networks.

- **Bulk storage**

The Wairarapa Water Project is currently undertaking a feasibility study for a storage facility at Wakamoekau. This will, if it proceeds, provide a significant increase in stored water in the middle to upper level of the Ruamāhanga Catchment.

Appendix 4: Irrigation and constructed water storage is set aside for irrigation and storage.

Such reservoirs can also provide a range of other services besides rural supply, such as commercial, domestic, industrial supplies, and amenity values.

- **On-farm storage**

On-farm storage is relatively common in Wairarapa. Reticulation schemes aim to eliminate them. They are used for irrigation, stock water and frost fighting. These are ponds topped up at high-water times, perhaps from a bulk storage facility or groundwater or from farm drains and used for tactical watering.

Private on-farm dams of reasonable size in the Wairarapa are currently located at⁵³:

- Carterton
- Northwest of Masterton
- Craggy Range (Martinborough)
- Two in the eastern hill country
- East Taratahi/Dakins Road

⁵³ Pers comm Stephen Thawley, Environmental Regulation, GWRC. Specific examples provided to the Wairarapa Water Resilience Strategy Group include – Rupert

Handyside on Upper Plains (400,000 cubic metres), Len French has one under construction.



Large scale community water storage

Lake Opuha is one of the few examples in New Zealand of a large scale dam built specifically for water storage purposes other than the network of hydroelectric dams, some of which also supply rural and urban water supplies.

Lake Opuha (pictured above) is a 700 hectare lake, built with the purpose of acting as an irrigation reservoir. The lake lies 12km from Fairlie.

Stored winter and spring river flows are released in summer for stock and crop watering, as well as for Timaru's domestic and industrial use. In addition to water storage, the lake provides electricity with a small-scale hydro 7.5MW electric plant on the outlet of the dam at the head of the Opuha River gorge.

Another example currently being constructed is the Waimea Dam close to Nelson. In addition to supply the Waimea Plains horticulture industry with reliable water it will also augment the Nelson and Tasman area urban water supplies.



Farm scale water storage

Individual properties can have their own water storage reservoirs. These are typically constructed and managed by the property owner, including construction, maintenance and pumping costs. Compared with other water deficit East Coast locations such as Canterbury, Hawkes Bay or Gisborne, there are very few examples of these in the Wairarapa.

Commonly, because of the relatively small volume they hold, use of the water is usually limited to specific events or circumstances such as frost fighting, crop watering or to carry over when consents prevent abstraction from surface or groundwater. Other than for frost fighting, they help to carry a farmer over water critical periods.

In such cases, if the reservoir is emptied, the water stored may not be able to be replaced until a later date once restrictions are eased.

- **Rural stormwater collection**

Collecting water from farm drains and storing it on-farm as a hedge in the peak season is being considered in Wairarapa, but there is no known practice current in operation. This has an added advantage of recycling nutrients lost with water.

- **Rainwater harvesting**

Tanks on domestic properties for rainwater harvesting is under consideration by all councils as they are all involved in the one (combined) district plan but is expensive. South Wairarapa District council is considering this option. Most rural users have their own rainwater capture. Although it is a tactical response, thinking of it in the long-term for new properties, it has merit.

The use of potable water for watering gardens is wasteful, yet alternatives such as grey water use are unproven. This may be an application for rainwater capture in residential areas. A voluntary scheme might eventually segue into a compulsory one for significant users (based on metering).

Because of the controversial nature of constructed and particularly bulk storage, a number of principles have been developed by the Wairarapa Water Resilience Strategy Group to ensure that storage takes its correct place in the mix

of resilience solutions. These principles are for guidance. They are not absolute.

The principles are:

- All things being equal, natural solutions would trump constructed ones, so natural storage would trump constructed storage.
- Adoption of constructed storage should not, as best as possible, impede the focus on natural solutions either in technical terms or in the minds of water users.
- Constructed storage should be used, as best as possible, for high-value uses so that water moves to the uses of highest value.
- Constructed storage can be used as a backstop to provide the needs of human health when other solutions either are ineffective or cannot supply the volume of water required.
- Constructed storage should try to include natural solutions as part of a package as it is developed, especially to offset environmental impacts. These could include riparian planting around the facility and wetland construction.
- Constructed storage is developed in the context of this Resilience Strategy and not outside of it.

Other resilience mechanisms

There are other mechanisms that can be used to manage the use of water – the allocation regime, regulation, education and price. Because water is a common and technically owned by no one, it cannot be bought or sold, just used. The RMA gives priority to existing consent holders on a first-in-first-served basis. Also, consents are a property right (for as long as they exist) so they are attached to the land, not the consent holder.

Utilities such as councils or Watercare in Auckland can charge for the supply of water – the cost of the infrastructure – but not for the actual water itself. They can and do charge for water on the basis of usage, but it is still for the supply, not the water. The Wakamoekau Scheme will also require payment for the infrastructure to deliver secure water, although the details of this are still under development.

As a result, there is limited scope in the rural setting where farmers source their own water to use price as a method of demand control. Rising demand and slowing supply will increase the value of water, but as water is a common – a free – commodity – this will not be reflected in increased costs for users, with potential compensating reductions in usage.

This lack of access to price mechanisms means that if supply is to be controlled, it has to be done through regulation. This is already the case. All bulk water users such as farmers, councils, and industrial users require consents from the regional council.

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Farmers often have the expectation that because of historical use they have a right to renew their consent with roughly similar consent conditions – renewal of existing consents take their actual use needs into account.

Regulatory mechanisms of this nature are very inflexible. They do not, by and large, differentiate between uses. For example, they do not specifically direct water to higher value uses and they allow water for low value uses, or in some cases no use at all, where consent holders do not use their full allocation. Consents are subject to availability and water supply is constrained at low-flow periods. The changing demand and supply situation will be increasingly expressed in water scarcity such as seasonal shortages as climate change effects take hold.

While this arrangement was acceptable historically, in a situation of climate change and the need to consider priority uses of a scarce resource, it is less acceptable. Add to that the possibility that measures such as groundwater augmentation and various attenuation methods are used to build groundwater, then some control may be required over access rights. This is dealt with in more detail in Appendix 3: Water banking and Payment for Environmental Services (PES) on water banking.

Similarly, with weak price signals for municipal supply, there is little incentive for private residents to reduce rates of leakage on or under their land either because they are not paying, or they are

paying so little it doesn't much affect their demand behaviour. However, it's intended that this situation may change.

This is a deep irony in all this, because a commodity that is becoming more valuable and more degraded by the day is unable to realise that value even to protect itself from further wastage and degradation. If we are to become resilient we must solve this conundrum.

Ownership and management of water is a national issue subject to national political debate, especially around the question of tangata whenua ownership. The ownership and management status of water could change in the foreseeable future, but it may not.



Chapter 13: Optimisation

The most challenging aspect of this report is to establish not only the direction of a resilience strategy, but to indicate priorities so that it can be translated into policy and action by the various agencies responsible for resilience.

Essence of the solution

The core of the problem, we foresee today, is the water deficit period of January to March. From a rural perspective, if the water deficit period covers more and more of the current growing season for crops and pasture, growth will be adversely affected.

Despite all the actions proposed to moderate demand more water will need to be retained in the ecosystem. The key is the freshes that climate modelling tells us will still take place, but with somewhat less volume. Retaining as much water as possible from these freshes, especially in the immediate pre-water deficit period of October to December, will be vital to resilience. They will produce enough water, but how to collect, retain and distribute it?

They become even more important when it is considered that 'normal' recharge of natural water sources will likely be interrupted by drought conditions brought on by dry winters following dry summers. We are concerned about protection of supply for human use and environmental use.

We have two objectives:

- To minimise extreme effects of lack of water in the water deficit period when they arise; and
- Slowing the encroachment of the water deficit impacts into April (and beyond).

Every solution has its strengths and limitations, possibly accompanied by unintended consequences. For example, it is not clear just what the capacity and capability of aquifers is to store and supply water. If we put water in aquifers will it still be there when we want it? What are the environmental benefits of water passing through the aquifers? These are fundamental questions. Similarly, if we were able to retain moisture in and around waterways and lakes through the expansion or creation of riparian planting and development of wetlands, would we improve both water quality and the level of soil moisture in the vicinity?

Science is going to gradually tell us more and we will learn from experience, but at this stage we will have to make judgements on the basis of the knowledge we have and don't have. To help with prioritising, we have developed a number of principles and priority uses listed in earlier chapters and they should be borne in mind when reading this chapter.

This water resilience project is a learning process, but to learn we must first take action, then monitor, review and adjust.

Evaluating water resilience solutions

To prioritise water resilience solutions, a series of five workshops were undertaken with participants in Wairarapa drawn from a variety of backgrounds - people with a reasonable working knowledge of water management, farming or water policy. They undertook a multi-criteria analysis exercise (MCA). A report on the workshops is in:

Appendix 2: Multi- criteria Analysis results.

Basically, there were two clear groupings in terms of solution preferences, namely:

#1 Preferences – storage, natural attenuation, managed attenuation and land use adaptation with GMP

#2 Preferences – groundwater augmentation, re-use and water use efficiency.

Some immediate conclusions arise from the rankings:

- **All solutions are in play** – no solution was scored by any group so low that it was considered a non-starter. Solutions are not strongly weighted in terms of importance or efficacy.
- **There is a preference for green over grey solutions** – the green solutions were first and second in the rankings, but green is not supported to the exclusion of grey.
- **Natural attenuation** – is the most universally agreed among the Wairarapa Water Resilience Strategy Group, plus the most preferred solution. Working with nature not against it is a strong point of convergence.
- **Water use efficiency** – was least supported, but not universally so; Greater Wellington hydrologists and local councils still gave it a reasonable score.
- **Groundwater augmentation** – received the least universal support, largely due to uncertainty about its effectiveness in the Wairarapa

setting; it would at least require trials to prove its viability.

- **Managed retention** – was highly approved primarily because of its whole-of-catchment potential, but the Greater Wellington hydrologists doubted its effectiveness on technical grounds. Their concerns were related to the complexity of aquifer structures, soils and geology, the feasibility of actually implementing it at a catchment scale and maintenance issues.
- **Water re-use** – was less well supported, but not by local councils and stakeholders, such as industry, who interestingly both utilise this solution.
- **Storage** – was ranked high, just below natural attenuation and managed retention.
- **Change of land use coupled with Good Management Practice** – received positive scores and was well supported but reactions to it were highly variable.
- **Managing adaptive land use, managed retention and natural attenuation solutions together as an integrated whole is more favoured.** This is part of the broader indication in the results that the participants generally believe that multi-dimensional solutions are desirable and recognition of the fact that some solutions might not work as well as anticipated leaving other solutions as a backstop.
- **Green solutions particularly, will rely on co-operation and/or compensation of some sort.**

Individuals who participate or dedicate land, their time etc. to make this happen may need to be incentivised to encourage them to help assemble a catchment scale suite of solutions. This is not going to be straightforward to implement because it will require a mindset change for many especially as many of the benefits will be realised downstream of the land they own and operate.

Water management dimensions

Other dimensions arose from the discussion in the MCA workshops that are worthy of mention:

➤ Whole-of-catchment versus localised solutions

The importance of solutions that could operate at scale to match the scale of climate change impacts was reinforced. Climate change will impact all of the catchment and whole-of-catchment solutions are required as a response. Local solutions with local benefits are still important, but they would need to operate in tandem. The most obvious whole-of-catchment solution is managed retention with its focus on holding large amounts of water in soil, streams and aquifers.

➤ Long-term solutions

Favour was expressed for a long-term view and the building of robust solutions that will last well into the future. This was not to exclude short-term actions, but thinking long-term was seen as an essential component of the resilience programme.

➤ High cost versus lower cost

Because of the large costs involved and the need for the solutions to be well-funded, well-conceived and well-constructed so that they stay the course, it was recognised that work would need to start soon as possible, even before the full impact of climate change is evident.

➤ Incidence of cost on land user versus incidence of cost on the community

This is really the question of cost-sharing, both in the immediate and generationally. Some solutions, particularly larger, long term solutions will require substantial investment.

The incidence of cost will need to be apportioned in different ways, some to the immediate user (as in the case of a constructed storage reservoir and reticulation system) and some by indirect users such as managed retention that feeds the environment, domestic supply and civic amenities. The mechanism of Payments for Environmental Services has a section allocated to it in the appendices.

Characteristics of solutions

Combining these management dimensions, the results of the MCA analysis and the analysis to date in this Strategy document, a picture begins to emerge as to where we should direct our attention. The vital question is what role does each have to play in the total mix of solutions?

Some solutions are already in play:

- The installation of smart water meters by local councils.

- Enhancement of municipal water storage to create a buffer.
- MPI's Sustainable Food and Fibre Futures supports problem-solving and innovation in New Zealand's food and fibre sectors by co-investing in initiatives.
- One Billion Trees Programme including the Jobs for Nature. The Ruamāhanga catchment and the Wairarapa Moana Wetlands project will be targeted with the Greater Wellington contributing approximately \$4m on top of \$6m from the Government.

Managed retention

This is a key water capture (supply) solution and its importance is amplified by the fact that it is strongly green and catchment-wide in its character and potentially simpler to implement than some other solutions. This Strategy requires one or two solutions that capture of large amounts of water because of the expected scale of the water deficit.

Managed retention is relatively low technology and within the scope of many farmers and land users, thus some of the equity in the development could be 'sweat' equity not just capital, making it more financially manageable. It can be broken up into a series of individual projects, done incrementally as resources are available, implemented location-by-location.

There are questions around managed retention:

- Greater Wellington's hydrologists queried whether the water directed into groundwater via managed retention would be of significantly

greater than is seeping in of its own accord at present

- Would it be recoverable?
- Can it be done at the scale required?
- It's untried and unknown
- Volumes might not be sufficient.

Managed retention on hill country is almost a separate consideration. The eastern hills are likely to be significantly adversely affected by climate change and whether managed retention solutions are cost effective in that environment it is difficult to know without in-depth investigation.

Land use adaption and Good Management Practice

This is a key water use (demand) solution. Its intention is to spread demand out of the water deficit period and reduce overall demand whilst enhancing production value. It is a mix of interventions. It is primarily a "green" intervention in the sense that it is about adapting production to climate change as it will be targeting water for high valued production.

It will be most effective at scale across many properties. It is potentially disruptive because changes to land use can involve change to the whole business model of an individual farmer including consideration of market demand. It has the advantage of being more local, based on individual land user priorities, preferences and locations.

There are some questions around adaption:

- New land uses can take a considerable time to become established
- Land users are unlikely to do it unless it is incentivised or unless circumstances mean they have to.

The idea of Good Management Practice has some real attractions. This could take the form of resilient farming guidelines which could be promoted as part of a changing land use package. It is not envisaged as a regulatory measure in the way it is used in Canterbury.

Natural attenuation

Natural attenuation scored very well in the MCA and was favoured across all groups. It has a great number of attractions. It applies equally in rural and urban settings. It mostly involves a series of discrete projects like a single or chain of wetlands or a riparian strip and is project-based, meaning implementation can be as large or small as resources allow. If done at scale, and that is the ideal, it would have a cumulative whole-of-catchment impact.

Questions which arose in discussion were:

- Cost
- Time required
- Commitment required to get to scale

One major advantage of these projects is their visibility and attractiveness. Natural attenuation projects appeal to a wider population – rural and urban – and are therefore more likely to attract public and community funding. It is not unknown for urban people to be involved in planting initiatives in rural areas and that would help immensely in building relationships between the sectors on resilience.

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Storage

Storage, like managed retention, is a supply solution and has multiple roles to play. Its most important role is water volume. It effectively transfers winter water into summer diminishing the reliance of spring and summer freshes. Because there is a high-level of control over the water (compared to groundwater) it can be used for irrigation, frost fighting, augmentation of summer river flows (although with the downside of increasing water temperatures), stock water race flows, domestic supply, industrial use and natural resilience.

Reliability is its greatest asset enabling land users to get more from less. Generally, the larger the water storage, the cheaper the unit cost of that water; however, that can have counter outcomes. It is important to note that the water user/farmer funds that would pay for storage would not necessarily be available for other non-supply solutions, and with supply solutions such as managed retention where recovery is uncertain, the amount a user is prepared to invest may be lower than for storage. These are issues to be tested once feasibility is undertaken.

An important benefit of storage is that it can be used to incentivise land use adaption through controls over the distribution of water, and the cost of the water itself. Short-term and tactical storage such as on-farm ponds, tanks associated with tile drains and rainwater harvesting by residents have their place,

but because of the small amounts of water involved their impact is limited. It is likely, into the future, that the economics of short term storage will improve as climate pressure intensifies.

There are questions:

- Its limitations are its spatial location. It's essentially local as it applies to a particular command area, both urban and rural.
- The cost of storage is well known and is high but to offset this there is proven return on investment and the cost falls directly on the user.
- There are environmental impacts which need to be mitigated, some of which could also be mitigated through nature-based solutions.

Water use efficiency

Water use efficiency is immensely appealing as a solution because it feels like more water at little or no cost. It is primarily a grey infrastructure intervention relating to piping networks including repair, replacement and maintenance, metering and water conservation measures. If urban networks were improved and sensor-driven variable rate irrigation systems were more extensively used, there would be a quick, and short-term improvement in water availability, and that has real strategic value.

Water use efficiency is less significant when viewed from a whole-of-catchment perspective because of the modest real gains, but in terms of short term gains and building awareness of resilience it is very important.

The other dimension of water use efficiency is allocation efficiency. This is the allocation of water to users which is not used and the inability to move water around users. If successfully executed, it could improve water availability in short order.

Groundwater augmentation

Augmentation has benefits and deficiencies. Like several of the solutions proposed, the factor going against it most is its unproven nature in the Wairarapa (and New Zealand) context with its short groundwater travel times and lack of deep aquifers; the SkyTEM aerial groundwater survey will throw light on this matter.

Water re-use

Further extension of re-use in Wairarapa is certainly possible, over and above current re-use. The re-use regimes already in place or well-advanced, particularly the treatment of sewage and disposal onto land, were vital for environmental reasons, but now they are done, or almost done, this process is well advanced and the gains are about to come into effect. In addition, with the cessation of dumping treated effluent directly into rivers will mean they will be able to revert to a more natural state.

The real advantage of the current emerging regime is that it keeps contaminated water out of rivers and waterways during summer; this is a huge advantage.

At a single-user level such as a factory or a farm (e.g. effluent pond) it may be a high

cost but it is an essential cost of doing business. In short, most examples of re-use are obligatory from a water quality perspective. The jury is still out on concepts such as grey water. The Kapiti experience where there are advantages and disadvantages, is an example requiring investigation before any actions are taken.

Four priorities

While there are indications of weighting on questions of importance and efficacy of the solutions from the analysis to date, it is not strong enough to pick one or two strong options at the expense of others. Instead, a framework or skeleton of parallel solutions has been developed, each relying on the other. It comprises four focus areas:

Focus area 1: Water Capture Focus Area

No matter how we look at it, the water loss from climate change has to be replaced with the capture of available water, and at scale. We have identified three preferred solutions within the capture focus area:

- **Managed retention**
This solution has huge potential and is well supported as a long-term bulk collection method, especially for the capture of water from freshes but, and there is a but, it is unproven. There will need to be hydrological studies to identify ideal sites and

designs, experimental sites to iron out problems and design experimentation to optimise their operation. Legal and funding issues will need to be resolved.

There are other considerations too. Will bunds reduce river flows below the location of the bunds and what impact would that have on indigenous biodiversity and other natural resilience values? If so, will they be consentable or acceptable to the public? Who will be responsible for the construction of the bunds, where will the materials be sourced from, let alone their maintenance, what be the land ownership status for the bunds and access to them, etc?

The benefits of managed retention:

- If viable it represents a significant whole-of-catchment solution
- It is scaleable, though would need to have critical mass
- It is lower technology and potentially lower cost reducing barrier to development
- It engages river management and catchment groups

- **Constructed storage**

The principal focus here is bulk storage for use specifically in the water deficit period, to offset the worst effects in that period and to incentivise adaption of land use to higher-value crops and off-peak planting. Its great advantage is to increase reliability which results in efficient use of water in the rural setting. It would also, in some situations, supply domestic uses.

Bulk storage is a hedge against the risks associated with groundwater-based solutions such as managed retention and groundwater augmentation, though only for part of the catchment, unless a number of storage reservoirs is contemplated.

The benefits of the water constructed storage:

- Provides reliable water; a known commodity at the start of each season
- Able to apply irrigation as and when plants require enables more efficient nutrient use, minimising leaching and run-off whilst allowing production to remain competitive
- Provides water for multiple diverse uses e.g. municipal uses, the natural environment and agriculture
- Opens up opportunities for greater diversity of crops than would otherwise be possible, especially with climate change effects
- Known availability of water facilitates good contract prices for commodities.

- **Hill country attenuation**

This is subset of natural water capture intended to keep the hill country as productive as possible. There will be issues around affordability relative to the potential productivity of hill country and any adverse impacts on small streams will need to be monitored and

managed to avoid unintended consequences. With growth in demand for use of hill country for trees (for carbon), the amount of hill country in pasture may reduce.

The benefits of the water capture focus area:

- Increased reliability of supply
- It has the potential of scale
- It is largely cumulative, so it combines short- and long-term advantages
- It builds groundwater availability - more water flowing through the groundwater and back into rivers and streams as well as use for irrigation
- It involves more water flowing into natural retention sites such as wetlands, riparian areas, thereby supporting other resilience solutions and providing better water quality and improved biodiversity
- It should improve water reliability
- Reduced sediment flows from the hill country could be expected
- Water will be available to incentivise land use change, although this is partially dependent on allocation solutions being in place

Focus area 2: Natural attenuation focus area

At the core of natural attenuation is a series of natural solutions:

- Wetlands
- Riparian planting/reversion
- Woodlot planting
- Strategic forestation

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➤ Regenerative agriculture

These solutions retain moisture in the vegetation itself, in soil and water bodies are strongly supported both by stakeholders and science. There are enough examples of the development of these solutions to have confidence in their effectiveness.

The benefits of natural attenuation:

- Greater surface retention of water for longer into the water deficit period.
- Greater natural cleansing of water for environmental benefits.
- Reduced water temperature in rivers, streams and races through overhanging shading reducing algal bloom and other contamination issues.
- Reducing nitrogen levels (and other contaminants) by creating a buffer/filter from farm activities.
- Restoring and protecting the mauri of the water.

Focus area 3: Allocation focus area

Allocation is on the demand-side of the equation; who gets how much, when, over what period, and at what rate of supply? As the various capture strategies come into play, larger amounts of water will be collected, raising the vital question who can use what proportion (if any) of this water and on what basis? This is not only the allocation of a scarce resource, but the allocation of a resource that has potentially been deliberately augmented (such as managed retention) at a cost to someone in the form of green and grey infrastructure. A cost recovery mechanism may be required.

Aspects of allocation are:

- Moving water allocations and maximising beneficial use – encouraging transfer of allocations
- Allocation efficiency – being consented what is required, that is, not water banking for the future so that other users cannot access the water

The benefits of the allocation focus area are:

- More efficient use of water recognising it's a finite resource
- Higher value use of water
- Generation of value to fund greater resilience
- Greater innovation and flexibility in water use

Focus area 4: Land use adaption focus area

Land use adaption is also on the demand-side of the equation. It has been well established in this Strategy that more water simply and solely to maintain the status quo of land use is not viable in any long-term climate change scenario. Nor is it possible to consider significant additional water for any uses that increase levels of nitrogen leaching which is already a resilience problem.

This focus area involves adapting land use practices both out of the water deficit period or introducing land uses better able to resist the ravages of that period.

- Planting of new or different crops or pastoral regimes – crops that take advantage of the expanded growing season, that require less water or are deeper rooting; crops that are of

higher value to meet the cost of water capture.

- Mixed farming – introducing new farming regimes that rotate or mix uses; that are better adapted to the changed climatic conditions; that are potentially complementary.

The benefits:

- Broadening of water demand into the shoulder seasons when supply is theoretically more reliable as a result of freshes.
- Smoothing the demand curve throughout the year to better match supply and storage capacity (natural and constructed).
- New higher value crops and pastures producing higher margins that can help finance water management improvements.
- Improvements in soil compaction/de-compaction.

The four rooms of resilience

These four focus areas need to be developed in parallel, not sequentially. To create a sense of purpose in each of these focus areas, they are characterised as “rooms” in the larger structure of water resilience. Different activities take place in different rooms and require different mindsets and management approaches. The diagram on the next page illustrates this approach and is proposed as a framework for connecting the various solutions into an action plan, as presented in the following chapter.

These four rooms are the backbone, the skeleton of the water resilience. They are the ‘tight four’ areas at the heart of the strategy. Around these four focus areas contributions are made by a mix of other

solutions such as water use efficiency, water re-use, groundwater augmentation and others. Further on in this chapter we to link these solutions altogether.

The challenges in these focus areas

There are questions to answer and challenges to meet. Here are just some of them:

Capture focus

- How to fund managed attenuation when the returns and benefits are not immediate?
- How to fund the scale of cost that will be required?
- How to incentivise land use change and get better value from land use change?
- How to persuade landowners to make land available for green infrastructure?
- Who will drive this focus area?
- How to undertake proof of concept that these techniques actually perform to a meaningful degree?

Attenuation focus

- How to fund developments on the scale required?
- How to persuade landowners to provide land for wetlands and riparian?
- How to move from the current lack of activity to high intensity activity in this area?

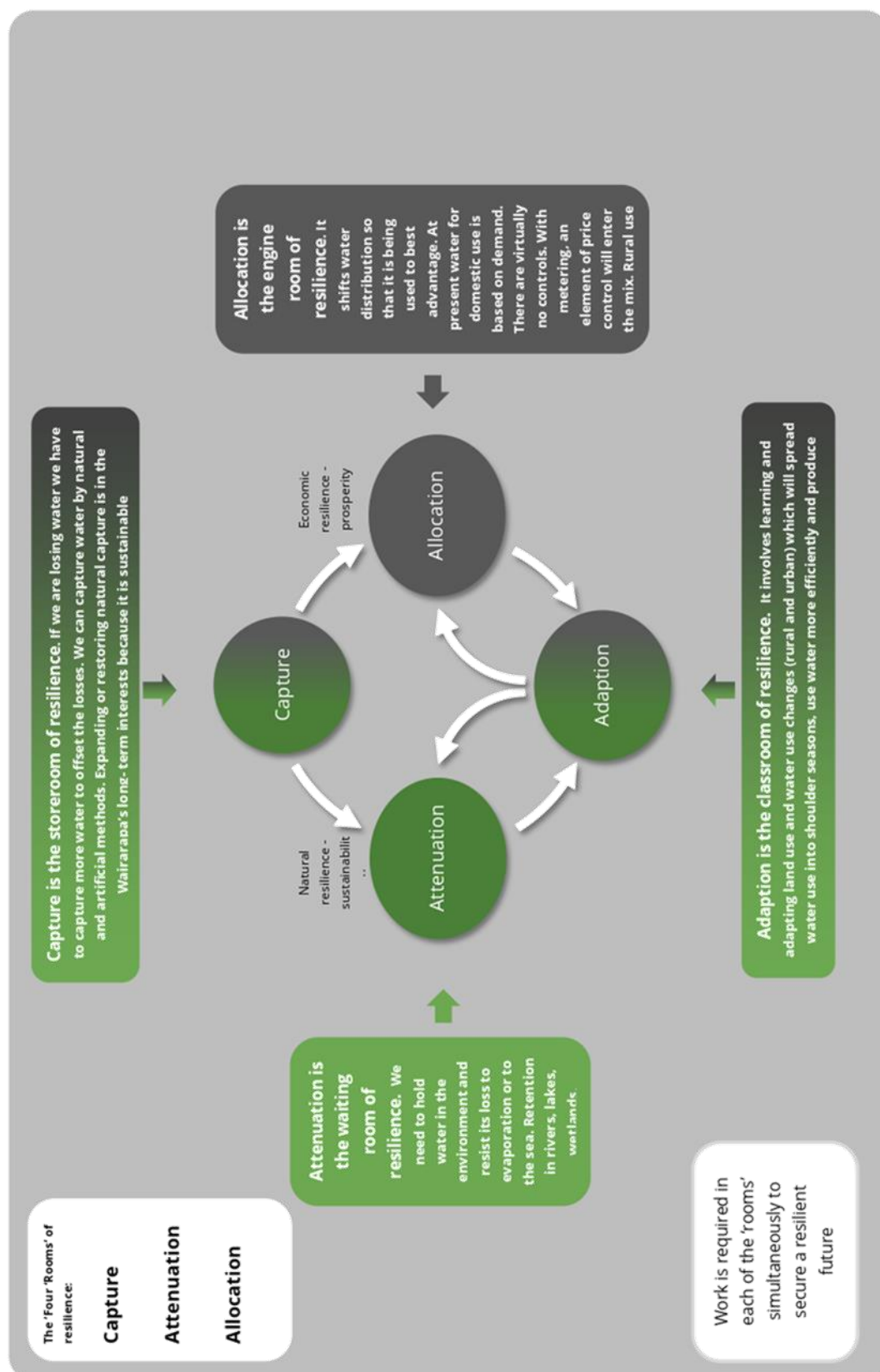
Allocation focus

- How to match up water availability and land use adaption and move water to higher value uses?
- How to further advance the science sufficient to ensure the integrity of the information available on which any decisions are made i.e. exactly how much water do we have and where?
- How to establish an allocation regime that protects bottom lines but is sufficiently flexible and dynamic beyond that to achieve the objectives?
- How to develop some sort of payment regime such as Payment for Environmental Services as a form of compensation where benefits are gained 'downstream' at someone else's expense?
- How best to integrate iwi rights and interests? This will only be resolved by government water allocation reforms.
- How to avoid unintended consequences?

Adaption focus

- How to persuade land users of the benefits of adaption? By providing a mechanism to 'group' producers in a way that facilitates change - instead of farmers making changes on their own.
- How to persuade them of those benefits before adaption becomes urgent?
- How to incentivise adaption, especially amongst the more reluctant users?
- How to fund these changes?
- How to reconcile adaption with market pressures and expectations?
- How to gain benefits from provenance thinking?

The 'Four 'Rooms' of resilience - Translating priorities into Action



Chapter 14: Governance and operations

In the previous chapter four key focus areas ("rooms") were identified that, when tied together, form the platform for the delivery of the Strategy. To remind ourselves, they are: Capture, Attenuation, Allocation and Adaption. To be effective, these areas need to be tightly integrated.

There are all sorts of potential linkages between them, for example:

- Rethinking aspects of allocation will ensure that water is used in the better ways and the right amounts of water are allocated, and in the 'right' places.
- Allocation can help drive land use changes and best practice through details of supply arrangements established in the context of the Strategy.
- Water capture and supply can drive reliability which in turn drives land use change and efficiency improvements.
- Water capture can also drive natural attenuation, which is essential for building the resilience of the natural environment.
- Natural attenuation, especially at scale, can hold moisture in the soil which can impact on land use change and good management practice.

The list of possible linkages is very long and the more connections that can be made, the more effective the strategy. For this reason, the programme across the four key focus areas needs to be developed simultaneously, so that those connections

are made and built into the model. The product will contribute to the "water management system", or to put it slightly differently, the "water management ecosystem" which matches the ecosystem characteristics of the natural world. Water resilience is one part of an integrated approach.

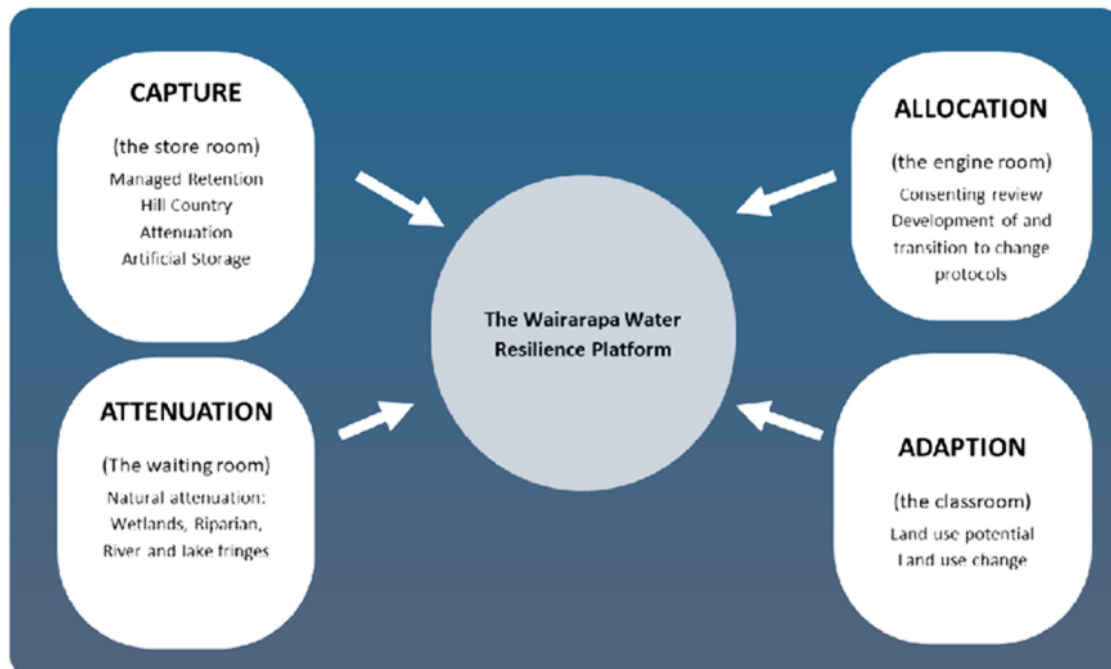
The natural world has had millennia to develop its connections. We are only just starting down this road. It is for this reason that it has to be seen as a journey. It is, by definition, complex. Human beings have inbuilt resistance to complexity. This is a dilemma we need to solve, ideally through research, education and exemplars.

Another critical element is building on what we've already got, beginning with the least interventionist path – it's not as though we are starting off with nothing⁵⁴. This would then be followed by actions which give the biggest impact in the least time so we get 'runs on the board' – the effects of climate change won't wait for us. In parallel with these 'proven' actions, we can also focus on solutions for which investigations or trials are required to establish whether they will be effective in the Wairarapa situation.

⁵⁴ Several community catchment groups already exist, the beginnings of riparian plantings and wetlands restoration, central government funding initiatives such as Jobs for Nature (part of the One Billion Trees Programme),

municipal network pipe repair and maintenance programmes, increased water storage buffer, installation of smart meters, application of treated effluent to land, etc.

Each of the rooms has a different combination of interests and stakeholders around it.



Take "Water capture", the skills that are required in this focus area relate to the collection and distribution of water, to the building of grey infrastructure, whether they be bunds or an constructed reservoir, dealing with all the commercial and legal issues around supply such as supply contracts, easements on land for capture purpose and so on. This is a highly specialised area and requires an independent, non-commercial Wairarapa-wide perspective. The only current agency in this area is Wairarapa Water Limited (WWL), whose focus is primarily on the Wakamoekau reservoir but has the stated objective to develop other projects including nature-based solutions. It is

conceivable however that an organisation such as WWL could broaden their operational focus across other aspects of capture. This would, of course, require them to have a broader remit and submit to contractual arrangements involving other requirements to constructed storage which is their current focus.

Alternatively, some sort of new supply cooperative could be developed to promote water capture practices and technologies, though it would have to start from scratch in terms of the establishment processes and costs.

In the "Allocation" area, the lead agency is clearly Greater Wellington because of its statutory responsibilities. It currently has responsibility for all consenting, including consenting for the local councils and even for their own use. It is possible that Greater Wellington is highly invested in the current system and may be unwilling to change it, and that may also be the case with many of the land users who have consents. Be that as it may, Greater Wellington is the obvious organisation to manage this element of the Resilience programme.

The "Adaption" focus area is more complex in that land use and land use change is a very individual matter to farmers and the farming system they operate. Clearly, they will have their own preferences and approaches. They will also respond to the limits and incentives that exist around them, especially regulatory limits. To be effective, land use adaption should therefore be farmer-led. This suggests that it should involve a cluster of individual farmers, sector groups, catchment groups, farm advisors and even processing companies. How that could be brought together requires consideration by the farmers and land users. This cluster may have an organisational form or simply be a collection of supportive relationships. Potential mechanisms exist whereby a grouping approach has the potential to be implemented; individual farmers can't be expected to do it on their own. Care needs to be taken to avoid over-managing.

Finally, the "Attenuation" focus area has huge potential. Currently there are active

programmes of planting underway, in many cases led either by individual farmers or by initiatives from voluntary groups such as river management and catchment groups. For example, planting days are becoming a feature. The difficulty with the current arrangements is that they are limited, localised and voluntary. For this focus area to be effective a level of scale is required well beyond current activity, raising the question of priority and resources. As with Adaption, this will require combination of farmers and other land users, community groups, river management group and Greater Wellington combined together into some sort of operational entity, or operating independently.

Besides farmer and community initiatives, there are also agency initiatives. Greater Wellington has recently been granted funding under Government's "Jobs for Nature" programme in the northern part of the region including programmes associated with Wairarapa Moana in association with DOC. Other programmes include deer culling, afforestation, planting, farmer-built dams and the Fonterra riparian initiative.

Governance structure

The "Four Rooms Platform" is the glue that holds this together. As opposed to the operational matters and resourcing, it would seem logical that an existing entity should be utilised to lead the overarching governance arrangements - the "Platform". This is provided that its terms of reference are consistent with the meeting the challenges and implementing

the changes required to address water resilience in the Wairarapa.

The Water Resilience Strategy group suggested that the Wairarapa Committee of Greater Wellington could provide this governance role⁵⁵; it has a suitable mandate and agency representation to perform this function. Not only this, but the committee already exists, so adding this focus to its dealings will certainly be complementary.

The Committee comprises eight members, with Greater Wellington providing its administration. The members are the councillor elected by the Wairarapa constituency and two other councillors from Greater Wellington and the Mayors from South Wairarapa District Council, Carterton District Council and Masterton District Council. It also includes one member each from Ngāti Kahungunu PSGE ki Wairarapa and Rangitāne Tū Mai Rā (Wairarapa Tamaki nui-ā-Rua) PSGE. It is proposed that the committee membership be expanded to provide co-governance with these two iwi organisations.

The purpose of the Wairarapa Committee is to consider matters of importance to the Wairarapa and make recommendations to Council on these matters.

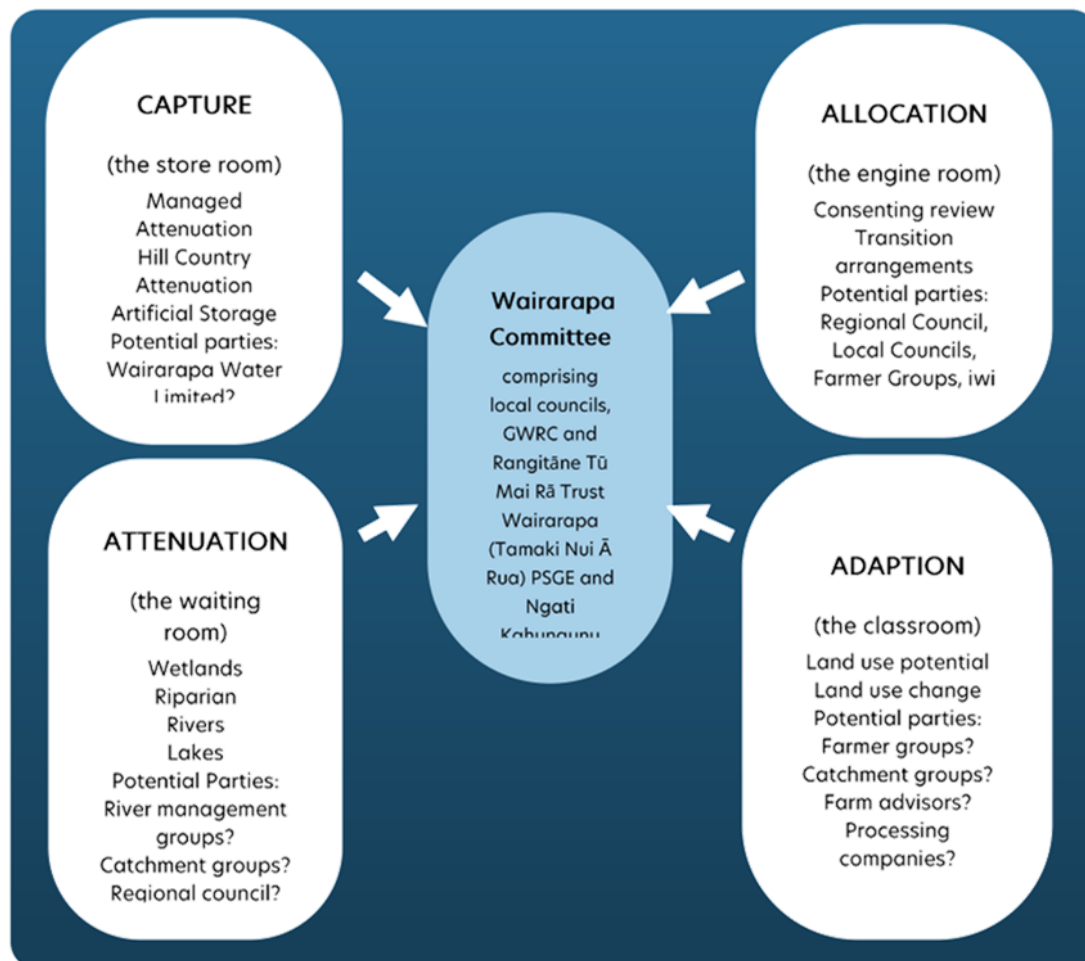
Before advancing Water Resilience Strategy group proposal as the

governance body any further, this possibility would need to be ratified by the individual parties that make up the Wairarapa Committee, as well as the committee itself.

⁵⁵ The Terms of Reference for the Wairarapa Committee are provided in the Appendices.

On that basis the above diagram would look rather more like this:

Where does the leadership come from?



How would this structure work?

The Wairarapa Committee would:

- Oversee the vision for water resilience in Wairarapa.
 - Improve performance so that targets can be met as scheduled.
 - Take a big picture view of the region and the Strategy.
 - Ensure there is accountability and oversight of operations.
 - Manage risk.
 - Oversee financial resourcing and expenditure.
- Find the right balance between making short-term gains and building long-term resilience.

In the proposed structure, the entities in each of the "rooms" or focus areas would be responsible for devising how their area would operate. The central resilience platform would be responsible for the integration of these elements into a single integrated system.

What happens to the other resilience solutions?

A number of solutions are not included in the tight four focus areas. They include the collection of solutions in the water use efficiency basket, including public education, conservation measures, network repairs and maintenance, metering and the various forms of water re-use or multiple use; nearly all these activities occur within the urban space. Even though it involves only a small proportion of the total water volume, 72% (33,900) of the Wairarapa's population is totally dependent on the urban network

water supply. Compared with rural users, urban households have no back up supply - once they lose access to potable water, they are at the mercy of the local council to restore it.

These are regarded as important and as clip-ons to the main framework. These two groups of solutions are an indirect part of the capture focus area. The reason for this is that capture is about "more available water". Efficiency is a way of creating more water - less used is more available.

The two largest areas of gain in efficiency are in domestic supply and irrigation technology. Domestic supply is a clear responsibility of the councils and they are well appraised of this requirement. They can continue to work on this priority. Irrigation efficiency is closely linked to allocation and should be part of the considerations in that "room".

Other resilience solutions will come in the form of knowledge and the ability to build on that information base. This involves monitoring, testing, surveying etc.

Three Waters Review

It needs to be noted that Government has been reviewing regulatory and service delivery arrangements for drinking water, wastewater and stormwater services - its Three Waters Review. The review is to give New Zealanders confidence that:

- Drinking water is safe and risks to source drinking water are being proactively managed.
- Wastewater and stormwater networks support good environmental outcomes and Te Mana o Te Wai.

- Water services are efficient, sustainable, resilient, and affordable.

A key feature of this development is that it could operate from nationally coordinated regional centres. This could mean that the management of urban water in Wairarapa could be part of a south of the North Island unit with the assets and responsibilities of the three Wairarapa councils for urban water transferred to that entity.

This potentially adds a complication to the water picture in Wairarapa and particularly with regard to the dynamics of urban and rural water. At present, they are not in competition, but they could be in the future as supplies diminish and demand increases. This change of arrangements needs to be factored into thinking about water resilience and the water resilience project needs to remain flexible to these possibilities.



Appendices

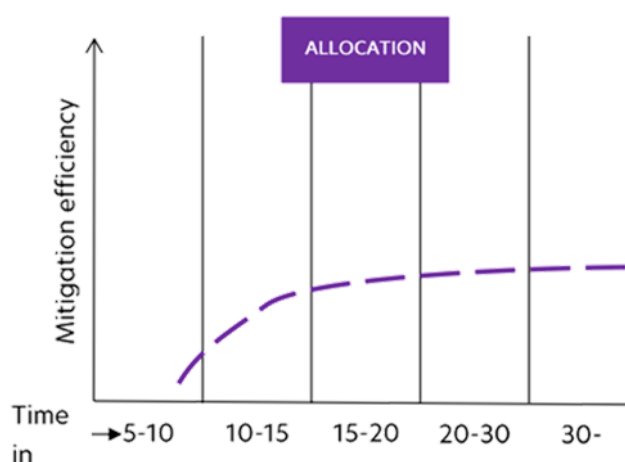
Appendix 1: Road map and scheduling

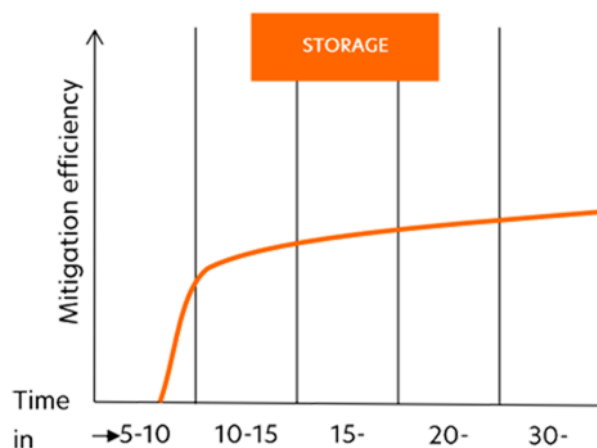
This chapter considers placing solutions on a road map for action together with scheduling of solutions at a high level. There is further analysis required to take this from a high level to an operational level.

In this chapter is a series of line graphs. They are notional graphs designed to illustrate the expected shape of the impact curve, rather than being evidentially based. They are not to scale at this point, the relative mitigation efficiency has yet to be identified.

They are intended to depict relative timeframes.

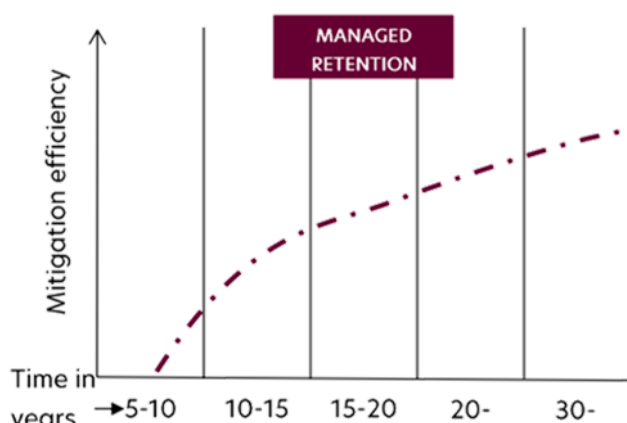
In the Allocation Room, there is a one-off task to be done - a review of allocation is required with a view to introducing a modified regime in line with the Strategy. This requires background work, consultation with users and complex design activity, plus the notification and implementation of a plan change. Once completed and implemented, the refreshed system would become operational and continue forward. It is possible that further modifications will be required. Its ongoing contribution to resilience is depicted by the flat line.





Storage needs to be considered relatively early in the mix because of its potential role in incentivising land use change and water use efficiency. Storage is responding to an existing need. Its contribution will become balanced out over time by other sources of water using nature-based solutions such as managed retention. The line flattens into the future because storage will have played its early strategic role. Tactical storage such as on-farm ponds or tanks associated with tile drains could be deployed on an as-

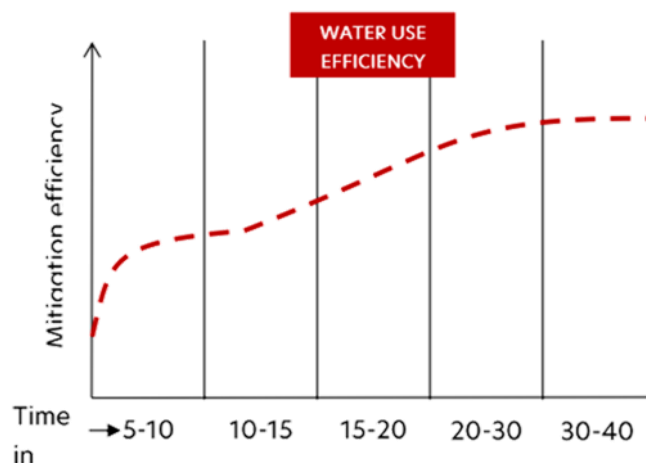
required basis. It should be noted that large scale storage such as Wakamoekau, has a six year development period. Stopping and starting again would push that timeline back.



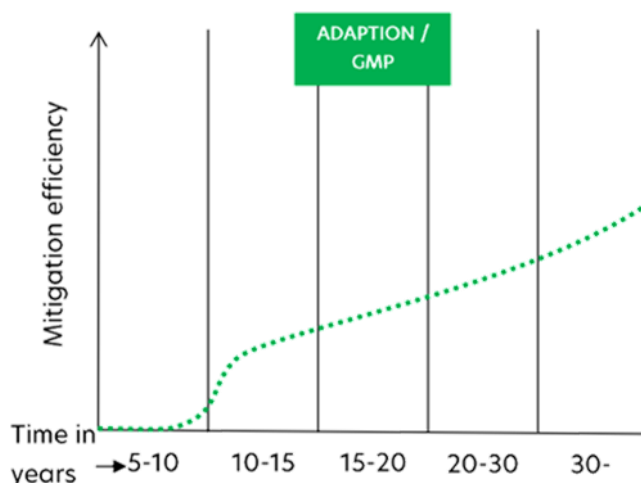
Managed retention is seen in the long-term as providing the "heavy lifting" of water capture pending successful feasibility and testing and whether the water will be recoverable from groundwater. Its development trajectory is gradual. If proven, its trajectory may be steeper; equally it could flatten off if only modest gains are able to be made on an on-going basis. Additionally, it may need a plan

change in regulation to start and this needs to be factored in.

Water use efficiency is already active in the region through water metering. The principal gains still to be made are in the repair of infrastructure to minimise losses, and the upgrading of irrigators to moderate water loss through over-watering. The gains are relatively short term but very significant in that timeframe. There is a strong case for a real accent on efficiency in the first 5-

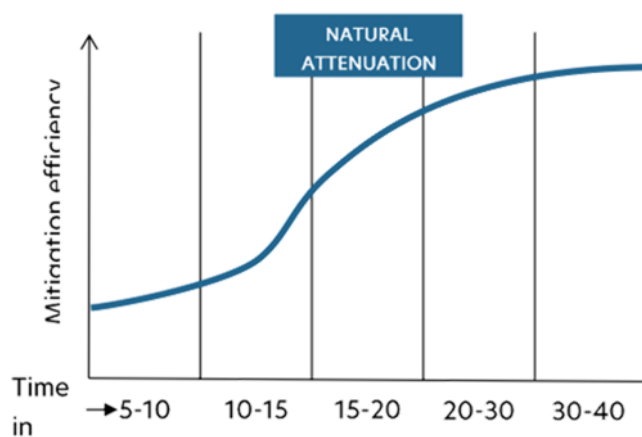


10 years because it is so much more attainable and less complicated than other initiatives.



Adaption of land use is much more of a progressive matter. Land use change can be incentivised by control over the supply of water, but only within reasonable parameters. To change land use can often mean changes to whole farm systems. This takes time and investment. There are also market considerations which could frustrate the best laid plans. The graph identifies an early planning

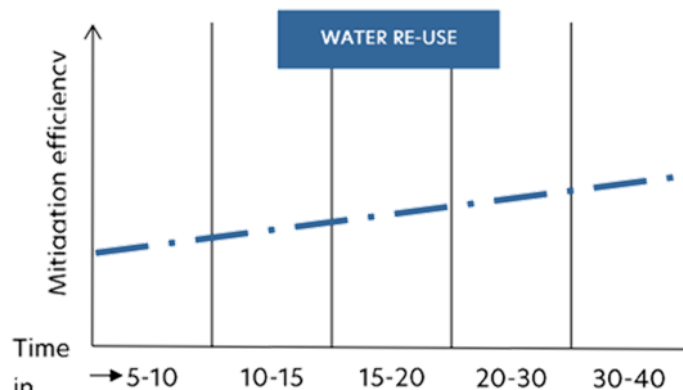
and feasibility process and then gradual application.



Natural attenuation is a vital part of the resilience mix. There is already activity in this area, though it would be fair to say that it is limited and largely the product of a few well-motivated land users making a voluntary contribution. To get it onto the scale required would require a major effort and probably large public investment. The investment in natural attenuation needs to be aligned with that in managed

retention because together they are likely to have significant impact.

The graph for water re-use starts high because of existing activity, especially sewage treatment and industrial re-use. Given this is already significant, the gains over the short- to medium-term are seen as moderate. More enterprises using water may come to the region and technologies will improve, and these might release more water for other uses. No major increases of re-use such as treating sewage to a higher level are envisaged.



Road map

In broad term there are three categories of intervention:

- **Bolters** - these are activities that can get away early and actively. The main activity in this category is water use efficiency solutions and this should be an early focus.
- **Base builders** - these are the activities that other solutions depend on and which need to be commenced

early to build the base. Probably the main activity in this category is allocation and to an extent adaption of land use. Allocation will require pre-work to deal with equity and opportunity issues (and may have to wait for new legislation).

- **Bearers** - these are the "heavy lifting" solutions that will require a great deal of preparation and problem solving, but if these issues are resolved, their contribution could be considerable, long-term and steady. Storage and natural attenuation are proven in

terms of their effectiveness, while solutions such as managed retention and MAR need to be investigated thoroughly before they can be deployed as a major player in this field.

These need to be brought together into an action map. Some thought needs to be given to the critical path and sequencing of these actions as there may be logical steps that must be taken first before other actions can occur. For example, if any of these actions need a plan change to implement, Greater Wellington will need to develop and notify a plan change which can take a number of years. The map looks something like the following and has 10 clear steps for delivery in the first 5-8 years within the three categories:

BOLTERS - EARLY ACTION

These are the early wins that will raise awareness of the programme and show tangible gains with the least interventions being required:

1. **Set-up - councils to understand their work programmes and ongoing commitments**
 - a. Establish the "Platform" and the "Rooms"
 - b. Get the 'wagon' rolling
2. **Get the most possible from immediate efficiency arrangements:**
 - o Focus on urban water efficiency - identifying the most cost-effective efficiency activities and prioritise them into the LTPs of the councils.
 - o Focus on rural water efficiency - seek to extend current irrigation efficiency

with active promotion of the subsidies for variable rate irrigators.

3. **Natural attenuation programme development - set up the waiting room**
 - o Build a comprehensive multi-decade programme of natural attenuation - rural and urban.
 - o Seek Greater Wellington and Government investment in this package.
 - o Look for areas where easy 'wins' could be gained to also help gain a profile.
 - o Engage stakeholders.
 - o Launch and roll out.

BASE BUILDERS - FOUNDATION WORK

These are the long-term projects underway that need to be started as soon as possible and which underpin other work:

4. **Undertake water balance study**
 - establish monitoring
 - o Water balance information is part of the monitoring of the success of the programme and to help with ongoing design and priorities and should be seen as ongoing, not one-off.
 - o This is required to get a strong handle on the quantification of water required and where it might come from.
 - o This is unlikely to change the fundamentals of the Strategy but it will assist with detailing of the programme.
 - o In particular it will help set the timetable as it becomes obvious how quickly the water balance will move in an adverse direction.
5. **Complete, analyse and interpret the SkyTEM aerial survey project**
 - o This will provide vital data for the water balance study.
 - o It will assist with the allocation project.
 - o It will assist with assessing the potential of managed retention.
 - o It is a key enabler.
6. **Undertake a study of funding measures (water banking and PES)**

- o This will provide a principled base for supporting and funding the project.
- o It will also provide a basis on which to engage with Greater Wellington, Government and other funders.

7. **Implementation plans** - integrate the Resilience Strategy into implementation plans
 - o As catchment plans emerge through Greater Wellington resilience considerations need to be built into these plans.
 - o Action is required to identify how this will happen and in what form.
 - o This is necessary to ensure a long-term view of operations and funding.

BEARERS - MAJOR IMPLEMENTATION

These are the projects that require significant "heavy lifting" to get them to a point of feasibility and funding

8. **Managed retention** - set up the store room
 - o Undertake a feasibility study of the idea.
 - o Prepare and cost an action plan.
 - o Seek Greater Wellington and Government input into the plan.
9. **Storage** - augmenting the storeroom
 - o Wakamoekau storage is an established feasibility project with its own budget and timeline.
 - o It will continue to move through its process.

- This project needs to be analysed in the context of this Strategy.
- The current feasibility and consenting process will decide whether Wakamoekau proceeds or not, or in a different form. Depending on the outcome of the Wakamoekau project, other tactical storage projects may come into play.

10. Allocation – set up the engine room

- Design and set-up a project to examine and report on current and preferred allocation models.
- Identify and roll out a preferred model so that it is operating to rationalise water use as quickly as possible. This will be a long hard grind so need to start early.
- Changes to allocation will become the burning platform for water use

change, particularly water use efficiency and land use adaption.

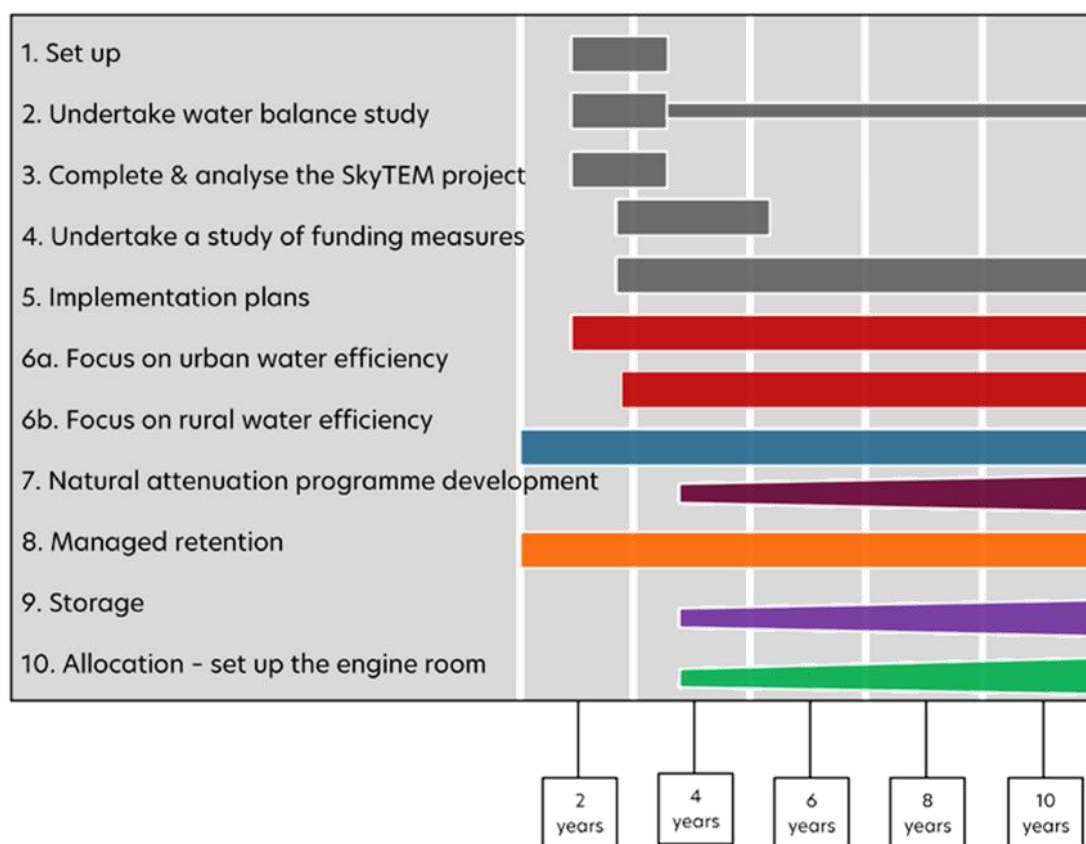
BEARERS - FURTHER MAJOR IMPLEMENTATION

These are the final implementation projects that will require a detailed process of setting up. Land use adaption is potentially evolutionary and requires a concerted programme of action and education. Land use adaption is not placed here to imply it is a late starter because work in this area is already underway. It's placement is more of a reflection of its gradual and evolutionary nature.

11. Land use adaption

- Build on the work of Leftfield Innovation.
- Develop an adaption strategy.
- Seek to incentivise that strategy.

Scheduling of water resilience solutions



Appendix 2: Multi- criteria Analysis results

The Multi-criteria Analysis (MCA) comprised five workshops together engaging around 45 people. After extensive briefing on the criteria and the resilience solutions, they were facilitated to complete a group scoring exercise. The groups were:

- The Wairarapa Water Resilience Strategy Group.
- A selection of participants from the three local councils – officials and elected representatives.
- A selection of experts in hydrology and water management from Greater Wellington.
- A selection of community stakeholders comprising people with an interest in farming, regional development and the environment.
- A selection of participants from Ngati Kahungunu.

The participants, while drawn from these groups, were not there to represent the point of view of any organisation but to bring their knowledge and experience to bear on the priority setting task. The

workshops used a well-known methodology termed Multi-criteria Analysis (MCA) to prioritise the resilience solutions. The resilience solutions were those outlined in this Strategy. The criteria were, developed with the Wairarapa Water Resilience Strategy Group.

The criteria and the list of solutions were simplified into categories to make for a manageable workshop. The workshops were three hours with the first two hours spent working through the criteria and the solutions so that they were well understood. The last hour was spent scoring.

The MCA was used to identify the general consensus around the solutions. It was not meant to be a statistical exercise and the results should be treated as indicative rather than definitive. It needs to be remembered that many, though not all, those involved had a moderate- to high-level of knowledge of water management.

Criteria

This set of criteria was used to measure the effectiveness and appropriateness of the resilience solutions:

1. Multiple positive impacts
2. Support for land use adaption
3. Cultural and lifestyle uses
4. Water quality improvement
5. Cost efficiency
6. Productivity
7. Access
8. Environmental improvement

Resilience Solutions

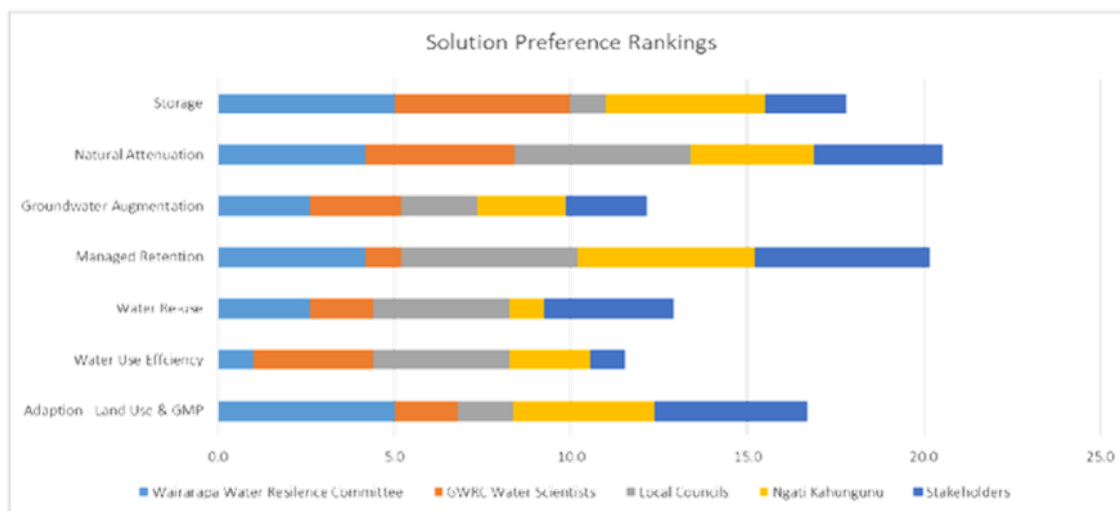
The solutions were taken from Adaption and MAW categories:

1. Land Use Adaption / Good management practice
2. Water use efficiency
3. Water re-use
4. Managed attenuation
5. Groundwater augmentation
6. Natural attenuation
7. Storage

The list of the criteria and solutions used for the MCA follows. The solutions were not divided into adaption and MAW categories. In fact, only one adaption solution was used and the rest were MAW solutions. This is because in the water resilience strategy there is a strong,

though not exclusive, focus on water-related solutions.

The graph below summarises the results of the MCA exercise for each of the resilience solutions:



Appendix 3: Water banking and Payment for Environmental Services (PES)

This appendix is intended as background for the strategy, rather than part of it. Funding of resilience is a major subject matter in its own right.

Water banking is the practice of foregoing water deliveries during certain periods, and “banking” either the right to use the foregone water in the future, or saving it for someone else to use in exchange for a fee or delivery in kind. It is usually used where there is significant storage capacity to facilitate such transfers of water. The term “water banking” has dual meanings. It refers on the one hand to the storage of water for future use, as in a water bank, but more importantly, it refers to the method of financial transaction where an investment in water is deposited on the expectation of recovery at a later date.

Water banking is largely a foreign concept in New Zealand but is widely used in other parts of the world, particularly the US. It is used to enhance water supply reliability for irrigation. It is most applicable where water is drawn from groundwater and then replaced from surface water through techniques such as managed (or natural) aquifer recharge.

The groundwater supply is then managed through the purchasing and selling of groundwater rights in the same way that water supplies from surface storage might be purchased.

In a Wairarapa context water banking has difficulties. Groundwater storage has more complications than surface water. These complications are exaggerated by some landform and aquifer characteristics.

There can often be a large discrepancy between the water being pumped into aquifers and that which is available to come out. There are significant natural flows into groundwater. There are also significant losses. In particular, groundwater that is taken near rivers is regarded as part of river water. Groundwater naturally rises back into rivers and streams in their lower reaches. There is also leakage to unknown parts of the groundwater system.

Aquifers in Wairarapa are fractured and obstructed by the effects of earthquake-driven land movements.

The proposed SkyTEM aero-magnetic survey may identify greater deep aquifer water resources which could be regarded as more stable, but they pose problems with recharge because of the difficulty of access. For further discussion on this matter refer back to the section of the Strategy on groundwater.

Another way of looking at groundwater is the substitution effect. In the event that surface storage is available, its use is given priority and groundwater is held back until surface stored water supplies are dwindling. At that point, drawing of groundwater could kick in. This has the advantage that surface water is used

early in the dry weather cycle reducing losses to evaporation with groundwater not subject to evaporation until it is brought to the surface and spread onto the land. The disadvantage is that much of groundwater (Category A) is really an extension of surface water.

There is also an attenuation factor in groundwater supply. For example, water from freshes may flow through groundwater for a period (perhaps only a few weeks). If those freshes are in November and December, then that water may be available in the middle of the peak-dry period, if it can be recaptured.

Water banking becomes relevant when surface and ground water are to be managed together. To achieve this type of inter-operability, infrastructure would be necessary to transfer water. Further, at present the cost structures for extracting groundwater compared to what they would be for surface water are quite different. Arguably, both would have to operate under the same, or a closely aligned regime. The cost of managed retention or managed aquifer recharge would have to be included in the cost of extracting groundwater. This is not a water cost but an infrastructure cost. There would also be a portion of water from storage finding its way into the aquifer when it passes down the river from storage as proposed in the Wakamoekau Storage Scheme.

In Wairarapa there is another level of complexity to add to the picture. Carterton and South Wairarapa towns draw a large

proportion of their water from aquifers through the use of bores. The current system of allocation of water consents recognises the primacy of water for domestic use, but there are limited controls on that use. There is further complexity around the condition of some ground water. In the south, natural contaminants such as manganese are present in the water which have a corrosive effect on pumping equipment and in large quantities have some health implications.

Water banking is a concept that is probably before its time in Wairarapa, but this is a Strategy with a horizon of 30-50 years, so it needs to at least be "on the table" for discussion. It has the advantage of sharing the cost of accessing and supplying water. It could assist with bringing measures of real cost into the equation and this increased value can begin to fund advances in natural resilience that are going to be difficult to fund as long as they are seen as an "extra" rather than "integral" cost of water.

Water banking could assist with greater equity between rural and urban users and it would assist with getting the most expensive water to the most valuable uses. The immediate assumption is that this is 'code' for farmers will pay more. In point of fact, it may be a way of increasing the contribution of urban dwellers to the overall resilience effort, thereby sharing the costs and the benefits. In the same way that rural users may have to pay more for water in the water deficit period, so might urban users. Some of those funds would go to ensuring the integrity of the

water they are using and the environment from which it comes.

Cap and trade mechanisms are already in use in some parts of the country to control water use and limit contamination issues. This could be another approach to equitable distribution.

However it is conceived, water banking would require a governance and regulatory/allocation system that stretches across all managed water – supply and demand. Water banking requires a broad strategic view of water, rather than a short-term tactical problem-solving view.

Finally, it is recognised that for some, using terms like “banking” portray a strongly utilitarian (or even “ownership”) view of water which is contrary to the current trend towards natural resilience and common ownership. Language has to be used carefully, but one of the big challenges of a resilience strategy is how resilience will be funded. It will only ever be funded properly when it is integral to the use of water and is levied on an equity basis. Water banking should not be seen as a wholly commercial view of water management, but instead it should be viewed through a social investment lens designed to support the economic, social and cultural capital of the community. We still have a long way to go before society will accept this type of view.

⁵⁶ “The Effectiveness of Payments for Environmental Services”, Borner J, et al, World Development Vol 96 pp 359-374, 2017

Payments for Environmental Services

The idea of payment for environmental services (PES) has been alive for several decades internationally but has made limited progress in terms of application and delivery⁵⁶. PES has been defined as “voluntary transactions between services users and services providers that are conditional on agreed rules of natural resource management for generating offsite services”.⁵⁷ Most commonly they have consisted of incentive-based payments to a land user to protect agricultural soils and retire environmentally sensitive lands. There are far fewer examples where PES is used for punitive reasons, to deter poor practice.

There are examples of these activities in New Zealand. The payment of incentives to farmers in the Taupo and Rotorua catchments by their respective regional councils to reduce nitrogen flows into the lakes is the best example. These examples are interesting. Where in the Taupo example farmers were obliged to change their land use, the incentive was more of a compensation payment. Whereas in the case of Rotorua, where it was a genuine and substantial incentive, only a little over half the fund was taken up. This was principally because there were many extenuating circumstances including political and community considerations.

⁵⁷ Wunder, 2015 p241 quoted in Borner et al

Tree planting is another example and the Billion Trees programme initiated by the current Government is an example of a subsidy targeting an environmental outcome. Once again take up has been an issue. South Wairarapa district Council approached the scheme with great enthusiasm until they realised that there wasn't the public land available to plant the trees and private landowners were generally not interested, for financial and cultural reasons.

Subsidy schemes have been used in other parts of the country. ECan, for example, introduced in 2010 a 50/50 fund to support environmental initiatives. This fund was chronically underused because the sponsors of projects could not come up with their 50% share. It was felt that reducing their required share would send the wrong message, until it was realised the incentive was simply not working. Money was not the only problem. Some regional councils provide support to farmers to install variable rate irrigator technology. Greater Wellington offers such assistance in specific cases.

International research has pointed to many examples of unintended consequences from PES. One of those side effects is that PES can achieve environmental outcomes but at the expense of socio-economic outcomes. Another is high transaction costs (including recruiting participants, monitoring and non-compliance) that consume financial resources.

In the Wairarapa context there is a case to explore incentives. For example, incentives to change land use. In that situation the incentive may be access to water or higher level of water reliability. There are questions whether water, a natural and common resource, can be used in this way, though irrigation schemes around the country reserve the right to control the supply of water to shareholders on the basis of non-compliant behaviour with scheme rules.

There are also equity examples. Farmers who build bunds to direct water into groundwater but have no access to that groundwater might expect consideration from those farmers who do. This scenario is a real possibility in Wairarapa and in this situation the receiving farmer would be benefitting from a service that has a partial environmental content – the use of the groundwater medium for distribution. This particular example has the potential problem of recovery. Water induced into aquifers may not be available to those who wish to extract it due to a whole range of hydrological and geomorphological reasons.

The learning from the literature is that care needs to be taken in design and that PES tends to be high on promise but somewhat lower on delivery.

If PES is a difficult concept to introduce, there are other options, though they are less attractive. Greater Wellington could apply a target rate, but this would be across a whole area and would not easily differentiate those benefitting from water

recovery. Another alternative might be developing a farmers' cooperative where they 'socialise' costs and benefits. This would suffer from the freeloader problem. A system that attached payments to consents is complex and would be difficult to introduce. It would require regulatory support.

The whole question of directing costs to those who benefit from water is a difficult one and conversations on it will evolve over the coming years.

Appendix 4: Irrigation and constructed water storage

Irrigation and constructed storage are not the same thing, despite the fact that they are often confused in the public mind. There is extensive irrigation in the Ruamāhanga catchment, of which a very small portion is provided by constructed storage presently. Irrigation will continue to play an important role in a climate change future because despite strenuous attempts at adaption, more water will be required to offset losses to evaporation.

Conversely, constructed storage can be used for uses other than irrigation such as domestic supply, industrial and environmental uses or for augmenting low flows in the dry season.

The proposed Wakamoekau water storage scheme sited approximately 10km NW of Masterton is currently being investigated at feasibility level by Wairarapa Water Limited. That work was largely completed by December 2020 and used for the consenting process.

The consenting/procurement phase will then proceed between January 2021 and December 2022, followed by three years to construct and fill the project, which may become operational in 2026. These dates are all estimated at this stage.

Initiated by farmers and initially intended for agricultural uses, but since modified into a multiple uses community scheme, this project has the potential to provide stored water for other uses such as to the Masterton District Council treatment

facility for reticulated urban demand and to associated rural areas to replace unsustainable water races. Approximately a quarter of the water would be captured from the Wakamoekau catchment and released back through the dam wall as minimum flows, existing allocations, flushing flows and shareholder allocations, while the remainder would be pumped from the Waingawa River during supplementary flows.

Status of constructed storage

Irrigation and constructed storage have been given a separate section in the appendices because the construction of storage dams around the country (and the irrigation from them) has been controversial and the position of constructed storage in a resilience strategy needs to be carefully defined. The particular point of controversy centres on water quality issues. Constructed storage is seen to be associated with irrigating dairy farms which in turn is seen to be a primary source of diffuse contamination in rivers, lakes and waterways. Opposition to storage has also become a point of leverage for some to press for full consideration of other types of resilience solutions besides constructed storage. Those opposed also believe that there are better solutions than constructed storage.

In this Strategy, as must be clear from the approach contained in this document, constructed storage is seen as just one solution to providing irrigated water, with

particular attributes, downsides and risks. In the multi-criteria analysis, it has been treated as one category of solution amongst a total of eight.

There are several issues that constructed storage throws up and which must be addressed:

- **Modification**

It is a form of artificial modification of the environment at a time when greater emphasis is being placed on either nature-based solutions or low impact modification. There is a widespread desire to give priority to nature-based solutions. The extent to which constructed storage infrastructure disturbs natural landforms and processes is an important consideration.

- **Denial**

The push for constructed storage is seen by some as an implicit denial of the importance of a natural resilience perspective. Giving priority to constructed storage ahead of other solutions implies a continuing solely functional view of water.

- **Narrow spectrum**

It has been conceived as a solution for narrow interests, that is, dairy farming and some intensive horticulture, both of which are seen as high nitrogen emitters. This is changing as a role emerges for stored water for domestic (potable) supply and even for augmentation to support natural resilience at times of low flows. It is moving from being perceived as a narrow to a broader spectrum solution.

- **Inter-operability**

The resilience perspective which has a whole-system view of water increasingly sees constructed storage and natural storage (groundwater) as being potentially inter-operable, meaning that constructed storage is not seen as a separate solution.

- **Dominant discourse**

There has been criticism that the technical nature of grey infrastructure and built storage has led to technical considerations dominating the discourse. The approach of this Strategy is designed to avoid such a situation. The real costs and benefits of storage must therefore be carefully considered and expressed with transparency so that all stakeholders can participate in the discourse and their views are valued.

If constructed storage is to have an ongoing role in water resilience, these issues must be considered, debated and resolved. The role, scale and contribution of constructed storage to the Strategy needs to be carefully assessed through which a basis of trust and confidence in this resilience strategy can emerge.

Irrigation use

This section provides the number of farms (hectares) under irrigation, types of irrigation, time lapse volumes of water used for irrigation back 20-30 years, irrigation and land use patterns. The amount of water allocated through resource consents across the region increased significantly between 1990 and 2010 but has largely remained stable since

then. In the Ruamāhanga, irrigation is the dominant use. Currently, approximately 18,000ha is irrigated in the Wairarapa, but this only accounts for a quarter of Wairarapa water use.

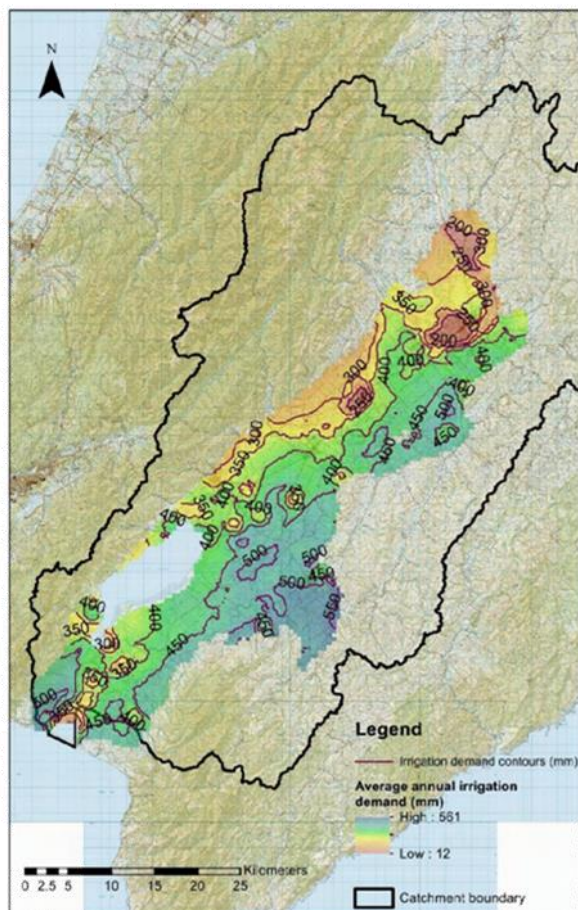
Most of the region's major surface and groundwater resource is now near or fully allocated, meaning that for rivers at normal to low flows there is just enough water to meet all consented water takes while still maintaining the environmental health of these waterways.

The amount of groundwater that can be safely allocated is likely to reduce in the future because we now know much more about the linkages between groundwater and surface water, and how groundwater abstraction affects nearby river and stream levels. That knowledge will increase further following the proposed aerial survey.

The pNRP splits surface water allocation into overall catchment management units which are in turn split into sub-units. The overall catchment management unit in this case is the Ruamāhanga River and all its tributaries, and is currently 107% allocated. Several of the sub-units (highlighted in red) are, 'on paper', also markedly over-allocated.

Irrigation demand

Current modelled average irrigation demand



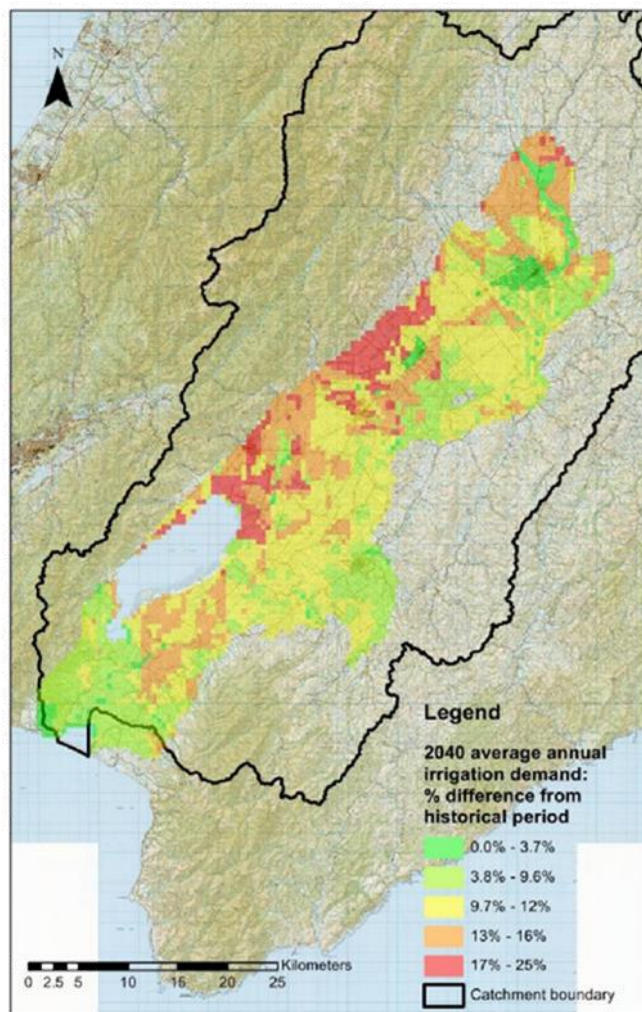
Source: Groundwater recharge and irrigation demand modelling: Ruamāhanga Collaborative Modelling Project, Aqualinc Research Limited 2017

The map above depicts the current demand for modelled average annual potential irrigation water in an 'average' year – in some years it will be far less that

that shown, while in others such as the 2019/20 summer it is far more.

The highest irrigation demand (561 mm/yr) is in the eastern part of the catchment where the rain shadow effect is most dominant, the lowest in the west. This pattern exists now and is likely to continue in the same pattern in coming decades.

Projected % difference in average irrigation demand through to 2040



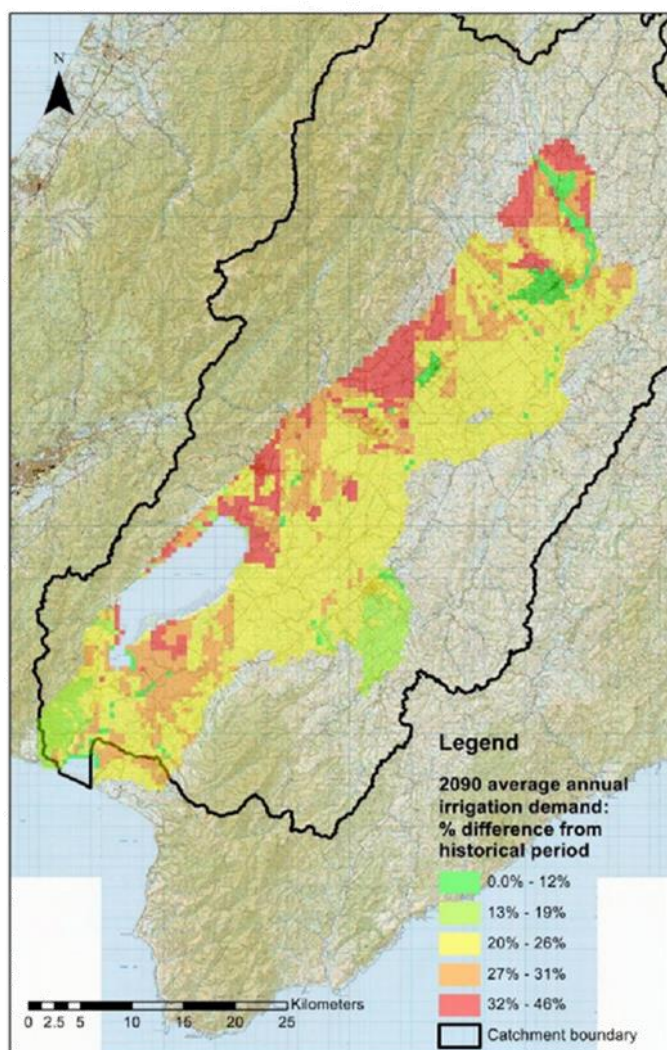
Source: Groundwater recharge and irrigation demand modelling: Ruamāhanga Collaborative Modelling Project, Aqualinc Research Limited 2017

As shown on the map above, the modelled percentage change in average annual irrigation demand between the projected levels for 2040 and the modelled historical period shows an increase in demand of up to 25% in the north and west of the catchment, with smaller increases in the south and east. That is a substantial increase in demand from an already fully allocated resource.

The modelled percentage change in average annual irrigation demand between 2090 and the modelled historical period is shown below. Even though the spatial pattern of increases is similar to 2040 period, the magnitude is greater, with an increase of up to 46% predicted.

Projected % difference in average irrigation demand through to 2090

Note the colours used for the 2040 and 2090 maps have different values.



Source: Groundwater recharge and irrigation demand modelling: Ruamāhanga Collaborative Modelling Project, Aqualinc Research Limited 2017

Irrigation technology is advancing all the time and it can produce good results. Irrigation farmer Mark Guscott reports that the installation of a variable rate irrigator and soil-sensing probes saved him 19% of water. He said the largest savings are in the shoulder of the season or in the wet seasons, rather than in the middle of the

dry season when large amounts of water are required, especially when irrigating pasture.

He says that the best results can be had on mixed arable farms where there are multiple crops in different soil zones with different water requirements at different

times of the season. It can be quite complex to manage the effective 'dosing' of water. He makes the point that once you are using technology you are wanting to upgrade it as equipment needs replacement. The costs of new irrigation gear are high. Replacing a pivot is now close to \$100,000.

In terms of where Wairarapa stands with regard to other regions, Stephen Thawley of Greater Wellington says that Canterbury has about 53% of irrigation under centre pivots and K-Lines/long lateral which are at the more efficient end of the irrigation spectrum. The Greater Wellington region has about 55%. There are more pivots in Canterbury but that is more to do with topography.

These figures indicate that there is certainly room for improvement in Wairarapa, but that local irrigators are up with the pack on a national comparison.

Irrigation from storage ponds

The use of storage ponds and other forms of tactical irrigation is relatively undeveloped in Wairarapa. The 2014 Opus Report⁵⁸ talked of these as "secondary storage". It envisioned that they would play a smaller role than a primary storage and would generally only supply one property. OPUS considered secondary storage to be a security measure to offset the risk of the primary storage not being able to meet peak demand.

⁵⁸ OPUS, "Wairarapa Water Use Project On-Plains Storage refinement" 2014

Secondary storage is generally considered to be a much more expensive option and, due to lower water volumes, to act mainly to offset extreme adverse conditions, rather than providing a sustained supply of water.

Both primary and secondary storage have the potential of alignment with water races. OPUS notes that Taratahi River Races network's principal purpose, and consequently design parameters, was to supply stock drinking water. "Over time, however, ancillary uses have also developed, including: domestic and industrial (non-potable) purposes, firefighting and irrigation."

OPUS makes the point that at first glance the race network may have potential for distributing water for irrigation, but there are a number of significant constraints. They say it is unlikely the network of stock races could be easily adapted to convey irrigation water.⁵⁹

As an aside, potential exists for water resource efficiencies to result by combining with the water already allocated to the Taratahi Water Race and Masterton's municipal water supply, both currently sourced from the Waingawa River.

Some vineyards have frost fighting ponds which they use to protect spring budding, while a few farms have limited purpose-built water storage capacity – the latter generally only have sufficient water to last a few weeks at best.

⁵⁹ OPUS, pp2

Irrigation from groundwater

A significant proportion (60%) of water used for irrigation is from groundwater. In general, particularly in the past, groundwater sources are very reliable water. However, close connections between surface water and groundwater means that many groundwater takes are becoming more restricted, i.e. some takes are less reliable than they were. Some groundwater zones, as already explained, are over-allocated and some clawback of allocation is required.

Further investigation is required to see if there are opportunities to take more groundwater, potentially with higher reliability, if the spatial distribution of takes is shifted, particularly from shallow to deeper sources. Of course, there are higher pumping costs in moving to deeper sources.

The WIP identifies flow levels for the rivers in the region. Most rivers hit low flows in the summer and abstraction is no longer possible with the water being returned to the environment and some used for domestic purposes. The number of days without any water allocation could have significant implications for some activities involving a dependence on water for their survival especially during January to March. Even with climate change, on average, the key period of water deficiency will be in January to March and not before it.

Appendix 5: Unintended consequences

The whole question of unintended or unforeseen consequences deserves separate treatment. We need to remind ourselves that good intentions are no substitute for good practice. This could double as a risk register for a resilience strategy.

In a strategy like this we are embarking on a series of actions that will continue to modify the environment around us. Even nature-based solutions will mostly be man-made. Because we don't have the same level of hindsight and foresight of nature nor the time of evolution, we are likely to make mistakes or oversights. We have to protect against such possibilities.

It is the unforeseen consequences of many water supply (and disposal) measures in the past that have brought some of these solutions into disrepute. In today's world, unintended consequences have to be fully considered prior to action to modify land and water systems.

Notable examples of unintended consequences from other activities are:

- | | |
|--|---|
| <ul style="list-style-type: none"> i. Flood control – building flood control infrastructure that neutralises natural resilience. An obvious example is the redirection of the Ruamāhanga past Lake Wairarapa with the consequent loss of numerous wetlands and the drying of lake surrounds. The goal of reducing flood risk by speeding up the passage of water through the catchment has resulted in the | <ul style="list-style-type: none"> ii. Loss of production – some aspects of resilience implementation will impact on productivity, particularly those related to water quality. This is already happening as a result of Whaitua, but productivity provides the financial resources to build resilience and care has to be taken not to unnecessarily bite the hand that feeds. iii. Loss of industry – food-related industries are likely to be an important part of the Wairarapa economy of the future. Unless industries not even currently present in Wairarapa are thought about in terms of available water, our actions may prevent their arrival and the benefits to employment and wellbeing that they might bring. iv. Amenity facilities – that require constant replenishment of water at times when availability is low. The example of Henley Lake illustrates that point. v. Clearing hill areas of trees – resulting in loss of shade for animals, loss of moisture retention, and accelerating water run-off taking with it contaminants and sediment that end up in rivers and streams. vi. Tile drains – that have the beneficial effect of draining paddocks to avoid saturation in the winter and retain soil |
|--|---|

structure, but in so doing losing nutrients from the soil which end up in rivers and lakes and then have to be replaced with mineral fertilisers.

of natural and constructed water resilience working together for best effect, and to see resilience as part of a total system rather than as separate individual solutions.

- vii. **Pivot irrigators** - requiring the removal of trees which provide shading and resilience benefits.
- viii. **Energy costs** - the high energy requirements of a number of strategies such as water re-use and pumping of deep groundwater, which could work against the broad matter of CO₂ release into the atmosphere and climate change reduction, unless the electricity is renewable.
- ix. **Spoiling of culturally significant waters** - this especially refers to waters for the collection of mahinga kai, the use of Waitapu (sacred water) and Waiariki (chieftain water). Another example is swimming water (Waitoko) where Māori have traditionally bathed. The blessing of babies in sacred water, often near the confluence of two rivers, depicts the joining of two blood lines.
- x. **Treated sewage** - the disposal of treated sewage into rivers making river water unusable for stock water for the dairy industry. It also disrupts cultural use.

There are always upsides and downsides in innovation. These have to be looked at carefully and a balance struck. The answer is not to halt activity and innovation, but to think about them from the perspective

Appendix 6: The Wairarapa Water Resilience Strategy Group Membership

Adrienne Staples	Jo Hayes
Alastair Smaill	Kathryn Ross
Alex Beijen	Leo Vollebregt
Alistair Cross	Lyn Patterson
Amber Craig,	Marama Tuuta
Andy Duncan	Michael Player
Bruce Geden	Mick Williams
Carlene Te Tau	Mike Birch
Chris Lewis	Neil Fisher
Chris Peterson	Norris Everton
Dame Margaret Bazley (Chair)	Peter Gawith
Daran Ponter	Rawiri Smith
Dave Gittings	Richard Kershaw
David Hayes	Robin Potangaroa
David Hopman	Robyn Cherry-Campbell
David Perks	Robyn Wells
Elizabeth McGruddy	Sean McBride
Geoff Henley	Tim Lusk
Greg Campbell	Wayne O'Donnell
Greg Lang	William Beetham
Harry Wilson	
Jane Davis	
Jim Lynch	

Occasionally these people used alternates.

Appendix 7: Terms of Reference Water Resilience Strategy Group

The following Terms of Reference were developed at the beginning of the project, but never formally agreed due to changes

Status

The Wairarapa Water Resilience Strategy Group has been set up under the auspices of the four councils of the Wairarapa region – Masterton District Council, Carterton District Council, South Wairarapa District Council and Greater Wellington Regional Council. The Strategy is also closely aligned with the Wairarapa Economic Development Strategy (WEDS) which provides a regional context for consideration of water management and resilience.

Development of the Strategy was being funded by the Provincial Growth Fund through a grant awarded to the four applicant councils.

While being under the aegis of the councils, they are not under any obligation to accept the findings and recommendations of the Strategy until such time as they have had the opportunity to consider the Strategy in its entirety at the end of its completion. This is a non-statutory strategy.

This Strategy will sit beside and draw on other statutory and non-statutory water and land use initiatives in the region such as the Ruamāhanga Whaitua Implementation Plan.

of resilience group membership. They have been a guide to the project.

This Strategy has to straddle two sometimes conflicting requirements – to be sufficiently detailed to be technically credible particularly for its use by councils and technical audiences, and to be sufficiently simple and obvious to be understandable to community and non-technical audiences.

Te tiriti o Waitangi and tangata whenua

The Wairarapa Water Resilience Strategy group acknowledges te Tiriti o Waitangi and the foundational principles of partnership, participation and protection guaranteed by the Crown.

These principles are outlined below:

- **Partnership:** interactions between the Treaty partners must be based on mutual good faith, cooperation, tolerance, honesty and respect
- **Participation:** this principle secures active and equitable participation by tangata whenua
- **Protection:** protection of whakapapa, cultural practices and taonga, including protocols, customs and language

These three principles will guide the Strategy Group in its approach. The Wairarapa Water Resilience Strategy group will work with Rangitāne and

Kahungunu in the design of solutions and be mindful of the impact on the wellbeing and mana of whānau, hapū, iwi to ensure these solutions uphold the above principles.

The Wairarapa Water Resilience Strategy group, through its iwi representatives, will engage with whānau, hapū and marae while ensuring the identities and whakapapa of both Rangitāne and Kahungunu are maintained.

Coverage

The scope of this strategy is for the Wairarapa region, however the primary focus of the Strategy will be on the Ruamāhanga Catchment. This is because it is the primary catchment area. There will also be other catchments in the region such as those in the eastern hills which empty out on the east coast of New Zealand and the sources in the Tararuas.

Purpose

The purpose of project is to prepare a Strategy including action recommendations that will guide the policies and practices of the four councils around resilient water management and is intended to be a guide to private land and water interests including farmers, sector groups, water-related enterprises, water management groups and water storage enterprises such as Wairarapa Water Limited.

Mission

To create a road map and programme of action and responses that sets the

Wairarapa in the best direction possible to meet the challenges of climate change.

Focus

The Wairarapa Water Resilience Strategy will address a number of fundamental points regarding water resilience in the Wairarapa region:

- The wide range of impacts of impending climate change (preservation, adaptation and mitigation) and matching regulatory constraints such as those that might emerge through the Carbon Zero Bill, the emerging National Policy Statement (NPS) for freshwater and other legislative actions.
- Create a framework and implement this to analyse all water resilience solutions to ensure we understand the impacts from an economic, cultural, wellbeing, environmental and tangata whenua points of view.
- Collaborating on methods for water preservation, while adhering to our committee values, and moderating those impacts against economic, culture, wellbeing, environmental and tangata whenua points of view.
- What land use management practices may need to change to meet the water quality expectations described in regional and national regulatory instruments and how this impacts on water usage and requirements.
- How a collaborative water resilience regime in the Wairarapa Region will be implemented and managed sustainably into the future.

This Strategy is first and foremost a water resilience strategy. It complements, but does not overlap with, the funds granted by the PGF for prefeasibility work on the Wakamoekau Community Water Storage Scheme (WCWSS) and the feasibility and

consent work to follow. The two projects are quite separate, though sharing of relevant information will be encouraged. If this project is to be part of a true water resilience programme, as intended, then work is required on how water will be used and by whom, specifically for what and how this integrates together into a total water resilience picture for the catchment. Water supply is only one portion of our total resilience picture.

These additional points made by members of the WWRSG and reflect the approach that is expected in the preparation of this Strategy:

- Doing nothing is not an option
- Despite other work being done on irrigation, the Resilience Strategy should start from first principles and the four wellbeings will be at the foundation of considerations.
- It is noted that the immediate felt need for water is probably strongest in the rural community, but this reflects the stage we are in the cycle of climate change. Impacts are expected right across the Wairarapa community and these need full consideration in this Strategy.
- Water storage should be seen as part of a range of possible interventions. The Strategy may turn those interventions into a hierarchy of priorities.
- Public information and education should be an important part of the Strategy both in creating it and in the recommendations for action.
- Efficient use is an important consideration and is a matter of practice and a state of mind.
- An integrated catchment approach is to be used as a framework for the preparation of the Strategy and the

extent of the catchment needs to be considered. For example, the eastern hills from where streams flow into the Ruamāhanga and the Tararuas should be included.

- Water balance should be a key concept in considerations of resilience.
- The appropriateness of central or diffused storage, ground or surface, needs to be considered and what role each plays.
- The role of nature-based systems for water management need to be fully represented in the Strategy.
- Catchment health needs to be a focus as reflected in the Whaitua process.
- Added-value and innovation in water use needs to be front of mind.
- The Whaitua Implementation Programme (WIP) is a core foundation document. The adoption of the recommendations of the WIP into the Greater Wellington Regional Council Natural Resources Plan (NRP) and the implementation of its recommendations will continue in parallel to the development of the Resilience Strategy.

Scope

Two outputs of this project are envisaged:

- **A strategy report**
 - This would be a comprehensive outline of the work undertaken, the methodology used, the results and the conclusions
 - It is anticipated as a comprehensive 90-120 page document and is intended for an informed audience
- **A summary report**

- This would be a brief paper outlining the key findings and directions of the Strategy and specifying the road map and next steps. It is estimated at 8-10 pages with a strong visual element to it.

A particular focus of engagement will be catchment or river management groups, about 36 of which already exist in the region. A wide range of stakeholders will be engaged from both rural and urban backgrounds.

Procedures

The Wairarapa Water Resilience Strategy Group will determine the final content and recommendations of the strategy document. They will oversee the Strategy document throughout its production. The WWRSG, chaired by Dame Margaret Bazley, will operate on a collaborative basis seeking to achieve agreement on the key matters in the Strategy.

The Water Resilience Strategy group should also look to engage with wider strategic committees in the Wairarapa region including Wairarapa Regional Economic Development Strategy (WEDS), relevant documents and data from all four councils, all relevant iwi strategies, Whaitua Implementation Plan and any other relevant strategies.

Code of Conduct

The WWRSG is not a "representative" group, but a group of stakeholders who it is felt have a sufficient spread of experience, knowledge and skills to undertake the task. A Code of Conduct is appended.

Consultation and engagement

A programme of stakeholder and public engagement will be undertaken in parallel with and as an integral part of the Strategy and as resources allow. There will be a high level of transparency with relevant documents placed on a website for public access and comment and contribution will be sought from those affected. The details of management of the consultation and engagement programme will be overseen by the WWRSG.

Addenda

The addenda comprise a series of background papers that were used to support the main text. They come under the general title of "Characterisation" as they are informational and descriptive in nature. They are referenced in the main text where relevant.

Addendum 1: Characterising mana whenua perspectives

The identity and wellbeing of Wairarapa iwi, Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa are directly associated with Te Awa Tapu o Ruamāhanga (the sacred Ruamāhanga River) and its many tributaries. From the headwaters to the sea, local iwi and hapū identify with the river system as a source of mana and mauri. These traditional relationships of Māori with water are recognised in the Resource Management Act 1991 (RMA) and in the NPS-FM as matters of national significance. Recent Treaty of Waitangi settlements have also recognised the mana whenua role as kaitiaki in the future governance and management of Wairarapa Moana (Lake Wairarapa, including its wetland margins and connecting waterways and Lake Ōnoke) and Ruamāhanga.

Who is Ruamāhanga?

The mana (pride and strength) of Ruamāhanga is carved across the lower North Island. Ruamāhanga has massive scale, great diversity and a generative force that enables and empowers all life in the Wairarapa Valley. Ruamāhanga is the largest flowing body of water in the Wellington region. It extends from Pukematawai, a peak in the north-western Tararua Range, to Wairarapa Moana in south-eastern Wairarapa. This is a journey of more than 130 kilometres, taking in many thousands of hectares of land and a myriad of water bodies, large and small. Along the way the flow of Ruamāhanga is at times strengthened, as it receives water from many tributaries, and at others

diminished, as water is given to the land, forming springs and streams that ultimately return to the main stem.

Te Awa Tapu o Ruamāhanga – the sanctity of Ruamāhanga

Ruamāhanga exists in a cultural and spiritual context described by Wairarapa iwi Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa.

The breath of life (te hā o te ora) was placed within the Ruamāhanga River at the beginning of time.

The hā is present in Papatūānuku the earth mother's blood or the water that flows in through her main vein the Ruamāhanga. If water can breathe, all other life breathes and therefore ira tangata/humans are sustained.

Ngā Taonga nui a Kiwa – Schedule B, Proposed Natural Resources Plan

Wairarapa iwi Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa have regard to the sanctity of Ruamāhanga and how the health of the water is fundamental to human health and wellbeing. Iwi have a unique relationship with water and water is a consistent point of interest. Māori were active and influential participants in the formulation of the Whaitua Implementation Programme.

The integration of the mana whenua perspective with catchment planning was critical to the work of the Whaitua Committee, which worked with local kaitiaki and marae communities to ensure that Māori values are recognised and provided for in the WIP. The Committee's recommendations aim to ensure that active mana whenua leadership and participation is integral to the implementation of improved water quality and quantity in all places in the Ruamāhanga whaitua.

The recommendations of the Whaitua do this by requiring that hapū/marae have a structural role in freshwater management unit (FMU) implementation management processes and that their values are integral to reporting on progress at community catchment scale. The recommendations also require that hapū/marae capacity and capabilities to both lead and participate as mana whenua kaitiaki are supported and resourced through the development of a mana whenua-led kaitiaki support mechanism.

Stewardship

Mana whenua have responsibilities in the stewardship for water as kaitiaki and poutiriao.

Mana whenua o Wairarapa have cultural, spiritual, traditional and historic

associations with the lands, waters, flora and fauna within their rohe and have a responsibility to preserve, protect and manage all natural resources within their rohe as kaitiaki in accordance with the principles and values set out below:

Ki te kore ngā poutiriao hei tiaki i te tūranga o ia mea, o ia mea, te haere a ia mea a ia mea, te mahi a ia mea a ia mea, nā kōnei i witi ai ngā mea katoa, mei kore ngā poutiriao kua taupatupatu ngā mea katoa ki a rātou anō, pēnei kua hē kua matemate.⁶⁰

(If Poutiriao did not act to protect the position, the movement and the actions of all individual things, they would cross over and interfere with each other; without Poutiriao all things would clash and compete with each other, things would not be balanced and everything would self-destruct.)

Further helpful text is drawn from the "Values for Wairarapa Waterways" Report, November 2011 by Caleb Royal⁶¹:

"Māori values associated to a particular river, place, or community, are most commonly generated through the occupation of an area, and the cultural requirement to behave in a manner consistent with kaupapa Maori (foundation of cultural normalities). The values identified in this project include;

⁶⁰ Ra Smith, Ngati Kahungunu

⁶¹ <http://www.gw.govt.nz/assets/Our-Environment/Environmental-monitoring/Cultural-Values-for-Wairarapa-Waterways-report.pdf> pp 3

- *Wairua (spiritual) - Tohi rites, removal of tapu associated with war/death, baptisms and blessings of people and items.*
- *Tinana (physical body) - washing after child birth or menstration, water for cleaning and cooking, collection of food and weaving resources, preserving/storing food.*
- *Hinengaro (mental wellbeing) - collection of rongoa (healing plants), drinking water (mental clarity), teaching and learning (education), meditation.*
- *Whanau - transportation (waka), recreation, gathering of building resources, positioning of Pa, manaaki (sharing) the bountiful resources.*
- *In addition to the themed values of; wairua, tinana, hinengaro, and whanau, there were values identified that recognise the ecological importance of the Wairarapa waterways. Iwi identified the concepts of; ki uta ki tai (mountains to the sea), mauri (life essence), and habitat protection as key values for the future management of the water resource."*

waterway, also attribute significant value on a waterways ability to nourish the spiritual, mental, and community wellbeing. When discharges of pollutants, algal blooms, and flood protection works compromise these values, raising the minimum flow is unlikely to address the problem determined by Māori. There is an expectation from mana whenua that the rivers and streams which once provided this nourishment for their community should be available to support their cultural identity.

Māori values attributed to the rivers and streams throughout the Wairarapa Valley are consistently being compromised through low flows, poor water quality and loss of biodiversity. There is a distinct difference between minimum flow values determined from a Greater Wellington perspective and an iwi Maori perspective. The report affirms that minimum flow volumes from Greater Wellington are based almost exclusively on the habitat space for fish which should provide for the ecological values associated with the waterway. Conversely, Maori values, whilst acknowledging the value of ecology of the

Addendum 2: Characterising the physical geography

The Wairarapa is contained and compact in nature with a 130 square kilometres fertile alluvial flat valley floor bounded by relatively low mountains in the west and hills in the east with a long coastal strip. North/south fault lines are responsible for the shape and much of the valley has been uplifted, some as recently as the 19th century.

The compact geography creates a sense of integration within and separation from without. The faulting and tilting has sharply modified land forms including rivers and groundwater areas. The location of Wairarapa east of the main divide is crucial to understanding its climate and response to climate change.

Climate overview

Westerly weather systems dominate the climate and during summer produce foehn winds (the 'Nor'wester' to locals) and high temperatures. Wairarapa has always experienced hot dry summers. South-easterly rain-bearing winds can produce heavy rainfall events resulting in flooding, otherwise winters are dry and cold. Rainfall is highest in the west near the ranges and diminishes eastward, creating quite different conditions over a relatively small land area.

While the Tararuas catch snowfalls throughout winter, the snow does not lie for long. Water storage in snow fields, characteristic of the South Island and

which feeds irrigation well into the spring and summer, is not a feature of the Tararuas.

Wairarapa has been pre-disposed to drought conditions long before the advent of climate change effects. The dry and relatively low wind (compared to neighbouring regions) in parts of Wairarapa makes it attractive as a visitor destination in summer and winter. Climate change will gradually move the climate from a "continental" to one with more "Mediterranean" characteristics.

Characterising the economy

As every year goes by Wairarapa looks increasingly like the rest of New Zealand in economic terms. Urban populations are increasing as a percentage and employment is moving from the primary and secondary sectors to the tertiary and quaternary sectors. The ANZSIC Level 1 industry which created most jobs over the last ten years (2009 to 2019) was 'Healthcare and Social Assistance'. 'Professional, Scientific and Technical Services' are ranked second and 'Education and Training' third. By contrast, sheep-beef cattle farming shed 79 jobs between 2009 and 2019, whereas it had seen the largest growth of any industry over the previous period since 2000 (+359 jobs).⁶² Agriculture will always be a significant part of the local economy, but over time Wairarapa will become more urbanised and an extension of the

⁶² Source: Infometrics

Wellington economy. Urban people have a different relationship to water than rural people.

Wairarapa is a small economy and if per capita living standards are to be maintained at or near the New Zealand average there is going to be a need for a constant flow of wealth into the region from outside in the form of consumer spending and business investment. Similarly, significant viable businesses are going to have to find markets outside Wairarapa and possibly outside New Zealand. There are already significant enterprises in the area in meat and timber processing locating close to their supply of raw material (like animals and trees). There are limited prospects for additional major plants because there are few other locally sourced raw materials. With a skinny labour market and located off the main transport arterials, Wairarapa is unlikely to be the site of new large plants. The type of urban population of the future is likely to be less connected to the land (and water) than the current population.

The other potential raw material is the fertile alluvial soils of the valley which, if well managed, could be used for sustained specialist cropping, horticultural and fruit production. Increasingly that resource will only be accessible with the natural resource of water, otherwise with climate change the productivity of soils will become constrained.

Future rural-related development is more likely at the boutique and artisan end of the spectrum based on specialist crops

and agricultural products, selling added-value products to visitors (tourists) and outside the region with a high-value proposition. The potential consumers of these goods are likely to be educated and sensitive on environmental and sustainability issues and Wairarapa enterprises will have to meet these expectations to prosper. Food provenance will become more and more important and the treatment of water and the environment will have to be exemplary.

Characterising the community

Wairarapa is not intensively settled, although much of the population is concentrated in the mid-reaches of the Ruamāhanga River. Low population density may well be a temporary situation. As New Zealand's population increases past five million and people are moving out of main centres like Auckland, population pressure is building in places like Wairarapa.

All local Wairarapa councils are opening up sub-divisions in response to demand and the population is moving upward from inward migration, which is a very different scenario to even a few years ago. The local councils report very moderate population increase predictions out as far as 20 years, which is surprising. This reflects Infometrics' view that growth will tail off over this period which is a sentiment we don't share. New Zealand is becoming an attractive destination in the context of COVID-19, climate change, social upheaval and other disruption in many western countries.

There is still a traditional rural population (agriculture, forestry and fishing is still the largest sector for employment), but it is dwindling through farm amalgamation, automation and urban spread. In addition, the aspirations of farming families are increasingly about what urban living has to offer than the bucolic rural experience. Values and beliefs are changing.

The impacts of the proximity to Wellington cannot be under-estimated. While some forms of transportation will become constrained by emissions considerations, there are massive upgrades of public transport underway. As a result, Wellington will continue, in fact may increase, in significance for Wairarapa.

Significant numbers of young people leave Wairarapa for education creating a hollowing effect in the post-teen population. On the other hand, there are two types of situations where people migrate from Wellington to Wairarapa - lower income people seeking cheaper housing and lower cost of living, and higher net worth people seeking lifestyle living experiences. Both these groups are in the 30 and 40 age-group. The combination of these dynamics leaves a gap in the 20s age-group which has an acute effect on businesses seeking lower cost young labour, particularly farming. On the other hand, growth in the 30-40 age group will drive tertiary and quaternary development.

Gradually these imports will exceed the locals. This is already happening in places like Greytown and Martinborough. Add to

this influence that of weekend visitors with properties in the region, especially the south. There is strong evidence that all the population categories, though some more than others, seek quality of life and environment and that matters of water and environment will be of continuing importance to them.

Characterising Wairarapa's water systems

This section deals with what's in and what's out of water resilience considerations. While the emphasis of this Strategy is on the Ruamāhanga Catchment, consideration is being given to the whole of the Wairarapa including the eastern hills and the eastern coastal strip.

It also recognises that the water bodies of Wairarapa are very much part of a system based on both 'natural design' in the sense of a confined valley, but also 'artificial design' where modifications have been made to change flows and volumes of water to achieve public or private benefits.

Groundwater and the water races are dealt with in separate chapters.

The river and groundwater systems of Wairarapa are what could be termed a closed system. What goes in must come out as rivers and streams flow through the catchment to the sea. As a result, water moves actively between rivers and groundwater depending on climatic conditions and water demand. Water loss from this system is through evaporation.

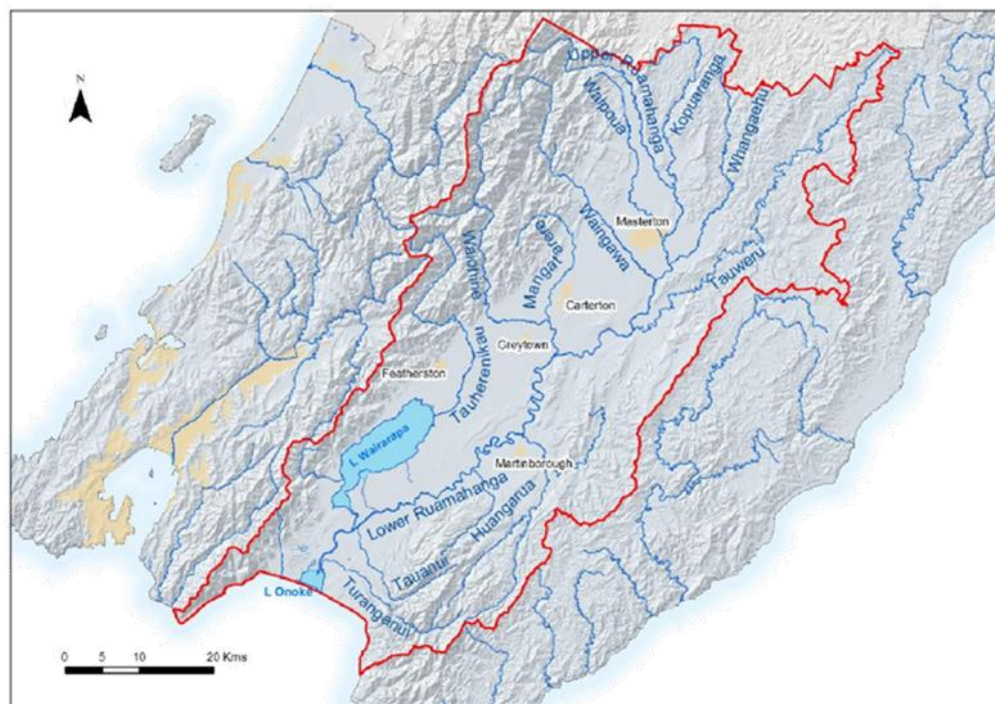
The Ruamāhanga catchment is the agricultural powerhouse of the region, although there are around 340 rivers and streams in the region. Dairying, drystock farming, orchards and vineyards all play a significant role in the area's economy. The area covers a massive 3,555m² (44 percent of the region's land area) and is home to around 37,000 people (eight percent of the region's population). Most of the people reside in the towns of Masterton, Carterton, Greytown, Featherston and Martinborough.

The Ruamāhanga River is a central feature – with its headwaters in the Tararua Ranges near Mt Dundas, north of Pūkaha Mount Bruce and emerges into the Wairarapa Valley west of Mauriceville.

The river has a total length of 162kms flowing south and then southwest before emptying into Palliser Bay via Lake Ōnoke. The river is therefore the water source for the natural environment, town and rural water supplies but is under increasing pressure from population growth and climate change.

The catchment has an area of 3,430 km². In its upper reaches the river has a wide, semi-braided channel, although in places it is confined by terraces and assumes a single-thread form. In its lower reaches, the Ruamāhanga River has a meandering, single channel contained within stopbanks.

The map below shows the main rivers and the Ruamāhanga Whaitua boundary.



The catchment contains several significant tributary catchments of the Ruamāhanga River, including the Waipoua, Waingawa, Mangatarere and Waiohine rivers that rise in the Tararua Range and the Tauweru and Huangarua rivers that originate in the eastern hill country. These rivers join the main stem of the Ruamāhanga River as it traverses the Wairarapa Valley floor before discharging to the Cook Strait on the south coast. The rivers and streams rising in the Tararua Range tend to have relatively high base flows and frequent freshes whereas rivers coming out the eastern hill country typically have extended periods of very low flow. Spring-fed streams (such as the Papawai, Otukura and Parkvale) are also a prominent feature of the Wairarapa Valley floor.

The western tributaries are subject to the cool, wet to extremely wet climatic conditions that occur in the Tararua Range, and have catchments clad with indigenous forest, with some alpine shrublands and tussock land in the highest reaches. In the upper reaches, these rivers have steep gradients and incise into the hard greywacke bedrock before traversing the younger alluvial gravels that dominate on the valley floor. The exception is the Waipoua River, which originates in the foothills of the Tararua Range. The Waipoua, Waingawa, Waiohine and Tauherenikau rivers vary along their length between single-thread and semi-braided channel form and carry high loads of gravel.

The main tributaries entering from the eastern hills are the Kopuaranga River, Whangaehu River, Tauweru River, Huangarua River, Tauanui River and Turanganui River. The first of these three differ greatly from the western tributaries. Their catchments are subject to drier climatic conditions, are of lower elevation and slope, and are predominantly pastoral in land use with an underlying geology of soft, sedimentary rock. In their lower reaches the Kopuaranga, Whangaehu, and Tauweru rivers are generally sluggish and have meandering, silty channels. These rivers tend to have poorer water quality – in particular, higher nutrient concentrations and suspended sediment loads – than the western tributaries. The Huangarua River (with its major tributary, Ruakokoputuna River) is sourced in the Aorangi Range, but flows through sedimentary hill country before entering the Ruamāhanga River. The other small rivers flowing off Aorangi Range, Tauanui and Turanganui rivers, enter the Ruamāhanga River in its lower reach. The rivers carry high gravel loads and tend to flow below bed level during dry periods. The major lowland streams, which commonly emerge from springs within the valley, include Makoura Stream, Parkvale Stream, Papawai Stream, Otukura Stream and various streams around the south Featherston area. The lowland streams are often interconnected with the Wairarapa water race systems, which are artificial waterways fed from the Ruamāhanga River and its major western tributaries.

Lakes Ōnoke and Wairarapa are major features of the catchment. Lake

Wairarapa, known to Māori as “Glistening Waters”, is the largest lake in Wairarapa. Being a shallow lake, it is large in area (78 square kilometres) but low in volume and provides little in the way of water storage for surrounding farmland. Its large surface area makes it prone to evaporation and to significant warming in the summer. Both Lakes Ōnoke and Wairarapa have been considerably modified and their water qualities have become degraded. The flows into the lakes and lake levels are now highly controlled, mainly for flood control purposes. The Ruamāhanga River now bypasses Lake Wairarapa and flows directly into Lake Ōnoke, which discharges directly into the sea through a modified outlet. Until the 1960s the Ruamāhanga flowed into Lake Wairarapa, but the Lower Valley Development Scheme, designed to protect surrounding farmlands from flooding, cut it off. Lake Wairarapa levels are artificially maintained through control gates (known as the barrage gates) at the south end installed when the Ruamāhanga was redirected. The Whaitua Committee has recommended investigation of the question of the Ruamāhanga being redirected back into Lake Wairarapa.

Beneath the Wairarapa Valley floor is the most significant and heavily used groundwater resource in the region. The permeable nature of the gravel and sand aquifers near the rivers means that there is a significant amount of exchange between surface and groundwaters in this zone. In addition to water being abstracted directly from rivers, pumping from

groundwater bores is also known to further deplete river flow.

Management of abstractions by the Greater Wellington in the catchment is focussed on treating surface and groundwater as a single, connected system. While the area is split into three sub-zones (Upper, Middle and Lower Ruamāhanga River) and several tributary river units to help manage low flows and allocation limits, the linkage between these zones is considered at the whole catchment scale.

At the catchment’s top end, around Pukaha/Mt Bruce, the water is clean and clear and in the top 25% of similar sites nationally for clarity, E coli rates, nitrogen and phosphorous levels. It passes the region’s five major towns and through intensively cultivated country, and contamination levels from rural and urban sources depress the river’s health. Each of the towns the river passes empty treated wastewater into the river, though in recent years more treated wastewater has been sprayed onto land. This trend will continue.

The riverbeds of almost all the rivers have been modified over the years, mainly for flood protection, but also to capture more of the flood plain into farmland. There are also extensive drainage works across the valley principally designed to drain marshy land. These drainage schemes, many of which have pump stations, are maintained by Greater Wellington, though a few are in private ownership.

For Rangitāne, the river is an ancestral waterway, which many hapū refer to as the awa in their pepeha. The waters of the river are seen as the blood which flows through the veins of Papatūānuku, the earth mother. The waters are referred to as 'Te Wai Ora', (the life giving water), which is important for maintaining the health and well-being of all life forms.

As well as being an icon of Rangitāne tribal identity, the river was vital for the existence of settlements established on both banks of the river. There were traditionally 25 Ngāti Hāmua marae along the river between Tawera and Te Whiti, each of which had associated urupā and other waahi tapu. The Ruamāhanga was known for the quality of its eels and fresh water koura. The Ngāti Hāmua taniwha, Peketahi, was last seen in the river.

Since Pākehā settlement, the course, flow, and nature of the river has changed significantly. Changes in the course, largely due to River Board activities, have washed away waahi tapu along the banks of the river. The most drastic change has been the diversion of the river away from Lake Wairarapa to lower the level of the lake and drain surrounding lands. The removal of trees from river banks caused flooding, and eroded river banks. The river is considerably shallower today than in the past, when waka landing places were used in areas now considered unnavigable. Physical changes to the river, combined with introduced fish species, have reduced the stocks of tuna and koura. This has impacted on the ability of

Ngāti Hāmua to sustain them and provide hospitality to their guests.

Today, Rangitāne are concerned about the effects of pollution in the river, which make it unsafe for swimming, and affect the ability of hapū to gather kai from the river. In towns like Masterton for example, municipal sewage treatment oxidation ponds have discharged effluent into the river, which is both an affront to Ngāti Hāmua's spiritual and cultural beliefs and creates health hazards for swimming and traditional kai gathering.

Integrated catchment

There are 338 rivers and streams in the Wairarapa of varying sizes and volumes, but with the exception of the eastern coastal area they are highly integrated around the core spine of the Ruamāhanga. The natural river systems lend themselves to a catchment view and a catchment management approach to resilience.

Modifications to the river systems have arguably made them even more integrated with the intention of getting flood waters to the sea as quickly as possible. Impacts to the Ruamāhanga further up its course have implications further down on both volume and quality. A particular feature of the river and the lakes is the loss of up to 97% of wetlands as a result of modification measures. As natural treatment areas for contaminants, they no longer perform this function, although there is local action to restore some of these natural 'treatment' features.

Consideration of integrated catchment management is important to iwi. The catchment is seen as a complex system, like a mosaic, with inter-connected features. Ideally there should be a constant flow in the river with riffles and pools that provide habitat and protect from flood. Strategies for enhancing resilience could be used that mimic nature. Iwi would be seeking to retain or recapture as much of the natural flows as possible.

The effect of reduced river levels as a result of riverbed degradation is that gravity fed channels from the river become too high so that traditional methods of water distribution are not always operational, such as water races.

The rivers on the eastern coast are of a completely different nature. Each has their own catchment and river course. Apart from minor tributaries, none of them link up making them each individual (and generally small) river systems. Coming out of the hills near the coast they are generally fast flowing, carry a lot of sediment especially after rain and can generate severe erosion. They are prone to very low flows in summer and in some cases drying up altogether.

Riverbed degradation

There is a growing problem of riverbed degradation in the Wairarapa. It is thought that this is a cyclical problem but the local rivers are in a down cycle at present. This is a result of gravel takes from some rivers and a reduction in the amount of gravel coming down from the Tararuas, which in turn is governed by rainfall and seismic activity.

Addendum 3: Characterising water races

Five water race systems currently operate in the Wairarapa, namely:

- Opaki in Masterton District – 25km long (there is a proposal to close this race),
- Taratahi and Carrington in Carterton District – 240 and 36 km long respectively,
- Moroa and Longwood in South Wairarapa District – 240 and 40 km long respectively

Previously the “Upper Plains” race system operated in the Masterton area, but this was decommissioned in the early 1990s and replaced by a piped water system.

On 12 February 2020, Masterton District Council backed a proposal to close the 100-year-old water Opaki Water Race network, leaving it up to users to come up with reasons it should stay open. The council chose not to pursue a resource consent from Greater Wellington to continue to draw water from the Ruamāhanga River to supply the Opaki Water Race. The man-made stream network which runs through 54 properties could face closure after new minimum flow recommendations. Later in the year, at the behest of a majority of the Opaki users, the council agreed to a two year moratorium to give them an opportunity to see if the storage project at Wakamoekau could provide a viable alternative to closure. It is expected to close before 30 June 2026.

Capacity

Although the spatial distribution of the races is well defined and mapped, there is very little information on the capacity of the races. Information is restricted to the consented volumes, which may or may not bear accurate relationship to capacity.

The consented maximum intake volumes are substantial and represent a significant redirection of river water:

- Opaki 230 l/s
- Te Ore Ore 300 l/s (since closed by Masterton District Council)
- Taratahi 481 l/s (new consent application seeks a “flushing” flow of up to 800 l/s)
- Carrington 113 l/s (new consent application seeks a “flushing” flow of up to 250 l/s)
- Moroa 500 l/s
- Longwood 250 l/s⁶³

These rates apply to the intake channels; there is no evidence that sufficient capacity exists for these flows to be carried throughout the entire race network.

Ownership and control

The six race systems are managed by the Masterton, Carterton and South Wairarapa District Councils. They are empowered to operate the races and have access to them through the provisions of the Local Government Act 2002, and

⁶³ Greater Wellington report to Whaitua Committee 2014
“Water Allocation in the Ruamāhanga Whaitua”

resource consents from Greater Wellington. However, they do not generally own the land or hold easements across the land through which the races pass (although there is at least one known exception to this, at the head of the Opaki race).

Proposals to perhaps utilise some of the races as a form of managed aquifer recharge would involve ownership issues as the races would have to be widened to achieve meaningful recharge volumes, thereby further intruding onto private and productive land. Before any such moves were made, a considerable amount of investigation would be required to explore any such option.

Landowner views

Generally, races pass through privately owned land apart from where they cross under roads and railway corridors. While it is expected that some landowners will wish to retain the water races and may oppose their modification or change in use, others who may currently regard the

races as of no value or even as a nuisance, might view modifications, or more particularly closures, more favourably. There is certainly an argument that the significant amount of water going into them is and will impact adversely on low flows in the portion of the river they flow past (most empty back into the river system) and for no apparent good purpose. This could become a stronger argument if other methods are used to augment groundwater.

Consent considerations

The operation and management of the races is affected through the use of local bylaws (by the district councils) and resource consents (granted by Greater Wellington). Use of the races for additional purposes may require either amendment of the current provisions, and/or possibly new bylaws and resource consents. Detailed investigation of these requirements would be required.

Addendum 4: Characterising climate change impacts

Because of its eastern coast inland valley location, in the New Zealand context, the Wairarapa is projected to experience some of the more extreme effects from climate change especially in respect of water. The main contributing factors to the progressive supply/demand imbalance on the valley floor are a combination of:

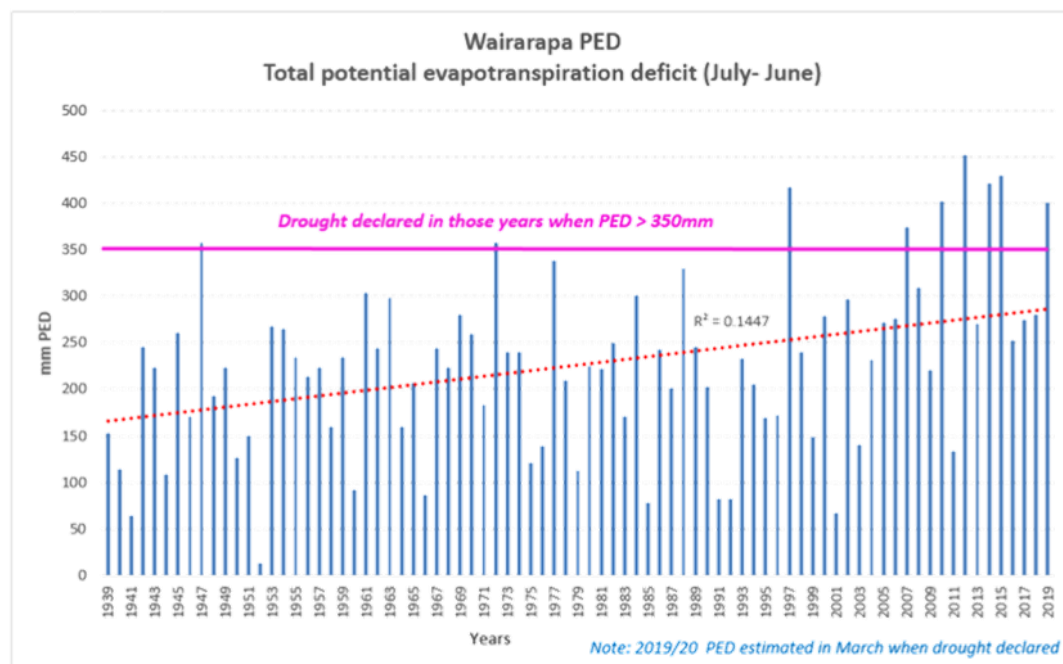
- Increasing mean temperatures - causing higher evapotranspiration (soils and plants)
- Increasing 'hot days'- i.e. days over 25 & 30C.
- Increasing minimum (night) temperatures - also less frost and therefore less chilling
- Day time temperatures increase more than night-time temperatures
- Decreasing mean river flows
- Decreasing median river flows
- Decreasing mean annual low flows (MALF) - most prevalent in summer droughts
- Decreasing valley floor rainfall
- Increasing fire risk - by 100 to 150%
- Decreasing number of rain days on the valley floor
- Slightly increasing heavy rain days (>25mm/day) - arriving more in concentrated bursts
- Proportionately, in future rainfall will decrease more in the west (near the ranges) compared with the east
- Increasing number of dry days (<1mm/day)
- Increasing total potential evapotranspiration (PED)⁶⁴

Increased temperatures will lead directly to increases in evapotranspiration.

The chart on the next page illustrates the increasing frequency of potential evapotranspiration days. These are days when water loss to evaporation is high, rapidly depleting soil moisture levels. Drought conditions are becoming more and more common. This is expected to continue and worsen.

The combination of the above metrics will have implications for urban water supply, human and animal health and comfort, pests, diseases, terrestrial and aquatic ecology, seasonal shifts, drought and flood frequency and intensity, agriculture production (what can or can't be economically grown), recreation, fire risk and many other effects. Both opportunities and risks will arise and recognising these is critical.

⁶⁴ The effects of climate change and water resource limits on the Ruamāhanga valley floor, September 2018



Graph interpreted from NIWA data

With climate change, the frequency of flushing flows increases by 28%⁶⁵ from mid-century onwards which is positive for water quality. However, as both mean and median flows decrease (both volume-based, not frequency-based), the volume of water carried by these flushing flows is likely to be less than currently experienced. Overall, the flow volumes reduce, but the frequency of short, sharp freshes increases. These freshes are a key factor in a resilience strategy.

One of the most useful gauges of climate change especially in a predominantly rural area is the number of growing degree days (GDD) in terms of monitoring plant growth and planning harvests. Presently,

assuming a 10 degree base, Masterton has 1,220; by mid-century it will be 1,460 and by the end of the century 2110 GDDs⁶⁶. These additional growing days are not just in the water deficit period of January to March and will create the opportunity for changed land use patterns.

The diagram below indicates, by mid-century Wairarapa will mimic what Hawke's Bay and Gisborne experience now, and by the end of the century it will equate to Northland today. In short, there will be an almost Mediterranean feel to the climate. Immediate evidence of this is the growth of olives in the region which has taken off in the last decade. At one level this sounds attractive and improved

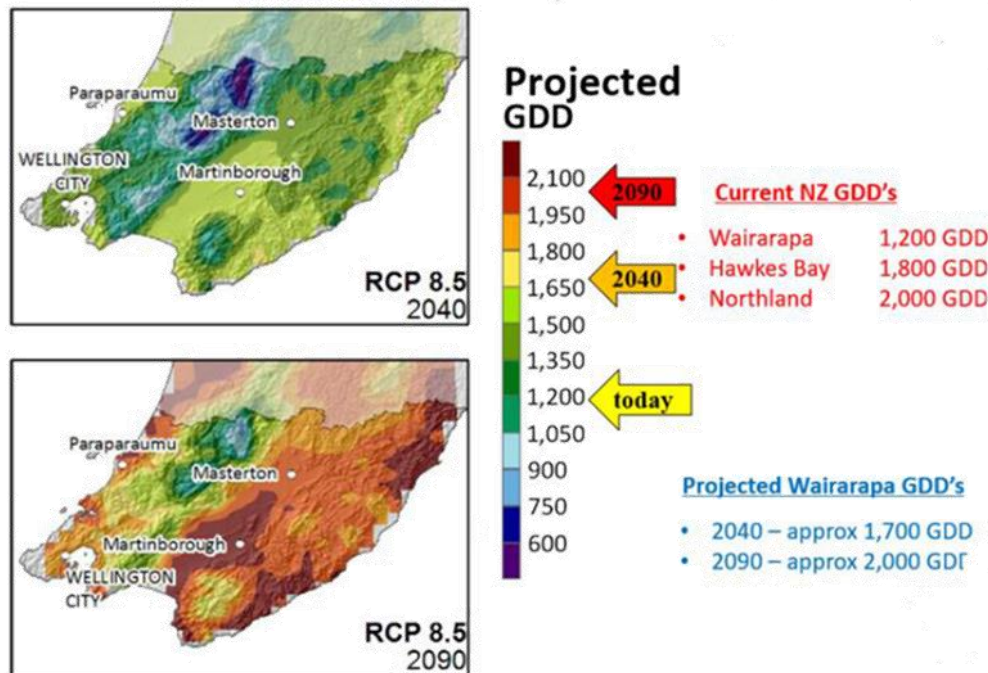
⁶⁵ Effects of Climate Change and Water Resource Limits on Valley Floor Water Resources by Aqualinc Ltd for GREATER WELLINGTON RCGWRC, May 2018

⁶⁶ Climate change and variability - Wellington Region prepared for Greater Wellington by Wellington Regional Council by NIWA, June 2017

living conditions will certainly attract people, but it indicates a quite fundamental change in land use patterns

and water demand. Mediterranean climates are not noted for intense pastoral farming.

Projected Changes in Growing Degree Days (10°C base)⁶⁷



Water-related Impacts

In the New Zealand context, Wairarapa comes out at the more extreme end of changes that NIWA predict will happen, with hotter temperatures, slightly lower rainfall in the valley and increased risk of drought. The projected climate change effects will have a gradually increasing adverse effect on access to reliable water in the Ruamāhanga valley.

As a result of the reduction in water availability due to the WIP water resource

limits alone (i.e. excluding climate change effects), average supply reliability for surface water extraction will decrease 9% during the summer months or 13% for shallow groundwater takes⁶⁸. In terms of overall pressure on the resource, consumption of drinking water by 2090 is projected to increase 40% for Carterton, 30% for Featherston, 20% for Greytown, 40% for Martinborough and 11.5% for Masterton⁶⁹.

In a similar vein, by 2040, averagely up to 15% more water will be required to irrigate land assuming its used for the same land

⁶⁷ Source: the NIWA Climate Change and Variability series (various dates). RCP 8.5 is adopted as the current change trends most closely to follow that projection trajectory, not more moderate values

⁶⁸ Effects of Climate Change and Water Resource Limits on Valley Floor Water Resources – Aqualinc 2018

⁶⁹ Wairarapa Township Water Supply Demand Forecasting, Tonkin & Taylor Ltd, 2017

uses as today, this will increase to 30% by 2090⁷⁰. This is in a context of overall less rainfall. The active impact is temperature driving much greater evapotranspiration. This points to the need for improved water use efficiency, changed strategies to keep soil moisture levels high and/or growing the appropriate 'crops' for the conditions.

While the valley will experience less rainfall, it is predicted that the same volume of rainfall will occur in the catchment's headwaters, with less intensity but more frequency.

With climate change, on average, soil moisture deficits will not pose an issue prior to the new year, but during January to March inclusive it will become even more of an issue than it is at present. This means that the water availability pressure will be very seasonal and very acute in the dry season. River flows will certainly be affected. The table below⁷¹ depicts the percentage changes relative to the historic period (1978-2014) to various metrics for the Waingawa River, by way of an example.

	Mean volume change	Median volume change	7dMALF volume change	FRE3 frequency change (flushing flows)
2040	-2%	-6%	-22%	+28%
2090	-6%	-11%	-21%	+29%

Climate indices projections

In 2019, NIWA compiled a report for a range of climate indices in the Wellington Region, comparing the recent past to modelled future conditions⁷².

Temperature will be the most significant driver behind climate change in the Wairarapa. The following temperature changes are projected by late century for Masterton. The changes are more pronounced through time and with an increased greenhouse effect:

- For warm nights ($T_{min} > 15^{\circ}\text{C}$), a 36-day increase p.a.

- For cold nights ($T_{min} < 5^{\circ}\text{C}$), a 54-day decrease p.a.
- For cold days ($T_{max} < 10^{\circ}\text{C}$), a 12-day decrease p.a.
- For hot days ($T_{max} > 25^{\circ}\text{C}$), a 70-day increase p.a.
- For extreme hot days ($T_{max} > 30^{\circ}\text{C}$), a 20-day increase p.a.
- For heatwave days (≥ 3 consecutive days with $T_{max} > 25^{\circ}\text{C}$), a 67-day increase p.a.
- For extreme heatwave days (≥ 3 consecutive days with $T_{max} > 30^{\circ}\text{C}$), there is a climate shift from the absence of extreme heatwave days to 11 days p.a.

It important to note that trends towards the above changes in these metrics have

⁷⁰ Effects of Climate Change and Water Resource Limits on Valley Floor Water Resources, Aqualinc 2018, pages 2 - 47

⁷¹ Effects of Climate Change and Water Resource Limits on Valley Floor Water Resources by Aqualinc Ltd, May 2018

⁷² Wellington Region climate change extremes and implications, NIWA, December 2019

already commenced, especially since mid-last century.

The delicate balance of natural effects has built up over millions of years and we as a species have now disturbed that balance. The pre-human settlement balance of Wairarapa was very different from today. There were vast forests from Pukaha/Mt Bruce to Palliser Bay interspersed with wetlands beside rivers, around Lake Wairarapa and in coastal areas. These features enabled ecosystems which fostered habitats for a wide variety of species of plants and animals. The fertile soils in the valley are a result of thousands of years of vegetation build-up.

Wetlands were abundant on low-lying land and depressions, adjacent to rivers and lakes with their own plant species and ecosystems. Wetlands included swamps, marshes, and fens in the lowlands, with bogs being mainly in the uplands. Rivers provided a diverse range of aquatic habitats containing diverse aquatic fauna and flora. Wetlands are estimated to be now 3 of their original coverage⁷³. This was the “natural infrastructure” of resilience.

Wairarapa’s original ecosystems were destroyed or significantly modified centuries ago. As described in the 2000 DOC report⁷⁴, “Prior to human settlement, podocarp-dominant forest covered most of the Ecological District. Maori fires in the

seventeenth century destroyed most original podocarp forest. Native grasslands, fernland, swamps and scrub then replaced the forests. Arrival of Europeans in the mid-nineteenth century brought further change to indigenous ecosystems. Much of the remaining forest was removed, smaller wetlands were drained, and native fernland and scrub cleared.”

Wetlands such as marshes were drained and claimed for agriculture, urban development and infrastructure such as roading and bridges. Regenerating native flora was eaten by stock. Flood control schemes have halted the regular cycle of flooding which was part of the renewal and resilience process.

The loss of bird species has been significant. We think of species loss as being more recent, but it has taken place over a long period. The introduction of pests, either deliberately or inadvertently, has also impacted the ecosystems. Obvious examples are possums, feral cats, mustelids, deer and game fish, but there are many others.

A fuller description of the original and indigenous biodiversity of the region can be found on the Greater Wellington Regional Council and Masterton District Council websites⁷⁵

⁷³ Land use and water quality report by Andrew Stewart for the Ruamāhanga Whaitua Committee, June 2014

⁷⁴ Wairarapa Plains Ecological District Survey: Report for the Protected Natural Areas Programme

⁷⁵ <http://www.gw.govt.nz/wairarapa-8/> and <https://mstn.govt.nz/council-2/projects/biodiversity-in-the-wairarapa/>

Addendum 5: Characterising the groundwater allocation regime

A maximum amount of water that can be allocated to users (the limit) is set in the PNRP as an annual volume. Some sub-units are currently over-utilised are shown in

red. However, the current limits are interim and will be revised on the basis of more recent modelling and trends analysis.

Category C Core allocation groundwater status (as at January 2021)⁷⁶

Ruamāhanga catchment groundwater sub-units	Existing allocation (m3/year)	Allocation amount (m3/year)	Percentage existing amount/ allocation amount
Te Ore Ore	778,990	480,000	162%
Waingawa	1,206,345	1,900,000	64%
Upper Ruamāhanga	558,705	3,550,000	16%
Fernhill-Tiffen	1,200,000	1,200,000	100%
Taratahi	498,565	1,400,000	37%
Parkvale (unconfined)	340,000	350,000	97%
Parkvale (confined)	2,162,000	1,550,000	139%
Mangatarere	3,050,245	2,300,000	132%
Tauherenikau	8,230,885	6,600,000	125%
Lake	11,140,165	6,750,000	165%
Huangarua	1,119,400	650,000	172%
Martinborough	779,743	800,000	98%
Dry River	570,065	650,000	88%
Ōnoke	2,095,200	2,100,000	100%

⁷⁶ Source: Whaitua Committee June 2016-original source GWRC Environmental Department

Availability and allocation

Wairarapa has one of the most complex groundwater flow systems in the country. The first 30 metres or so is a dynamic flow system that is connected to rivers and streams where they are most productive. Deeper productive aquifers are more localised and not particularly extensive on current reckoning (although understanding of deeper groundwater systems is evolving and hopefully will be particularly aided by the aerial electromagnetic survey which will contribute to revised geological and groundwater models in the coming few years). Lower yielding aquifers (bores in them can generally only provide relatively small volumes of water) occur at all depths across the valley in formations that do not permit the rapid flow of water – although only a small volume of water is taken from them collectively, they still have a considerable storage of groundwater. Occasionally, localised ‘pockets’ of high yielding aquifers can be found in these formations.

High yielding aquifers tend to occur along/adjacent to modern water courses and at depth where the gravels are reworked (cleaner) by old river systems but have been affected by tectonics (faulting/folding).

Groundwater is categorised into A, B and C.

- **Category A** is applied to shallow, generally very productive aquifers that are directly connected to surface water and represents about 50% by volume of total groundwater

allocation in the Wairarapa valley. Put simply, this is the easy water 15-20 metres down, near rivers and it is mostly taken – although it is the least reliable groundwater, being restricted at low river flows. Category A availability is controlled by surface water allocation availability.

- **Category B** defines aquifers that have a moderate level of connectivity to surface water than Category A as they tend to be deeper and further from rivers. Allocation from this zone is split between surface water and groundwater (Category C) ‘buckets’.
- **Category C** is deeper groundwater that does not have a direct connection to surface water – the surface water depletion effects from Category C takes a long time to occur (building up over the irrigation season). Category C aquifers can often sustain large takes in particular areas, but often can only sustain relatively small volumes of abstraction – for example the Taratahi and Upper Ruamāhanga zones (table above) have high availability because the water is more difficult to access due to the lower permeability formations.

There are significant questions around the availability of more groundwater than is already used. Beyond Category A, the groundwater that is available is generally more challenging to access as it is both costly to pump and bores tend to have a low yield. Nevertheless, this may still be a reliable resource that is worthy of attention. The storage in these aquifers is potentially quite large, it’s just harder to get at. It may not be that much more costly

to pump if only small volumes are sought.
There may be a lot of land uses that could
be sustained by lower yielding aquifers.
Land use may have to adapt to availability
and/or on-farm storage may have to be
provided.

Addendum 6: Characterising the rural economy

Pastoral systems

Dairy farms use water for household, stock drinking water, irrigation and hygiene (cleaning the machinery and the yard) and they use large but monitored quantities.⁷⁷

Wairarapa produces around 10% of the sheep, 7% of beef and 5% of dairy cattle in New Zealand⁷⁸. Sheep and beef uses of water include household and stock water, where hygiene uses are relatively negligible compared to dairy.

According to Statistics New Zealand⁷⁹, there are currently around 140 dairy farms and 350 commercial⁸⁰ sheep and beef farms in Wairarapa. These represent 1.3% and 3.4% respectively of the New Zealand totals.

The size of the herds is as follows:

- Sheep 476,000 (5% of New Zealand total)
- Beef 123,000 (3% of New Zealand total)
- Dairy 88,000 (1% of New Zealand total)

Water usage by animals is outlined in the chart on the next page. It illustrates the huge variations between land uses. Variations to land use will be essential as water scarcity tightens and replacement is not readily available. Decisions will be required about where best to direct and restrict water. These are tough decisions and not ones we have had to face before at this scale.

Range for water requirements for the stock types⁸¹

Farming enterprise	Type of animal	Average Day Demand (l/h/d)	Peak Day Demand (l/h/d)
Dairy	Milking cows	45	70
	Dry stock	30	45
	Dairy shed utilisation	50	70
Beef	Mature cattle, herd replacement stock and bulls	30	55
Sheep	Ewes, hoggets and rams	3.0	4.5
Deer	Hinds and stags (all ages)	6.0	12.0

⁷⁷ Climate change could see the decline in dairy farming in the Wairarapa as a result of a climate that has become too hot, dry and with unreliable water supplies.

⁷⁸ Leftfield, pp50

⁷⁹ 2017 census data (this is the latest)

⁸⁰ "Commercial" is defined by Beef+Lamb NZ for its Sheep and Beef Farm Survey as those over 750 Stock Units. There

are approximately 350 non-commercial or lifestyle blocks in addition to these.

⁸¹ Reasonable Stock Water Requirements, Guidelines for Resource Consent Applications, Technical report prepared for Horizons Regional Council, December 2007

<i>Horses</i>	Working horses	55	70
	Grazing horses	35	50
<i>Goats</i>	Milking goats	5.0	10
	Dry goats	3.5	7.0
<i>Pigs</i>	Mature pigs	11	18
	Brood sows	22	35
	Pigs up to 120 kg	7.0	11
<i>Poultry</i>	Laying and breeder hens	30*	45*
<i>all figures are for</i>	Non-laying hens and chickens	18	29
<i>1/100 birds/d</i>	Turkeys	55	100

To maintain pastoral farm viability, adaptations are frequently needed to deal with changes to pasture feed supply – both the total amount grown and its seasonality. Both lower and higher feed availability need to be dealt with. Lower supply means that if there are no changes to stock numbers productivity will decrease while higher supply with no changes in stock number will lead to decreases in grazing pressure and reduce the subsequent decline in pasture quality.

Dairy farms are usually more intensive and profitable, and hence short-term tactical changes are able to be made, such as buying in supplementary feed, and utilising installed irrigation. In contrast, for sheep and beef farming systems, especially those on hill country, possible changes are more difficult because the topography is not conducive to intervention-type changes such as tactical fertiliser use or irrigation.

Tactical changes are short- and medium-term adaptations that involve modifying the existing production system using current management options. Typically, these are decisions that are made on short (day-month) timeframes. Examples include

the buying and selling of stock, buying in supplementary feed, and deciding on the amount of feed to be allocated to different stock classes. Many of these potential changes are already used on a day-to-day basis by farmers to manage changes to potential future (months ahead) pasture growth such as low soil moisture levels in eastern areas; in such a situation farmers may pro-actively destock in anticipation of lower feed supply.

Strategic changes are the second level of adaptation: these involve changing a current system to another known production system or making substantive changes to the current system, where practices and technologies are well known. For example, a farmer may change the ratio of sheep to cattle; such systems are known (preferably in New Zealand) and the risks and issues relating to new systems can be anticipated.

However, these changes typically take a number of years, or new owners or managers to implement, hence may not have an immediate impact. In addition, other issues need to be considered: for example, changing animal type from sheep

to cattle may entail building new infrastructure such as fencing, cattle yards and better tracks. Other examples of longer-term strategic changes are increasing the next season's lambing percentage by the better feeding of ewes and changing stock genetics by introducing new, improved genetics. Examples of more wide-ranging strategic adaptations may include introducing irrigation or buying additional land in another area to make the existing system more flexible and resilient.

Last, there are transformational adaptations that involve innovation to develop completely new production systems or industries, which may include converting the farm from sheep and beef to a dairying operation or forestry. A prominent recent example in New Zealand is the planting of mānuka plantations for honey production. Potential future changes could involve sheep and goat dairy.

When changes to farming systems are made in response to climate change, there are likely to be changes to other impacts to the receiving environment. For example, changing from a sheep system to cattle may increase the potential for nitrate leaching (and nitrous oxide emissions) because of bigger urine patches with higher N loadings.

The key driver in pastoral farming, like most other farming, is consistency. The focus is on a high value and productive

animal. The goal is fewer feet on the ground for more value. For sheep and beef farmers it is about producing animals that stick close to the "specs" – a 40kg lamb is too light. A 50kg lamb is too heavy and eats too much grass. The ideal is around 45-48kg. Consistent inputs produce a consistent product. Consistency of inputs applies to water so reliability is as important, if not more so than quantity. Looking into the future this demand for consistency will continue to intensify.

Arable industry

Currently there is very limited wheat production for human consumption in the Wairarapa. The 2020 harvest was of only a small quantity (200 tonnes) from three farmers to test a system of delivering wheat to the mill and understand the quality of wheat grown in the Wairarapa.⁸²

Results for arable crops highlight the relevance of accounting for crop management, which can be seen as a representation of farmer tactic adaptation in response to climate change impacts. For example, the change in timing of crop growth in an agricultural system (e.g. spring crops as maize or winter crops as cash crop wheat) might imply different exposure to seasonal temperature in climate. In addition, insights into the importance of soil types, and how they are represented in biophysical simulations, are also key results from analysis. Specifically, soil with low water-holding capacity will be naturally more prone to the increase in

⁸² Leftfield pp42

drought conditions but final outcomes depend on management aspects (e.g. use of irrigation and changes to sowing dates).

Finally, inter-annual variability was shown to be a key metric to consider when analysing arable systems because some impact variables, such as N leaching losses, could be more affected by extreme events without necessarily large changes in median values. For example, the magnitude and frequency of high N leaching events might increase if high rainfall amounts occur more often before cash crop establishment (early in the autumn/winter season).

In terms of production, consistency again is vital. The direction of the industry is towards higher value products such as moving from animal feed to human consumption products. Consistent availability and application of water helps to achieve better milling grades. It will also form a sound basis for alternative products such as vegetable seed and other similar products that are being experimented with.

Horticultural industry

A boutique region, Wairarapa has just 2.6% of New Zealand's land under vine and contributes 1% (4500t) of New Zealand's total production from just over 1000ha in grapes. There are over 20 vineyards in three main sub-regions in the

area, Martinborough, Gladstone and Masterton. These sub-regions share a similar climate and soil structures yet offer subtle differences in character.⁸³

Around 60% of the table olives in New Zealand are grown in the Wairarapa at around 4.9 tonnes.

With 50,000 trees planted this equates to a planted area of around 160ha. Of these only around 5,500 are actively managed.⁸⁴

Fresh vegetable and berry production in the Wairarapa is small. Currently there is only around 12ha of berryfruit within the Wellington/Wairarapa region and 154 ha of fresh vegetables, the largest single crop type by area is brassicas.⁸⁵ Due to the pea weevil incursion Wairarapa has not grown peas for the last few years. Prior to the pea growing ban, the area grown was around 1200ha.⁸⁶ They have been replanted this year for the first time.

For wine grapes, noting the effect of climate change on phenology may require a change in cultivar to grape varieties adapted to warmer climate. One area of concern is the compressed time for fruit growth and the implications for sugar content and ultimately wine quality.

Tactical adaptation may require controlling the vegetative/floral balance through winter pruning, or additional pruning in summer (Clothier et al. 201287). However, the warmer climate may also open new areas suitable for wine grape

⁸³ Leftfield, pp35

⁸⁴ Leftfield pp 37

⁸⁵ Leftfield pp 39

⁸⁶ Leftfield pp 44

⁸⁷ Adapting the horticultural and vegetable industries to climate change (Brent Clothier, Alistair Hall and Steve Green
<https://www.mpi.govt.nz/dmsdocument/4059/direct>

that were previously too cool, though there would have to be significant change. The Martinborough region is dominated by pinot noir varieties with the climate not yet being able to compete with Marlborough for the production for export of Sauvignon Blanc.

The situation of the viticulture industry has been static in the last decade and it is looking for its next breakthrough. The water profile of different varieties is very different. Sauvignon Blanc, for example, is very thirsty, red varieties less so. The industry sees its next stage of growth potentially in events and food matching designed for tourists and visitors. Water supply, assuming current levels of availability, is not going to be a major concern in the next decade.

Thought is being given to the possibility that the changed climate may lend itself to high value crops in the Wairarapa such as kiwifruit and avocados. Significant plantings of these crops could transform the area, but would completely change the water demand profile of the horticulture⁸⁸ and fruit industry, both being thirsty crops. Leftfield talk of hops, pipfruit and summerfruit, vegetables for export, noting that these are not all possibilities simply because of climate change and may have been possible anyway.

Dryland agriculture

Dryland farming can be defined as farming in areas where evapotranspiration

exceeds rainfall, and there is no irrigation to support such deficits.

While greater water resilience can be achieved in Wairarapa, there are limits, especially in the extensive eastern hills location. While there are isolated patches of bore water available such as at Wainuiouru, farmers will increasingly have to practice forms of dryland farming.

Dryland farming is practiced on the Wairarapa valley floors and hill country. In recent years research on dryland farming has increased significantly. Dr Derrick Moot, professor of Plant Science at Lincoln University has led research teams looking for solutions to the vulnerability of dryland farmers, particularly those on the east coast of New Zealand. He recognised that the combination of water and nitrogen that is required to increase dry matter production, but the problem for many hill country farmers is that water is scarce and regulations around nitrogen use are tightening as a result of its extensive use.

Moot has advocated the use of lucerne, as an alternative to traditional ryegrass and clover, because it is deep rooting and fixes its own nitrogen from the air. Pastoral farmers commonly start their ewes on hill country early in the season in a dryland format. However, as the lambs grow they are transferred to pastures on the valley floor that are more productive due to irrigation or various moisture retention practices.

The science around dryland farming has significantly advanced in recent years and has the potential to become a significant part of agricultural practice in the Wairarapa. Dryland farming is about best use of the water available and its year-to-year availability. There are various techniques for retaining water on sloping ground such as cutting contours into the slopes and building nano dams to slow run-off. Water can be captured in dams that can also be used for stock water. Strategic tree planting of hill country, not just for shelter, but to hold water in the soil and to shade the land from the drying effects of high temperatures are all part of the equation.

Tree planting has many advantages of retaining moisture, slowing run-off and protecting rivers and streams from sediment loading. Carbon farming is inevitably going to become a real option where dryland stock farming is not sufficiently profitable to make it viable.

Addendum 7: Characterising the urban challenges

This addendum comprises background resilience assessments of each of the councils of the Wairarapa.

Masterton District Council (MDC)⁸⁹

Water Use Optimisation

Masterton is going through a transition not only with regard to its water supply, but in terms of economic and population growth. Unlike many rural centres in New Zealand, Masterton is experiencing growth and many of the challenges of growth. Masterton comprises the largest urban area in the Wairarapa, but also has a large rural hinterland by area, but not by population. It is a service centre for the whole of the Wairarapa as well as its own immediate hinterland.

Demand and supply

The Council is considering the future of its water supply – rural and urban. Its planning takes account of climate change assessments which the council sees as a combination of more and longer dry spells and weather events of greater intensity.

The Council anticipates a reduction of water demand by as much as 20% over the next five years. This will be the result of the:

- (i) installation of meters (which is currently 70% complete) - charging

- through meters will commence by 2022, and
- (ii) the identification and remedying of the leakage of water which is estimated to be over a third of that treated.

Roughly half this loss is from faulty council infrastructure and half from broken pipes, taps and other fittings malfunctioning and simple neglect by home-owners. The Council spends around \$1.6m a year on repairs and upgrades to pipes and has improved the situation, but the scale of the problem is significant. The town has 190 kilometres of supply pipes, but 40% of these (in 2013) were classified as in poor condition.

Beyond five years it is expected that demand will settle and grow at about 1% a year, which doesn't sound a lot until it is considered that is 32% over 20 years during a period when water availability will be under greater pressure. No significant new large users are expected in that timeframe, including in the Carterton Industrial Area just over the river from Masterton, part of which is serviced by MDC.

Masterton is not fully using its consented allocation. They are using between 11,800 and 14,400 cubic meters a day out of a consented total of 40,000 cubic meters per day (the lower usage figure is winter average daily demand, the higher figure is summer average daily demand). At

⁸⁹ Information in this section supplied by Masterton District Council

present MDC doesn't use half the water its consented so could be classed as an inefficient allocation depending growth needs etc.

At present, the full amount of Masterton's supply is drawn from the Waingawa River and that is expected to continue although constraints to take at low flows may strengthen as a result of the PNRP and WIP requirements to reduce to human health needs and stock use below minimum flows. Consideration is being given to some form of water storage facility to increase the amount to be stored and the feasibility on that requirement will be done over the next 3-4 years. Other options include taking supply from the proposed community water storage reservoir at Wakamoekau, constructing a dedicated storage reservoir at the treatment plant or drawing from groundwater. Either way, more water will be required when the rivers are low during summer in the period beyond five years out.

Rainfall harvesting is being considered for domestic dwellings, but is not regarded as a significant contributor to efficiency or demand management. Council is giving consideration to rainfall tanks with new builds such as is being done in Kāpiti. The volumes of water are low and as a result it doesn't help a great deal with summer dry if the water is to be used for watering gardens, etc. Large scale use of tanks is an expensive solution compared to large bulk storage.

⁹⁰ Refer Chapter 9

Wastewater and stormwater

Masterton's wastewater is treated and is disposed of to land and river. The current regime involves treated water being released to the river in the winter when flows are high and there is high dilution. During the summer approximately 90% of the treated wastewater is sprayed on land and used to grow feed for animals. Techniques are employed to ensure there is no contamination and regular testing is undertaken. The system is designed and consented to avoid waters entering aquifers.

Like other towns in Wairarapa there are significant soak pits around Masterton and storm water is currently absorbed into those soak pits. One in 10-20 year flows would saturate soak pits and the water goes directly into the river through 200 discharge points. There is one main stormwater system in the CBD.

Water races

Water races in the Masterton area, like other parts of Wairarapa, are more than 100 years old. They are relatively cheap to run and effective for what they are intended. In terms of providing stock water, they are not an efficient water distribution system in an age of efficiency, but as discussed elsewhere, they have other values which could offset their utilitarian deficiencies⁹⁰.

Resilience measures

MDC's principal water resilience foci is on efficiency and storage. Once the leakage

problems are minimised the Council will be looking for other efficiency gains in such areas as water supply network management which could include pressure management and replacement of leaky mains. Re-use of treated effluent and planting are strategies that will be considered, with efficiency of use principles being applied to the irrigation of parks, sports fields and management of swimming pools. Optimising efficiency through pricing is a complex matter but will receive greater attention in the near future once the installation of smart metering takes effect.

With respect to Masterton District's water resilience, their 2018 LTP states:

"We need to be able to store more water in order to meet increased demand from a growing population, provide safeguards against any future changes to resource consent conditions and provide greater resilience in times of drought. To address this, we will investigate options for deep water bore(s) or reservoirs for urban areas and raw water dams. The LTP includes a provision of \$100,000 in 2020-21 for investigation, and a further \$5.6 million over 2023-25 to complete the work. The consequence of not undertaking projects to increase our water supply resilience is that Masterton will not have a secondary drinking water supply that is separate to our main supply. Causes of using a secondary supply

could be, a natural event e.g. earthquake, infrastructure failure, or water supply contamination."

The 2021 Draft LTP allocates an amount of \$7m.

Looking ahead

The Council believes there needs to be an active resilience narrative – why it is important and what priorities the Council needs to consider. The next opportunity to consider these matters is the upcoming review of the Long Term Plan, part of which is the Water Supply Asset Management Plan. This will consider such matters as long term supply and the source of supply, plus efficiency and resilience measures.

Carterton District Council (CDC)⁹¹

As with other councils in the Wairarapa, there are challenges facing Carterton District Council's ability to meet future water needs. Changes in the management of urban supply that may arise through the Government's Three Water Initiative could result in fundamental changes for the Council. Other considerations are economic and population growth, the prospect of larger water users wanting to enter the district, particularly in the Waingawa industrial area⁹² and pressure on water supply generally.

Carterton District comprises a large and productive rural area and a significant and

⁹¹ All information in this section was supplied by the Carterton District Council

⁹² Note, reticulated water is supplied to Waingawa industrial area by MDC, not CDC.

growing town with pressure for lifestyle blocks on the town fringes. Carterton has a significant older population of retirees and this population is likely to increase. The Council currently provides water to 2,500 households.

Demand and supply

On the basis of current demand projections, Carterton will require an increase in urban supply within 10 years and the Council is looking to resolve what that might be by 2028. It will require an additional water source, either surface or groundwater. Current supply is roughly 50/50 with reliance on surface water in the wetter times of the year and reverting to groundwater in the dry period. Further surface take is unlikely due to lack of volumes in adjacent rivers. Incremental increases in demand are being met by development of the current bores, but there is a limit to this supply. Carterton is not fully using its consented allocation. They are using roughly 2,500 cubic meters a day out of a consented total of 5,000 cubic meters per day.

Where there is an immediate supply problem, is in meeting the morning and evening spikes in demand. This is because Carterton has very limited storage to even out these peaks. To help resolve this situation, their emergency storage capacity is in line for upgrading from just 12 hours at present to four days by constructing eight storage tanks during the 2020/2021 year.

Wastewater

Treated wastewater is currently discharged from treatment ponds into the Mangatāre Stream when consent conditions enable them to do so, as well onto land through an irrigation system during dry months. The current capacity of these ponds is just 65,000 cubic metres.

A new pond complex is being built that will boost storage capacity by a further 200,000 cubic metres. This will allow water to be held for an extended period when ground conditions are not suitable for land irrigation, principally in winter when the soil is saturated. Once, the land irrigation area is significantly extended, it's expected that stream discharges will reduce to discharges considerably. The Council's long term goal is to remove all discharges of treated wastewater from Mangatāre Stream.

Stormwater

There is limited stormwater reticulation in Carterton. What is there is open channel and open swale. The town absorbs most of its stormwater as it is built on natural soak pits. There are some flooding risks to the west of the town in the Lincoln Road area, but they are limited.

Infrastructure

Carterton District Council regards itself as having a good knowledge of the state of its water supply infrastructure which is generally in good condition. There is a project to improve the main pipe in the main street. Especially since metering was introduced, levels of leakage are not as high and are being reduced over time as infrastructure is replaced or upgraded.

Smart meters were installed in 2020 across the urban network, and the data from this will assist the detection of losses as they arise. Early results have identified around 75 low level constant flows.

Large users

There are limited large users in the district. Premier Beehive, a bacon and pork processing factory is one of those and it makes significant demand on wastewater system. JNL's wood processing factory are also large users but they take their supply from Masterton's municipal supply which is much closer to their location.

The demand from large users of the future is in the Council's mind. The most likely location is the industrial area on the Waingawa adjacent to Masterton, in which case supply is likely to come from Masterton or storage in the vicinity. There may also be future light industrial development to the south east of the town.

Water races

There are two water race systems in the Carterton District. These pose challenges for the Council. The existing consents for supply into these races expire in 2023. The races feed into what is deemed by the Greater Wellington to be modified waterways that now have natural characteristics and biodiversity. The Proposed Natural Resources Plan provisions place significant limits on the

disturbance of riverbeds which makes maintenance of the races difficult.

The contribution of water races to stock drinking water remains important and the amount that is contributed to groundwater is unknown.

Resilience issues

Growth of the town is planned to be to the east rather than the west. This is drier and more stable land. The conversation on resilience of these new developments is a live matter. For example, the future use of rainwater harvesting will be considered through the District Plan Change process to open up this area for residential development. The growth of lifestyle blocks is also a matter of discussion as there is a moderate level of demand, which may continue as the Wairarapa benefits from migration from main centres such as Wellington of people looking for lifestyle benefits. This will also be considered in the upcoming review of the District Plan. It is expected that lifestyle block development will not be connected to urban water and wastewater services.

South Wairarapa District Council (SWDC)⁹³

South Wairarapa, unlike the other two councils of the Wairarapa, incorporates three urban areas – Greytown, Featherston and Martinborough. These towns, though not greatly distant from each other, are in different geographic and climatic areas. Martinborough, in particular, is in a drier

⁹³ Information supplied by South Wairarapa District Council

area of the valley compared to the other two.

This portion of the Wairarapa has sustained significant population and economic growth in recent years from tourism and weekend visitors from Wellington. The Martinborough economy had a major boost back in the 80s and 90s with the development of the vineyards and this has flowed through into a significant visitor industry.

It would be fair to say that each of the towns has grown to the point that their water-related infrastructure has come under pressure and while some upgrading has been undertaken, more is required off a small rating base, to ensure the level of resilience expected by residents. This means that there is a limited capacity for dealing with shocks to the system.

Demand and supply

On average, 4.1 million litres of water is supplied per day to Greytown, Featherston, Martinborough and Pirinoa with a combined resident population of about 7,200 - on average about 569 litres per resident each day. Households use about 64% of the total supply with industry, businesses, schools, hospitals, the fire service and councils consuming the rest.

Demand for water has grown steadily with the growth of the population and economic activity, especially in the warm summer season. Water is supplied to these towns largely from bores. The Featherston and Greytown systems are linked.

Featherston has three bores with a fourth being installed, whereas Greytown supplements bore water with takes from bores adjacent to the Waiohine River but is dependent on river flows which are low in summer. Summer demand can spike by as much as 4.15 million litres per day in the summer above a year round average of 13.4 million litres per day (a 30% increase) at a time when water availability is under pressure.

South Wairarapa is not fully using its consented allocation across its three supplies.

- Waiohine (Featherston/Greytown) WTP - currently limited to 2,400m³/day but consented for 5,184m³/day.
- Memorial Park (Greytown) WTP - currently limited to 1,800m³/d but consented for 5,184m³/day.
- Ruamāhanga (Martinborough) WTP - currently limited to 2,400m³/d but consented for 4,320m³/day.

The constraining factor is water treatment plant capacity - the short term focus has been on ensuring quality more than quantity.

With minimal storage, there is little buffering of demand for Featherston and Greytown, which puts the supply system under pressure when there is sudden increase in demand. Plans are being made to incorporate a reservoir to reduce this vulnerability by providing 2-3 days buffering.

Martinborough has slightly more buffering, but historical factors mean it has overly

complicated arrangements such as a treatment plant on one side of the town and a reservoir on the other. There is also a small supply system at Pirinoa with 20 or so connections.

Martinborough draws its water from four bores. Its supply suffers from naturally-occurring manganese contamination. A recently installed plant to extract sufficient manganese to allow chlorination, will make the water quality more acceptable. Martinborough's consent to use the bore water expires in 2025 as a result of the Waitūia requirements, and this is yet to be renegotiated.

Historically the vineyards have been supplied from the town supply (a separate unchlorinated supply), but notice has been given to them that they will have to find alternative sources which will involve creating their own bores. This is likely to come up against the problem of over-allocation of groundwater, characteristic of this and many areas of the Wairarapa and will likely involve greater draw off in the summer months. Water use in Martinborough increased substantially in summer spiking up by as much as 2.8M litres per day above a summer medium of 1.3M litres per day - an increase of 215%.

Characteristic of the Wairarapa generally, leakage from the domestic supply systems is substantial. A 2020 Wellington Water Ltd report put Greytown's leaks as up to 69% (16.6 litres per second) Greytown. Steps are being taken by the Council to gradually remedy this problem, the most significant of which is the introduction of

metering which helps identify where the leaks are located so they can be repaired or replaced.

South Wairarapa District Council recently tried to float a proposal with central government for financial assistance to install residential tanks for harvesting of rainwater. Regrettably, the request was denied. While the unit cost was high, the opportunity to build awareness with residents of the need for efficient use of water was lost.

The Council has however signed a memorandum of understanding with central government, allowing it to access \$2.84 million in funding for water projects, to be completed by the end of March 2022.

Metering

South Wairarapa district's towns are now fully metered which is a foundation contribution to improving water use efficiency. At present, residents have a high 'free' allowance of water which means meters are not yet playing a significant role in building community awareness of water use efficiency. Further positive steps on this matter are being considered as part of the upcoming Long Term Plan. They will also help identify leaks and monitor large users.

Wastewater

As with other councils in Wairarapa, South Wairarapa fully treats its wastewater and sprays 90% of its treated effluent onto land. With three towns (and a small scheme at Lake Ferry) in its area, each has

its own wastewater system, making the overall cost very substantial. The council is in the process of applying to Greater Wellington for a new consent for the Featherston wastewater treatment plant to build a new plant. This will require significant investment. Cut and carry crops are grown on the land sprayed with treated effluent. Issues arise if the land gets too saturated leading to ponding; sufficient storage therefore needs to be provided to avoid this situation.

Stormwater

Stormwater in the district is largely unmanaged. Apart from some curb and channelling in the towns stormwater either finds its own way into streams and rivers or is directed into soak pits. Swales are used to direct the stormwater and it is not treated, raising concerns of contamination as the communities increase in size.

Water management

Since October 2019, South Wairarapa District Council has opted for a management arrangement with Wellington Water, whilst retaining the ownership of the assets itself. In a sense, the Council has effectively taken a first step in what may be a major reshaping of water management under the emerging Three Waters programme of central Government. This is the only Wairarapa Council to so far use an external agency to manage its three waters.

Addendum 8: Characterising industrial water use

There is a limited number of industrial scale plants in Wairarapa and most relate to the availability of raw materials in the region, or at least started from that premise. Because they are related to primary production, they are by and large significant water users and future production systems that might migrate to the region would also likely be significant water users.

The plants that are in the region are significant employers and are very important to the economy but also to the community providing a balance to the workforce⁹⁴. We investigated water use for four of them as a sample of industrial use in the area:

- **JNL** – 370 jobs - includes those in the plant and contractors in the forests
- **Premier Beehive** – 300 staff in Carterton (varies seasonally). Beehive is the largest employer in Wairarapa
- **Breadcraft** – 92 staff plus a further 15 temporary staff
- **Cabernet Foods** – 70 staff in Carterton

Collectively these enterprises are small water users but represent significant employment in the region.

JNL

JNL is a wood processing company with a largely export focus, though it is growing its domestic market share. Producing sawn

and engineered timber it is just like farming enterprises in the respect that production systems like theirs rely on stability, consistency and predictability, so control over their water use is vital. JNL is gradually building its water re-use capability with the objective of moving as close to self-sufficiency as possible. This involves treating water, settling out particulates and installing a reverse osmosis capability (which is currently being explored). They are also minimising the amount of waste leaving the plant.

At present, JNL receive water through the Masterton District Council reticulation system and that which they don't re-use is treated then sprayed onto land to support the growth of a nearby forest, which will eventually be millable. They currently use 250,000 to 300,000 litres of potable water per day.

Premier Beehive

Premier Beehive is a bacon-producing enterprise with a national market. They are well established in Wairarapa and see themselves as an integral part of the community. Their water consumption is about 3.38 litres per second. They have a daily consent of 200 cubic metres (1,400 per week), which they consistently use most days. Their annual consent is for 75,000 cubic metres, last year they used around 58,000. Usage is constant through the year and just varies with production.

⁹⁴ All data in this section has been supplied directly by the enterprises themselves

They are looking to reduce water use through staff education and process improvement. They have a current internal water treatment plant and are investigating new treatments - mainly to impact on discharge. Water can be re-used to a limited extent but is dependent on quality.

Their main concern is discharge as it includes high sodium levels (salt) and they are looking for solutions. Carterton District Council is concerned about this discharge. The irony is that if water discharge is reduced through conservation, sodium levels in the discharge are higher.

Breadcraft

Breadcraft is a major bread producer which distributes bread around the lower North Island.

Their water use varies quite a bit throughout the year depending on how busy they are. For the past couple of months (mid 2020) they have been using about 125m³ of water per month. Which equates to about 4,100 L/day.

Their source for water is Masterton District Council, which in turn comes from the Waingawa River. They use water for production and cleaning. Their supply is suitable and reliable with no uncertainty about continuity of supply.

Cabernet Foods

Cabernet is a major provider of premium meat, based in Carterton. It is a family business which has been operating since 2002, building on a long history of farming

in Wairarapa. They use bore water and consume 60 cubic metres per day, mainly for plant and processing hygiene to meet licensing obligations under the Animal Products Act.

Cabernet report that the current resource consent rationale prohibits business security. The uncertainty of low river flows will not enable a business to process and market animal protein within MPI regulations or to satisfy customer supply security concerns.

The company has installed additional water recovery tanks and reviewed water recovery initiatives but advises that initiatives that reduce water use will take away any ability to grow the business.

Conclusions

There are other major industrial users such as Higgins Contractors. They too are of a similar size and usage to these enterprises and are all significant employers in the region.

As a conservative estimate, these larger enterprises employ in total in excess of 1,000 people. They represent both primary and secondary earners in local families, but are critical to maintaining a population and occupational balance to the region.

All these enterprises are concerned about a reliable water supply (in terms of both quality and quantity) which is fundamental to their production systems. There is also the very important question of future industrial users and their potential

contribution to the Wairarapa economy.
At present, water reliability poses a
constraint on some new industries setting
up in the region or existing ones
expanding their operations.

Addendum 9: Characterising amenity use

The more intensively populated areas of Wairarapa are some distance from the coast, so river and lake-based amenities are important. Rivers are popular for swimming in the summer months and both Lakes Wairarapa and Ōnoke are used for recreational purposes for activities such as walking, boating and some other water sports. Their shallow nature doesn't lend them to the range of activities common on deeper lakes.

Walking and cycling trails are already in existence and significant extensions and enhancements are planned or underway. Rivers in particular, have high amenity values in the minds of people in Wairarapa.

While uses by mana whenua of the rivers could not be termed amenity use, they are nevertheless important and are dealt with elsewhere in this Strategy.

Henley Lake

Henley Lake⁹⁵ is integrated into the water systems of the region. Construction of Henley Lake, the site of a former quarry and prior to that a pā site, and its surrounding margins was initiated in the 1960s and completed in 1991 for recreation and wildlife purposes. Water is taken from the Ruamāhanga River via a gravel weir and a 1200 metre artificial channel. A culvert and control penstock is used to regulate the flow into Henley Lake. The penstock remains open at all times other

than during heavy rainfall and high river flow events. Te Ore Ore and Hiona Streams also flow directly into Henley Lake.

The lake has three discharge points. The northern most discharge point distributes water to a wetland area. The southern-most discharge point distributes water to a wetland area. The only direct discharge back to the Ruamāhanga River is from the main spillway between the northern and southern discharge points. Nevertheless, there is likely to be some seepage from the two wetland areas into the Ruamāhanga River.

Currently, the PNRP provisions require the take from a river to cease when it reaches minimum flow. However, the Whaitua Committee considered that this a "non-consumptive" take, and on these grounds recommended Greater Wellington investigate whether water could be provided for below minimum flows.

At present, Masterton District Council only recharges Henley Lake when the river is high which means there is no recharging in the dry summer months. This has implications for amenity use as the water quality deteriorates during the summer due to the lack of flushing limiting its use. If climate change results in lower river flows, especially in summer, then this may have a direct impact on amenity uses.

⁹⁵ Information supplied by Masterton District Council

Lake of Remembrance

The Lake of Remembrance in nearby Queen Elizabeth Park suffers the same challenges. It receives a large portion of stormwater from the Masterton CBD throughout the year. The quality of that water together with the lack of summer flushing is likely to pose problems for the Masterton District Council.

Addendum 10: Characterising the future of Wairarapa

The following scenarios of the future are intended to bring together economic, social, cultural and environmental considerations and speculate on the likely future of Wairarapa and what it might look like and have informed the Water Resilience Strategy. There are two types of scenarios for consideration. There are scenarios for the future of Wairarapa more broadly and there are scenarios around the future of water use and management. The two are closely related.

The recently published *Draft Wellington Regional Growth Framework 2021* highlights the anticipated population growth of the broader region of between 91,000 to 151,000 over the next 30 years, of which Wairarapa will experience at least its share and possibly a little more than its share. The Framework also highlights resilience issues. It describes one of the region's "key moves" as to "encourage a more sustainable, resilient and affordable urban form that makes efficient use of existing infrastructure and resources"⁹⁶. The Framework also makes climate change adaption and mitigation key aspects of its focus. These considerations are part of this chapter.

Characterisation of the future begins to throw light on future demand and best use. There are wider trends that are impacting on Wairarapa. This draws on a paper prepared for Masterton District

Council by a company named Tattico, Environmental Scan, (24 April 2020):

1. **Megatrends** – globalisation, urbanisation, equity and empowerment, technology, climate change
While these may be international in their nature, all of them speak to the experience in Wairarapa.
2. **Political** – local impacts
 - a. Trend to a focus on community wellbeing
 - b. High-level of local collaboration
 - c. Commitment to community engagement
 - d. Post-treaty settlement opportunities
 - e. Strengthening iwi relationships
3. **Social and cultural** – local impacts
 - a. Growing population
 - b. An ageing and a youthful population
 - c. Growing urbanisation
 - d. Areas of deprivation
 - e. Affordability and availability of housing
 - f. Poorer mental health outcomes
 - g. Growing Māori population
 - h. Increasing ethnic diversity
4. **Economic** – local impacts
 - a. Growing regional economy
 - b. Diversifying regional economy
 - c. Connectivity to Wellington

⁹⁶ "Draft Wellington Regional Framework" 2021 pp25

- d. Deficits in education and training for young people

- 5. **Environmental** – local impacts
 - a. Climate change impacts
 - b. Freshwater regulatory changes

With these prompts in mind it can be assumed that there is a range of resilience issues faced by the region besides climate change pressures. Drawing on this and other information and data, the following scenarios are an initial attempt to build a composite picture of Wairarapa and what that will do to water demand and responses to climate change.

Scenarios like this are very subjective and everyone will have their own views. It is very easy to reject scenarios as being purely speculative and that is true, but such rejection can amount to an unwillingness to face-up to the challenges of the future.

These scenarios emerge from an essential idea that quite apart from how water availability Wairarapa will play out, a rural/urban separation of interests may emerge (unless the separation is carefully managed), where a traditional agricultural identity will gradually give way to a growing urban identity. This tension may not be able to be managed and will just find its own level, although decisions around water use and availability will be a significant factor as to what scenario emerges most strongly.

A robust response to climate change, that is, a Water Resilience Strategy, will require community wide support, rural and urban.

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Here are the scenarios:

1. The two-speed food and service-based growth economy

On the one hand, Wairarapa would comprise a verdant valley floor, extensively watered during the hot summer with reliable water. The dry hills and coastal strip would be devoted to dryland farming. This rural activity would support specialist food production and manufacture with a strong artisan economy and growing tourism (internal and international). It is expected this would require a high level of investment in environmental mitigation to minimise adverse effects of intensive high value (not necessarily dairy) farming in the valley.

On the other hand, Wairarapa would also comprise a significant segment of the population working in tertiary and quaternary services in Wellington and Palmerston North and living in Wairarapa, or working and living in Wairarapa but deriving their business from outside Wairarapa (largely Wellington).

This two-speed economy could grow quickly with a sense of buoyancy and economic progress. It would likely experience conflict between the two interests – a rural community wanting water and an urban or lifestyle community wanting some water, but more particularly, an exemplary environment.

Water demand/supply – this is a high water-use scenario. There will be rural demand for irrigation and urban demand for domestic water.

Arguably a more prosperous community could invest more of its net worth in environmental protection, but rural/urban tensions would likely be high over who carries the responsibility for resilience.

2. **Sophisticated lifestyle-focused rural/urban community** - this scenario identifies Wairarapa as a lifestyle destination. The rural sector has a major role to play in the future of Wairarapa in this scenario, not necessarily just in its current form but perhaps as a more quality-focused and specialised economy including production and processing and making moderate additional demands on water availability and especially reliability for the production of food. However, its impact would be selective and tightly managed.

Wairarapa would also continue to build an urban and lifestyle profile, but rather than the strong technology and service thrust of scenario one, the development would be balanced with an emphasis on retirement and relocation of high-net worth people into the region, rather like Central Otago, but more accessible.

The emphasis would be on quality of life, a slower rural pace of life and an attractive rural and urban environment.

Water demand/supply - a more sophisticated and less acquisitive regional population will be savvier around water management. They will place a lower value on high water-using enterprises to process

primary products and be very aware of environmental values.

3. **Urban-overflow** - this scenario suggests that the future of Wairarapa is as an urban-based region in a rural setting. The core of economic growth will be in tertiary and some in the quaternary sectors providing a good lifestyle and living experience at a moderate cost. There will be moderately priced housing, and access to good quality food and services such as health and education. People will gravitate there as a counterpoint to the rapidly rising cost of living in the city and house prices.

This urban population will have some environmental concerns, but they will be primarily pre-occupied with an urban way of life. Growth will come from urban industries as an extension of Wellington and to a lesser extent the Manawātū, providing middle-range support and servicing jobs. They would be pleased to have a growing rural sector which would contribute to the rates base and the cost of local services. In short, the rural and urban sectors would bump along together in a satisfactory manner each getting most of what they want.

Water demand would grow from the rural sector in response to climate change and from the urban sector in response to population growth. There would also be demand from new industries which would provide employment for urban dwellers such as processing industries and (particularly domestic) tourism.

Water demand/supply - increasing demand from residential use, although overall demand will be moderate as new urban users will become more efficient users and affordability will be a factor. Rural demand will be significant as current land use patterns will tend to predominate.

4. **More of the same** - this scenario essentially postulates retention of the current 'shape' of the Wairarapa economy and environment by the augmentation of water into areas where climate change is producing deficits, or highlights loss or leakage from the system that creates deficiencies. There will be deficits in agriculture and domestic supply, but because it will remain a predominantly rural-dependent economy it will make significant demands on water.

Water demand/supply - increasing water demand principally due to climate change and falling supply due to WIP recommendations. Eventually a point of crisis will be reached, first in the rural community but increasingly in the urban community as well. A balance between productive use and environmental priorities will have to be found and neither will be happy.

5. **The hybrid** - the most likely scenario is a combination of bits of a number of those scenarios outlined above. What might this 'hybrid' look like? What would be its demands on water? Changes won't be instantaneous but measured over the years.

Whatever the scenarios are that we select as the most likely, they will have implications for water resilience.

What are the experts telling us?

Infometrics predicts slowing population growth after a period of increase in the last few years and the next one or two. Certainly, there are no indications from them that there will be an increase in natural fertility and in a post COVID era, after the flood of kiwis coming home has subsided, it is likely that immigration rates will be lower than in the last 5-10 years. This means that significant population increases could only be the result of internal migration - people leaving cities like Auckland and Wellington for a rural or a lower cost lifestyle.

We believe the most likely trend, and what we have based our resilience assumptions around, is an increasingly urbanised rural population. That would be more urban dwellers and rural people with urban expectations. There would also be significant growth in a professional group working remotely and being domiciled in Wairarapa for lifestyle reasons. These two groups will dominate the local culture. The things they have in common are strong lifestyle values and being strong on environmental values. Their lifestyle would be dependent on a strong economy which will need water. They will have enough in common to find a collaborative solution to water resilience challenges.

For a resilient community, Wairarapa ideally needs to have a diverse population

profile. It would be stronger with a deeper labour market and to take advantage of professional people seeking lifestyle values and bringing their jobs with them or commuting to Wellington for them. A balanced community needs a broadly-based skill set so that trade and semi-skilled people would be a great advantage to support local enterprises. Food is likely to be a continuing foundation of the economy, but service industries will too.

A water resilience policy may need to take account of the following:

- An urban-styled population with strong support for environmental values to preserve the unique character of Wairarapa. A rural population also with environmental sympathies balanced with prosperity concerns.
- Strong support throughout the community for water resilience following on from the recent drought and the prospect of further droughts in the future. Everyone is affected. This is likely to include support for water storage within an environmental context.
- Greater population of remote workers connected to Wellington and other centres, making Wairarapa the heart of their lifestyle and expecting to have water.

- Provision for increased visitor populations who would support the contemporary businesses such as hospitality and retail and who would also expect access to water.
- This visitor population would be moderate water users but high non-consumptive users – recreation and sports. Wairarapa is likely to continue as a visitor destination with a lifestyle rather than an adventure flavour.
- Provision for business growth such as larger food processing businesses would be required to support the economy and balance the populations. Such enterprises would likely be high water users – they will derive more value from local product further up the value chain and support prosperity through local employment.
- Provision for increased population on the urban fringes and on lifestyle blocks which will produce a significant semi-rural population with a rural location but an urban mentality.

Perhaps the major take-out from this discussion is that there is a strong base on which to build a mission-driven campaign around water resilience premised on a single idea – maintenance of an attractive lifestyle combining prosperity and environmental values.

Addendum 11: Characterising the Ruamāhanga Whaitua

The principal piece of work on water management of recent years is the Ruamāhanga Whaitua Implementation Programme (WIP)⁹⁷. It is the foundation document for the management of land and water in the Ruamāhanga catchment. It involved a wide range of stakeholders and was debated in depth over four years before the current report was resolved.

The WIP does not provide all the answers to catchment management and there are some real challenges for the Greater Wellington and local entities in implementing many of its recommendations, however it advanced considerations significantly. In some cases, further decision-making processes will be required. The WIP provides the context within which further decisions are considered. Key sections of the WIP, as well as other background information, are presented here. This is no substitute for reading the WIP itself.

The WIP sets out the new approach towards “catchment thinking” (see above “Integrated Catchment”) and increased resilience and identifies the direction and degree of change and the new mechanisms, objectives, limits, targets, methods and timeframes required to

achieve that change. The requirements of the WIP, once in effect, will have a significant impact on the character of the region.⁹⁸

For individuals and the community this means (in the words of the WIP):
“Implementation and compliance will require new costs, new work programmes and changes in practice that will inevitably affect some parts of the community more than others. It is anticipated that the new limits and management requirements proposed in this document will drive changes in land use, require additional funding from ratepayers and demand an “all in”, whole-landscape, whole-community approach to achieving freshwater objectives.”⁹⁹

“Doing nothing is not an option; our environment and economy are in danger of declining and we must find alternative ways of managing our catchment to ensure that future generations inherit a vibrant catchment, environment and lifestyle.”¹⁰⁰

The WIP sets out the water management challenges facing the Whaitua. It describes the existing state and recommends the extent of improvements

⁹⁷ All material in this chapter is drawn from the Ruamāhanga Whaitua Implementation Programme Greater Wellington GWRC August 2018

⁹⁸ Greater Wellington GWRC has been criticised for not having a comprehensive implementation programme for the WIP. This programme is still emerging.

⁹⁹ WIP page 17,
[http://www.gw.govt.nz/assets/Ruamāhanga-](http://www.gw.govt.nz/assets/Ruamāhanga-Whaitua/Final-Ruamhanga-WIP-August-2018-Pdf-version.pdf)

[Whaitua/Final-Ruamhanga-WIP-August-2018-Pdf-version.pdf](http://www.gw.govt.nz/assets/Ruamāhanga-Whaitua/Final-Ruamhanga-WIP-August-2018-Pdf-version.pdf)

¹⁰⁰ WIP page 8,
<http://www.gw.govt.nz/assets/Ruamāhanga-Whaitua/Final-Ruamhanga-WIP-August-2018-Pdf-version.pdf>

required. It recommends management options to achieve these improvements. In particular, the WIP recognises the special relationship mana whenua has with the Ruamāhanga catchment.

Challenges identified in the WIP

The Ruamāhanga catchment is highly modified, and in many places degraded. It does not meet some of the cultural, social, environmental and economic expectations and needs of the Wairarapa community. In particular:

- The natural state of rivers and lakes is such that that low flows occur in the rivers that harm the ecology and natural habitat, affecting the use of the rivers for recreation and cultural purposes; climate change is likely to be contributing to this already.
- Mana whenua values and interests are not well recognised in the current water management system
- The reliability of water supply for town and rural supplies, are decreasing
- The current water allocation mechanism is not the most efficient or equitable method
- Use of water in the urban or rural settings is inefficient i.e. leaks, absence of latest technologies, traditional land uses etc.
- In some places, water quality fails to meet national objectives and community expectations for swimability.
- Water quality fails to meet the national bottom lines in Wairarapa Moana (Lake Wairarapa, including its wetland margins and connecting waterways) and Lake Ōnoke.
- As the effects of climate become more pronounced, this will exacerbate flood

events, droughts, water reliability and habitat loss.

Existing water quality, as measured against the National Objectives Framework (NOF) banded framework, is shown in the appendices to the WIP alongside the desired quality (and shown as freshwater objectives). Where the existing state is shown as band D or E, this is below bottom lines. In these tables the desired water quality is shown in the freshwater objective column. In all cases the water quality must at least be in the same band as the existing state, or it can be better (as required by the National Policy Statement for Freshwater Management - NPS-FM).

The WIP notes that water quality has changed little over the last 20 years. Trends are small or inconclusive. There are some improving trends (again small), particularly in the main stem of the Ruamāhanga River. These are primarily related to a shift in discharge of treated sewage effluent from directly into the river to land disposal in Masterton and Carterton.

More recent research by Snelder 2017 notes: "The most notable trend in the Ruamāhanga catchment was in water clarity - 60% of sites showed an improving ten year trend and no sites showed a degrading trend. Lake Wairarapa showed improving trends for total phosphorous and total nitrogen and Lake Ōnoke

showed improving trends for total phosphorous and clarity.¹⁰¹

What the WIP is seeking to achieve?

The WIP (Chapter 4) identifies a broad range of freshwater objectives for streams, rivers and lakes that will apply up to the mid-century when climate change effects can be re-evaluated e.g. effects on minimum flows.

These objectives can be broadly summarised as follows:

- Water quality for recreation needs to improve across the whaitua so that waterways are swimmable. This includes improving the state of *Escherichia coli* (E. coli) in all river FMUs so that at least a National Objectives Framework (NOF) state of "C" is achieved by 2040
- Periphyton and macroinvertebrate health is improved in many streams and rivers, including to ensure that all water bodies meet the national bottom line for periphyton by 2040
- By 2050, sediment loads reaching waterways are substantially reduced in order to contribute to improving macroinvertebrate and indigenous fish health in streams and rivers and to improving ecosystem function and mahinga kai values in lakes
- The health of indigenous fish communities is improved in all water bodies, including to ensure that mahinga kai and cultural values are provided for
- The natural character of streams, rivers and lakes is restored, including

to ensure there are healthy macroinvertebrate native fish and plant communities in these water bodies

- The health and resilience of Lake Wairarapa and Lake Ōnoke are improved, including to ensure all national bottom lines are met and the trophic level index state of both lakes is improved

The WIP policy packages

The WIP proposes three policy packages to improve water quality. They are:

2. **Discharges and land use**
 - Load limits for contaminants
 - Sub-catchment planning
 - Farm environment planning
 - Riparian planting
 - Storm water discharge
3. **Rivers and lakes management**
 - Slowing water down across the whaitua
 - Restoration of Lake Wairarapa and Lake Ōnoke
 - Restoration of the connection of the Ruamāhanga River to Lake Wairarapa
 - Creation of wetlands
 - Enhancing the natural character of rivers, including by aligning flood management processes
4. **Flows and water allocation**
 - Enabling attenuation and storage
 - Ensuring minimum flows

¹⁰¹ Recent work by Snelder 2017 "Analysis of water quality trends for rivers and lakes in the Wellington region", followed up by the Greater Wellington Fairbrother GWRC

Fairbrother report of June 2017 "Are we meeting our environmental outcomes in the Ruamāhanga Catchment".

- Capping total allocation amounts from all water bodies
 - Requiring takers of Category A groundwater to fully cease takes of water at minimum flow
 - Further investigation of Category A groundwater takes
 - Ensuring the protection of small streams at low flow through more clearly setting minimum flows
 - Reducing the amount able to be taken as a permitted activity
 - Updating all resource consents
 - Reviewing conditions for resource consents to take water at appropriate intervals
- The WIP is a strongly consensus-based and stakeholder-engaged document, establishing this as a credible methodology.
 - The use of catchment committees in this process helped establish them as vital elements in water management.
 - It addressed the whole system, not just parts of it.
 - It strengthened the link between land use and water quality.
 - It added strength to emerging more environmentally sensitive practices such as the application of treated effluent to land rather than into rivers.
 - It recognised the contribution to contamination from rural and urban sources.

What do we take from the WIP for a resilience strategy?

The WIP has comprehensively addressed the question of allocation of water to the environment (as distinct from users) and the protection of its quality as a regional asset. In so doing, it has drawn some bottom lines which are regarded by many as tough and by others as necessary. These are bottom lines to protect the environment, not necessarily bottom lines for resilience. The two are related but are not the same thing.

The WIP represents something of a breakthrough in the zero-sum argument with respect to water between community utilisation and production values and environmental protection values with the recognition that both imperatives can be jointly managed to a common goal. The legacy it has left us includes:

Essentially, the WIP identifies what (and why) needs to be addressed, not so much how (and exactly when) it should be implemented; Greater Wellington's Natural Resources Plan will provide the statutory mechanism for enacting these actions. The WIP also does not say who or how it should be funded or in what order. As such, it did not identify an action plan or transition process from many of the current practices to new practices without significant adverse outcomes to lifestyles, livelihoods and prosperity. This action planning is a key future challenge of which the resilience strategy is part.

Relevant WIP recommendations

The Whaitua Implementation Programme (WIP) compromised more than 100 recommendations. The following lists just

the key recommendations¹⁰² (or relevant parts thereof) as they pertain to this strategy i.e. those that are directly applicable to the potential solutions and their implementation:

Recommendation 1

Greater Wellington will:

- Support mana whenua as active partners in the management of the Ruamāhanga whaitua

Recommendation 5

The Ruamāhanga whaitua integrated land and water management system should:

- Seek to be a comprehensive, catchment-wide system that increases ecological and social health and wellbeing as well as improving water use reliability
- Create resilience to the pressures of changing weather systems under climate change

Recommendation 11

The Committee recommends that:

- GMP be emphasised and innovation fostered as part of every farm plan and by the operational practices of Greater Wellington and territorial authorities in the whaitua
- Industry guidelines are the primary source of GMP guidance
- All sectors, including the three waters sector, actively design and progressively implement GMP, not just the primary sector
- Greater Wellington develops partnerships with industry,

stakeholders and communities for supporting the implementation and adoption of GMP

Recommendation 12

... water use efficiency be improved among all water users in the Ruamāhanga whaitua, including by:

- Local councils (as suppliers of water) improving water conservation by residential, commercial and industrial users, establishing appropriate demand management strategies during water shortages, improving resilience and reducing demand in issuing of consents for new builds and subdivisions, and investigating opportunities for water re-use
- Group and community water suppliers appropriately managing demand during water shortages and supporting improved resilience of supply
- Irrigation users meeting at least 80% efficiency of application and further improving practices through recognised programmes
- Greater Wellington recognising that exceptions to the "80% efficiency of application" requirement may be appropriate where the financial return from a less efficient water application can be shown to be high (i.e. the water use is highly economically efficient) or where there are meaningful benefits for the environment in a less efficient water use, effectively offsetting the benefits of being 80% efficient
- Greater Wellington and territorial authorities working together to develop long-term plans for the management of water races in the

¹⁰² The wording of some recommendations has been shortened where it doesn't affect the intent of the recommendation.

Ruamāhanga whaitua that meet the objectives of this WIP and provide for the values of the water bodies and communities

- Increasing education opportunities across types of water users

Recommendation 58

Greater Wellington works with territorial authorities on a suitable permitted activity rule for the irrigation of wastewater to farm land. This should include conditions on the standard of the discharged effluent, discharge rates and timing, and any restrictions on where this irrigation should occur.

Recommendation 70

To improve water supply reliability, the Ruamāhanga whaitua integrated land and water management system should:

- Integrate multiple management options for water retention, including attenuation, storage and harvesting at a range of scales, and efficient use in the long and short terms, rather than be dependent on any one mechanism
- Actively promote attenuation of water in soils, wetlands, lakes and groundwater systems across the catchment
- Ensure an equitable approach to improved water storage and water use efficiency by both rural and urban users

Recommendation 71

... recognises the importance of the role of attenuation of water in soils, wetlands and lakes and their riparian margins in the

whaitua to support groundwater recharge and wetland restoration and help build resilience in communities¹⁰³.

Recommendation 72

... recognises the benefits of multiple mechanisms (such as storage, harvesting, attenuation and aquifer recharge) that increase resilience and water reliability of supply.

Recommendation 73

... provide for circumstances where water may be taken at higher flows for purposes wider than storage e.g. aquifer recharge.

Recommendation 74

... investigates integrated solutions to water reliability. These should include integrating storage, harvesting, attenuation and managed aquifer recharge, and facilitate pilot projects to prove feasibility.

Recommendation 75

.... requires users of water to manage their take and use in a more equitable manner and to ensure GMP, including to:

- Seek efficiency gains when consents are renewed for all water use activities
- Promote small-scale storage on urban and rural properties in order to increase resilience and to encourage everyone to take part in improving water use efficiency
- Require takes from directly connected groundwater to reduce and cease at times of low flows in rivers in the same

¹⁰³ The following recommendations also make reference to the need for an increase in riparian plantings, namely; recommendations 3,4,17,24,29, 44, 54 with respect to providing biodiversity corridors, slowing water and thereby

helping decrease sediment loads, decreasing in-stream temperatures, and lowering nitrate and phosphorous loads in particular.

way that surface water takes are managed

- Require community supply takes to do more to reduce take at minimum flows, while protecting the ability to take water for people's health needs
- Reduce water race takes at minimum flows to only the water required to provide for people's domestic needs and stock drinking needs

Recommendation 76

.... the PNRP to provide for "non-consumptive" takes. Consideration will need to be given to:

- The volume of the take and discharge

- Ensuring that the efficiency of the water use is maximised in order to return a similar amount of water to the source
- Maintaining the quality of the discharge in relation to the quality of the source water
- The distance between the abstraction and discharge points
- Any net ecological benefits of the use of the water

Recommendation 103

... community water suppliers to improve water supply resilience by increasing the number of water sources, including water storage, particularly where a single source is relied on.

Addendum 12: Wairarapa Committee Terms of Reference

Terms of Reference for 2019-2022

Triennium

1. Purpose

To consider areas and matters of strategic importance to the Wairarapa, and recommend to the Greater Wellington Regional Council on these matters.

2. Specific responsibilities

The areas for consideration and recommendation to Council include, but are not limited to:

- Flood protection
- Land management
- Biosecurity
- Biodiversity
- Climate
- Public transport
- Natural resource management
- Broader areas of common interest to the territorial authorities and Council.

3. Members

3.1 The Councillor elected by the Wairarapa constituency.

3.2 Two other Councillors, appointed by Council.

3.3 Three other members, appointed by Council as follows:

- a The Mayor of Carterton District Council
- b The Mayor of Masterton District Council
- c The Mayor of South Wairarapa District Council.

3.4 Two other members, appointed by Council for each person's skills,

attributes or knowledge that will assist the work of the Committee, being:

- a One member, nominated by Ngāti Kahungunu ki Wairarapa
- b One member, nominated by Rangitāne ō Wairarapa.

4. Alternate members

4.1 For the members in sections 3.1 and 3.2, Council may nominate a pool of up to three alternate Councillors for appointment by Council. If one of those members is unable to attend a meeting any person from this pool may sit at the table, speak and vote in their place.

4.2 Each territorial authority in section 3.3 may nominate an alternate elected member for appointment by Council. If an appointed member is unable to attend a meeting their alternate member may sit at the table, speak and vote in their place.

4.3 Each iwi authority in section 3.4 may nominate an alternate member for appointment by Council. If an appointed member is unable to attend a meeting their alternate member may sit at the table, speak and vote in their place.

5. Quorum

Four members, including two Councillors.

6. Voting entitlement

6.1 All members have equal speaking and voting rights.

6.2 Council's Standing Orders apply to the Committee; except that the Chair, in the case of an equality of votes, does not have a casting vote (and therefore the motion is defeated and the status quo is preserved).

7. Servicing

The Committee is serviced by Greater Wellington.

8. Committee consideration

8.1 Matters of strategic importance to the Wairarapa Constituency (that are proposed for consideration by each of the Climate, Environment, and Transport Committees) shall first be referred to the Wairarapa Committee or its members for their consideration.

8.2 Proposals developed by Wairarapa-focused advisory groups formally established by Council shall be considered by the Committee for direct recommendation to Council for decision.

9. Council's decisions on Committee recommendations

9.1 Council's decisions on the Committee's recommendations are reported to the Committee.

9.2 Where Council makes any decision that is materially different from the Committee's recommendation, Council's report to the Committee will set out the reason/s for that decision.

10. Remuneration and expenses

10.1 The expenses of the elected members shall be met by the council they represent.

10.2 Non-elected members (who are not otherwise being remunerated) may claim Greater Wellington's standard daily meeting attendance allowances and expenses.

11. Meeting frequency

The Committee shall meet quarterly, with additional meetings as required.

Addendum 13: Bibliography

A large portion of the data in this publication was received from individual contributors. Where this is the case the sources are footnoted in the text. This bibliography includes background publications used to build the resilience framework contained in this report.

Information and submissions were received from various parties. These are also noted in footnotes or acknowledged in the text.

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IMAGE ATTRIBUTIONS

Lake_Wairarapa: By K1w1m0nk1e - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=3287312>
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7.7 RUAMĀHANGA CLIMATE CHANGE STRATEGY REVIEW

1. PURPOSE

To inform the Council of the reviewed version of the Ruamāhanga Strategy and Implementation plan, and the Corporate Greenhouse Gas Emissions Inventory (2020).

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

In 2019 Carterton District Council and South Wairarapa District Council agreed to work together to develop a joint climate change strategy. The first version of the Ruamāhanga Climate Change Strategy was adopted by this council's Policy and Strategy Committee on the 12 February 2020.

It was agreed that the Strategy should be reviewed in 2021.

4. REPORT ON CLIMATE CHANGE ACTIVITIES

4.1 Ruamāhanga Strategy

The first review of the Ruamāhanga Climate Change Strategy is in **Attachments 1 and 2**.

The Ruamāhanga Strategy has been developed in order to reduce the carbon footprint of Carterton District Council and South Wairarapa District Council.

The following changes have been made:

- There are now two volumes: the strategy and the action plan. This simplifies the reading of the documents,
- The socioeconomic context was updated with the latest data available,
- The climate change projections were updated with data provided by Greater Wellington Regional Council. These projections are consistent across all councils in the Wellington Region and across the Carterton District Council organisation,
- The likely impacts of climate change for Wairarapa were updated,
- A new section was added. This section explains the Council's achievements since the first adoption of the Ruamāhanga Strategy,
- The action plan was updated.

4.2 Greenhouse Gas Inventory Report for Carterton District Council

The 2020 Greenhouse Gas Inventory for Carterton District Council is in **Attachment 3**.

The report for the Council's Greenhouse Gas Inventory – 2020, has been finalised in accordance with the requirements of the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) and ISO 14064-1:2006 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.

In 2020, Carterton District Council emitted 275.99 tCO₂e (-26% compare to 2018):

	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Changes
Corporate Services	13.77	14.11	15.17	+10.16%
Community Services	63.70	57.99	23.14	-63.68%
Operations	112.73	127.31	79.43	-29.54%
Water Services	106.68	106.56	118.33	+10.92%
Parks and reserves	64.04	42.32	28.89	-54.89%
Regulatory	12.00	10.35	11.04	-8.04%
GROSS EMISSIONS	372.91	358.64	275.99	-25.99%

Emissions by business units

	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Changes
Scope 1	149.12	157.74	136.89	-8.20%
Scope 2	142.33	117.16	52.91	-62.83%
Scope 3	81.46	83.73	86.20	+5.82%
GROSS EMISSIONS	372.91	358.64	275.99	-25.99%

Emissions by scope

	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Changes
Electricity	154.53	127.21	57.44	-62.83%
Transport	149.72	158.49	137.71	-8.02%
Wastewater	37.21	38.16	51.48	+38.33%
Water supply	21.64	24.97	25.55	+18.07%
Waste	9.80	9.80	3.81	-61.16%
Refrigerant	0.00	0.00	0.00	0.00%
GROSS EMISSIONS	372.91	358.64	275.99	-25.99%

Emissions by sources

	t CH ₄ - 2018	t CH ₄ - 2019	t CH ₄ - 2020	Changes
Waste	2.30	2.30	2.95	+28%
Green waste	7.50	7.50	0.50	-93.33%
Wastewater	18.61	19.08	25.74	+38.33%
TOTAL	28.41	28.88	29.19	+2.73%

Biogenic methane emissions

In 2020, almost 50% of Carterton District Council's emissions come from the transport, followed by electricity (21%), wastewater treatment (19%) and water supply (9%). Waste production and refrigerant leakage account for a very small part of the emissions.

Note #1: The emissions factors provided by MfE were updated in 2020. Therefore, emissions for 2018 and 2019 were updated.

Note #2: The district was in lock down level 3 and 4 between the 23 March 2020 and the 14 May 2020 due to COVID-19 pandemic.

5. CONSIDERATIONS

5.1 Climate change

The Ruamāhanga Climate Change Strategy has been developed to reduce the greenhouse gas emissions of Carterton District Council, therefore, mitigate climate change.

5.2 Tāngata whenua

Tāngata Whenua were consulted in the development and implementation of the Ruamāhanga Strategy and will continue to be included in the actions. Hurunui o Rangi Marae and the South Wairarapa District Council's Māori Standing Committee have both contributed to the strategy.

5.3 Financial impact

The Council has a budget for the implementation of the Ruamāhanga Climate Change Strategy and action plan.

Priorities will be determined by the council and then the plan adjusted, if necessary.

5.4 Community Engagement requirements

Consultation with some community groups occurred during the development and implementation of the Ruamāhanga Strategy.

5.5 Risks

N/A

6. RECOMMENDATION

That the Council:

1. **Receives** the report.

2. **Adopts** the reviewed version of the Ruamāhanga Climate Change Strategy and Implementation plan in **Attachments 1 and 2**.
3. **Note** the Greenhouse Gas Inventory report for Carterton District Council in 2020 in **Attachment 3**.

File Number: 127586

Author: Glenda Seville, Community Development Coordinator

Attachments:

1. Ruamāhanga Strategy Vol 1 [↓](#)
2. Ruamāhanga Strategy Vol 2 [↓](#)
3. 2020 Greenhouse Gas Inventory for Carterton District Council [↓](#)

MAY 21

RUAMĀHANGA STRATEGY

VOLUME 1: CLIMATE CHANGE STRATEGY



Volume 1: Climate Change Strategy

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Disclaimer

The information in this strategy is true and complete to the best of our knowledge. All recommendations are made without guarantee on the part of the author or South Wairarapa District Council and Carterton District Council. The author and publisher disclaim any liability in connection with the use of this information.

1 Glossary

Definitions

Anthropogenic greenhouse gases: Greenhouse gases that are emitted from human activities

Biogenic Methane: Methane produced from biological (plant and animal) sources.

Carbon reservoirs: they are features that stores carbon (such as a tree).

Carbon sequestration: it is the process of removing carbon from the atmosphere and storing it. Trees are a great way to sequestered carbon.

CO₂e: Carbon Dioxide Equivalent – all greenhouse gases have a different GWP (Global Warming Potential). Therefore, all the greenhouse gases emitted can be summarised by using CO₂e. For example, methane has a GWP of 25, meaning that 1 tonne of methane will cause the same amount of warming as 25 tonnes of carbon dioxide: 1t CH₄ = 25 tCO₂e.

Evapotranspiration: This is the sum of the plants' transpiration and the ground's evaporation.

Greenhouse effect: It is a process that occurs when gases (greenhouse gases) in Earth's atmosphere trap the Sun's heat, and increase radiative forcing. This process makes Earth much warmer than it would be without an atmosphere. The greenhouse effect is one of the things that makes Earth a comfortable place to live.

Greenhouse gases: they are the gases that increase the greenhouse effect. More than forty gases are greenhouse gases, but the most important ones are Water vapour (H₂O) Carbon Dioxide (CO₂), Methane (CH₄), Ozon (O₃), Nitrous Oxide (N₂O) and fluorinated gases (HFC, PFC, SF₆).

Radiative forcing: It is the difference between the solar energy received by the planet and the energy reflected back to space. A positive radiative forcing means that Earth receives more energy than what is reflected. Therefore, the planet warms. The higher the radiative forcing is, the warmer the planet becomes. A negative radiative forcing means that Earth reflects more energy than what is received. Therefore, the planet cools down.

Sustainability: It is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (environmental protection, social and economic development) - Brundtland Report, 1987

Acronyms

CDC: Carterton District Council

CD: Carton District

CO₂: Carbon dioxide

EV: Electric Vehicles

GDP: Gross Domestic Product

GHG: greenhouse Gas

GPC: Global Protocol for Community Scale Greenhouse Gas Emissions Inventory

GWP: Global Warming Potential

GWRC: Greater Wellington Regional Council

ICE: Internal Combustion Engine

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IPCC: Intergovernmental Panel on Climate Change

IPPU: Industrial Processes and Product Use

NIWA: National Institute of Water and Atmospheric research

RCP: Representative Concentration Pathways

UNFCCC: United Nation Framework Convention on Climate Change

SWDC: South Wairarapa District Council

SWD: South Wairarapa District

TA: Territorials Authorities

WIP: Work In Progress

WRCCF: Wellington Region Climate Change Forum

WRCCWG: Wellington Region Climate Change Working Group

WREVWP: Wellington Region Electric Vehicle Working Party

Te Reo

Hawaiki: Ancient homeland - the places from which Māori migrated to Aotearoa/New Zealand.

Iwi: Extended kinship group, tribe, nation, people, nationality, race - often refers to a large group of people descended from a common ancestor and associated with a distinct territory. Ngāti Kahungunu ki Wairarapa and Rangitāne o Wairarapa are the two iwis in Wairarapa.

Kai moana: Seafood

Kaitiaki: Guardians and protectors of places

Kaitiakitanga: the responsibility to care for the physical, ecological and spiritual well-being of a place or resource to ensure harmony within the environment and protection against elements that cause permanent imbalances.

Kokopu: Whitebait

Ngā atua: Deity

Pākehā: Person from another country.

Piharau: Lamprey

Tangata whenua:

Taniwha: Guardians and protectors of places. Rākai Uru is the taniwha who is the caretaker of the lake Wairarapa. He takes the form of a large tōtara log.

Taonga: Treasure

Tapu: Sacred

Tuna: Eels

Whaitua: Designated space or catchment.

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2 Introduction

Climate Change is the biggest environmental challenge we are facing.

As Wairarapa is already experiencing the effect of Climate Change, especially temperature increase, droughts, sea level rise and erosion, Carterton District Council (CDC) and South Wairarapa District Council (SWDC) are committed to doing their part in mitigating Climate Change (reducing the greenhouse gas emissions).

In 2015, the Mayors signed the New Zealand Local Government Leaders' Climate Change Declaration and committed to:

- Develop and implement ambitious action plans that reduce greenhouse gas emissions and support resilience within our own councils and for our local communities. These plans will:
 - promote walking, cycling, public transport and other low carbon transport options;
 - work to improve the resource efficiency and health of homes, businesses and infrastructure in our district;
 - support the use of renewable energy and uptake of electric vehicles;
- Work with our communities to understand, prepare for and respond to the physical impacts of climate change;
- Work with central government to deliver on national emission reduction targets and support resilience in our communities.

The Ruamāhanga Strategy has been developed to reduce the carbon footprint of Carterton District Council and South Wairarapa District Council. This strategy was adopted in February 2020 for CDC and March 2020 for SWDC.

This strategy has two volumes. The first volume:

- presents the districts (socio-economic, environmental and cultural contexts);
- explains what Climate Change is and what may be the impact for Wairarapa;
- presents the greenhouse gas inventory for the Wellington Region (lead by Greater Wellington);
- presents the inventories of greenhouse gas emissions from Wairarapa and from council's activities for each Councils;
- sets up targets.

The second volume presents:

- our achievements since the strategy was adopted in 2020;
- An updated action plan for the coming years (2020-2023 and 2023-2033).

Adoption	CDC: February 2020 SWDC: March 2020
1 st review	March 2021
Next review due	2024

3 Executive summary

Climate Change is the biggest environmental challenge we are facing.

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The Ruamāhanga Strategy has been developed to reduce the carbon footprint of Carterton District Council and South Wairarapa District Council.

Socio-economic context

With a population of 19,773 in 2018, South Wairarapa and Carterton Districts are attractive, and the population had a +23.6% growth between 2006 and 2018 (around +1.8% per year). South Wairarapa and Carterton Districts are rural districts with a density of 5.4 pers/km².

In 2018, 37.1% of the households in the districts own one or less motor vehicles. 18.1% of the households in the district own 3 or more motor vehicles.

In 2018, the main fuel type for the district's households was wood (74.7%), followed by electricity (59.9%). Bottled gas and coal respectively had a 43.6% and 73.2% decrease between 2013 and 2018.

In 2018, unemployment in South Wairarapa and Carterton Districts was lower than in New Zealand (3.0% compared to 4.0%). The main industries are 'agriculture, forestry and fishing' (15.6% of the workforce) followed by 'professional, scientific and technical services' (9.2% of the workforce).

In 2018, 75.3% of the residents from South Wairarapa and Carterton Districts worked within the districts. 61.7% of the residents drove a car, truck or van to travel to work. Public transport (trains and buses) are used by 9.2% of the residents to go to work and 5.3% of the residents walked, jogged or biked.

Over 96% of the residents of South Wairarapa and Carterton Districts live and work within the districts.

Environmental context

Carterton and South Wairarapa Districts have dry and warm summers and wet and mild winters.

The main features in the landscape are the Tararua range in the North-West, the Aorangi range in the South, the Ruamāhanga plains and the rugged East coast.

The districts are mainly covered by farmlands (55.7%, including 6.7% of planted forests), closely followed by natural areas (43.8%, including 35.7% of natural forests). The farmlands and the four settlements of Featherston, Greytown, Martinborough and Carterton are mainly located in the Wairarapa plains and the Eastern Wairarapa. The Tararua Range and the Aorangi Range are the main natural areas of the districts.

Carterton and South Wairarapa Districts have a 142-kilometre shoreline. The coast has the settlements of Ngawi, Tora and Flat Point, but is mainly composed of rural and natural areas.

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Historical and cultural context

The Wairarapa has a strong mana whenua history with many important Māori heritage sites. The cultural landscape includes those places associated with ngā atua (deities), taniwha and kaitiaki (guardians and protectors of places), as well as places discovered, visited and or named by ancestors and explorers.

What is Climate Change and its impact for Wairarapa

According to the UNFCCC (United Nation Framework Convention on Climate Change), Climate Change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

The IPCC (Intergovernmental Panel on Climate Change) set up different scenarios depending on the greenhouse gas emissions. RCP2.6 is a low emissions scenario, RCP4.5 is a low to moderate emissions scenario, RCP6.0 is a moderate emission scenario and RCP8.5 is a high emissions scenario.

Globally, surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent. The ocean will continue to warm and acidify, and global mean sea level to rise.

Greater Wellington Regional Council provides climate change assumptions based on the RCP4.5 and RCP8.5. These assumptions were used to understand the likely impacts of climate change in Wairarapa.

The expected direct impacts of climate change (such as increased temperature, increased flood intensity and sea level rise) impact the communities living in Carterton and South Wairarapa District. The key impacts on the communities are:

- Impact on the environmental well-being (biodiversity losses, increased pests and rodents, increased coastal inundation...);
- Impact on the social well-being (increased risk on the human health and human life, increased pressure on drinking water quality and availability...);
- Impact on the economic well-being (reduced productivity, increased damage to properties, increased pressure on insurances and mortgages...);
- Impact on the cultural well-being (loss of cultural identity, loss of important cultural activities, loss of taonga species...).

Wairarapa Combined District greenhouse gas inventory

In 2018/19 reporting year, the Wairarapa Combined District emitted gross 1,734,320 tCO₂e and net 353,460 tCO₂e.

The biggest sector is agriculture (77.8%), followed by transport (15.7%). Stationary energy (3.4%), Waste (2.3%) and Industry (0.8%) are minor sources of emissions in the Wairarapa.

Total gross emissions fell by 7%, from 1,871,095 tCO₂e in 2001 to 1,734,320 tCO₂e in 2019. Reductions in emissions from stationary energy, waste and agriculture are responsible for the fall in total gross emissions. As the area's population has risen (by 22%, from 39,090 to 47,590), per capita gross emissions have reduced by 24% from 47.9 tCO₂e in 2001 to 36.4 tCO₂e in 2019.

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Net forestry sequestration reduced by 30% between 2001 and 2019 causing net emissions to increase from net-negative total emissions (-91,460 tCO₂e in 2001) to net-positive emissions (353,460 tCO₂e in 2019).

Carterton District Council greenhouse gas inventories

Carterton District Council had a gross emission of 372.91 tCO₂e in 2018 (base year) and 275.99 tCO₂e in 2020 (-26%). The biggest source is transport (50%) followed by electricity (21%, wastewater treatment (19%) and water supply (9%). Waste and refrigerant are minor sources of greenhouse gas.

Carterton District Council had a net emission of -6,864.48 tCO₂e in 2018 (base year) and -6,961.40 tCO₂e in 2020 (+1.41%).

Biogenic methane emissions increased by 2.73% between 2018 and 2020.

South Wairarapa District Council greenhouse gas inventories

South Wairarapa District Council had a gross emission of 248.20 tCO₂e in 2018 (base year) and 243.17 tCO₂e in 2020 (-2%). The biggest source is the electricity (38%) followed by water supply (21%), transport (21%) and wastewater treatment (19%). Waste and refrigerant are minor sources of greenhouse gas.

South Wairarapa District Council had a net emission of 2,687.68 tCO₂e in 2018 (base year) and 665.70 tCO₂e in 2020 (-795%).

Biogenic methane emissions decreased by 2.29% between 2018 and 2020.

Targets

Carbon targets have been set up. They are ambitious but also, achievable and realistic. Being small councils, we must be aware of our limits.

During the period 2020 – 2030, Carterton and South Wairarapa District Councils aim to:

- Reduce their gross greenhouse gas emissions;
- Increase the reservoirs, therefore the amount of greenhouse gas sequestered every year;
- Reduce biogenic methane by 10% below 2017 levels.

4 Socioeconomic context

With a population of 19,773 in 2018, South Wairarapa and Carterton Districts are attractive, and the population had a +23.6% growth between 2006 and 2018 (around +1.8% per year). South Wairarapa and Carterton Districts are rural districts with a density of 5.4 pers/km².

In 2018, 37.1% of the households in the districts own one or less motor vehicles. 18.1% of the households in the district own 3 or more motor vehicles.

In 2018, the main fuel type for the district's households was wood (74.7%), followed by electricity (59.9%). Bottled gas and coal respectively had a 43.6% and 73.2% decrease between 2013 and 2018.

In 2018, unemployment in South Wairarapa and Carterton Districts was lower than in New Zealand (3.0% compared to 4.0%). The main industries are 'agriculture, forestry and fishing' (15.6% of the workforce) followed by 'professional, scientific and technical services' (9.2% of the workforce).

In 2018, 75.3% of the residents from South Wairarapa and Carterton Districts worked within the districts. 61.7% of the residents drove a car, truck or van to travel to work. Public transport (trains and buses) are used by 9.2% of the residents to go to work and 5.3% of the residents walked, jogged or biked.

Over 96% of the residents of South Wairarapa and Carterton Districts live and work within the districts.

4.1 Carterton District (CD)

4.1.1 Population

	2006	2013	2018	Change between 2006 - 2018	2050 (forecast)	Change between 2018 - 2050
Population	7,101	8,235	9,198	+29.5%	13,068	+42.1%

Source: Infometrics, 2021

Table 1: CD's population

	Population 2018	Land area	Density (pers/km ²)
Population	9,198	1,180 km ²	7.79

Source: Infometrics, 2021

Table 2: CD's population density in 2018

Between 2006 and 2018 Carterton District's population increased quickly (average: 2.2% per year) and passed from 7,101 in 2006 to 9,198 in 2018. The forecast shows that the population will keep increasing even though it is slower (average: 1.1% per year). The population in 2050 is estimated to be 13,068.

CD's density is low (7.79 persons per km²).

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4.1.2 Dwellings

4.1.2.1 Dwellings

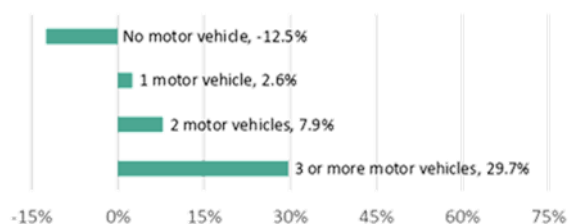
	2006	2013	2018	Change between 2013 – 2018
Dwellings	2,784	3,321	3,657	+10.1%

Source: Infometrics, 2021

Table 3: CD's dwellings

CD had a 10.1% increase in dwellings between 2013 and 2018.

4.1.2.2 Car ownership

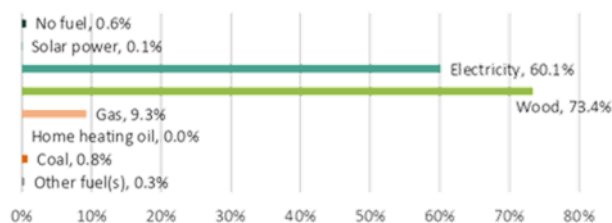


Source: Infometrics, 2021

Figure 1: CD's households car ownership change between 2013 and 2018

Households without motor vehicles decreased by 12.5% between 2013 and 2018 while households with at least one motor vehicle increased. The biggest increase is for the households with 3 or more vehicle (+29.7%). Because CD is a rural district and due to limited public transport, people rely on their own vehicles.

4.1.2.3 Household fuel type



Source: Infometrics, 2021

Figure 2: CD's households fuel type in 2018

Wood (73.4% of the households) and electricity (60.1% of the households) are the two main fuels for the households in CD in 2018.

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4.1.3 Employment

4.1.3.1 Employment status

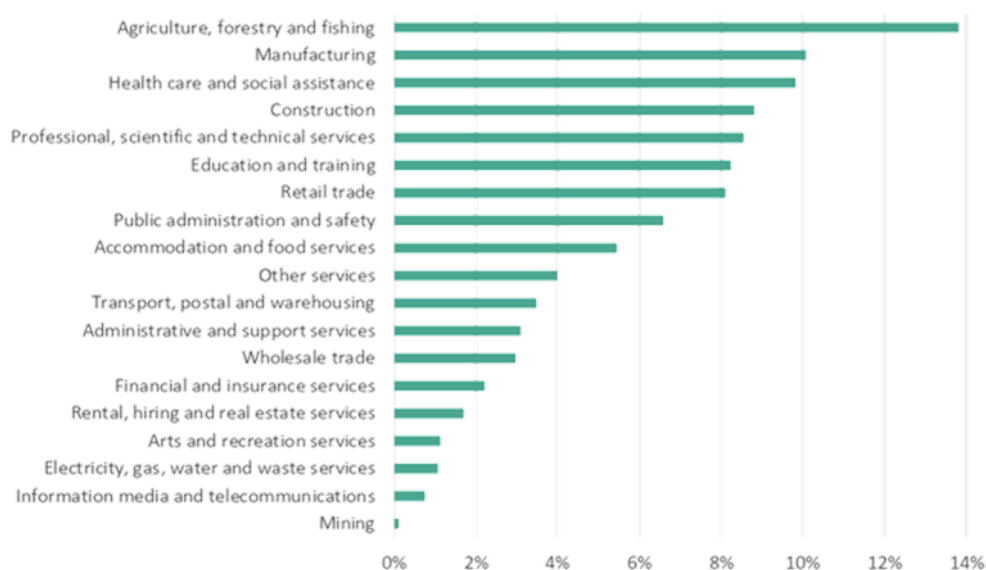
	2006		2013		2018		Change between 2013 – 2018
	Number	%	Number	%	Number	%	
Employed full-time	2,733	48.8%	3,015	74.2%	3,492	46.8%	+15.8%
Employed part-time	885	15.8%	1,047	25.8%	1,242	16.7%	+18.6%
Unemployed	129	2.3%	243	6.0%	240	3.2%	-1.2%
Not in labour force	1,731	30.9%	2,070	51.0%	2,484	33.3%	+20.0%
Unidentified	129	2.3%	222	5.5%	0	0.0%	-100.0%
	5,604		4,062		7,458		

Source: Infometrics, 2021

Table 4: CD's residents employment status

The unemployment rate in 2018 for CD was below the national rate of 4.0%.

4.1.3.2 Workforce profiles



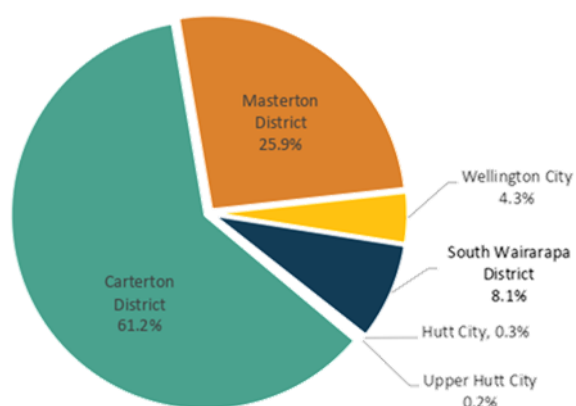
Source: NZ Stat, 2021

Figure 3: CD's workforce industry sector of employment in 2018

Agriculture, forestry and fishing is the biggest sector and represents almost 14% of the workforce profile. Manufacturing is the second biggest sector with over 10% of the workforce.

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4.1.3.3 Carterton's residents place of work

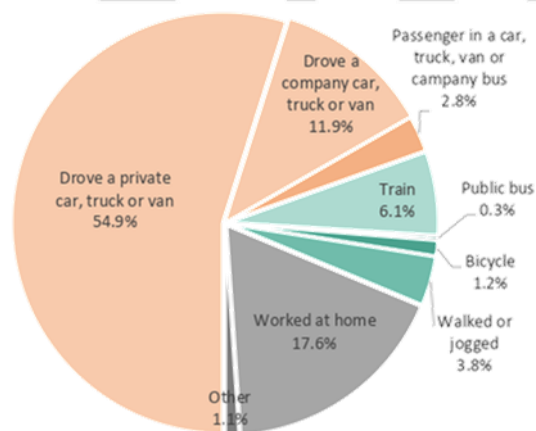


Source: Commuter Waka App, 2021

Figure 4: CD's residents place of work in 2018

Over 95% of the CD's residents works in Wairarapa (61.2% in CD, 25.9% in Masterton District and 8.1% in South Wairarapa District). 4.3% of the CD residents work in Wellington City. A small number of residents works in Hutt City and Upper Hutt City.

4.1.3.4 Method of travel to work

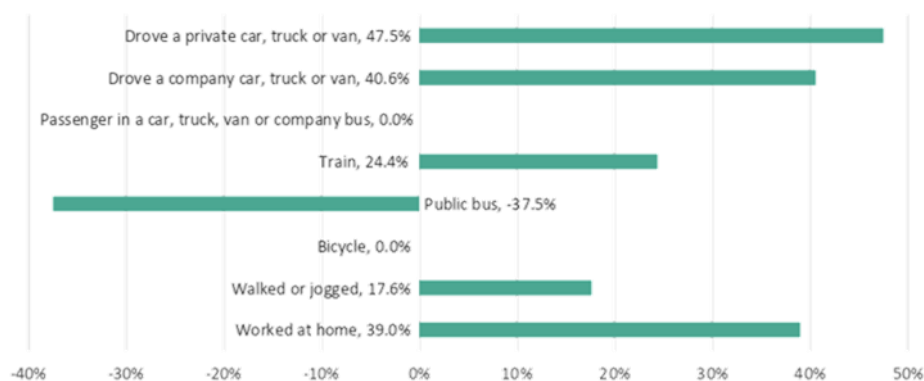


Source: Infometrics, 2021

Figure 5: CD's residents' method of travel to work in 2018

Almost 70% of the CD's residents use a high carbon emission way of transport to work (drive a car, truck or van or be a passenger). 11.8% of residents use a low carbon way of transport to go to work (train, walk or jogged, bicycle, public bus).

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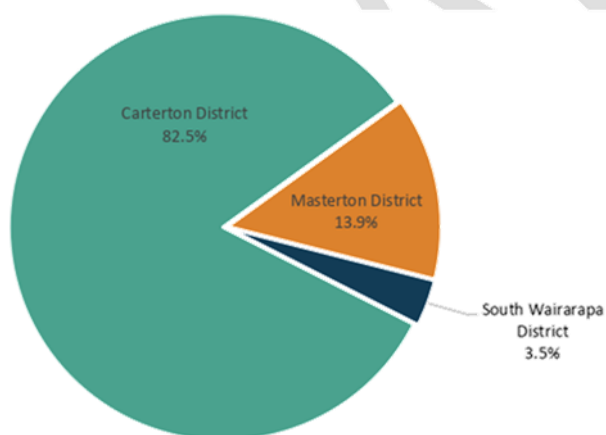


Source: Infometrics, 2021

Figure 6: CD's residents' method of travel to work change between 2013 and 2018

The low carbon way of travel (train (+24.4%) and walked or jogged (+17.6%)) increased between 2013 and 2018. However, the bicycle users stayed stable and the public bus users decreased (-37.5%). Moreover, the high carbon emission way of travel increased (+47.5% for the private car, truck or van users and +40.6% for the company car, truck or van users).

4.1.3.5 Carterton's workers place of residence



Source: Commuter Waka App, 2021

Figure 7: CD's workers place of residence in 2018

Carterton's workers live for almost 83% in Carterton District, almost 14% in Masterton District and 3.5% in South Wairarapa District.

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4.2 South Wairarapa District (SWD)

4.2.1 Population

	2006	2013	2018	Change between 2006 - 2018	2050 (forecast)	Change between 2018 - 2050
Population	8,892	9,528	10,575	+18.9%	14,098	+33.3%
<i>Featherston</i>	2,343	2,250	2,487	+6.1%	3,469	+39.5%
<i>Greytown</i>	2,103	2,238	2,466	+17.3%	3,642	+47.7%
<i>Martinborough</i>	1,329	1,473	1,767	+33.0%	2,493	+41.1%
<i>Rural areas</i>	3,114	3,570	3,852	+23.7%	4,494	+16.7%

Source: Infometrics, 2021

Table 5: SWD's population

	Population 2018	Land area	Density (pers/km ²)
Population	10,575	2,457 km ²	4.3

Source: Infometrics, 2021

Table 6: SWD's population density in 2018

Between 2006 and 2018 South Wairarapa District's population increased quickly (average: 1.5% per year) and went from 8,892 in 2006 to 10,575 in 2018. The forecast shows that the population will keep increasing even though it is slower (average: 1% per year). The population in 2050 is estimated to be 14,098.

SWD's density is very low (4.3 persons per km²).

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4.2.2 Dwellings

4.2.2.1 Dwellings

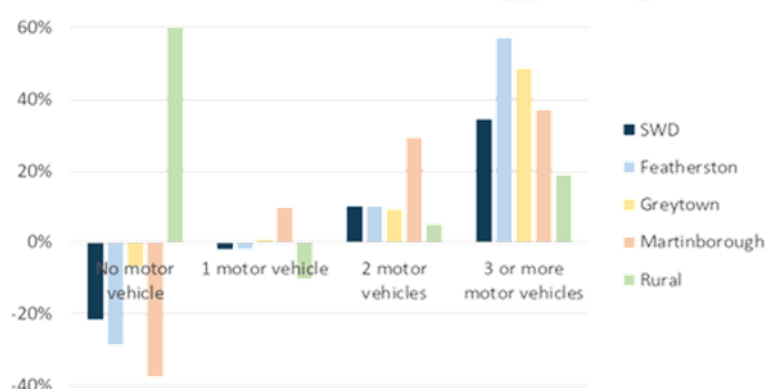
	2006	2013	2018	Change between 2013 – 2018
SWD	3,678	3,984	4,395	+10.3%
Featherston	969	996	1,035	+3.9%
Greytown	879	942	1,059	+12.4%
Martinborough	585	639	759	+18.8%
Rural areas	1,242	1,407	1,545	+9.8%

Source: Infometrics, 2021

Table 7: SWD's dwellings

SWD had an 10.3% increase in dwellings between 2013 and 2018. The biggest increase happened in Martinborough (+18.8%), followed by Greytown (+12.4%).

4.2.2.2 Car ownership



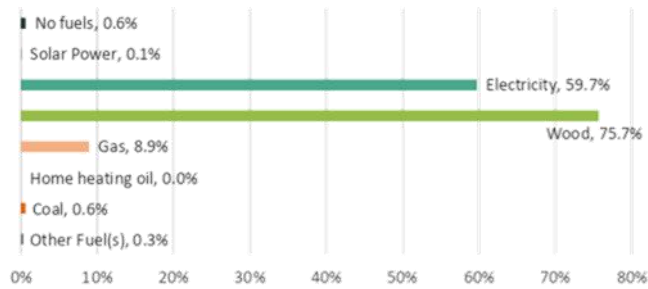
Source: NZ Stat, 2021

Figure 8: Car ownership change between 2013 and 2018

The percentage of households with 3 or more motor vehicles increased by 34.4% between 2013 and 2018 and the number of households without a motor vehicle decreased by 21.5%. This increase of households with 3 or more motor vehicles can be explained by the fact that SWD is a rural district and people living there rely on their vehicles.

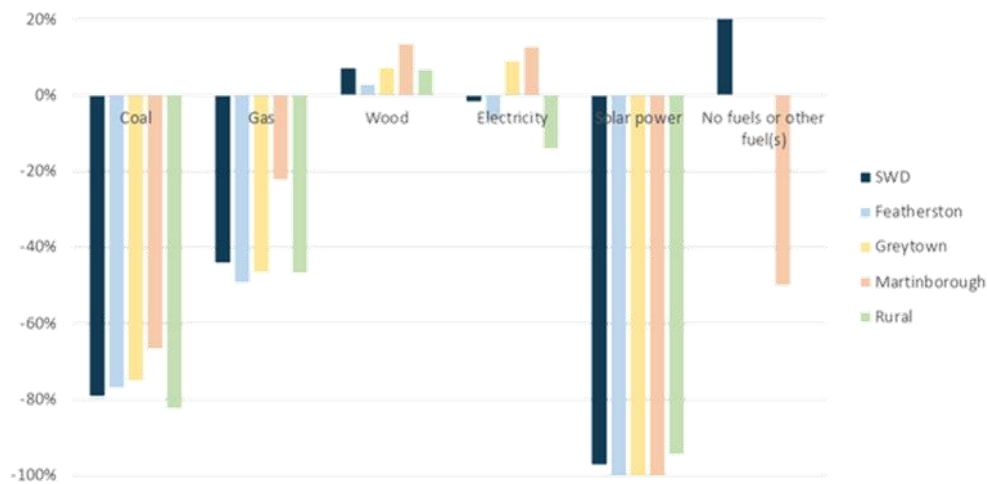
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4.2.2.3 Household fuel type



Source: Infometrics, 2021

Figure 9: SWD's households fuel type in 2018



Source: Infometrics, 2021

Figure 10: Households fuel type change between 2013 and 2018

The fuel type which are high greenhouse gas emitters such as coal and gas are decreasing. The use of wood increased everywhere in the district.

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4.2.3 Employment

4.2.3.1 Employment status

	2006		2013		2018		Change between 2013 – 2018
	Number	%	Number	%	Number	%	
SWD							
Employed full-time	3,483	49.5%	3,225	42.0%	4,239	49.0%	+31.4%
Employed part-time	1,062	15.1%	1,260	16.4%	1,446	16.7%	+14.8%
Unemployed	141	2.0%	261	3.4%	237	2.7%	-9.2%
Not in labour force	2,109	30.0%	2,343	30.5%	2,736	31.6%	+16.8%
Unidentified	246	3.5%	285	3.7%	0	0.0%	-100.0%
	7,041		7,674		8,658		
Featherston							
Employed full-time	813	45.0%	765	41.9%	924	45.8%	+20.8%
Employed part-time	225	12.5%	237	13.0%	267	13.2%	+12.7%
Unemployed	63	3.5%	117	6.4%	108	5.3%	-7.7%
Not in labour force	624	34.6%	651	35.6%	720	35.7%	+10.6%
Unidentified	75	4.2%	60	3.3%	0	0.0%	-100.0%
	1,806		1,827		2,019		
Greytown							
Employed full-time	747	43.7%	741	40.6%	921	45.0%	+24.3%
Employed part-time	279	16.3%	303	16.6%	330	16.1%	+8.9%
Unemployed	30	1.8%	54	3.0%	42	2.1%	-22.2%
Not in labour force	630	36.8%	684	37.5%	747	36.5%	+9.2%
Unidentified	27	1.6%	51	2.8%	0	0.0%	-100.0%
	1,710		1,824		2,046		
Martinborough							
Employed full-time	525	47.7%	555	45.8%	723	49.0%	+30.3%
Employed part-time	153	13.9%	204	16.8%	246	16.7%	+20.6%
Unemployed	18	1.6%	33	2.7%	30	2.0%	-9.1%
Not in labour force	354	32.2%	381	31.4%	480	32.5%	+26.0%
Unidentified	45	4.1%	39	3.2%	0	0.0%	-100.0%
	1,101		1,212		1,476		
Rural areas							
Employed full-time	1,401	57.6%	1,470	52.4%	1,671	53.6%	+13.7%
Employed part-time	402	16.5%	516	18.4%	603	19.3%	+16.9%
Unemployed	27	1.1%	57	2.0%	57	1.8%	0.0%
Not in labour force	495	20.3%	627	22.4%	789	25.3%	+25.8%
Unidentified	99	4.1%	135	4.8%	0	0.0%	-100.0%
	2,433		2,805		3,120		

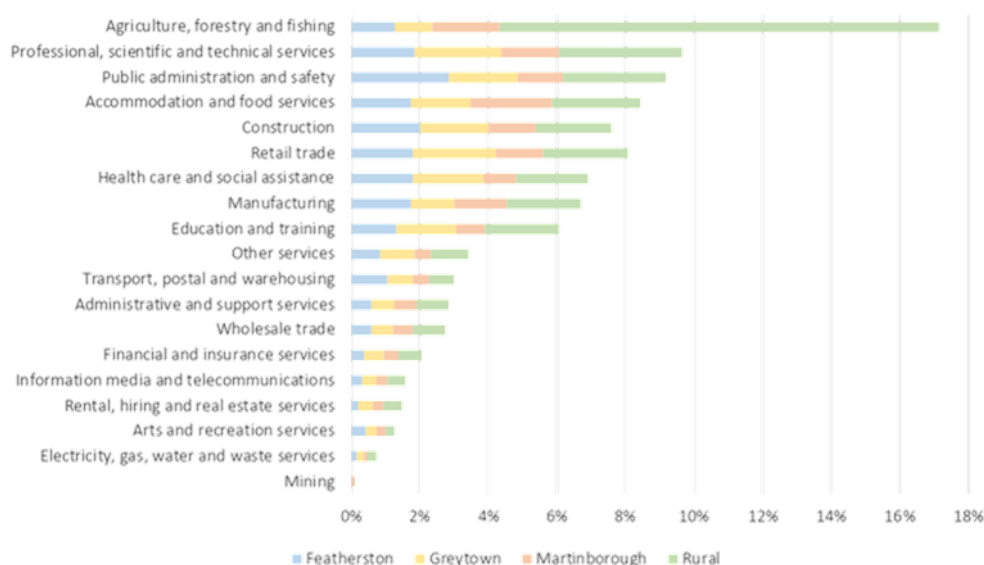
Source: Infometrics, 2021

Table 8: SWD's resident employment status

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The unemployment rate in SWD is below the national rate (4.0% in 2018). However, Featherston is above the national rate (5.3% unemployment) but this rate has decreased since 2013. The district's employment increased a lot since 2013 (+31.4% for full-time employment and +14.8% for part-time employment), especially in Martinborough.

4.2.3.2 Workforce profiles

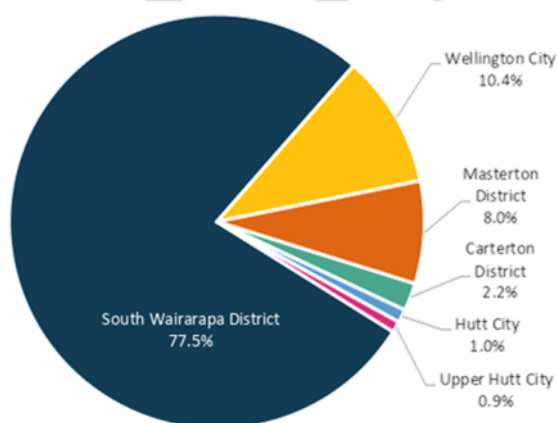


Source: NZ Stat, 2021

Figure 11: SWD's workforce industry sector of employment in 2018

Agriculture, forestry and fishing is the biggest sector and represents 17.2% of the workforce profile.

4.2.3.3 South Wairarapa's residents place of work



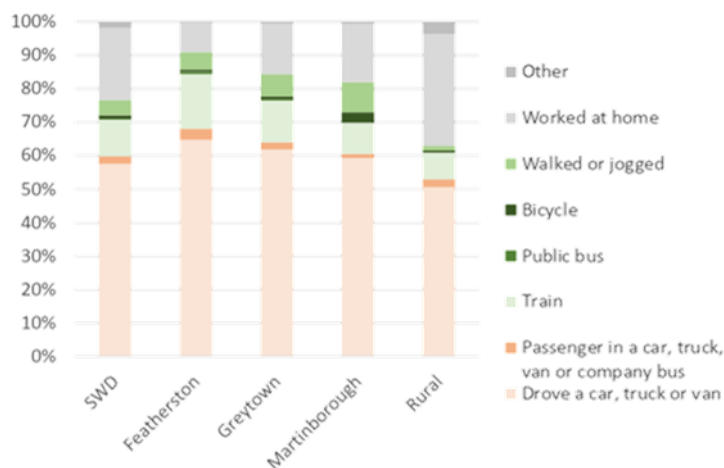
Source: Commuter Waka App, 2021

Figure 12: SWD's residents place of work in 2018

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Almost 90% of the SWD's residents works in Wairarapa (77.5% in SWD, 8% in Masterton District and 2.2% in Carterton District). 10.4% of the residents works in Wellington City. A small number of residents works in Hutt City and Upper Hutt City.

4.2.3.4 Method of travel to work



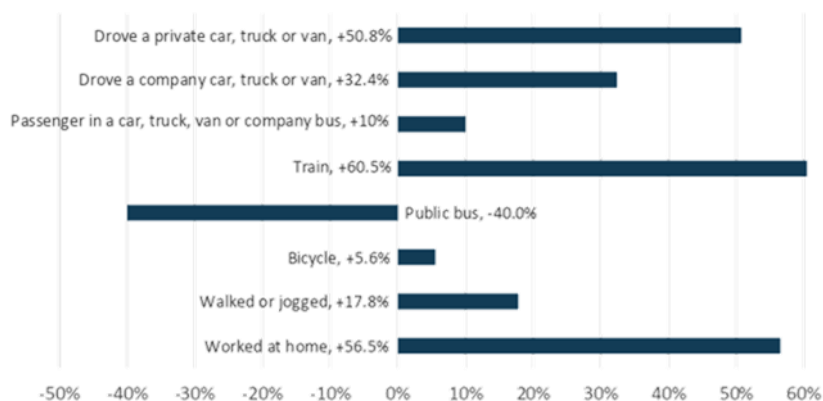
Source: Infometrics, 2021

Figure 13: Residents' method of travel to work in 2018

Almost 60% of the SWD's residents use a high carbon emission way of transport to work (drive a car, truck or van or be a passenger). 16.7% of the residents use a low carbon way of transport to go to work (train, walk or jogged, bicycle, public bus).

These trends are about the same for the three towns. However, we note a higher use of the train in Featherston (due to the proximity of the train station) and of the bicycle in Martinborough. The rural areas' residents mainly use motor vehicles to go to work or work from home.

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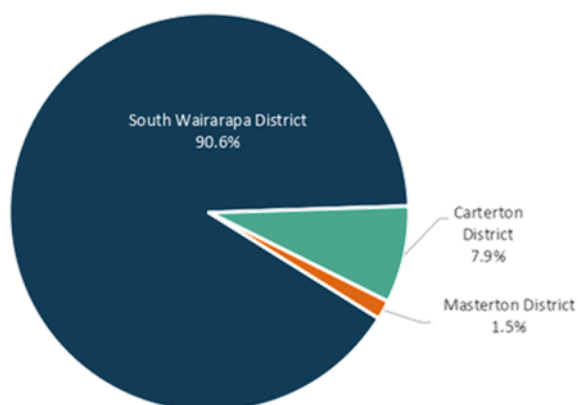


Source: Infometrics, 2021

Figure 14: SWD's residents' method of travel to work evolution between 2013 and 2018

The train users (+60.5%) increased quicker than the car, truck or van users (+50.8% for private vehicles and +32.4 for company vehicles) between 2013 and 2018 and the walkers/joggers increased by 17.8%. However, the public bus users decreased by 40.0%.

4.2.3.5 South Wairarapa's workers place of residence



Source: Infometrics, 2021

Figure 15: SWD's workers place of residence in 2019

Over 90% of the SWD's workers live in the SWD, 8% in Carterton District and 1.5% in Masterton District.

5 Environmental context

5.1 Climate

Carterton and South Wairarapa Districts have dry and warm summers and wet and mild winters.

The following data is provided by the NIWA¹. They have been recorded between 1981 and 2010 in Masterton.

Temperature

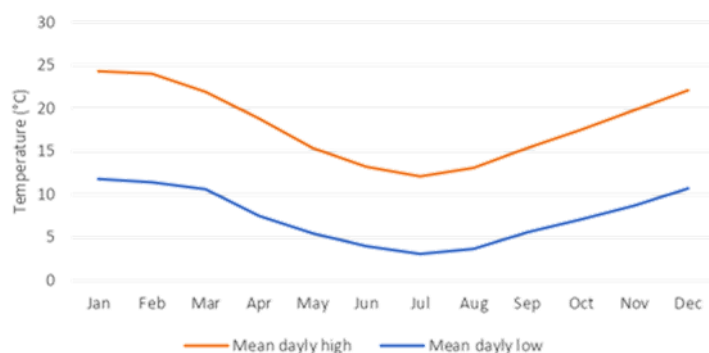
See Figure 21, page 28.

Wairarapa enjoys warm summers and mild winters even though frost may happen.

In summer maximum air temperatures range from 20°C to 28°C, but temperatures above 30°C have been recorded. High temperature may be accompanied by a strong dry foehn wind from the northwest.

Winter is mild in the north of the region and cooler in the south. Typical winter daytime maximum air temperatures range from 10°C to 16°C.

Frost occurs mainly in winter even though frosts can happen occasionally all year around. July and August are the months with the most frosts recorded (12.9 and 13.2 days respectively).

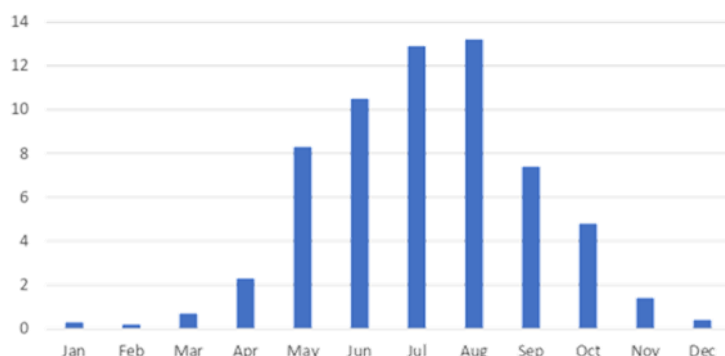


Source: NIWA 2012

Figure 16: Mean temperature in Masterton for 1981 – 2010

¹ National Institute of Water and Atmospheric Research

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Source: NIWA 2012

Figure 17: Mean monthly value in Masterton for 1981 – 2010, Numbers of days of ground frost

Pluviometry

See Figure 22, page 29.

Rainfall is influenced to a large extent by the Tararua Range that lie across the west to east movement of the weather systems.

The ranges are wetter than the plains. Eastern Wairarapa is also slightly wetter than the plains:

- over 2,000 mm for the Tararua range and 1,800 mm of the Aorangi range;
- under 800 mm for Martinborough and the plains around;
- between 1,000 and 1,400 mm for the Eastern Wairarapa.

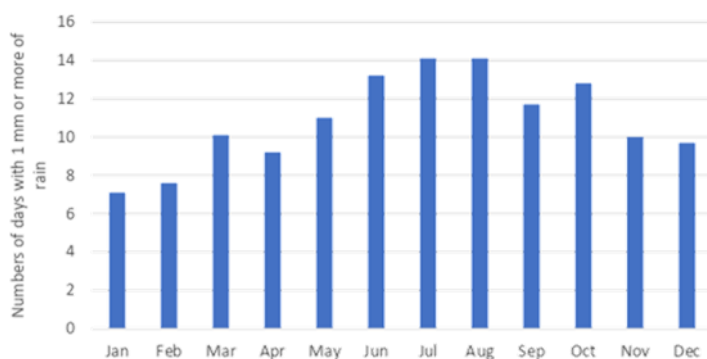
Masterton receives 927.6 mm of rain every year. January (44.4 mm and 7.1 wet days) and April (54 mm and 9.2 wet days) are the driest months. May (93.6 mm and 11 wet days), June (105.3 mm and 13.2 wet days) and July (90.9 mm and 14.1 wet days) are the wettest.



Source: NIWA 2012

Figure 18: Mean monthly pluviometry in Masterton for 1981 – 2010

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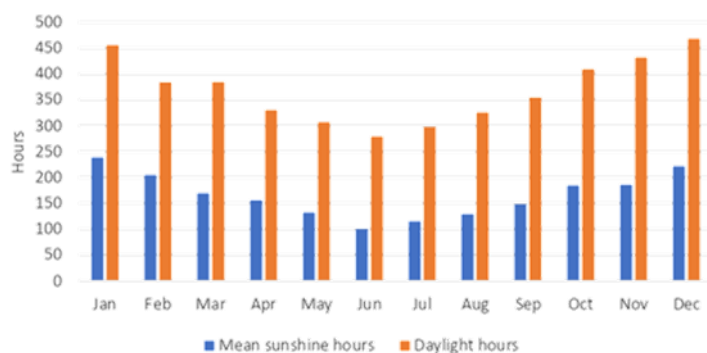
Source: NIWA 2012

Figure 19: Mean monthly value in Masterton for 1981 – 2010, Numbers of days with 1 mm or more of rain

Sunshine

See Figure 23, page 30.

Summer is the sunniest time of the year (238.6 hours of sunshine in January and 221.3 hours of sunshine in December) when winter is the least sunny time of the year (99.9 hours of sunshine in June, 114.9 hours of sunshine in July).



Source: NIWA 2012

Figure 20: Mean monthly hours of sunshine in Masterton for 1981 – 2010

Masterton receives 1,982.1 hours of sunshine every year. The Tararua range is the least sunny part of the region (under 1,750 hours of sunshine yearly) when the coast is the sunniest part of the region (2,100 hours of sunshine every year).

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Wind

See Figure 24, page 31.

The strongest winds happen at the summit of the ranges (mean annual average between 8 and 9 m/s). The wind in the Wairarapa plains range between 2 and 3 m/s. The wind gets stronger and stronger as we move east and ranges from 5 m/s (west of Eastern Wairarapa) to 7 m/s (east of Eastern Wairarapa).

In summer the winds are mainly dry north-westerlies and in winter, they are moist south and south-easterlies.

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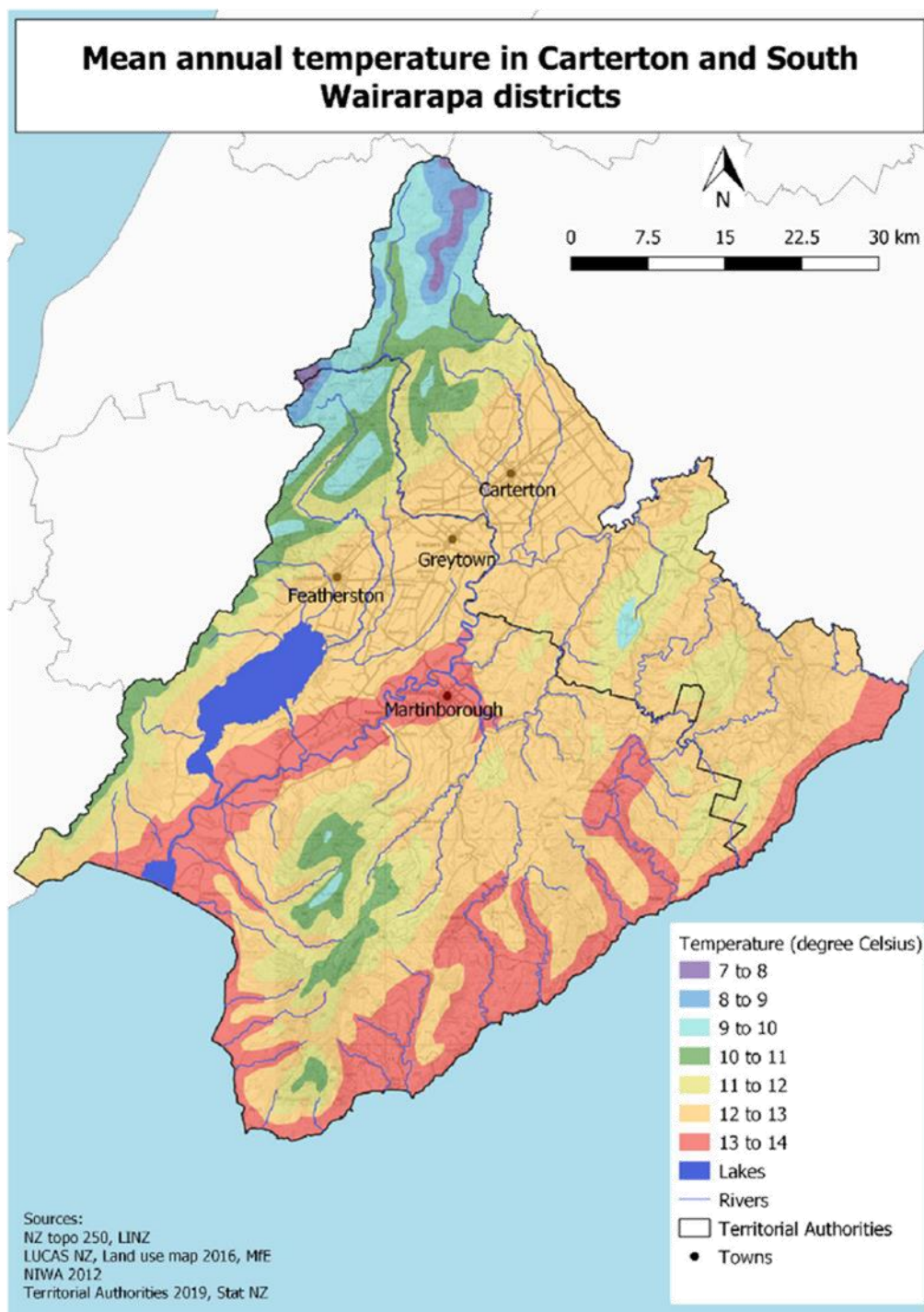


Figure 21: Mean annual average temperature for CD and SWD

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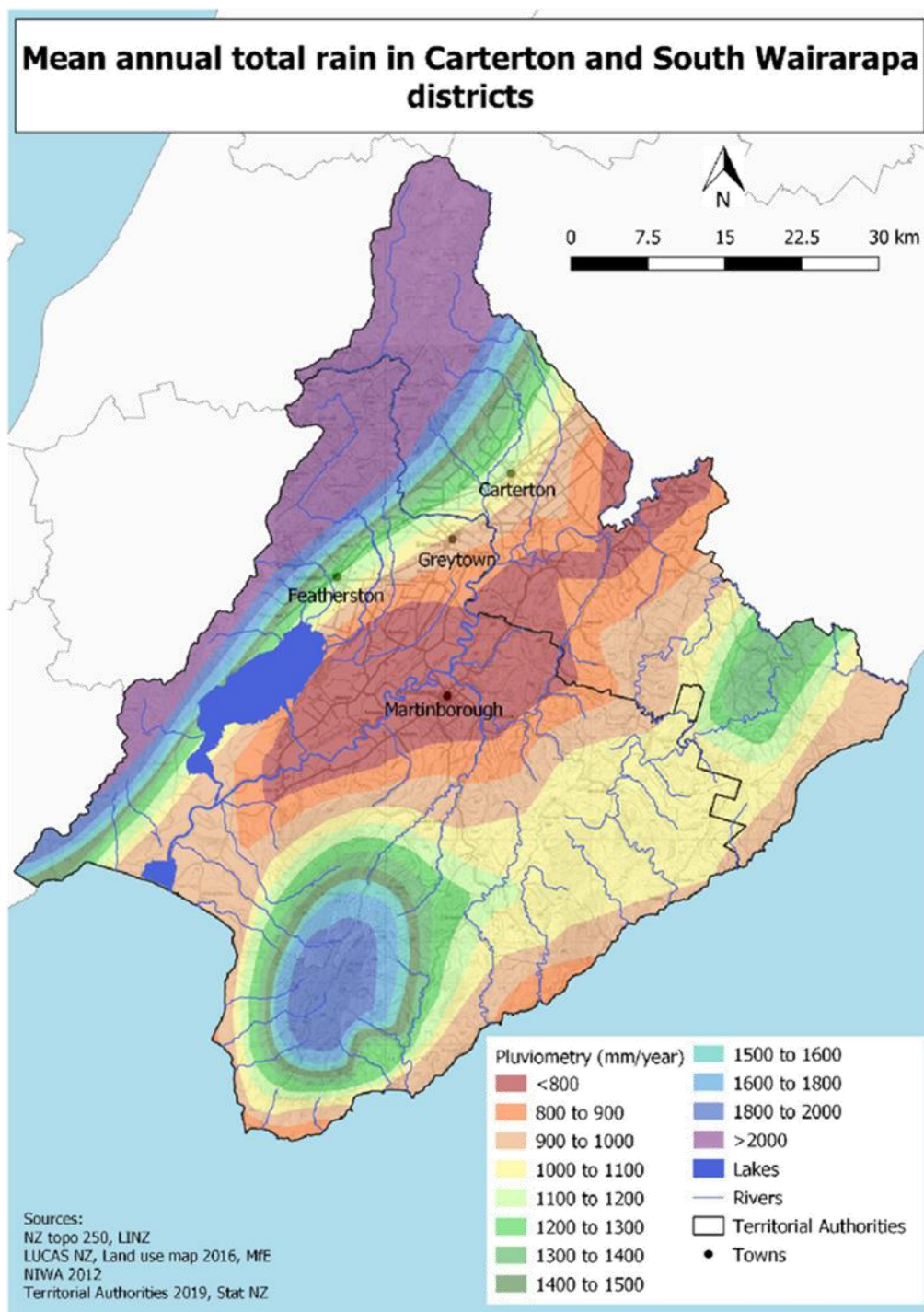


Figure 22: Mean annual total rainfall for CD and SWD

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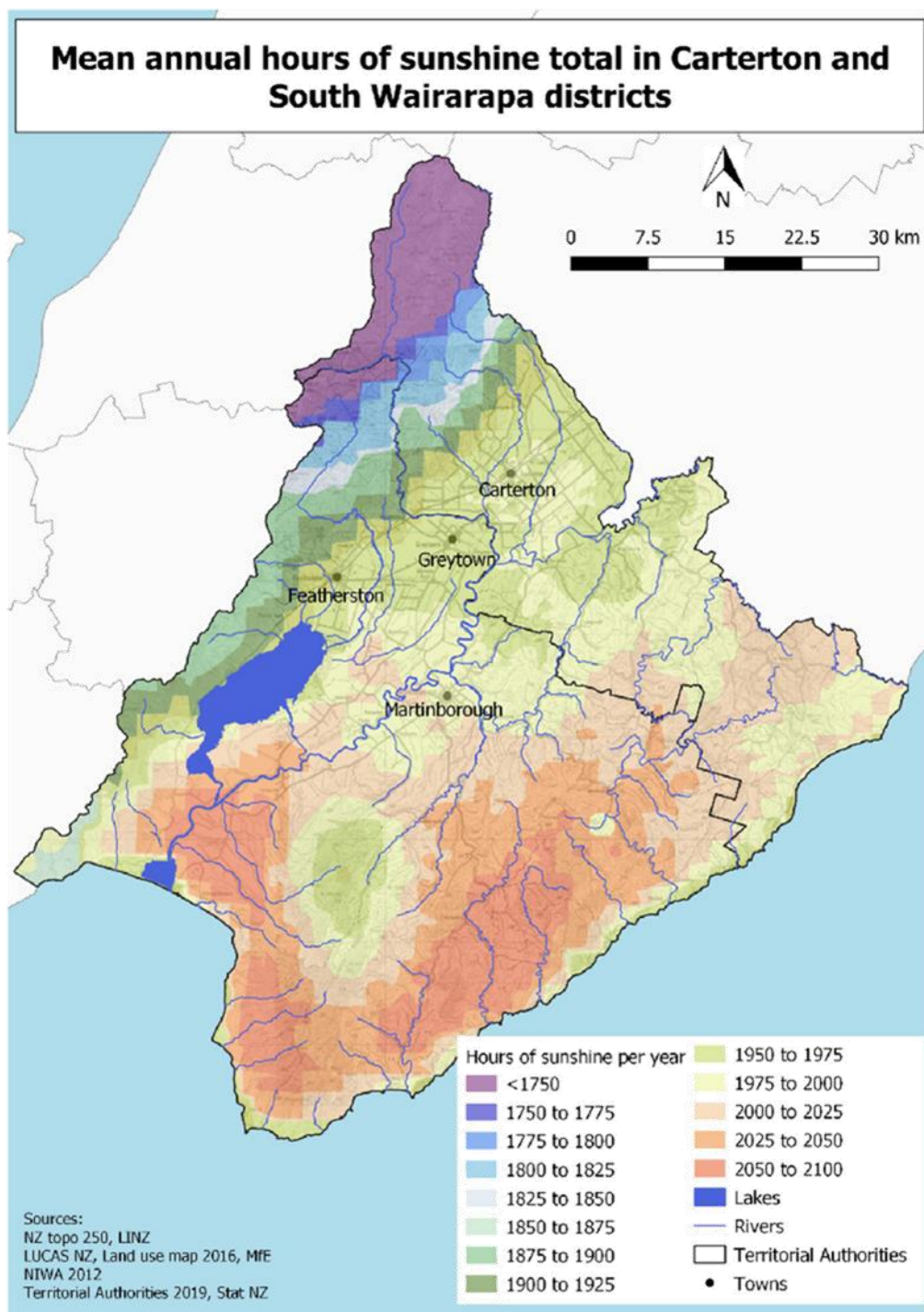


Figure 23: Mean annual sunshine hours total for CD and SWD

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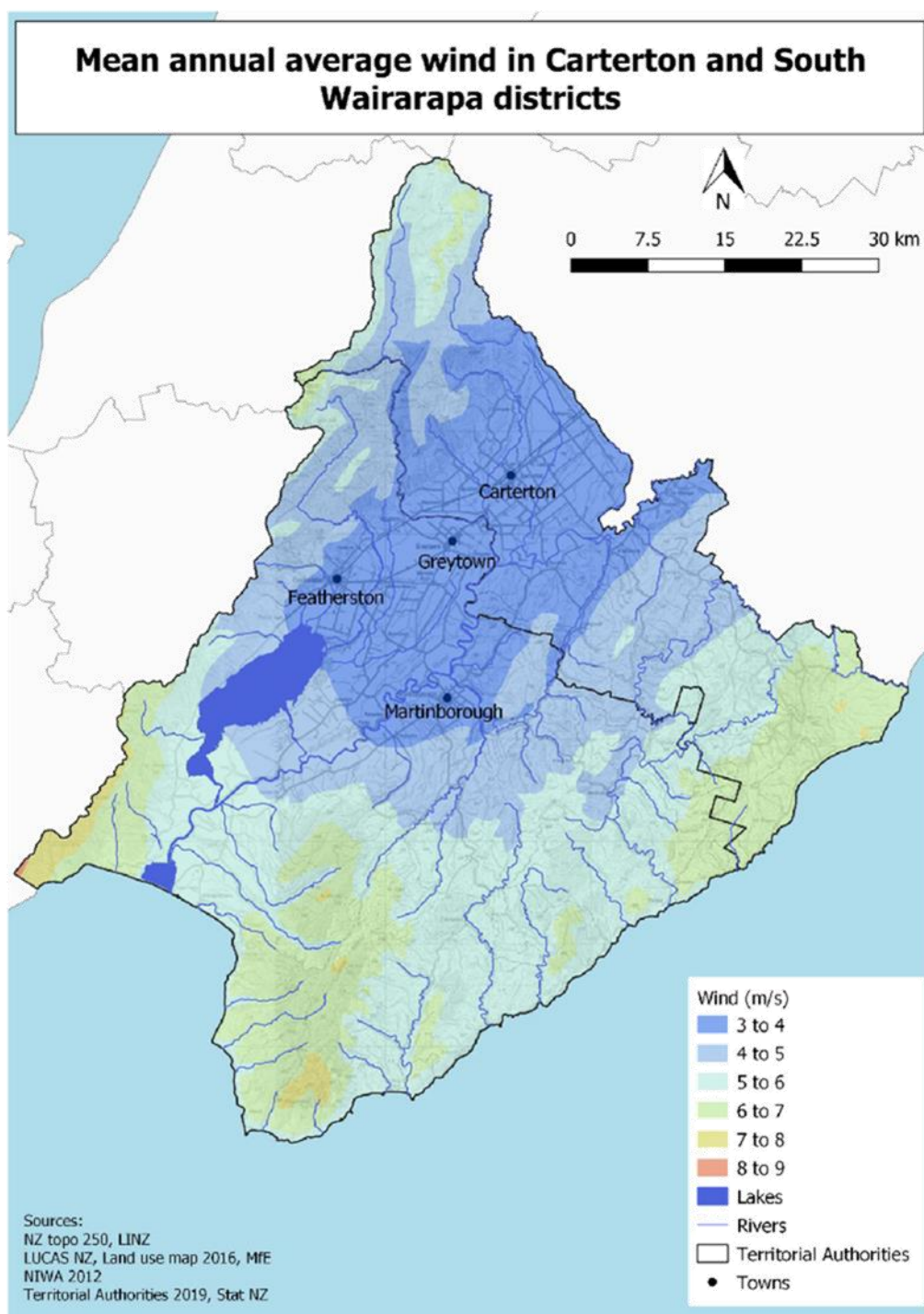


Figure 24: Mean annual average wind for CD and SWD

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5.2 Landscape features

The main features in the landscape are the Tararua range in the North-West, the Aorangi range in the South, the Ruamāhanga plains and the rugged East coast.

Carterton and South Wairarapa Districts are mainly rural districts. The main features in the landscape are:

- The Tararua range in the North-West: mainly native forest;
- The Aorangi range in the South of SWD: mainly native forest;
- The plains between the ranges (around the Ruamāhanga river): mainly high producing exotic grassland but also wetlands around Lake Wairarapa and Lake Onoke;
- East of Wairarapa: this part is more rugged. The lowest part are mainly low producing grassland and the highest part are mainly forest (planted and native).

As shown in the Figure 25, page 35 and Figure 26, page 36, the landscape and the landcover depends very much on the ground elevation.

5.3 Landcover

The districts are mainly covered by farmlands (55.7%, including 6.7% of planted forests), closely followed by natural areas (43.8%, including 35.7% of natural forests). The farmlands and the four settlements of Featherston, Greytown, Martinborough and Carterton are mainly located in the Wairarapa plains and the Eastern Wairarapa. The Tararua Range and the Aorangi Range are the main natural areas of the districts.

Carterton and South Wairarapa Districts have a 142-kilometre shoreline. The coast has the settlements of Ngawi, Tora and Flat Point, but is mainly composed of rural and natural areas.

	Surface (km ²)	Percentage (%)
Agriculture and Forestry	2025	55.7%
<i>Grassland - High producing</i>	1137	31.3%
<i>Grassland - Low producing</i>	595	16.4%
<i>Planted forest</i>	243	6.7%
<i>Cropland</i>	51	1.4%
Natural areas	1594	43.8%
<i>Forest - Natural</i>	1299	35.7%
<i>Grassland - With woody biomass</i>	176	4.8%
<i>Wetland</i>	120	3.3%
Settlements	12	0.3%
Other	5	0.1%
TOTAL	3636	100%

Table 9: Landcover in 2016 for CD and SWD

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5.3.1 Rural areas

The majority of Wairarapa's environment has a rural character, in which the environmental quality is largely determined by prevailing natural elements, whether the land is used for primary productive purposes or for conservation purposes.

Rural land is a significant resource due to the economic value of primary production activities to Wairarapa, and the associated processing and service industries. The use of this resource is constantly changing, in response to economic demands and conditions. The continued prosperity of Wairarapa as a whole is largely dependent on the use of rural resources adapting to changing economic opportunities.

The rural environment is typically characterised by the following elements:

- Open space, natural landscapes, and vegetation predominate over the built environment;
- Working productive landscape, with a wide range of agricultural, horticultural and forestry purposes;
- Large areas of exotic and indigenous vegetation, including pasture, crops, forest and scrublands;
- Place where people live and work, with low population density;

Significant areas of the Rural Zone are held in public ownership and managed for conservation purposes, with the key assets being the Tararua and Aorangi Forest Parks and Lake Wairarapa. Aside from their intrinsic ecological values, Wairarapa's conservation management areas also have important cultural, economic and recreational values. These areas are perceived to be part of Wairarapa's rural environment, although they differ from the primary production areas in their land use, environmental character and amenity values.

5.3.1.1 Agriculture and forestry

See Figure 27, page 37.

In South Wairarapa and Carterton Districts, agriculture, forestry and fishing represents 20.4% of the workforce industry sector of employment (2018). The land used for agriculture and forestry represents 55.7% of Carterton and South Wairarapa districts combined.

Most of the high producing grassland is located in the Wairarapa Plain and the low producing grassland is located in the East of Wairarapa. The planted forests are mainly in the East of Carterton district. Areas of planted forest can be found around the Aorangi and the Tararua ranges.

5.3.1.2 Natural areas

See Figure 28, page 38.

The natural forest covers 35.7% of South Wairarapa and Carterton Districts. It is mainly located in the Tararua and the Aorangi Ranges and in the Eastern Wairarapa.

South Wairarapa District presents 120 km² of wetlands, mainly located around Lake Wairarapa and lake Onoke. These wetlands are very important for the biodiversity.

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5.3.2 Human infrastructure

See Figure 29, page 39.

Both districts contain a variety of residential areas, including those within the main urban communities of Carterton, Featherston, Martinborough and Greytown, as well as smaller coastal and rural settlements.

Most of the infrastructure is located in the Wairarapa plain.

Featherston, Greytown and Carterton are connected by the State Highway 2 (SH2) and Martinborough is connected to Featherston with the State Highway 53 (SH53). Bidwills Cutting road is the link between Martinborough and Greytown and Ponatahi road is the link between Martinborough and Carterton.

Featherston, Greytown and Carterton are linked with the railway (Featherston station, Woodside station, Matarawa station and Carterton station).

The settlements cover only 0.3% of the land of both districts.

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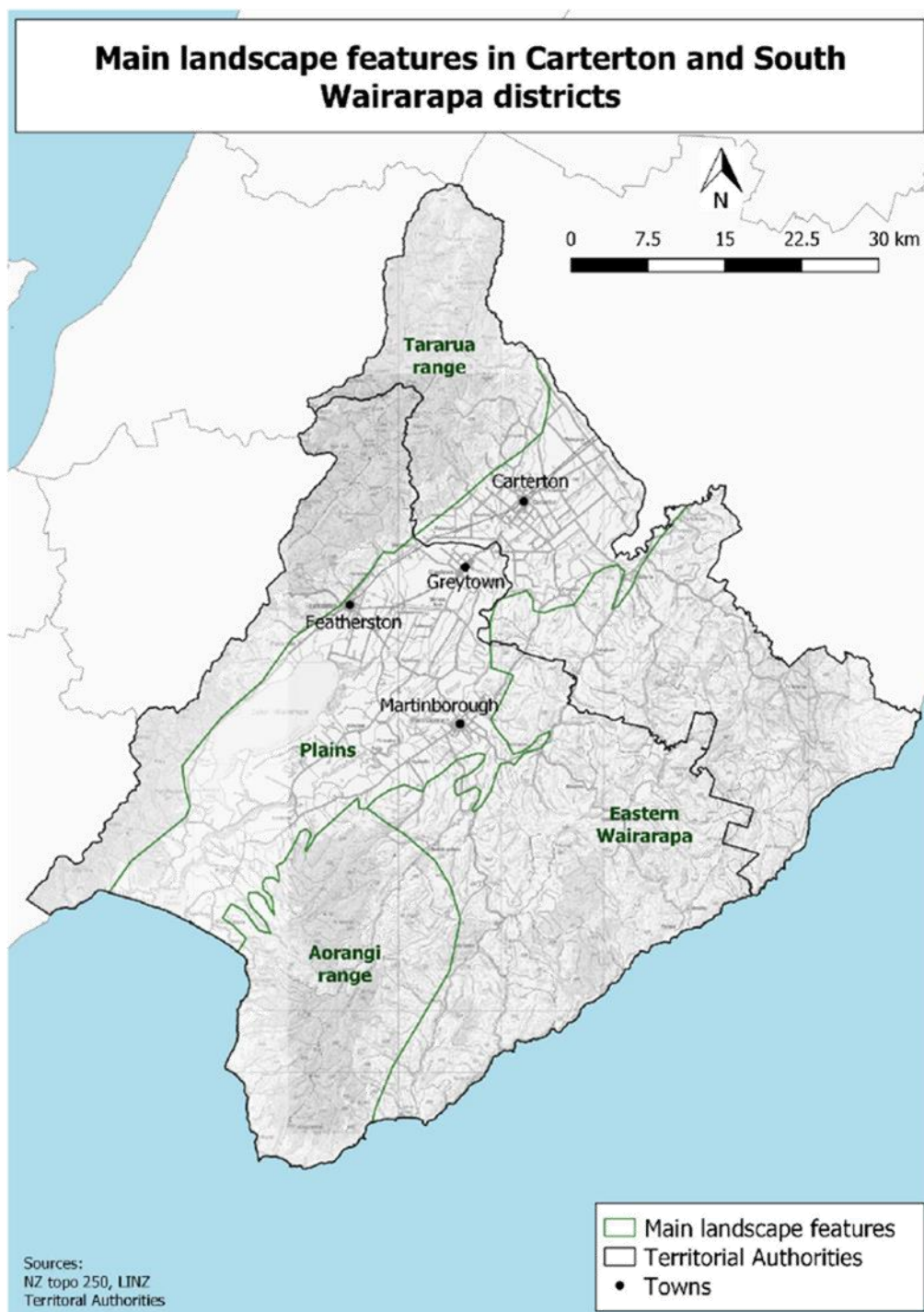


Figure 25: Main landscape features for CD and SWD

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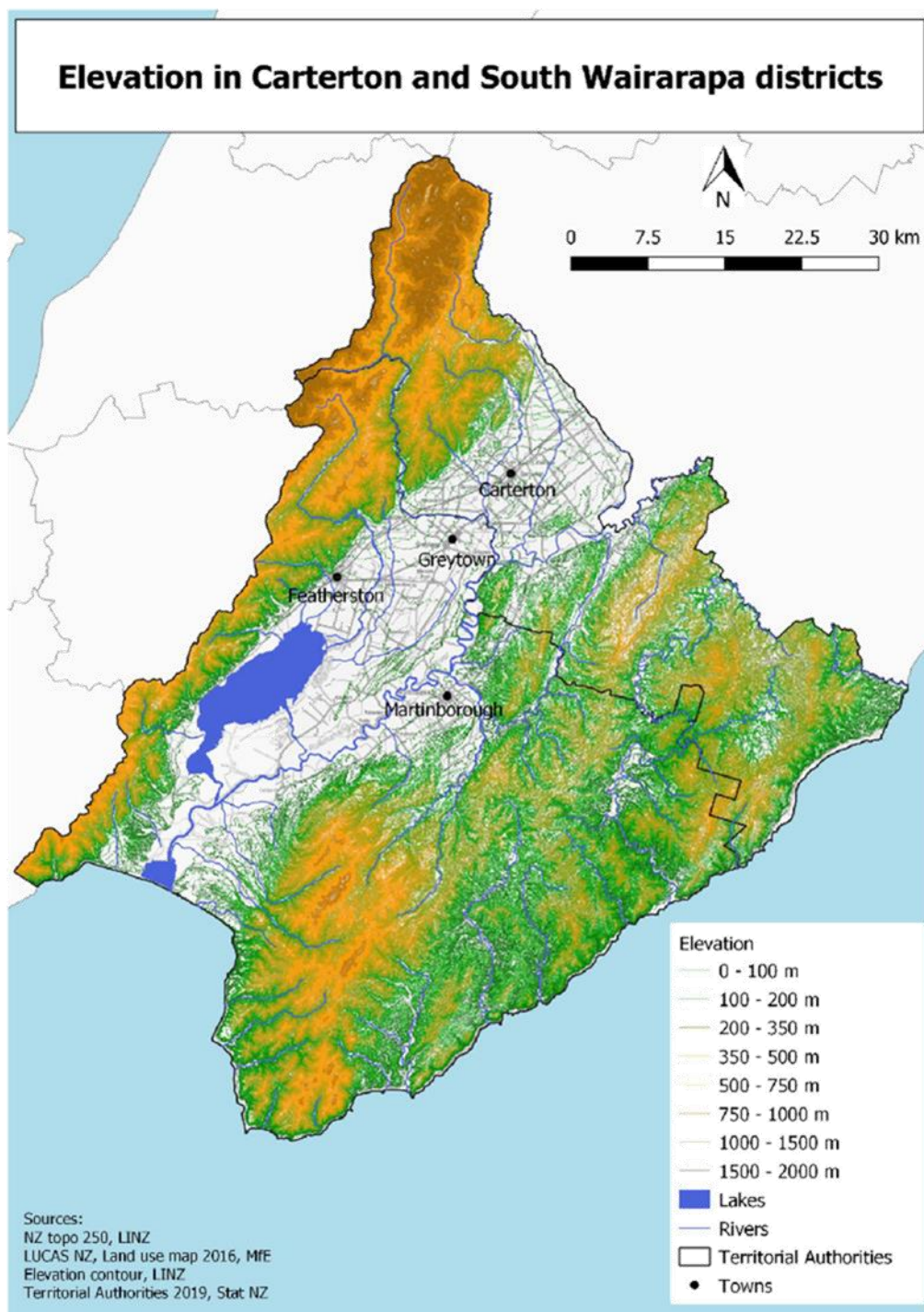


Figure 26: Elevation for CD and SWD

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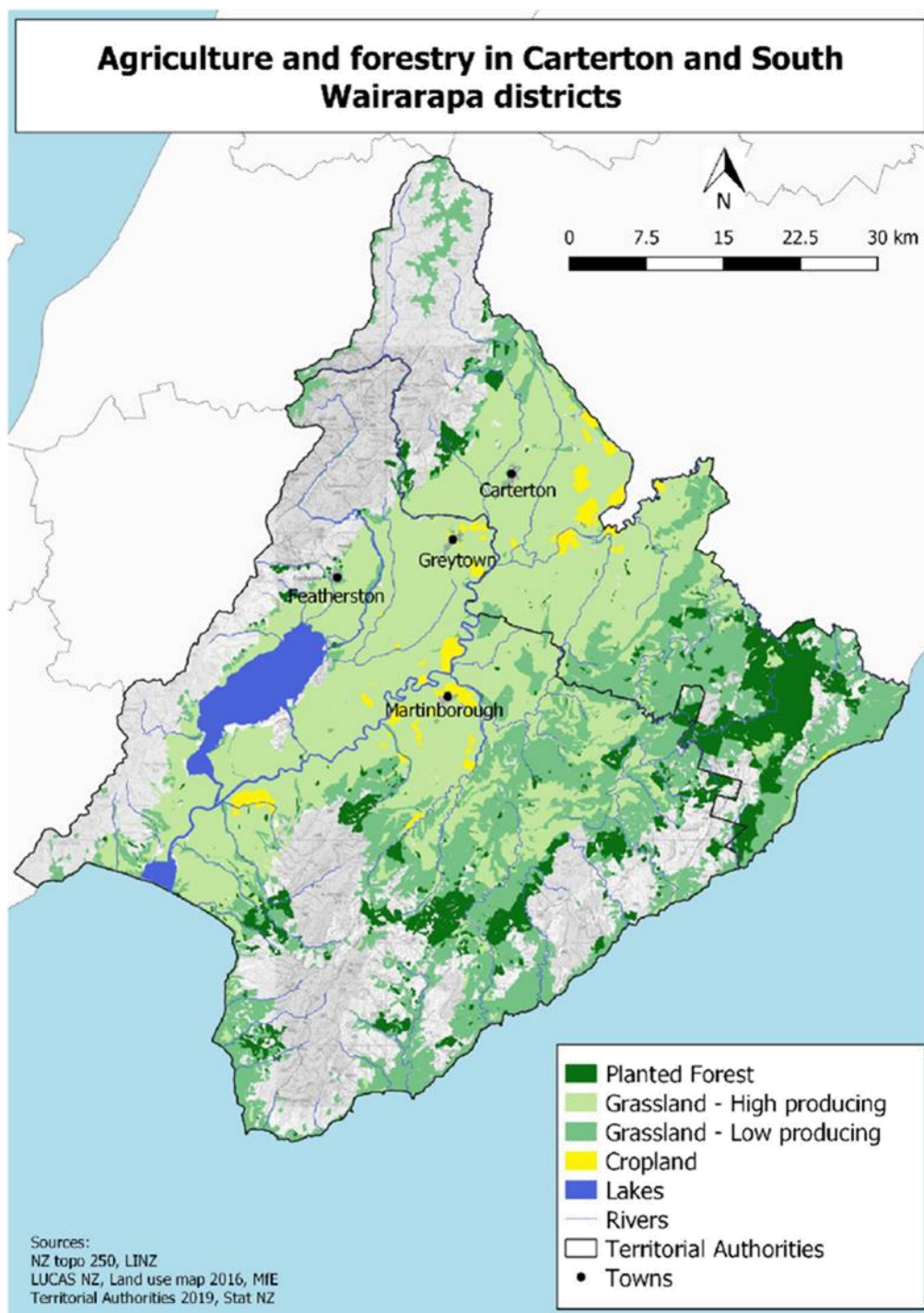


Figure 27: Agriculture in CD and SWD

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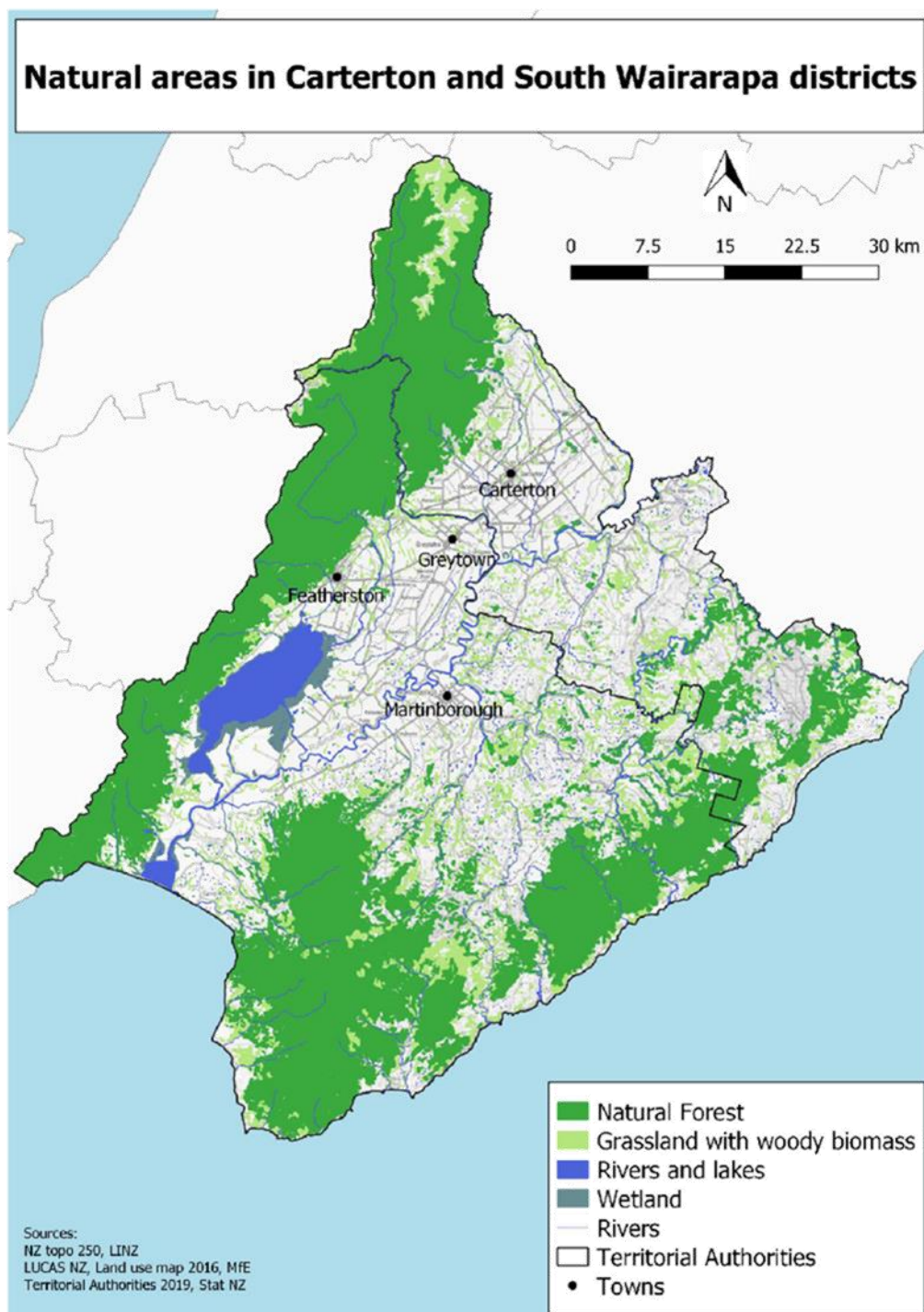


Figure 28: Natural areas in CD and SWD

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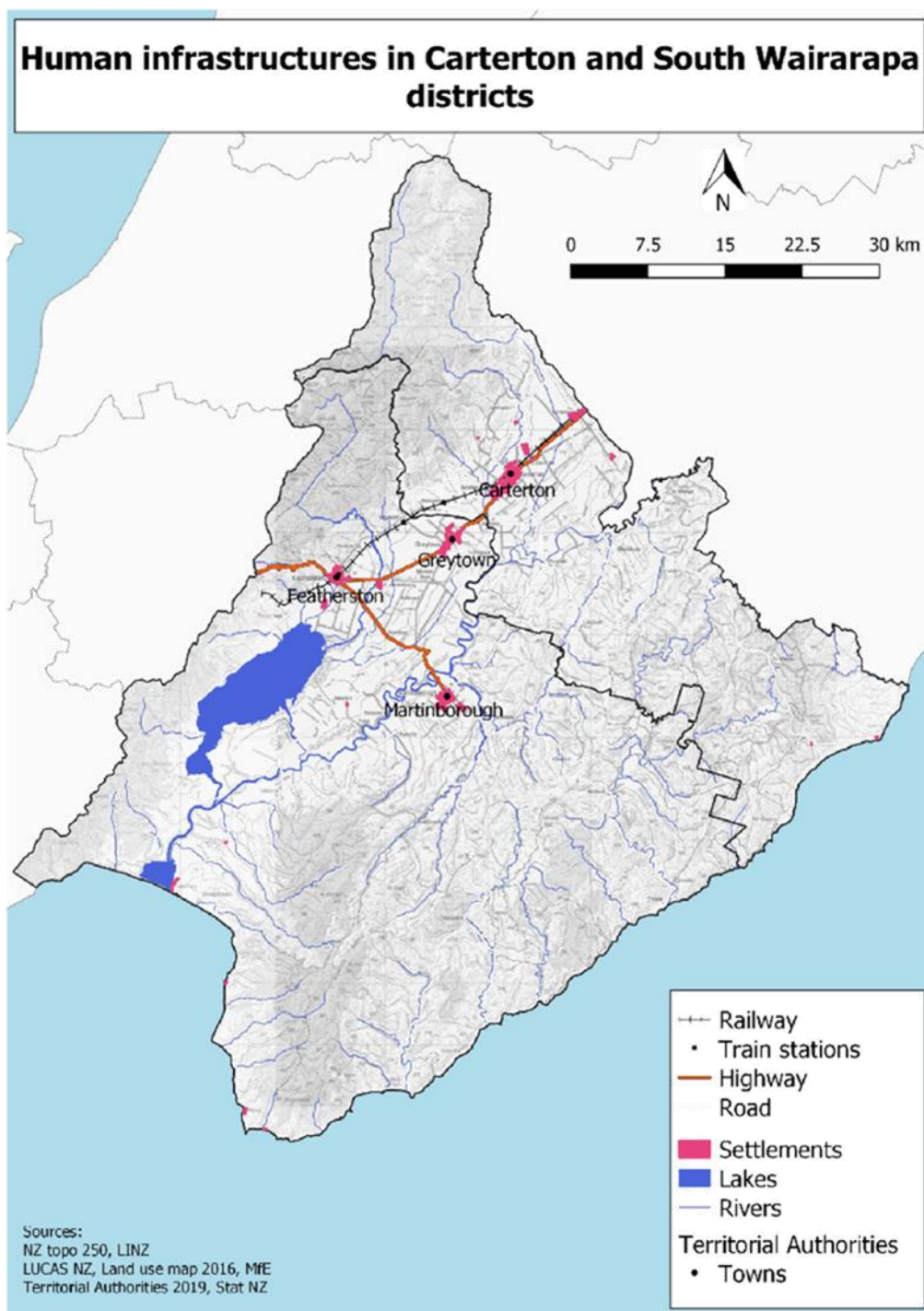


Figure 29: Human infrastructures in CD and SWD

6 Historical and cultural context

The Wairarapa has a strong mana whenua history with many important Māori heritage sites. The cultural landscape includes those places associated with ngā atua (deities), taniwha and kaitiaki (guardians and protectors of places), as well as places discovered, visited and or named by ancestors and explorers.

6.1 History

6.1.1 Pre-European era

Well established Māori communities lived in the southern Wairarapa since the 14th century. They were descended from a place of origin in the Pacific known to them as Hawaiki.

They were communities of people who:

- hunted and gathered food from the rocky shoreline, the coastal environment and the lakes, primarily harvesting tuna (eels) but also other native species including kokopu (whitebait) and piharau (lamprey);
- ventured into the interior to hunt for forest birds and gather other wild produce from the inland valleys, wetlands and hills;
- developed areas of land for the cultivation of kumara and probably also taro and gourd.

For centuries the natural environment has provided both material and spiritual sustenance for Māori communities. Lake Wairarapa and the South Wairarapa coastline are of immense cultural, spiritual and historic significance to Māori.

Wairarapa Māori regarded the lakes and their surrounding lands as an important source of physical and spiritual well-being, seeing it as a taonga, handed to them by their ancestors to be cherished. The land, the waters and all their inhabitants, human and non-human alike, were part of a wider world governed by gods and were tapu or sacred.

6.1.2 European colonisation

European settlers arrived on the margins of Wairarapa Moana in the early 1840s, bringing with them a completely different set of cultural values and a truly foreign way of looking at and assessing land.

For the early settlers, the land was a great opportunity to develop farming: *"The land is for the most part covered with fern and coarse grass, easily cleared and affording ample pasturage for cattle in its present state"* wrote the New Zealand Company's surveyor Robert Stokes in 1841. In 1844, the surveyor Henry Tiffen wrote that the soil is very fertile and up to six feet deep in places. He also said that the land around the bottom lake was prone to be flooded but if the lake could be kept at a lower level, 4,000 acres of rich watered meadow land would be available for graziers.

In 1844, the first stations were established around the shore of the lake. The Wharekākā farm was the first extensive sheep station in New Zealand. Then started the disagreement between Māori and Pākehā over the control of the lake Onoke outlet. Māori wanted a high-water level for tuna (eel) fishing when Pākehā wanted a low-water level for grazing.

In the 1850s, the Māori started to sell their land to the Pākehā after leasing was made illegal by the Crown. Māori made it clear the sale did not include the bed of the lakes and that they were selling to the tahakupu, the highwater mark. The failure to properly survey the land, and the disagreement over exactly what had been sold and what had been retained by Māori was to lead to tension over ownership of the land uplifted in the 1855 earthquake, and the ability to control the outlet to the sea.

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This disagreement ended in 1896 when tangata whenua gifted the lakes to the Government. The settlers were then free to:

- Stop bank the Ruamāhanga river, the Lake Wairarapa Lake and the Lake Onoke;
- Drain the rich swamp pasture;
- Control the Lake Onoke outlet.

What has been gifted was the Native Land Court title the Crown had forced on Māori, and with it control of the outlet at Onoke. What had not been gifted, were the waters and fisheries of Wairarapa Moana. Premier Richard Seddon, who can take much of the credit for the gifting of the lakes said, *"The waters are still yours and so are the fish"*. However, after a few years, these words were forgotten.

The last major wetland destruction around the lake happened in 1974 when the Te Hōpai Lagoon has been drained and turned into pasture.

6.2 Cultural context

Kaitiakitanga

Kaitiakitanga encompasses guardianship, preservation, conservation and protection. In its simplest form kaitiakitanga is the responsibility to care for the physical, ecological and spiritual well-being of a place or resource to ensure harmony within the environment and protection against elements that cause permanent imbalances.

The primary kaitiaki or guardian were the Atua; Tāne is the kaitiaki of the forest and Tangaroa is the kaitiaki of the sea. A kaitiaki can be spiritual (such as a taniwha) or physical such as the tōtara log of Wairarapa Moana.

Lake Wairarapa

Lake Wairarapa is of immense cultural and spiritual significance to Māori.

Traditional fishing (such as tuna/eel fishing) was a major activity on the lake. *"Throughout the ages, the mouth of Wairarapa Moana has paid homage to its eel migration by obligingly closing its mouth at the end of February or the beginning of March. Legend records that Rākai Uru, the taniwha who is the caretaker of the lake, is responsible for this seasonal closing. Rākai Uru takes the form of a large tōtara log. When the migration is about to take place he makes a journey out to sea, and the mouth of the lake closes behind him"*². Māori exported as many as ten tons of tuna/eels annually as far away as the Bay of Plenty.

With the changes to the Lake Wairarapa wetlands over the past 150 years many traditional fishing sites and sources of plant materials such as flax, ti (cabbage tree) and pingao have been lost or greatly reduced. With appropriate management and plantings, some of these sites could be restored specifically for the sustainable harvest of cultural materials, which would have the additional benefit of increasing habitat diversity for wildlife.

Guidelines for the management of the Lake Wairarapa wetlands have been produced and adopted by interested parties.

² T.V. Saunders 'The eels of Lake Wairarapa', Te Ao Hou, June 1965.

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Nowadays, projects are being led in order to restore wetlands (therefore the important role to local iwi for gathering kai moana) around Lake Wairarapa. For instance, the Pou Aruhe Saltmarsh Freshwater Initiative near Lake Onoke is an ambitious project with Greater Wellington Regional Council, mana whenua and local conservation groups. Ra Smith³ said Māori bring important values to these projects which could connect the whole region.

Ruamāhanga river and other rivers

Ra Smith says, "*We [Māori] think of rivers as a character, and the character of the river holds the mauri⁴, often called the life force*".

"On the opposite side from where the two rivers meet is the whare kōhanga, a place like a maternity ward. When babies were born they would take the whenua [placenta] and be buried in the ground, and they would take the baby down into the river and make up a lullaby. It was no rockabye baby, it was eight verses of very intense lullaby about the blessing of the baby and its life expectancy."

Ra Smith says the most important confluence was where the Ruamāhanga met Lake Wairarapa, a point that no longer exists.

³ Ra Smith is part of the Ngāti Kahungunu ki Wairarapa iwi.

⁴ According to the Māori Dictionary, Mauri is "life principle, life force, vital essence, special nature, a material symbol of a life principle, source of emotions - the essential quality and vitality of a being or entity. Also used for a physical object, individual, ecosystem or social group in which this essence is located".

7 Climate Change and impacts for Carterton and South Wairarapa Districts

7.1 What is Climate Change

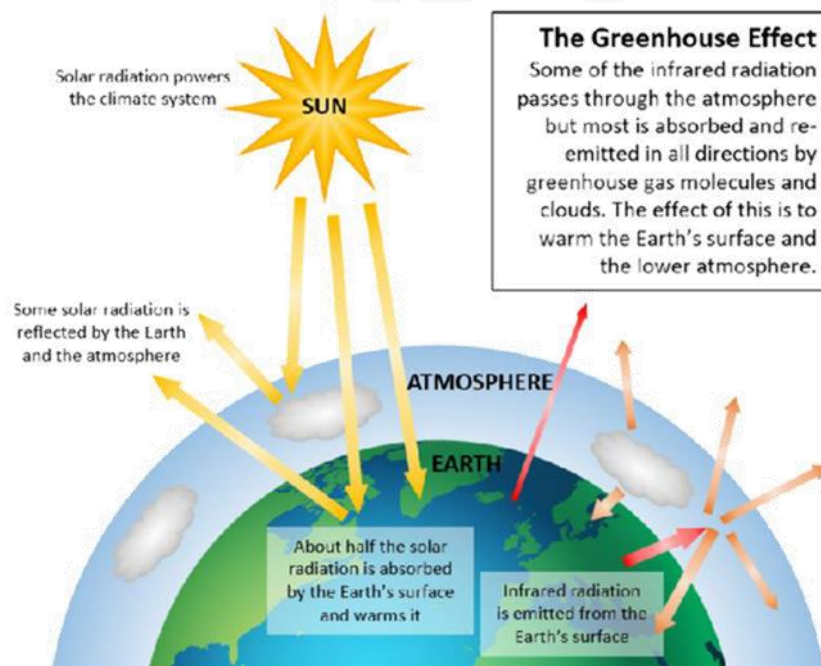
According to the UNFCCC (United Nation Framework Convention on Climate Change), Climate Change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

7.1.1 Atmosphere composition

Earth's atmosphere is made up of nitrogen (78%), oxygen (21%), and a small percentage of greenhouse gases, such as carbon dioxide and methane.

7.1.2 Greenhouse effect

Greenhouse gases trap warmth from the sun and make life on Earth possible. Without the influence of the greenhouse effect on our planet, the average surface temperature would be -18°C (average temperature on Earth with the greenhouse effect is 15°C).



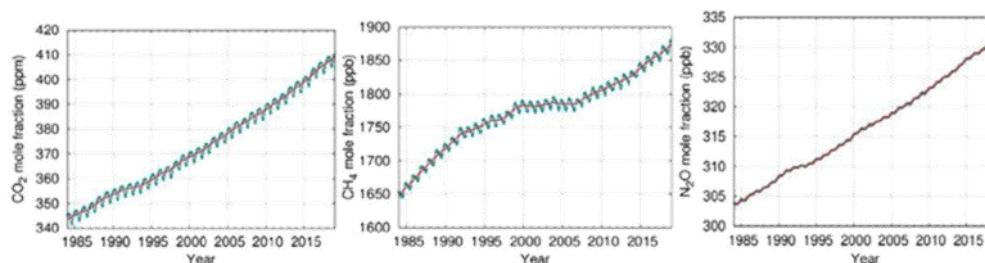
Source: NIWA, <https://www.niwa.co.nz/our-science/climate/information-and-resources/clivar/greenhouse>

Figure 30: The greenhouse effect

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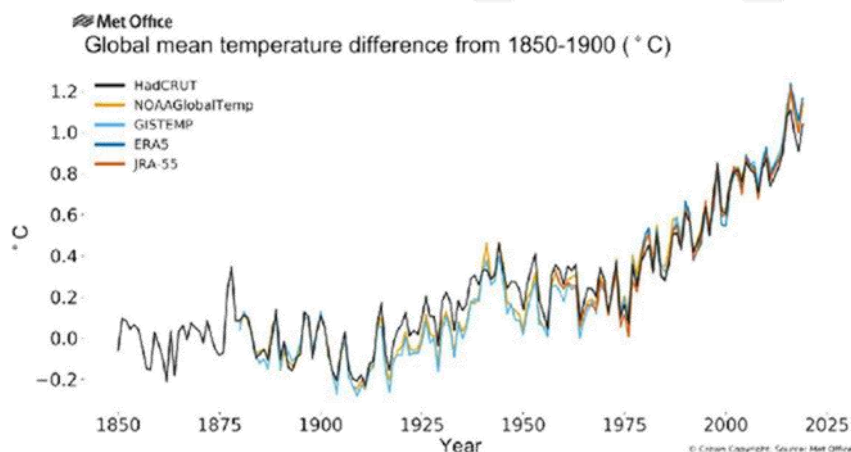
7.1.3 What causes Climate Change?

The greenhouse gas (CO_2 , CH_4 and N_2O) concentration in the atmosphere has been raising quickly since the last 150 years (since the industrial revolution) because of fossil fuels burning, deforestation, etc. The temperature is correlated to the greenhouse gas concentration as shown in the graphs below.



Source: WMO Provisional Statement on the State of the Global Climate in 2019, World Meteorological Organization, 2019

Figure 31: Concentration (ppm) in Carbon dioxide, Methane and Nitrous oxide from 1984 to 2018.



Source: WMO Provisional Statement on the State of the Global Climate in 2019, World Meteorological Organization, 2019

Figure 32: Global annual mean temperature difference pre-industrial conditions (1850-1900, °C)

Not only are temperatures rising but the whole climate is changing (increase in the extreme weather events (e.g. storm, drought), melt of the ice pack, sea level rise, ocean acidification, etc).

The next section will expose the climate change projections and the likely impacts on Wairarapa.

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7.2 Climate change projections and likely impacts

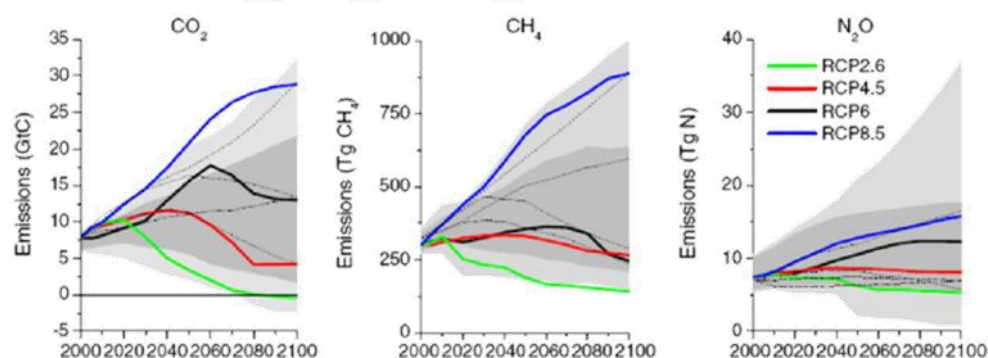
7.2.1 IPCC emissions scenarios

The IPCC (Intergovernmental Panel on Climate Change) set up different scenarios depending on the greenhouse gas emissions. RCP2.6 is a low emissions scenario, RCP4.5 is a low to moderate emissions scenario, RCP6.0 is a moderate emission scenario and RCP8.5 is a high emissions scenario.

Anthropogenic GHG emissions are mainly driven by population size, economic activity, lifestyle, energy use, land use patterns, technology and climate policy. The Representative Concentration Pathways (RCPs), which are used for making projections based on these factors, describe four different 21st century pathways of GHG emissions and atmospheric concentrations, air pollutant emissions and land use. The RCPs include:

- A stringent mitigation scenario (RCP2.6): aims to keep global warming likely below 2°C above pre-industrial temperatures. CO₂ emissions peak in 2020 and start to decline to reach net zero in 2050 and zero in 2100. Radiative forcing reaches 2.6 W m⁻² at year 2100, relative to pre-industrial conditions;
- A low/intermediate scenario (RCP4.5): CO₂ emissions peak in 2040 and start to decline to reach net zero in 2080. Radiative forcing reaches 4.5 W m⁻² at year 2100, relative to pre-industrial conditions;
- An intermediate scenario (RCP6.0): CO₂ emissions peak around 2060 and start to decline. Radiative forcing reaches 6.5 W m⁻² at year 2100, relative to pre-industrial conditions;
- A scenario with very high GHG emissions (RCP8.5): no measures are taken to reduce the greenhouse gas emissions. Radiative forcing reaches 8.5 W m⁻² at year 2100, relative to pre-industrial conditions.

Scenarios without additional efforts to constrain emissions ('baseline scenarios') lead to pathways ranging between RCP6.0 and RCP8.5.



Grey area indicates the 98th and 99th percentiles (light/dark grey) of the literature. The dotted lines indicate four of the SRES marker scenarios. Note that the literature values are not harmonized

Source: *The representative concentration pathways: an overview*, Van Vuuren et al., 2011 - <https://link.springer.com/article/10.1007/s10584-011-0148-z>

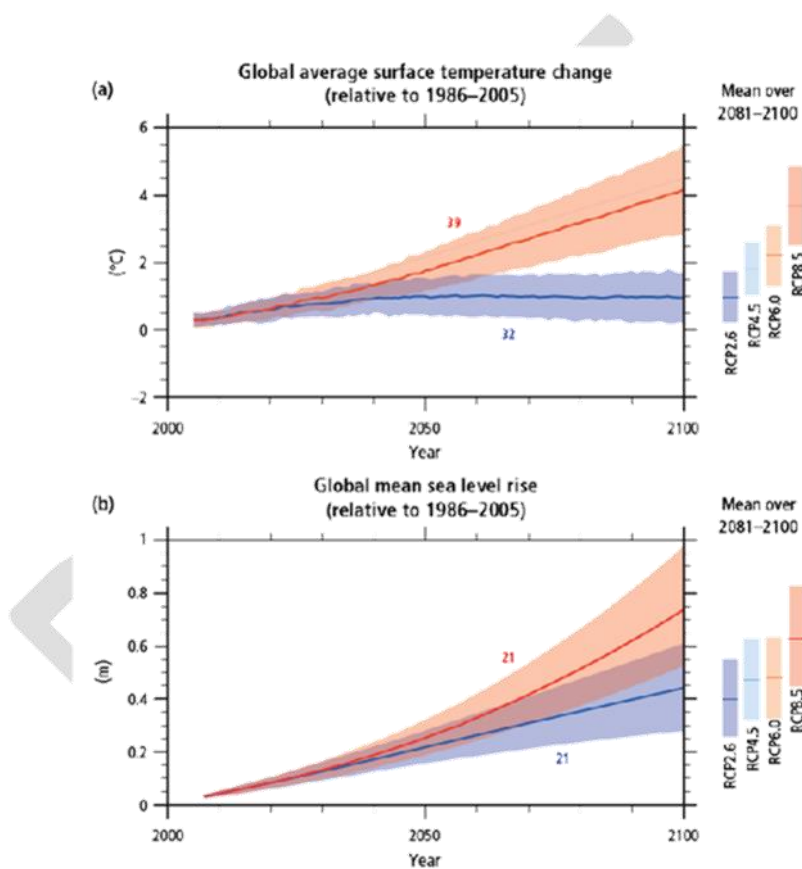
Figure 33: emissions of the main greenhouse gases across the RCPs

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7.2.2 Likely global impacts

Globally, surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent. The ocean will continue to warm and acidify, and global mean sea level to rise.

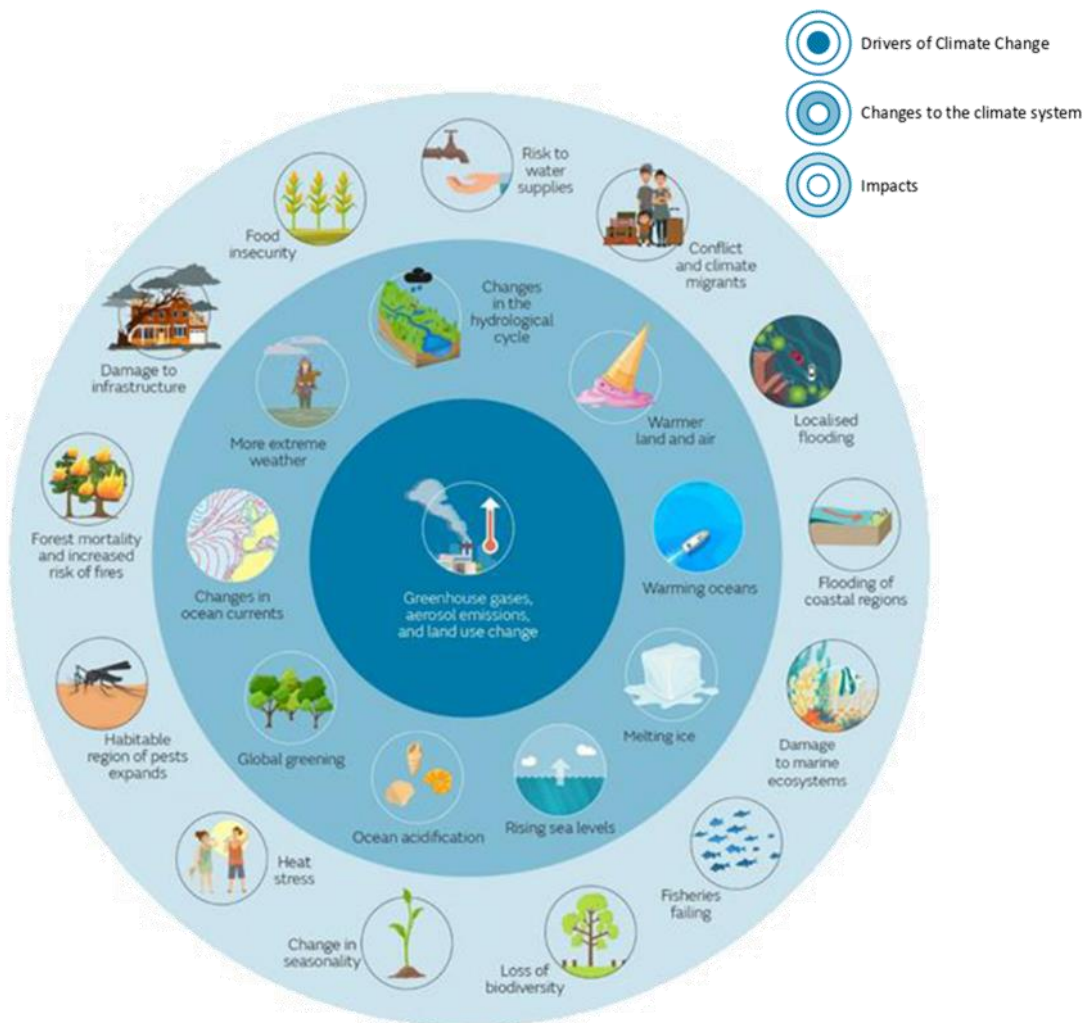
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Source: *Climate change 2014 – Synthesis report – Summary for policy makers, AR5, IPCC, 2014*

Figure 34: Global average surface temperature change and global mean sea-level rise relative to 1986-2005

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Source: Metoffice, <https://www.metoffice.gov.uk/weather/learn-about/climate-and-climate-change/climate-change/effects-of-climate-change>

Figure 35: Illustration of some of the drivers of Climate Change and impacts they could have on the climate system

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7.2.3 Climate Change projections for Wairarapa

Greater Wellington Regional Council provides climate change assumptions based on the RCP4.5 and RCP8.5. These assumptions were used to understand the likely impacts of climate change in Wairarapa.

GWRC provides climate change parameters for each Whaitua catchment (super catchments) in the Wellington region. These parameters are based on the following reports:

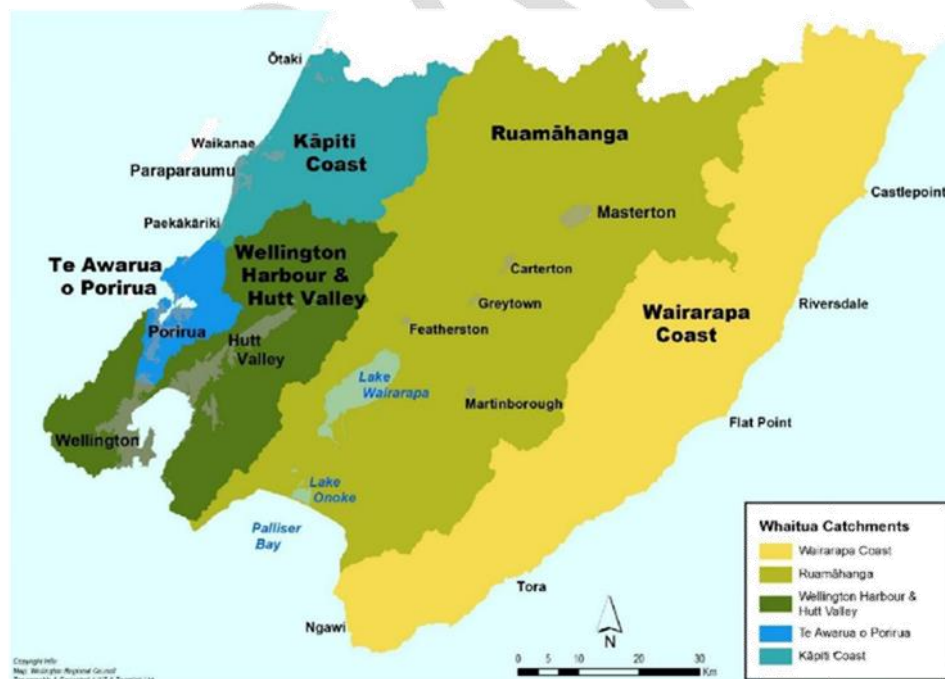
- Climate Change and variability – Wellington Region, report prepared by NIWA for GWRC, June 2017;
- Wellington Region climate change extremes and implications, report prepared by NIWA for GWRC, December 2019.

These reports and parameters are based on the following IPCC scenarios:

- RCP4.5: Intermediate/low emissions scenario;
- RCP8.5: High emissions scenario.

The following Table 10 summarise the projected impacts of climate change for the Wairarapa (Ruamāhanga Whaitua and Wairarapa Coast Whaitua, see Figure 37).

The uncertainties regarding the climate models are low: physics is well known and well modelised. However, there are uncertainties regarding the greenhouse gas emissions projections (how much anthropogenic greenhouse gas will be released in the atmosphere in the future).



Source: GWRC, <http://www.gw.govt.nz/assets/Whaitua-Te-Whanganui-a-Tara/whaitua-map.jpg>

Figure 36: Whaitua Catchments in the Wellington Region

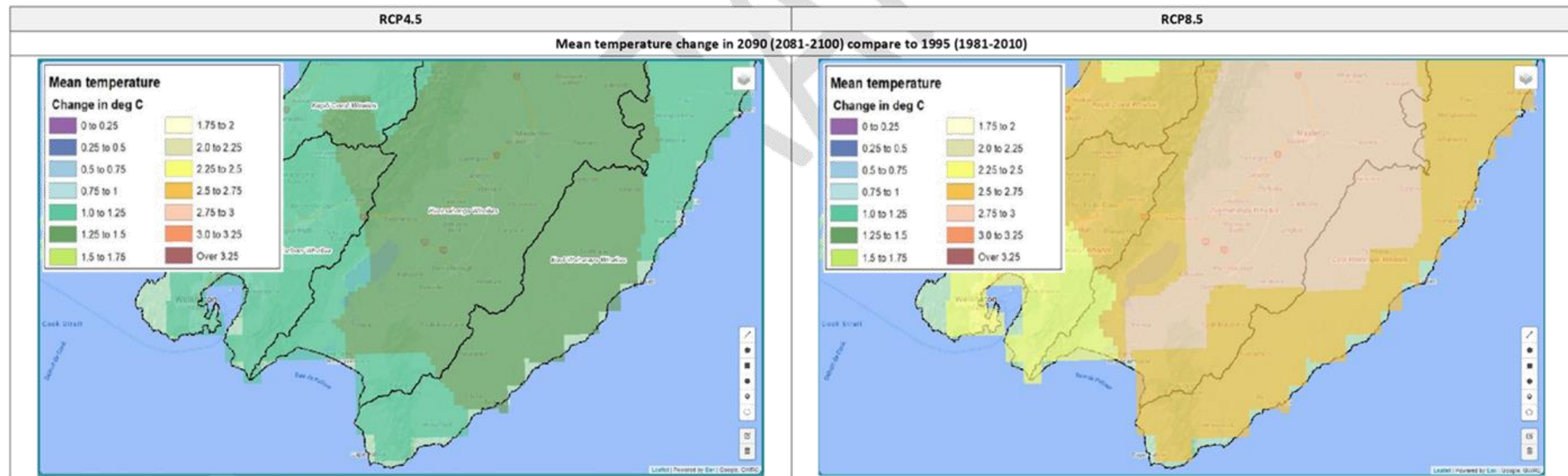
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		2040	2090	Seasonal changes	Climate extremes predictions	Uncertainties
Temperature and seasonality	Average annual T°C	Ruamāhanga Whaitua: +0.7 to +1°C above present Wairarapa Coast Whaitua: +0.5 to +1°C above present	Ruamāhanga Whaitua: +1.2 to +3°C above present Wairarapa Coast Whaitua: +1 to +3°C above present	Ruamāhanga Whaitua: Maximum warming in autumn and summer, least in winter Wairarapa Coast Whaitua: Maximum warming in autumn and summer, least in spring	Warm nights (>15°C) could triple in Masterton by the end of the century, while cold days (<10°C) may entirely disappear Heat wave days (i.e. at least three consecutive hot days) could increase by fivefold Unprecedented weather: very long duration heat waves (more than 10 or 15 consecutive hot days) will start to occur in the future Long dry spells (10 or more consecutive days without rain) are expected to increase by up to 50% (additional 20 days per year)	Ruamāhanga Whaitua: lower range for significant emissions reduction (Paris Agreement targets met), and upper range for high emissions. Wairarapa Coast Whaitua: Lower range for RCP4.5 and upper range for RCP8.5
	Hot days (above 25°C)	Ruamāhanga Whaitua: Between 0 and 30 days increase Wairarapa Coast Whaitua: Between 5 and 30 days increase	Ruamāhanga Whaitua: Between 0 and 80 days increase Wairarapa Coast Whaitua: Between 15 and 60 days increase			
	Frost nights	Ruamāhanga Whaitua: Between 0 and 15 days reduction Wairarapa Coast Whaitua: Between 0 and 5 days reduction	Ruamāhanga Whaitua: Between 0 and 40 days reduction Wairarapa Coast Whaitua: Between 0 and 15 days reduction			
	Annual Growing Degree Days (GDD) base 10°C $GDD = (T^{\circ}C_{max} + T^{\circ}C_{min})/2 - T^{\circ}C_{base}$ Measures potential for crop and pasture growth	Increase of 0 to 300 GDD units	Ruamāhanga Whaitua: Increase of 200 to 1000 GDD units Wairarapa Coast Whaitua: Increase of 200 to 900 GDD units			
	Annual potential evapotranspiration deficit (mm) Measures drought intensity	Ruamāhanga Whaitua: +20 to +120 mm Wairarapa Coast Whaitua: +40 to +120 mm	Ruamāhanga Whaitua: +0 to +180 mm Wairarapa Coast Whaitua: +40 to +160 mm			
Rainfall patterns and intensity	Average annual rainfall	5% decrease to 5% increase	Ruamāhanga Whaitua: 0% to 10% decrease Wairarapa Coast Whaitua: 10% decrease to 5% increase	Greater likelihood of positive changes in autumn, winter and spring.	High impact, short duration extreme rainfall events (expected to occur once every 100 years or longer) are predicted to occur more frequently, and also produce up to 13% more rain per degree of warming	There is a large uncertainty in the range of changes due to model differences, emissions scenarios. Changes against emission scenarios are not necessarily linear.
	Amount of rain falling during heavy rainfall days (>99 th percentile of daily rainfall)	Ruamāhanga Whaitua: 0% to 10% increase Wairarapa Coast Whaitua: 0% to 15% increase	Ruamāhanga Whaitua: 0% to 20% increase Wairarapa Coast Whaitua: 0% to 30% increase			Although the uncertainty in average rainfall range is high, extreme rainfall increases are more certain due to the increased amount of water vapour that the atmosphere can hold as it gets warmer (about 8% increase in saturation vapour per degree of warming)
	River mean annual low flow discharge (MAL) Measure water shortage in the catchments	Up to 60% decrease	Up to 80% decrease			
	River mean annual flood discharge (MAF) Measures flood potential in the catchments	Ruamāhanga Whaitua: 20% decrease to 40% increase depending on catchment Wairarapa Coast Whaitua: 20% decrease to 20% increase depending on catchment	20% decrease to 60% increase depending on catchment			

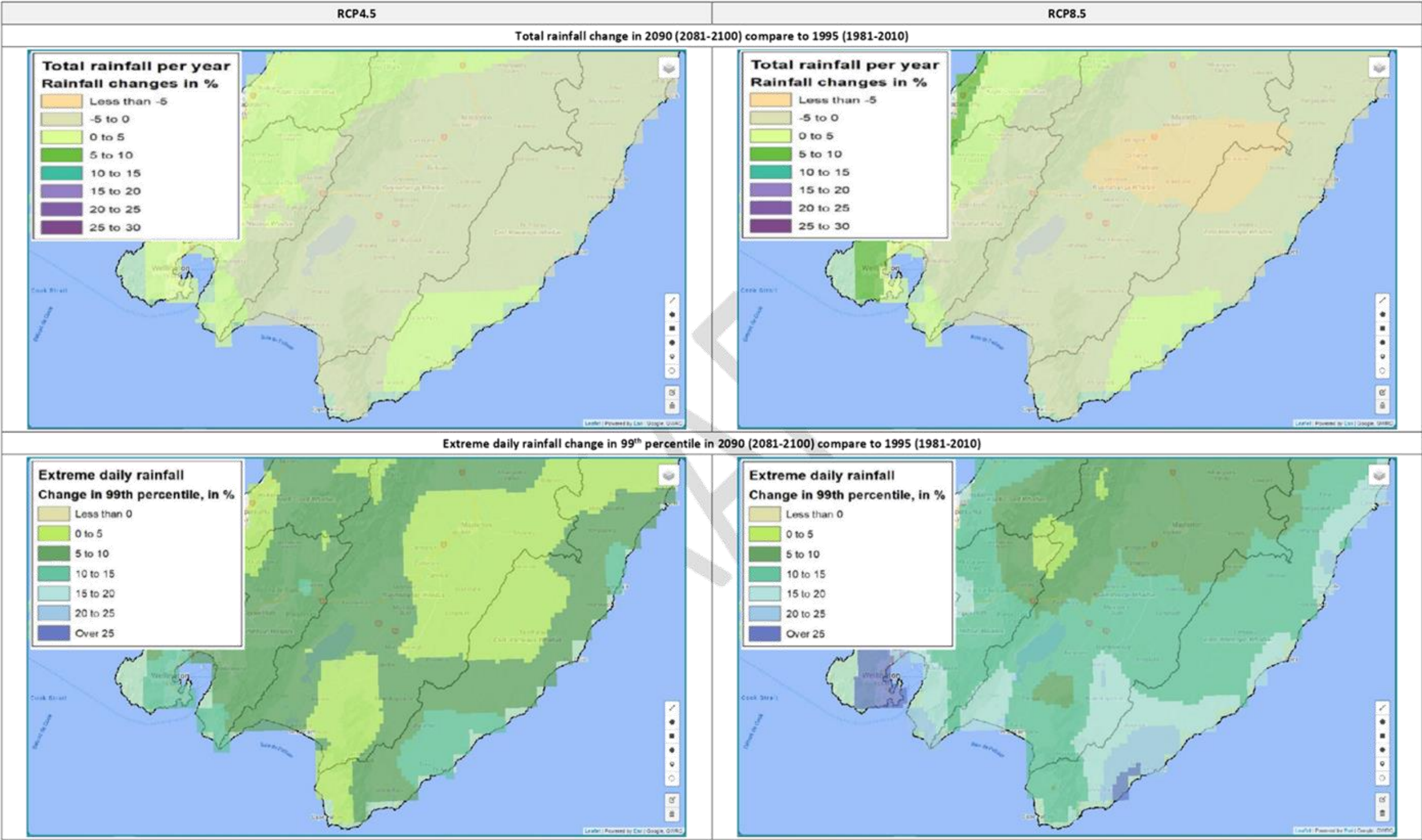
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	Days of very high and extreme forest fire danger	100% to 150% increase	100% to 150% increase			These figures are given by IPCC model averages. Individual models can show much higher increases of up to 700%.
Wind	Annual number of windy days	Ruamāhanga Whaitua: 0 to 4 days increase Wairarapa Coast Whaitua: 0 to 6 days increase	Ruamāhanga Whaitua: 0 to 12 days increase Wairarapa Coast Whaitua: 0 to 10 days increase			
	Intensity of wind during windy days (>99 th percentile of daily mean)	0% to 3% increase	1% to 4% increase			
Sea level and coastal hazards	Permanent sea level rise	+0.12 m to +0.24 m above present	+0.68 m to +1.75 m above present	More regular storm events in the fragile coastal environment may also mean faster and more significant coastal retreat.		The projected sea level rise for 2090 is based on IPCC AR5 plus an estimated additional contribution from Antarctica, based on papers published in Nature in 2018. There is very high confidence in sea level rise projections, probably more so than any other variable.
Oceanic changes	Acidification of the ocean					
	General temperature rise of sea water					
	Marine heatwaves					

Table 10: Projected impacts of climate change for the Wairarapa



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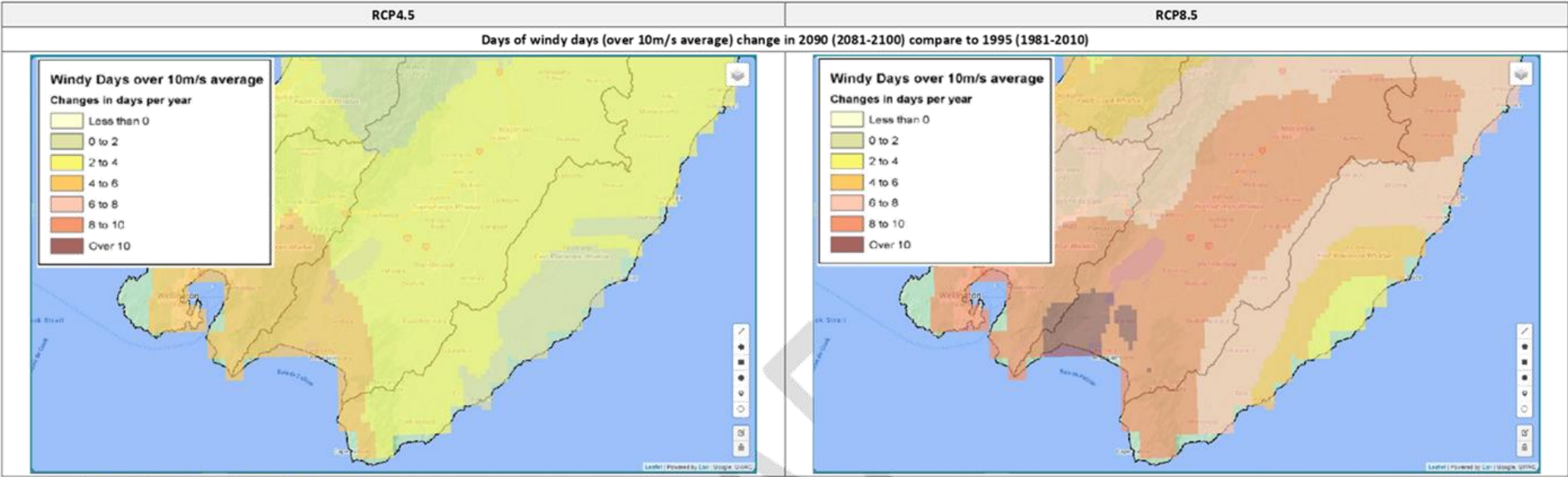
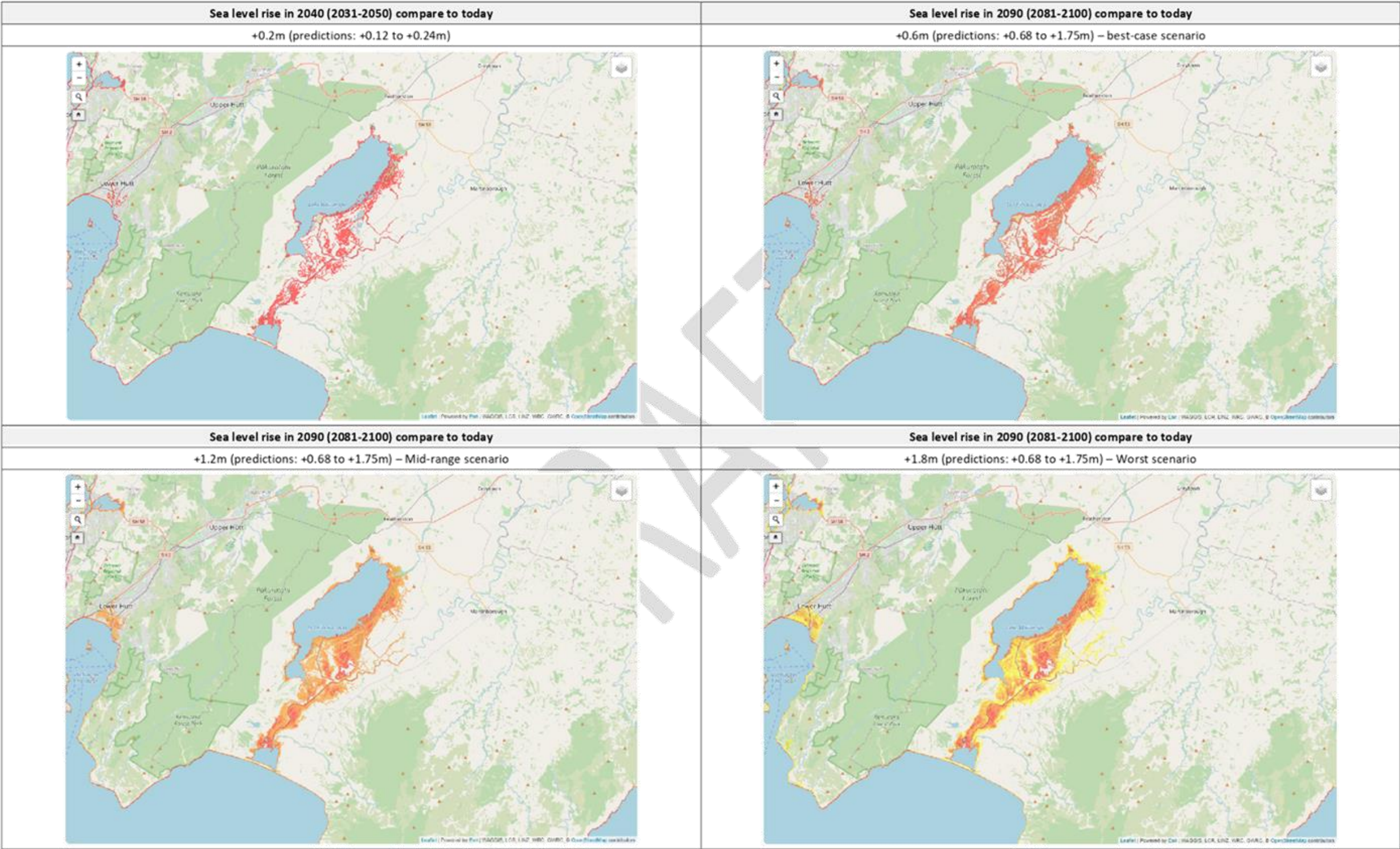


Figure 37: Climate change predictions

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Source: GWRC, <https://mapping1.gw.govt.nz/gw/slr/>

Figure 38: Sea level rise predictions around Lake Wairarapa and Lake Onoke

7.2.4 Likely impacts of Climate Change for Wairarapa

The expected direct impacts of climate change (such as increased temperature, increased flood intensity and sea level rise) impact the communities living in Carterton and South Wairarapa District. The key impacts on the communities are:

- Impact on the environmental well-being (biodiversity losses, increased pests and rodents, increased coastal inundation...);
- Impact on the social well-being (increased risk on the human health and human life, increased pressure on drinking water quality and availability...);
- Impact on the economic well-being (reduced productivity, increased damage to properties, increased pressure on insurances and mortgages...);
- Impact on the cultural well-being (loss of cultural identity, loss of important cultural activities, loss of taonga species...).

Expected direct impacts of climate change	Impacts on communities from expected effects of climate change			
	Environmental well-being	Social well-being	Economic well-being	Cultural well-being
- Increased temperatures, drought frequency and intensity*	<ul style="list-style-type: none"> - Biodiversity losses* - Extinction of some species - Higher stress on indigenous ecosystems, plants and animals - Range and habitat of native plants and animals will change (including marine species) - Timing of seasonal activities such as flowering, breeding and migration will change - Increased pests such as wasps and rodents* - Reduced soil fertility* - High potential for fruit fly establishment* - Increased air pollution 	<ul style="list-style-type: none"> - Increased seasonal allergies (e.g. pollen)* - Increased human stress (climate anxiety) - Increased human heat stress and mental issues, rurally and in urban centres - Increased diseases (e.g. due to new pests, air pollution, etc) - Increased heat islands due to human activities, large areas of concrete, buildings and vehicles 	<ul style="list-style-type: none"> - Reduced workplace productivity - Higher temperatures may allow for different crops to be grown - Impacts on rural productivity and forestry - Opportunity for tourism due to warmer temperatures 	<ul style="list-style-type: none"> - Loss of cultural identity - Loss on taonga species
- Increased flood intensity*	<ul style="list-style-type: none"> - Impacts on plants, animals and natural habitats 	<ul style="list-style-type: none"> - Increased human stress (climate anxiety) - Impact on human life (injuries and/or deaths) 	<ul style="list-style-type: none"> - Increased damage to property and infrastructure - Difficulty in obtaining insurance (reduce or remove insurances from certain areas, significant price increase, mitigation measure required by insurers) - Impacts on rural productivity and forestry 	<ul style="list-style-type: none"> - Loss of identity - Loss of important cultural activities (e.g. mahinga kai)
- Increased erosion (e.g. due to runoff or sea level rise)*	<ul style="list-style-type: none"> - Impacts on plants, animals and natural habitats 	<ul style="list-style-type: none"> - Increased human stress (climate anxiety) - Impact on human life (injuries and/or deaths) 	<ul style="list-style-type: none"> - Increased damage to property and infrastructure - Difficulty in obtaining insurance (reduce or remove insurances from certain areas, significant price increase, mitigation measure required by insurers) - Impacts on rural productivity and forestry 	<ul style="list-style-type: none"> - Loss of identity - Loss of important cultural activities (e.g. mahinga kai)
- Water quality and availability pressures*	<ul style="list-style-type: none"> - Increased level of toxic algae - Biodiversity losses 	<ul style="list-style-type: none"> - Increased pressure on water storage* (higher demand for drinking water at times when water is likely to be scarcer) - Increased human stress (climate anxiety) - Health affected by poor water quality - Increased pressure to reduce water consumption - Impacts on recreational activities 	<ul style="list-style-type: none"> - Impacts on rural productivity and forestry (water shortages) - Increased pressure on the community to become more resilient and self-sufficient (water tanks) 	<ul style="list-style-type: none"> - Loss of identity - Impact Ko wai, mo wai, no wai (waterways connect communities) – cultural value
- Saltwater intrusion* on groundwater		<ul style="list-style-type: none"> - Groundwater quality and availability pressures* - Increased human stress (climate anxiety) 		<ul style="list-style-type: none"> - Loss of identity - Impact Ko wai, mo wai, no wai (waterways connect communities) – cultural value
- Increased wildfire*	<ul style="list-style-type: none"> - Impacts on plants, animals and natural habitats - Biodiversity losses 	<ul style="list-style-type: none"> - Increased human stress (climate anxiety) - Impact on human life (injuries and/or deaths) 	<ul style="list-style-type: none"> - Impacts on rural productivity and forestry 	<ul style="list-style-type: none"> - Loss of identity
- Sea level rise	<ul style="list-style-type: none"> - Increased coastal inundation (some areas to become permanently inundated)* - Saltwater incursion into freshwater habitats - Biodiversity losses 	<ul style="list-style-type: none"> - Increased human stress (climate anxiety) - Population displacement 	<ul style="list-style-type: none"> - Increased damage to property and infrastructure - Difficulty in obtaining insurance (reduce or remove insurances from certain areas, significant price increase, mitigation measure required by insurers) 	<ul style="list-style-type: none"> - Loss of identity - Loss of important cultural activities (e.g. mahinga kai) - Loss in archaeological sites
- Ocean acidification*	<ul style="list-style-type: none"> - Decline in fish population* - Altered marine ecosystems, particularly affecting hard shelled species - Biodiversity losses 	<ul style="list-style-type: none"> - Increased human stress (climate anxiety) - Impacts on recreational activities 	<ul style="list-style-type: none"> - Impacts on aquaculture and fishing industries 	<ul style="list-style-type: none"> - Loss of identity

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Expected direct impacts of climate change	Impacts on communities from expected effects of climate change			
	Environmental well-being	Social well-being	Economic well-being	Cultural well-being
- Increased winds	- More frequent damages to trees	- Increased human stress (climate anxiety) - Impacts on recreational activities	- Impacts on forestry productivity	- Loss of identity

* Key environmental impacts for the Ruamāhanga Whaitua and the Wairarapa Coast Whaitua

Table 11: Impact on the communities from expected direct impacts of climate change

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8 Greenhouse gas inventory

8.1 Wairarapa Combined District

In 2018/19 reporting year, the Wairarapa Combined District emitted gross 1,734,320 tCO₂e and net 353,460 tCO₂e. The biggest sector is agriculture (77.8%), followed by transport (15.7%). Stationary energy (3.4%), Waste (2.3%) and Industry (0.8%) are minor sources of emissions in the Wairarapa.

Total gross emissions fell by 7%, from 1,871,095 tCO₂e in 2001 to 1,734,320 tCO₂e in 2019. Reductions in emissions from stationary energy, waste and agriculture are responsible for the fall in total gross emissions. As the area's population has risen (by 22%, from 39,090 to 47,590), per capita gross emissions have reduced by 24% from 47.9 tCO₂e in 2001 to 36.4 tCO₂e in 2019.

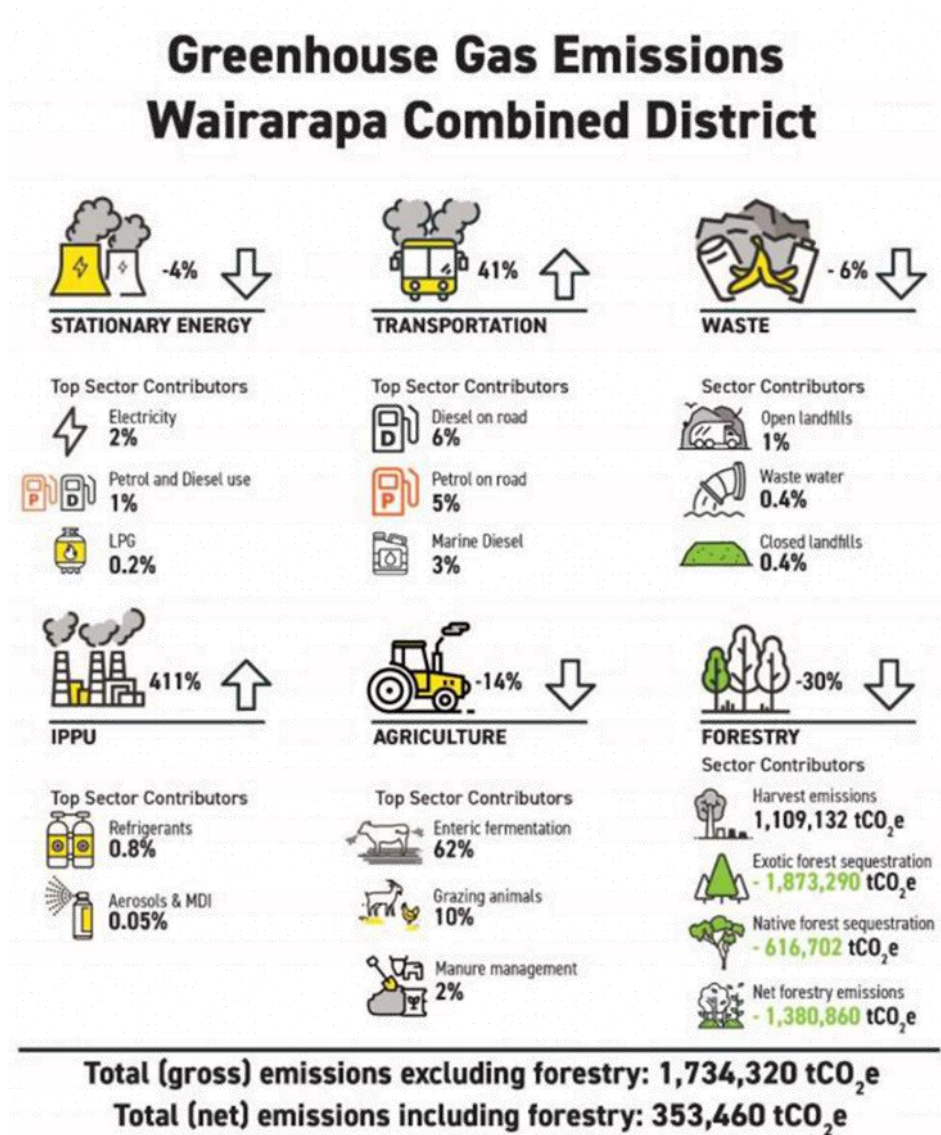
Net forestry sequestration reduced by 30% between 2001 and 2019 causing net emissions to increase from net-negative total emissions (-91,460 tCO₂e in 2001) to net-positive emissions (353,460 tCO₂e in 2019).

Carbon emissions for the Wairarapa Combined districts have been measured using the Global Protocol for Community Scale Greenhouse Gas Emissions Inventory (GPC). The method includes emissions from stationary energy, transportation, waste, industry (IPPU), agriculture and forestry sectors. This work has been done by AECOM, commissioned by Greater Wellington Regional Council.

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8.1.1 Summary

Figure 39 summarises the rate of change in emissions and top contributors to emissions for different sectors.



Source: Wairarapa Combined District Greenhouse Gas Inventory, AECOM, 2020

Figure 39: Summary of change in emissions from 2001 to 2019 including top contributors to total gross emissions from each sector in 2019

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8.1.2 2018/19 Wairarapa Combined District inventory

Sector	tCO ₂ e	% Gross	% Sector
Stationary Energy			
Electricity Consumption	31,928	1.8%	53.8%
Electricity T&D Loss	2,622	0.2%	4.4%
Natural Gas	-	0.0%	0.0%
Natural Gas T&D Loss	-	0.0%	0.0%
LPG	3,130	0.2%	5.3%
Stationary Petrol & Diesel Use	20,159	1.2%	34.0%
Coal	718	0.0%	1.2%
Biofuel / Wood	737	0.0%	1.2%
Total:	59,293	3.4%	100%
Transportation			
Petrol	91,514	5.3%	33.7%
Diesel	105,330	6.1%	38.8%
Rail Emissions	696	0.0%	0.3%
Bus (Electric)	9	0.0%	0.0%
Jet Kerosene	23,367	1.3%	8.6%
Av Gas	51	0.0%	0.0%
Marine Diesel	47,294	2.7%	17.4%
Light Fuel Oil	3,018	0.2%	1.1%
LPG	232	0.0%	0.1%
Total:	271,511	15.7%	100%
Waste			
Solid Waste Disposal	32,665	1.9%	81.8%
Wastewater	7,285	0.4%	18.2%
Total	39,950	2.3%	100%
IPPU			
Industrial Emissions	14,219	0.8%	100.0%
Total	14,219	0.8%	100%
Agriculture			
Agriculture	1,349,348	77.8%	100%
Total	1,349,348	77.8%	100%
Forestry			
Exotic Forest Sequestration	-1,873,290	N/A	N/A
Native Forest Sequestration	-616,702	N/A	N/A
Harvest Emissions	1,109,132	N/A	N/A
Total	-1,380,860	N/A	100%
Total Emissions			
tCO₂e			
Total (net) incl. forestry	353,460		
Total (gross) excl. forestry	1,734,320		

Source: Wairarapa Combined District Greenhouse Gas Inventory, AECOM, 2020

Table 12: Summary of Wairarapa Combined District's gross emissions split by sector and associated sub-categories

In 2018/19 reporting year, the Wairarapa Combined District emitted gross 1,734,320 tCO₂e and net 353,460 tCO₂e.

The biggest sector is agriculture (77.8%), followed by transport (15.7%). Stationary energy (3.4%), Waste (2.3%) and Industry (0.8%) are minor sources of emissions in Wairarapa.

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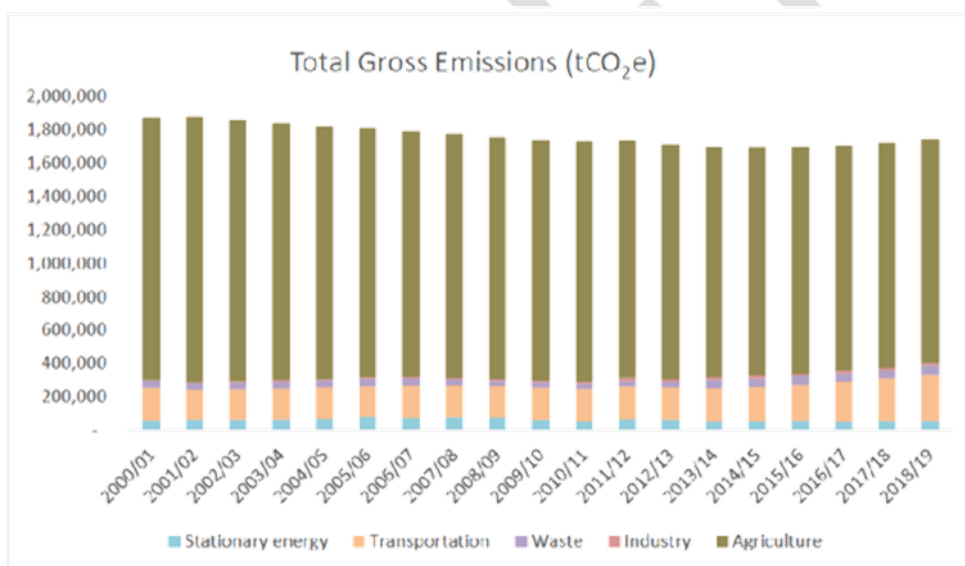
Biogenic Methane (Included in gross emissions)		
Biofuel	19	t CH ₄
Biodiesel	-	t CH ₄
Landfill Gas	961	t CH ₄
Wastewater Treatment	187	t CH ₄
Enteric fermentation	31,813	t CH ₄
Manure Management	992	t CH ₄
Total biogenic CH₄	33,972	t CH₄

Source: Wairarapa Combined District Greenhouse Gas Inventory, AECOM, 2020

Table 13: Biogenic Methane emitted in 2018/19

Table 13 state the biogenic methane emissions. The Wairarapa Combined District emitted 33,972 tons of Biogenic Methane in 2018/19. The importance of Biogenic Methane is highlighted in NZ's Climate Change Response (Zero Carbon) Amendment Act. The Act includes targets to reduce Biogenic CH₄ between 24 percent and 47 percent below 2017 levels by 2050, and 10 percent reduction below 2017 levels by 2030.

8.1.3 Changes in emissions inventory, 2001 to 2019

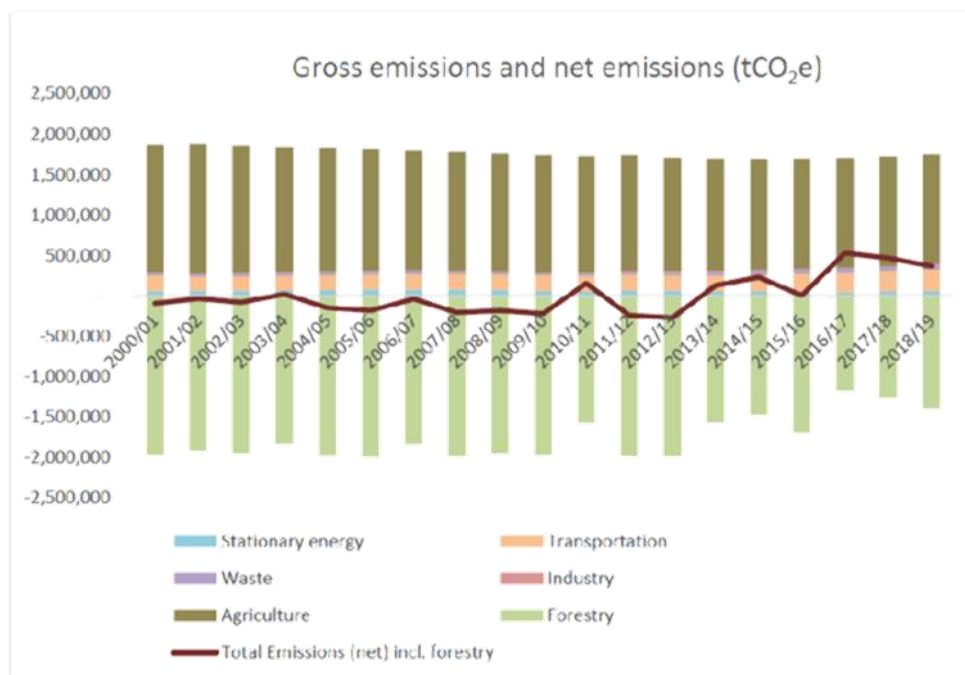


Source: Wairarapa Combined District Greenhouse Gas Inventory, AECOM, 2020

Figure 40: Gross emissions per year (excluding forestry) from 2001 to 2019

Total gross emissions fell by 7%, from 1,871,095 tCO₂e in 2001 to 1,734,320 tCO₂e in 2019. Reductions in emissions from stationary energy, waste and agriculture are responsible for the fall in total gross emissions. As the area's population has risen (by 22%, from 39,090 to 47,590) and per capita gross emissions have reduced by 24% from 47.9 tCO₂e in 2001 to 36.4 tCO₂e in 2019.

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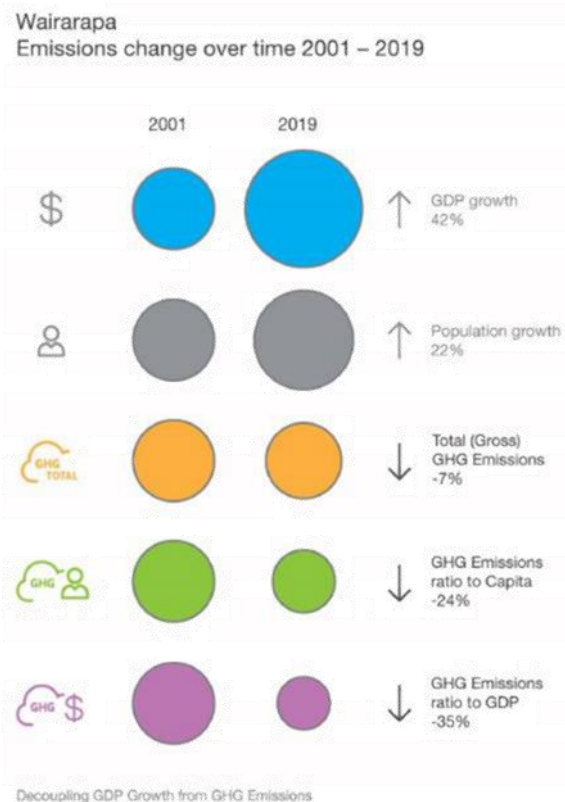


Source: Wairarapa Combined District Greenhouse Gas Inventory, AECOM, 2020

Figure 41: Annual emissions showing gross and net emissions (including forestry) from 2001 to 2019

Figure 41 shows the impact of sequestration in the forestry sector on reducing net emissions. Net forestry sequestration reduced by 30% between 2001 and 2019 causing net emissions to increase from net-negative total emissions (-91,460 tCO₂e in 2001) to net-positive emissions (353,460 tCO₂e in 2019).

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Source: Wairarapa Combined District Greenhouse Gas Inventory, AECOM, 2020

Figure 42: Change in total gross emissions compared to other metrics of interest

Figure 42 shows the change in gross emissions when compared to changes in other metrics of interest between 2001 and 2019. Total gross emissions have reduced by 7%, against the backdrop of a 22% growth in population within the Wairarapa. Per capita emissions have fallen roughly in line with the rise in population observed (by 24%).

When emissions grow less rapidly than Gross Domestic Product (GDP) as a measure of income then this process is known as decoupling. The term decoupling is an expression of the desire to mitigate emissions without harming economic wellbeing. The changes in emissions and GDP illustrated in Figure 42 suggest at a high-level decoupling has occurred in the last two decades. GDP was 42% higher in 2019 than in 2001 while emissions per unit of GDP declined by 35%.

The exact drivers for the decoupling of emissions from GDP are difficult to pinpoint. New policies, for restructuring the way to meet demand for energy, food, transport and housing will all contribute. In this case, both direct local actions including reducing the emissions from landfill gas and indirect national trends e.g. reduction of emissions from electricity generation will have contributed to the trends noted.

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8.2 Carterton District Council

Carterton District Council had a gross emission of 372.91 tCO₂e in 2018 (base year) and 275.99 tCO₂e in 2020 (-26%). The biggest source is transport (50%) followed by electricity (21%, wastewater treatment (19%) and water supply (9%). Waste and refrigerant are minor sources of greenhouse gas.

Carterton District Council had a net emission of -6,864.48 tCO₂e in 2018 (base year) and -6,961.40 tCO₂e in 2020 (+1.41%).

Biogenic methane emissions increased by 2.73% between 2018 and 2020.

The Table 14, Table 15, Table 16, Table 18, Table 17 and Table 20 are the summary on the greenhouse gas inventory made for CDC since 2018. For further information, refer to the greenhouse gas inventory reports.

The methodology used for these greenhouse gas inventories is the methodology provided by MfE 'Measuring Emissions: A Guide for Organisations'. The emission factors were updated in 2020. Also, due to Covid-19, a lockdown (level 3 and 4) happened between the 23rd of March 2020 and 14th May 2020.

	Scope	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Evolution 2018 - 2020
CORPORATE SERVICES		13.77	14.11	15.17	+10.16%
Electricity – Other	Scope 2	3.10	2.92	3.07	
Transport and distribution losses	Scope 3	0.27	0.25	0.26	
Transport – Diesel	Scope 1	0	0	0	
Transport – Petrol	Scope 1	7.50	7.89	8.06	
Transport – Flights	Scope 3	0.60	0.75	0.83	
Waste	Scope 3	2.30	2.30	2.95	
Refrigerant	Scope 1	0	0	0	
COMMUNITY SERVICES		63.70	57.99	23.14	-63.68%
Electricity – Other	Scope 2	58.67	53.41	21.31	
Transport and distribution losses	Scope 3	5.03	4.58	1.83	
OPERATIONS		112.73	127.31	79.43	-29.54%
Electricity – Other	Scope 2	3.04	3.18	1.57	
Electricity – Street lights	Scope 2	64.89	49.70	20.38	
Transport and distribution losses	Scope 3	5.82	4.35	1.88	

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	Scope	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Evolution 2018 - 2020
<i>Transport – Diesel</i>	Scope 1	30.82	55.71	48.98	
<i>Transport – Petrol</i>	Scope 1	8.16	14.19	6.62	
WATER		106.68	106.56	118.33	+10.92%
<i>Transport – Diesel</i>	Scope 1	47.82	43.42	41.30	
<i>Transport – Petrol</i>	Scope 1	0	0	0	
<i>Water supply</i>	Scope 3	21.64	24.97	25.55	
<i>Wastewater treatment</i>	Scope 3	47.82	38.16	51.48	
PARKS AND RESERVES		64.04	42.32	28.89	-54.89%
<i>Electricity – Other</i>	Scope 2	12.63	7.95	6.57	
<i>Transport and distribution losses</i>	Scope 3	1.08	0.68	0.56	
<i>Transport – Diesel</i>	Scope 1	42.09	25.42	20.11	
<i>Transport – Petrol</i>	Scope 1	0.74	0.77	0.78	
<i>Green waste</i>	Scope 3	7.50	7.50	0.86	
REGULATORY		12.00	10.35	11.04	-8.04%
<i>Transport – Diesel</i>	Scope 1	6.52	5.93	2.63	
<i>Transport – Petrol</i>	Scope 1	5.48	4.42	8.40	
GROSS EMISSIONS		372.91	358.67	275.99	-25.99%

Table 14: Emissions by business units

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	t Co ₂ e – 2018	t Co ₂ e – 2019	t Co ₂ e – 2020	Evolution 2018 - 2020
Scope 1	149.12	157.74	136.89	-8.20%
Scope 2	142.33	117.16	52.91	-62.83%
Scope 3	81.46	83.73	86.20	+5.82%
GROSS EMISSIONS	372.91	358.67	275.99	-25.99%

Table 15: Emissions by scopes⁵

⁵ Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions not included in scope 2

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	t Co ₂ e – 2018	t Co ₂ e – 2019	t Co ₂ e – 2020	Evolution 2018 - 2020
ELECTRICITY	154.53	127.21	57.44	-62.83%
Streetlights	64.89	49.70	20.38	
Other	77.44	67.46	32.53	
Transport and distribution losses	12.20	10.05	4.54	
TRANSPORT	149.72	158.49	137.71	-8.02%
Petrol	21.87	27.27	23.86	
Diesel	127.25	130.47	113.02	
Flights	0.60	0.75	0.83	
WASTEWATER	37.21	38.16	51.48	+38.33%
WATER SUPPLY	21.64	24.97	25.55	+18.07%
WASTE	9.80	9.80	3.81	-61.16%
REFRIGERANT	0.00	0.00	0.00	0%
GROSS EMISSIONS	372.91	358.67	275.99	-25.99%

Table 16: Emissions by sources

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	t CO ₂ e - 2018	t CO ₂ e - 2019	t CO ₂ e - 2020	Evolution 2018 - 2020
GROSS EMISSIONS	372.91	358.67	275.99	-25.99%
<i>Sequestration (forests)</i>	-7,237.39	-7,237.39	-7,237.39	0%
<i>Harvest emissions</i>	0	0	0	0%
TOTAL	-7,237.39	-7,237.39	-7,237.39	0%
NET EMISSIONS	-6,864.48	-6,878.76	-6,961.40	+1.41%

Table 17: Forestry

	2018	2019	2020	Evolution 2018 - 2020
Gross emissions per FTE (t CO ₂ e) 2018: 59.8 FTE 2019: 61.2 FTE 2020: 66.3 FTE	6.24	5.86	4.16	-33.25%
Gross emissions per capita (kg CO ₂ e) 2018: 9,440 2019: 9,690 2020: 9,888	39.50	37.01	27.91	-29.43%

Table 18: Emissions per FTE and per head of population

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	tCH ₄ – 2018	tCH ₄ – 2019	tCH ₄ – 2020	Evolution 2018 - 2020
Waste	2.30	2.30	2.95	+28.00%
	7.50	7.50	0.50	-93.33%
Wastewater	18.61	19.08	25.74	+38.33%
Total	28.41	28.88	29.19	+2.73%

Table 19: Biogenic methane emissions

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8.3 South Wairarapa District Council

South Wairarapa District Council had a gross emission of 248.20 tCO₂e in 2018 (base year) and 243.17 tCO₂e in 2020 (-2%). The biggest source is the electricity (38%) followed by water supply (21%), transport (21%) and wastewater treatment (19%). Waste and refrigerant are minor sources of greenhouse gas.

South Wairarapa District Council had a net emission of 2,687.68 tCO₂e in 2018 (base year) and 665.70 tCO₂e in 2020 (-795%).

Biogenic methane emissions decreased by 2.29% between 2018 and 2020.

The Table 20, Table 21, Table 22, Table 24, Table 23 and Table 25 are the summary on the greenhouse gas inventory made for SWDC since 2018. For further information, refer to the greenhouse gas inventory reports.

The methodology used for these greenhouse gas inventories is the methodology provided by MfE 'Measuring Emissions: A Guide for Organisations'. The emission factors were updated in 2020. Also, due to Covid-19, a lockdown (level 3 and 4) happened between the 23rd of March 2020 and 14th May 2020.

	Scope	t CO ₂ e – 2018	t CO ₂ e – 2019	t CO ₂ e – 2020	Evolution 2018 - 2020
CORPORATE SERVICES		34.55	43.20	30.85	-10.70%
Electricity – Other	Scope 2	5.52	4.75	5.48	
Transport and distribution losses	Scope 3	0.47	0.41	0.47	
Transport – Diesel	Scope 1	7.35	12.87	9.82	
Transport – Petrol	Scope 1	16.55	18.66	13.02	
Transport – Flights	Scope 3	1.93	3.78	0	
Waste	Scope 3	2.73	2.73	2.07	
Refrigerant	Scope 1	0.00	0.00	0	
COMMUNITY SERVICES		20.98	25.60	25.79	+22.90%
Electricity – Other	Scope 2	19.33	23.58	23.75	
Transport and distribution losses	Scope 3	1.66	2.02	2.04	
OPERATIONS		55.19	44.99	35.82	-35.10%
Electricity – Other	Scope 2	0.33	0.33	2.04	
Electricity – Street lights	Scope 2	30.71	23.27	22.77	
Transport and distribution losses	Scope 3	2.66	2.02	2.13	
Transport – Diesel	Scope 1	7.64	6.23	1.48	

Volume 1: Climate Change Strategy

	Scope	t Co ₂ e – 2018	t Co ₂ e – 2019	t Co ₂ e – 2020	Evolution 2018 - 2020
<i>Transport – Petrol</i>	Scope 1	13.85	13.14	7.40	
WATER		93.16	81.43	97.99	+5.18%
<i>Water supply</i>	Scope 3	46.04	46.05	52.04	
<i>Wastewater treatment</i>	Scope 3	47.12	35.39	45.95	
PARKS AND RESERVES		31.40	30.85	39.15	+24.68%
<i>Electricity – Other</i>	Scope 2	26.46	25.22	31.11	
<i>Transport and distribution losses</i>	Scope 3	2.27	2.16	2.67	
<i>Transport – Diesel</i>	Scope 1	0.00	0.00	0	
<i>Transport – Petrol</i>	Scope 1	2.67	3.46	5.37	
REGULATORY		12.91	12.72	13.56	+5.04%
<i>Transport – Diesel</i>	Scope 1	11.48	11.58	11.71	
<i>Transport – Petrol</i>	Scope 1	1.43	1.15	1.86	
GROSS EMISSIONS		248.20	238.80	243.17	-2.03%

Table 20: Emissions by business units

	t Co ₂ e – 2018	t Co ₂ e – 2019	t Co ₂ e – 2020	Evolution 2018 - 2020
Scope 1	60.97	67.08	50.66	-16.94%
Scope 2	82.35	77.16	85.15	+3.42%
Scope 3	104.88	94.56	107.35	+2.37%
GROSS EMISSIONS	248.20	238.80	243.17	-2.03%

Table 21: Emissions by scopes⁵

Volume 1: Climate Change Strategy

	t Co ₂ e – 2018	t Co ₂ e – 2019	t Co ₂ e – 2020	Evolution 2018 - 2020
ELECTRICITY	89.41	83.77	92.46	+3.42%
Streetlights	30.71	23.27	22.77	
Other	51.64	53.88	62.38	
Transport and distribution losses	7.06	6.62	7.31	
TRANSPORT	62.90	70.86	50.66	-19.49%
Petrol	34.50	36.40	27.65	
Diesel	26.47	30.68	23.01	
Flights	1.93	3.78	0	
WASTEWATER	47.12	35.39	45.95	-2.49%
WATER SUPPLY	46.04	46.05	52.04	+13.04%
WASTE	2.73	2.73	2.07	-24.16%
REFRIGERANT	0.00	0.00	0.00	0%
GROSS EMISSIONS	248.20	238.80	243.17	-2.03%

Table 22: Emissions by sources

	t Co ₂ e – 2018	t Co ₂ e – 2019	t Co ₂ e – 2020	Evolution 2018 - 2020
GROSS EMISSIONS	248.20	238.80	243.17	-2.03%
Sequestration (forests)	-2,511.26	-2,408.15	-2,332.09	-7.13%
Harvest emissions	4,950.74	2,659.96	2,754.62	-44.36%
TOTAL	2,439.48	251.81	422.53	-82.68%
NET EMISSIONS	2687.68	490.60	665.70	-75.23%

Table 23: Forestry

Volume 1: Climate Change Strategy

	2018	2019	2020	Evolution 2018 - 2020
Gross emissions per FTE (t CO ₂ e) 2018: 41 FTE 2019: 44 FTE 2020: 48 FTE	6.05	5.43	5.07	-16.31%
Gross emission per capita (kg CO ₂ e) 2018: 10,920 2019: 11,100 2020: 11,245	22.73	21.51	21.63	-4.86%

Table 24: Emissions per FTE and per head of population

	tCH ₄ – 2018	tCH ₄ – 2019	tCH ₄ – 2020	Evolution 2018 - 2020
Waste	2.07	2.07	2.07	0%
Wastewater	23.56	17.69	22.97	-2.49%
Total	25.63	19.77	25.05	-2.29%

Table 25: Biogenic methane emissions

9 Targets

Carbon targets have been set up. They are ambitious but also, achievable and realistic. Being small councils, we must be aware of our limits.

During the period 2020 – 2030, Carterton and South Wairarapa District Councils aim to:

- Reduce their gross greenhouse gas emissions;
- Increase the reservoirs, therefore the amount of greenhouse gas sequestered every year;
- Reduce biogenic methane by 10% below 2017 levels.

9.1 International targets – Paris Agreement

The Paris Agreement was adopted by Parties under the United Nations Framework Convention on Climate Change (UNFCCC) on 12 December 2015. It commits all countries to take action on climate change. New Zealand ratified the Paris Agreement on 4 October 2016.

The purpose of the Paris Agreement is to:

- keep the global average temperature well below 2°C above pre-industrial levels, while pursuing efforts to limit the temperature increase to 1.5°C;
- strengthen the ability of countries to deal with the impacts of climate change;
- make sure that financial flows support the development of low-carbon and climate-resilient economies.

By ratifying the agreement New Zealand commits to having an emissions reduction target and regularly updating it. Ratification also commits us to:

- continue to regularly report on our emissions and how we're tracking towards meeting our target;
- continue to provide financial support to assist developing countries' mitigation and adaptation efforts;
- plan for adaptation.

9.2 National targets – Climate Change Response (Zero Carbon) Amendment Act

The Climate Change Response (Zero Carbon) Amendment Act sets a greenhouse gas reduction targets and require that:

- net accounting emissions of greenhouse gases in a calendar year, other than biogenic methane, are zero by the calendar year beginning on 1 January 2050 and for each subsequent calendar year;
- emissions of biogenic methane⁶ in a calendar year:
 - are 10% less than 2017 emissions⁷ by the calendar year beginning on 1 January 2030;
 - are 24% to 47% less than 2017 emissions by the calendar year beginning on 1 January 2050 and for each subsequent calendar year.

The 2050 target will be met if emissions reductions meet or exceed those required by the target.

⁶ Methane produced from biological sources (plant and animal).

⁷ 2017 emissions mean the emissions of biogenic methane for the calendar year beginning on 1 January 2017.

9.3 Councils' targets

Carterton and South Wairarapa District Councils aimed to set up greenhouse gas emissions targets in order to comply to Climate Change Response (Zero Carbon) Amendment Act and to the Paris agreement.

The targets must be ambitious but also, achievable and realistic. Being small councils, we have to be aware of our limits.

During the period 2020 – 2030, Carterton and South Wairarapa District Councils aim to:

- Reduce their gross greenhouse gas emissions;
- Increase the reservoirs, therefore the amount of greenhouse gas sequestered every year;
- Reduce biogenic methane⁸ by 10% below 2017 levels.

To be able to be able to achieve these targets, the councils set up an action plan that is exposed in the following part of the strategy. The actions are intended for:

- the councils;
- the community;
- the businesses.

The greenhouse gas inventories will allow the councils to keep track and record of their emissions and make sure the councils are in the right direction.

⁸ Biogenic methane is produced from biological (plant and animal) sources.

10 Conclusion

By writing this ambitious strategy and action plan, Carterton District Council and South Wairarapa District Council are compliant to:

- the Paris Agreement;
- the Climate Change Response (Zero Carbon) Amendment Act;
- the New Zealand Local Government Leaders' Climate Change Declaration.

Indeed, the councils:

- Wrote a Climate Change Strategy in order to reduce their greenhouse gas emissions;
- Committed to regularly report on their greenhouse gas emissions;
- Set up carbon reduction 2030 targets that are compliant to the Climate Change Response (Zero Carbon) Amendment Act:
 - Reduce gross greenhouse gas emissions;
 - Increase the reservoirs, therefore the amount of greenhouse gas sequestered every year;
 - Reduce biogenic methane by 10% below 2017 levels.

This strategy was adopted in February 2020 for CDC and March 2020 for SWDC. This version is the first review of the Ruamāhanga Strategy (April 2021).

11 Contacts and workgroups

The councils are part of many groups to improve its efficiency in climate change mitigation:

- the Wellington Region Climate Change Forum;
- the Wellington Region Electric Vehicle Working Party;
- the Climate Change Officer Network (across New Zealand);
- The Enviroschools Climate Change Group;
- Wairarapa Climate Change Caucus.

12 References

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DRAFT

APRIL 21

RUAMĀHANGA STRATEGY

VOLUME 2: ACTION PLAN



Volume 2: Action Plan

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Volume 2: Action Plan

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Document review

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Disclaimer

The information in this action plan is true and complete to the best of our knowledge. All recommendations are made without guarantee on the part of the author or South Wairarapa District Council and Carterton District Council. The author and publisher disclaim any liability in connection with the use of this information.

1 Achievements for the period 2019-2021

The period 2019-2021 was the first years of implementation of the Ruamāhanga Strategy. This year's main objective was to raise awareness and start reducing the emissions.

The gross emissions (and net emissions) have reduced for both Councils between 2018 and 2020. However, emissions naturally fluctuate from one year to the other (more or less emissions). Therefore, we must wait to see if this reduction is a long-term trend or meaning the Councils are truly making efforts to reduce its footprint.

Awareness was increased in the organisations and the community through many actions (workshops, themed week, dashboard and newsletter, social media, etc).

1.1 Councils: lead by example

Action	Time frame	KPI	Achievements	
			CDC	SWDC
Councils' activities				
1-1.1.1. Measure and report on council's emissions	2018 - ongoing	One inventory and report published each year.	Gross emissions: - 2018: 777.12 tCO ₂ e - 2019: 774.55 tCO ₂ e - 2020: 275.98 tCO ₂ e	Gross emissions: - 2018: 764.10 tCO ₂ e - 2019: 625.50 tCO ₂ e - 2020: 243.18 tCO ₂ e
1-1.1.2. Work with GWRC and other TAs	2019 – ongoing	Attendance to meetings and support to other TAs	Attendance to the WRCCF and the WWECWP meetings. Attendance to the climate change officers network meetings. Formation of the Wairarapa Climate Caucus (group of climate change officers, elected members and Iwi representative in Wairarapa Region).	
1-1.1.3. Review the procurement policy	2020 – 2021	Adoption of the procurement policy	The procurement policy is currently being reviewed and will consider a sustainable procurement (environmental, social, economic and cultural outcomes). The policy will be adopted in April 2021.	The procurement policy will be reviewed in 2021 and will consider a sustainable procurement (environmental, social, economic and cultural outcomes).
This action also answers the action 3-1.1.2.				

Action	Time frame	KPI	Achievements	
			CDC	SWDC
1-1.1.4. Implement a Carbon Reduction Policy	2020 – 2021	The internal Carbon Reduction Policy is written and used by 2020. The other policies are reviewed and approved by 2020.	The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. All other policies were revised, and climate change clauses were added if necessary. The conclusion of this work was given to the policy managers.	The Carbon Reduction Policy and guidance were shared with the policy and governance manager. All other policies were revised, and climate change clauses were added if necessary. The conclusion of this work was given to the policy and governance manager.
1-1.1.5. Input Climate Change in planning documents and strategies	2020	Climate change is embedded in the planning in the Councils' systems.	Climate change was considered in the LTP, and other strategies (infrastructure strategy). Climate change is being considered in the review of the special plan. The WRCCWF is working on two project of the Wellington Region Growth Framework (WRGF). One project is about climate change mitigation and the second is about climate change adaptation. Climate change will need to be considered during the combined district plan review in 2022.	
Transportation				
1-1.2.1. Consider other options than ICE vehicle	2019 – 2023	Council's employees are aware about the other options available to reduce the use of car. The transport's emissions decrease.	An electric vehicle drive test was cancelled by the EV provider (Feb 19). Alternative to ICE vehicles were promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20) E-bike scheme set up in March 2021 for all staff members, elected members and opportunity for the councils to purchase a discounted e-bike for its fleet. 4 hybrid vehicles were purchased in October 20. Looking into purchasing an e-bike.	
1-1.2.2. Adopt fuel-efficient driving techniques	2019 – ongoing	Council's employees are aware about fuel-efficient driving techniques and they use them. The transport's emissions decrease.	Fuel-efficient driving techniques were promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20) CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.	

Action	Time frame	KPI	Achievements	
			CDC	SWDC
1-1.2.3. Lead a fleet review	2020	Report on the results of the fleet review.	The fleet review was finalised in June 20 and given to managers for consideration.	The fleet review has not been done because the fleet was not GPS tracked (Argus). The system was implemented in March 20 so a fleet review will be possible at some point in 2021 (after a full year of data available).
Energy consumption				
1-1.3.1. Adopt an energy saving behaviour	2019 – ongoing	Council's employees are aware about energy saving behaviour and they adopt it. The energy use decrease (in the offices).	Energy saving behaviour was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20) CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.	
1-1.3.2. Use LED technology (including streetlights)	2018 – ongoing	The numbers of Led lights increase until 100% of the lights are LED and the emissions decrease.	2018-2019: transition the streetlights to LED CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.	
1-1.3.3. Lead a building efficiency assessment	2020	The assessment is done, and a report is written.	A self-building-efficiency-assessment was conducted in 2020 but the results were not reliable. To have reliable results, we would need to do an energy audit conducted by an expert.	
Renewable energy				
1-1.4.1. Buy electricity from a company that uses 100% renewable energy	2019	The power company supplying the councils uses 100% renewable energies.	Since Oct 19, 91% of the energy used is renewable	Since Oct 19, 100% of the energy used is renewable
3-waters				
1-1.5.1. Reduce reticulated water leaks	2019 - ongoing	The amount of water losses goes down.	CDC keeps doing leak detection and repair in order to reduce the water losses.	Wellington Water keeps doing leak detection and repair in order to reduce the water losses.

Action	Time frame	KPI	Achievements	
			CDC	SWDC
1-1.5.2. Use water saving technologies	2019 - ongoing	The water consumption goes down and the water saving technologies are always an option in the choices for new devices.	Energy saving behaviour was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20). The adoption of the procurement policy will help making the right decision and using water saving technologies. CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.	
1-1.5.3. Reduce storm water and ground water in the sewers	2019 - Ongoing	Old and defective sewers are being replaced by new pipes.	CDC keeps fixing sewers in order to reduce leaks and groundwater intrusion.	Wellington water keeps fixing sewers in order to reduce leaks and groundwater intrusion.
Waste				
1-1.6.1. Compost	2019 – ongoing	Every kitchen has a caddy that is emptied in a compost bin.	Staff members organised food scrap collection in the kitchens (to compost or to feed animals) Compost was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20) CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.	
1-1.6.2. Recycle	2019 – ongoing	Staff knows about recycling and uses the recycling stations.	Recycling options are available in the offices. Recycling was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20) CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members. SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.	

Action	Time frame	KPI	Achievements	
			CDC	SWDC
1-1.6.3. Optimise the IT (especially paper prints)	2019 – ongoing	The prints number goes down.	<p>Support paperless with Stellar and other initiatives.</p> <p>Prints reduction was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20).</p> <p>Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20)</p> <p>CDC: The Carbon Reduction Policy and guidance were shared with the managers and are currently being explained to all staff members.</p> <p>SWDC: The Carbon Reduction Policy and guidance were shared with the policy and governance manager.</p>	<p>Prints tracked since 2020</p> <p>Prints tracked since 2019</p>
Carbon sequestration				
1-1.7.1. Preserve our forests	2019 – ongoing	The surface of forest owned is stable and if deforestation a report is done to prove the purpose of it.	<p>Carbon sequestration was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20).</p> <p>Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20)</p>	Harvested forests are being replanted as much as possible
1-1.7.2. Lead a land assessment to increase tree planting and wetland restoration	2020	The land assessment is done.	The Reserve Management Plan is currently being reviewed and is an opportunity to identify possible areas for planting.	Areas where identified to plant natives (2 ha around the Waiohine bores and 4 ha at Lake Ferry in replacement of pine trees)
Communication and education				
1-1.8.1. Engage the staff in the carbon footprint reduction	2019 – ongoing	The staff is engaged in the carbon footprint reduction and act to reduce their emissions.	<p>Greenhouse gas emissions reduction was promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20).</p> <p>Workshops were organised to explain what climate change is, explain the council's emissions and explain how to reduce the emissions (Feb-Mar 20).</p> <p>Monthly dashboard and newsletter to understand the councils' emissions. These are sent to all staff members.</p>	

Action	Time frame	KPI	Achievements	
			CDC	SWDC
1-1.8.2. Keep the Council's members and staff informed	2019 – ongoing	The Councils' members and staff are well informed about the actions of the Climate Change Advisor.	A climate change component was added in the Council's reports in 2019. A clear guidance was developed to help staff members filling this section.	A climate change component in the Council's reports is currently under development. A clear guidance will accompany this component to help staff member filling the section.

Table 1: Achievements for the Council's actions in 2019-2021

1.2 Community and businesses: support low carbon behaviours and circular economy

Action	Time frame	KPI	Achievements
Transportation			
1-2.1.1. Promote alternatives to ICE vehicles	2019 - ongoing	The community and businesses use alternatives to combustion engine vehicles more and more.	Promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Promoted in Midweek articles.
1-2.1.2. Promote fuel-efficient driving techniques	2019 - ongoing	The community is aware of the fuel-efficient driving techniques.	Promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Promoted in Midweek articles.
1-2.1.3. Develop bike lanes	2019 - ongoing	The Climate Change Advisor is in contact with the Five Towns Trails Trust and supports it until the success of the project.	Coordination between the Five Towns Trails officer and Climate Change Advisor. Climate Change Advisor is part of discussions for the Regional Land Transport Plan.
1-2.1.4. Support the development of the EV chargers' network	2020	An application is done in February 2020 (approvals provided late July 2020).	EV charger already present in Featherston (Super Value) and successful application for an EV charger in Carterton (New World). EV charger to be installed in Martinborough (P&K).
Housing			
1-2.2.1. Promote an energy saving behaviour	2019 - ongoing	The community is aware of the energy saving behaviour.	Promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Promoted in Midweek articles.
Love local			
1-2.3.1. Promote locally produced food, goods and services	2019 - ongoing	The community and businesses are aware of alternatives such as farmers market and choose to consume wisely.	Promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Promoted in Midweek articles.
Carbon sequestration			
1-2.5.1. Promote forest preservation and afforestation	2019 - ongoing	The community is aware of the benefits of the forests, protect them and plant trees.	Promoted during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Promoted in Midweek articles.

Action	Time frame	KPI	Achievements
Communication and education			
1-2.6.1. Coordinate the Conservation week	2019 – ongoing	Communication campaigns are held once a year during Climate Change week or Conservation week.	Events held during Global Climate Change week (Oct 19) and Conservation week (Aug 20).
1-2.6.2. Hold a Climate Change stall at local events	2020 – ongoing	The community's awareness towards climate change increases as well as its engagement.	COVID-19 stopped us to do so. Will be done at future events.
1-2.6.3. Educate the children to Climate Change	2020 – ongoing	The councils are engaged with Enviroschools and actions / programmes are being held with the children.	Support Enviroschools. Two sessions "How to be a Climate Warriors" were held in October 20 for the School Holiday Programme. Two sessions "Tawashis – the zero waste Japanese sponge" were held in April 21 for the School Holiday Programme.
1-2.6.4. Watch for new scientific publications, laws, rules to keep the community informed	2019 – ongoing	The community is well informed about Climate Change and everyone is able to understand it.	Continuous watch from the climate change advisor. Information shared during Global Climate Change week (Oct 19) and Conservation week (Aug 20). Information shared almost every day through the Facebook page "Climate Change Wairarapa".

Table 2: Achievements for the community and businesses' actions in 2019-2021

2 Summary of coming actions

2.1 Councils: lead by example

	2021-2023 Strengthen the engagement towards Climate Change and keep reducing the emissions	2023-2033 Achieve and go beyond our targets
1. Councils: lead by example		
1. Council's activities	1-1.1.1. Measure and report on council's emissions 1-1.1.2. Work with GWRC and other TAs 1-1.1.5. Input Climate Change in planning document and strategies 3-1.1.1. Update the Ruamāhanga Strategy 3-1.1.3. Implement a Low Carbon Events policy	1-1.1.1. Ongoing 1-1.1.2. Ongoing 3-1.1.1. Ongoing
2. Transportation	1-1.2.1. Consider other options than ICE vehicle 1-1.2.2. Adopt fuel-efficient driving techniques 3-1.2.1. Update the fleet according to the results of the fleet review	1-1.2.1. Ongoing 1-1.2.2. Ongoing 3-1.2.1. Ongoing 10-1.2.1. Lead a strong fleet vehicle transition to EV
3. Energy consumption	1-1.3.1. Adopt an energy saving behaviour 1-1.3.2. Use LED technology (including streetlights) 3-1.3.1. Lead an energy audits 3-1.3.2. Implement the energy audits	1-1.3.1. Ongoing 1-1.3.2. Ongoing 3-1.3.2. Ongoing
4. Renewable energy	-	10-1.4.1. Investigate photovoltaic 10-1.4.2. Implement the photovoltaic feasibility study
5. 3-waters	1-1.5.1. Reduce reticulated water leaks 1-1.5.3. Reduce storm water and ground water in the sewers 3-1.5.1. Increase the rainwater collection	1-1.5.1. Ongoing 1-1.5.3. Ongoing 3-1.5.1. Ongoing
6. Waste	1-1.6.1. Compost 1-1.6.2. Recycle 1-1.6.3. Optimise the IT (especially paper prints)	1-1.6.1. Ongoing 1-1.6.2. Ongoing 1-1.6.3. Ongoing

	2021-2023 Strengthen the engagement towards Climate Change and keep reducing the emissions	2023-2033 Achieve and go beyond our targets
7. Carbon sequestration	1-1.7.1. <i>Preserve our forests</i> 1-1.7.2. <i>Lead a land assessment to increase tree planting and wetland restoration</i> 3-1.7.1. Increase afforestation 3-1.7.2. Restore wetlands	1-1.7.1. <i>Ongoing</i> 3-1.7.1. <i>Ongoing</i> 3-1.7.2. <i>Ongoing</i>
8. Communication and education	1-1.8.1. <i>Engage the staff in the carbon footprint reduction</i> 1-1.8.2. <i>Keep the council's members and staff informed</i>	1-1.8.1. <i>Ongoing</i> 1-1.8.2. <i>Ongoing</i>

Table 3: Summary of the Councils' action plan

DRAFT

2.2 Community and businesses: support low carbon behaviours and circular economy

		2021-2023 Strengthen the engagement towards Climate Change and keep reducing the emissions	2023-2033 Achieve and go beyond our targets
2. Community and businesses: support low carbon behaviours and circular economy			
<p>Action: Explore and present future opportunities for co-development of the joint Wairarapa Community Climate Change Action Plan to the three Wairarapa District Councils for their consideration.</p> <p>Explanation: Masterton District Council (MDC) is about to start the co-development of the Masterton District Climate Change Action Plan with their community. Once that plan is adopted by the Masterton District Council there will be opportunities for aligning and integrating the actions from both MDC and Ruamāhanga Action Plans into one Wairarapa wide action plan. This will provide for enabling Wairarapa wide climate action whilst still allowing the three district councils to address specific actions within their respective districts. Officers will work collaboratively on presenting the three Councils with potential options for the process and practicalities of how Wairarapa wide action plan can be developed.</p>			
1. Transportation	<p>1-2.1.1. Promote alternatives to ICE vehicles</p> <p>1-2.1.2. Promote fuel-efficient driving techniques</p> <p>1-2.1.3. Develop bike lanes</p>	<p>1-2.1.1. Ongoing</p> <p>1-2.1.2. Ongoing</p> <p>1-2.1.3. Ongoing</p> <p>10-2.1.1. Support a long-term bike hire between the five towns</p> <p>10-2.1.2. Support carpool carparks</p>	
2. Housing	<p>1-2.2.1. Promote an energy saving behaviour</p> <p>3-2.2.1. Promote healthy homes and buildings for ratepayers and businesses</p> <p>3-2.2.2. Promote renewable energies for ratepayers and businesses</p> <p>3-2.2.3. Work with the building team to increase houses' health</p> <p>3-2.2.4. Purchase and make available for the community self-assessment kits</p>	<p>1-2.2.1. Ongoing</p>	
3. Love Local	1-2.3.1. Promote locally produced food, goods and services	1-2.3.1. Ongoing	
4. Waste	<p>Solid waste emits methane which is a strong greenhouse gas (1 ton of methane has the same effect on the climate as 28 tons of carbon dioxide). It is why reducing solid waste is very important (especially food waste).</p> <p>The solid waste reduction is managed by the Regional Zero Waste Advisor; therefore, the actions are not developed in this strategy</p>		
5. Carbon sequestration	<p>1-2.5.1. Promote forest preservation and afforestation</p> <p>3-2.5.1. Support a bank seed across Wairarapa region</p>	1-2.5.1. Ongoing	

	2021-2023 Strengthen the engagement towards Climate Change and keep reducing the emissions	2023-2033 Achieve and go beyond our targets
2. Community and businesses: support low carbon behaviours and circular economy		
6. Communication and education	1-2.6.1. <i>Coordinate the Conservation week</i> 1-2.6.2. <i>Hold a Climate Change stall at local events</i> 1-2.6.3. <i>Educate the children to Climate Change</i> 1-2.6.4. <i>Watch for new scientific publications, laws, rules to keep the community informed</i> 3-2.6.1. <i>Organise the Climate Change biennial</i>	1-2.6.1. <i>Ongoing</i> 1-2.6.2. <i>Ongoing</i> 1-2.6.3. <i>Ongoing</i> 1-2.6.4. <i>Ongoing</i> 3-2.6.1. <i>Ongoing</i>

Table 4: Summary of the community and businesses' action plan

3 Coming actions

3.1 Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions

3.1.1 Councils: lead by example

Council's activities

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.1. Council's activities	
3-1.1.1. Update the Ruamāhanga Strategy	
Description	The Ruamāhanga Strategy will be updated every three years in order to follow up in the actions already done and set up another set of actions. This action also aims to keep the context and greenhouse gas inventories up to date.
Project management	Climate Change Advisor
Time frame	Every 3 years (starting May 2021)
Key Performance Indicator	The Ruamāhanga Strategy is kept updated.

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.1. Council's activities	
3-1.1.3. Implement a Low Carbon Events policy	
Description	In order to reduce the carbon footprint of the events organised by the councils, a policy will be implemented. This policy will be developed with the events managers of the councils to make sure that is suitable and that the managers will be able to use it in an appropriate way.
Project management	Event managers
Time frame	2021
Key Performance Indicator	The Policy will be written and used by 2021

Transportation

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.2. Transportation	
3-1.2.1. Update the fleet according to the results of the fleet review	
Description	The fleet vehicle will be update according to the results of the fleet review. Where possible, low carbon vehicle will be preferred (EVs, e-bike, etc). This action aims to significantly reduce the emissions coming from transport.
Project management	Fleet managers
Time frame	2020 – ongoing
Key Performance Indicator	The fleet vehicle is being updated. The emissions coming from transport are decreasing.

Energy consumption

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.3. Energy consumption	
3-1.3.1. Lead and energy audits	
Description	An expert will be contracted to lead energy audits to efficiently reduce the emissions from energy consumption.
Project management	Climate Change Advisor
Time frame	2021-2022
Key Performance Indicator	Energy audits done

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.3. Energy consumption	
3-1.3.2. Implement the energy audits	
Description	Start by the low hanging fruits. This action aims to reduce the emissions from stationary energy and reduce costs (long-term) of energy consumption.
Project management	Will depend on the actions proposed in the energy audits.
Time frame	2024 - ongoing
Key Performance Indicator	Actions are implemented and emissions from stationary energy decrease.

3-waters

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.5. 3-waters	
3-1.5.1. Increase the rainwater collection	
Description	Water treatment is a large part of the greenhouse gas emissions. In order to reduce the water consumption, the councils will install water tank to collect rainwater on their premises where possible. This water can be used in the toilets for instance.
Project management	Amenities managers
Time frame	2021 – ongoing
Key Performance Indicator	Water tanks are being installed where possible.

Carbon sequestration

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.7. Carbon sequestration	
3-1.7.1. Increase afforestation	
Description	According to the results of the land assessment, trees will be planted on suitable location in order to increase carbon reservoirs. The planting could be a community or school project.
Project management	Climate Change Advisor Parks and Reserves managers
Time frame	2022 – ongoing
Key Performance Indicator	The surface of the forests increases as well as the carbon sequestration.

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-1. Councils: lead by example	
3-1.7. Carbon sequestration	
3-1.7.2. Restore wetlands	
Description	According to the results of the land assessment, suitable wetlands will be restored in order to increase carbon reservoirs. The restoration could be a community or school project.
Project management	Climate Change Advisor Parks and Reserves managers
Time frame	2022 – ongoing
Key Performance Indicator	Wetlands are being restored and carbon sequestration increases.

3.1.2 Community and businesses: support low carbon behaviours and circular economy

Wairarapa Community Action Plan

Action: Explore and present future opportunities for co-development of the joint Wairarapa Community Climate Change Action Plan to the three Wairarapa District Councils for their consideration.

Explanation: Masterton District Council (MDC) is about to start the co-development of the Masterton District Climate Change Action Plan with their community. Once that plan is adopted by the Masterton District Council there will be opportunities for aligning and integrating the actions from both MDC and Ruamāhanga Action Plans into one Wairarapa wide action plan. This will provide for enabling Wairarapa wide climate action whilst still allowing the three district councils to address specific actions within their respective districts. Officers will work collaboratively on presenting the three Councils with potential options for the process and practicalities of how Wairarapa wide action plan can be developed.

Housing

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.2. Housing	
3-2.2.1. Promote healthy homes and buildings for ratepayers and businesses	
Description	Climate Change Advisor in collaboration with appropriate stakeholders will develop two flyers to promote healthy homes and buildings. The first flyer will be intended to ratepayers and the second to businesses. This action aims to engage the community and businesses into reducing their emissions through healthy homes and buildings.
Project management	Climate Change Advisor Communication managers
Time frame	2021
Key Performance Indicator	The flyers are done and widely known by the community and businesses.

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.2. Housing	
3-2.2.2. Promote renewable energies for ratepayers and businesses	
Description	Climate Change Advisor in collaboration with appropriate stakeholders will develop two flyers to promote renewable energies. The first flyer will be intended to ratepayers and the second to businesses. This action aims to engage the community and businesses into reducing their emissions by preferring renewable energies.
Project management	Climate Change Advisor Communication managers
Time frame	2021
Key Performance Indicator	The flyers are done and widely known by the community and businesses.

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.2. Housing	
3-2.2.3. Work with the building team to increase houses' health	
Description	Collaboratively with the team building, implements techniques that will increase the houses' health (such as mentioning certification (Homefit, Homestar) on the LIM reports).
Project management	Climate Change Advisor Building managers
Time frame	2022
Key Performance Indicator	Techniques to increase the houses' health have been investigated and implemented.

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.2. Housing	
3-2.2.4. Purchase and make available for the community self-assessment kits	
Description	These kits will allow residents and businesses to understand how their houses and/or buildings performs (heat losses, devices efficiency, etc). This will give support to the residents and businesses to make changes and increase the efficiency of their houses and/or buildings. Therefore, it will help reduce the emissions from buildings in the region.
Project management	Climate Change Advisor Library managers
Time frame	2022
Key Performance Indicator	The self-assessment kits are available for free at each library in Wairarapa Region.

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.2. Housing	
3-2.2.5. Support the Wairarapa Healthy Homes Programme	
Description	Support the Wairarapa Healthy Homes Programme (including financial support).
Project management	Group Manager, Partnerships and Operation Community Services Manager
Time frame	2021 - ongoing

Carbon sequestration

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.5. Carbon sequestration	
3-2.5.1. Support a bank seed across Wairarapa region	
Description	Provide a stand at each library for people to share their seeds. Provide a proper communication around this initiative will ensure the success of the seed bank.
Project management	Climate Change Advisor Communication managers
Time frame	2021
Key Performance Indicator	The seed bank is established.

Communication and education

3- Three-year action plan – Strengthen the engagement towards Climate Change and keep reducing the emissions	
3-2. Community and businesses: support low carbon behaviours and circular economy	
3-2.6. Communication and education	
3-2.6.1. Organise the Climate Change biennial	
Description	The Climate Change Advisor will organise the Climate Change biennial in collaboration with appropriate stakeholders. This event aims to increase the awareness, understanding and engagement of Climate Change by the community.
Project management	Climate Change Advisor Communication managers
Time frame	2022 – ongoing
Key Performance Indicator	The first biennial is held in 2022.

3.2 Ten-year action plan – Achieve and go beyond our targets

3.2.1 Councils: lead by example

Transportation

10- Ten-year action plan – Achieve and go beyond our targets	
10-1. Councils: lead by example	
10-1.2. Transportation	
10-1.2.1. Lead a strong fleet vehicle transition to EV	
Description	Following the action 3-1.2.1. <i>Update the fleet according to the results of the fleet review</i> , the councils may lead a stronger transition to EVs in order to significantly reduce their emissions.
Project management	Fleet managers
Time frame	2030

Renewable energy

10- Ten-year action plan – Achieve and go beyond our targets	
10-1. Councils: lead by example	
10-1.4. Renewable energy	
10-1.4.1. Investigate photovoltaic	
Description	The Climate Change Advisor, helped with an expert, will study the feasibility of photovoltaic on the councils' buildings and other assets (such as streetlights)
Project management	Climate Change Advisor
Time frame	2024-2025
Key Performance Indicator	Potential sites identified to install photovoltaic.

10- Ten-year action plan – Achieve and go beyond our targets	
10-1. Councils: lead by example	
10-1.4. Renewable energy	
10-1.4.2. Implement the photovoltaic feasibility study	
Description	When and where possible, the councils will transition from grid power to photovoltaic. This action aims to reduce the stationary emissions.
Project management	Amenities managers
Time frame	2026 - ongoing
Key Performance Indicator	Solar panels are being installed when and where possible.

3.2.2 Community and businesses: support low carbon behaviours and circular economy

Transportation

10- Ten-year action plan – Achieve and go beyond our targets	
10-2. Community and businesses: support low carbon behaviours and circular economy	
10-2.1. Transportation	
10-2.1.1. Support a long-term bike hire between the five towns	
Description	Alongside with the action 1-2.1.3. <i>Develop bike lanes</i> , the councils may support a long-term bike hire facility in order to increase the usage of bikes between the five towns therefore, to reduce the emissions.
Time frame	2030

10- Ten-year action plan – Achieve and go beyond our targets	
10-2. Community and businesses: support low carbon behaviours and circular economy	
10-2.1. Transportation	
10-2.1.2. Support carpool carparks	
Description	The councils may support carparks dedicated to car-poolers (especially in Featherston where people commute to Wellington).
Time frame	2030

MAY 21

GREENHOUSE GAS INVENTORY

CARTERTON DISTRICT COUNCIL - 2020



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1 Summary

Note #1: The emissions factors provided by MfE were updated in 2020. Therefore, emissions for 2018 and 2019 were updated.

Note #2: The district was in lock down level 3 and 4 between the 23rd of March 2020 and 14th May 2020 due to Covid-19 pandemic.

	Scope	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Uncertainties
CORPORATE SERVICES		13.77	14.11	15.17	15.17*
Electricity	Scope 2	3.10	2.92	3.07	*
T&D losses ¹	Scope 3	0.27	0.25	0.26	*
Transport - Diesel	Scope 1	0	0	0	*
Transport - Petrol	Scope 1	7.50	7.89	8.06	*
Transport - Flights	Scope 3	0.60	0.75	0.83	*
Office waste	Scope 3	2.30	2.30	2.95	*
Refrigerant	Scope 1	0	0	0	*
COMMUNITY SERVICES		63.70	57.99	23.14	23.14*
Electricity	Scope 2	58.67	53.41	21.31	*
T&D losses	Scope 3	5.03	4.58	1.83	*
OPERATIONS		112.73	127.31	79.43	79.43*
Electricity - Other	Scope 2	3.04	3.18	1.57	*
Electricity - Streetlights	Scope 2	64.89	49.70	20.38	*
T&D losses	Scope 3	5.82	4.35	1.88	*
Transport - Diesel	Scope 1	30.82	55.71	48.98	*
Transport - Petrol	Scope 1	8.16	14.19	6.62	*
WATER		106.68	106.56	118.33	[83.07 ; 168.28]
Transport - Diesel	Scope 1	47.82	43.42	41.30	*
Transport - Petrol	Scope 1	0	0	0	*
Water supply	Scope 3	21.64	24.97	25.55	*

¹ Transport and Distribution

Wastewater treatment	Scope 3	47.82	38.16	51.48	+/-10% activity data +/-40% CH ₄ factor +/-90% N ₂ O factor [16.22 ; 93.43]
PARKS AND RESERVES		64.04	42.32	28.89	28.89*
Electricity	Scope 2	12.63	7.95	6.57	*
T&D losses	Scope 3	1.08	0.68	0.56	*
Transport - Diesel	Scope 1	42.09	25.42	20.11	*
Transport - Petrol	Scope 1	0.74	0.77	0.78	*
Green waste - Landfill	Scope 3	7.50	7.50	0	*
Green waste - Composted	Scope 3	0	0	0.86	*
REGULATORY		12.00	10.35	11.04	11.04*
Transport - Diesel	Scope 1	6.52	5.93	2.63	*
Transport - Petrol	Scope 1	5.48	4.42	8.40	*
GROSS EMISSIONS		372.91	358.64	275.99	[240.73 ; 317.94]

* Uncertainties exist but are not quantifiable

Table 1: Emissions by business units

	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Uncertainties
Scope 1	149.12	157.74	136.89	136.89*
Scope 2	142.33	117.16	52.91	52.91*
Scope 3	81.46	83.73	86.20	[50.93 ; 128.14]
GROSS EMISSIONS	372.91	358.64	275.99	[240.73 ; 317.94]

* Uncertainties exist but are not quantifiable

Table 2: Emissions by scopes

	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020	Uncertainties
ELECTRICITY	154.53	127.21	57.44	57.44*
<i>Streetlights</i>	64.89	49.70	20.38	*
<i>Other</i>	77.44	67.46	32.53	*
<i>T&D losses</i>	12.20	10.05	4.54	*
TRANSPORT	149.72	158.49	137.71	137.72*
<i>Petrol</i>	21.87	27.27	23.86	*
<i>Diesel</i>	127.25	130.47	113.02	*
<i>Flights</i>	0.60	0.75	0.83	*
WASTEWATER	37.21	38.16	51.48	+/-10% activity data +/-40% CH ₄ factor +/-90% N ₂ O factor [16.22 ; 93.43]
WATER SUPPLY	21.64	24.97	25.55	25.55*
WASTE	9.80	9.80	3.81	3.81*
REFRIGERANT	0.00	0.00	0.00	*
GROSS EMISSIONS	372.91	358.64	275.99	[240.73 ; 317.94]

* Uncertainties exist but are not quantifiable

Table 3: Emissions by sources

	t Co ₂ e - 2018	t Co ₂ e - 2019	t Co ₂ e - 2020
GROSS EMISSIONS	372.91	358.64	275.99
Forestry (removals)	-7,237.39	-7,237.39	-7,237.39
Forestry (harvest emissions)	0.00	0.00	0.00
TOTAL	-7,237.39	-7,237.39	-7,237.39
NET EMISSIONS	-6,864.48	-6,878.76	-6,961.40

Table 4: Forestry

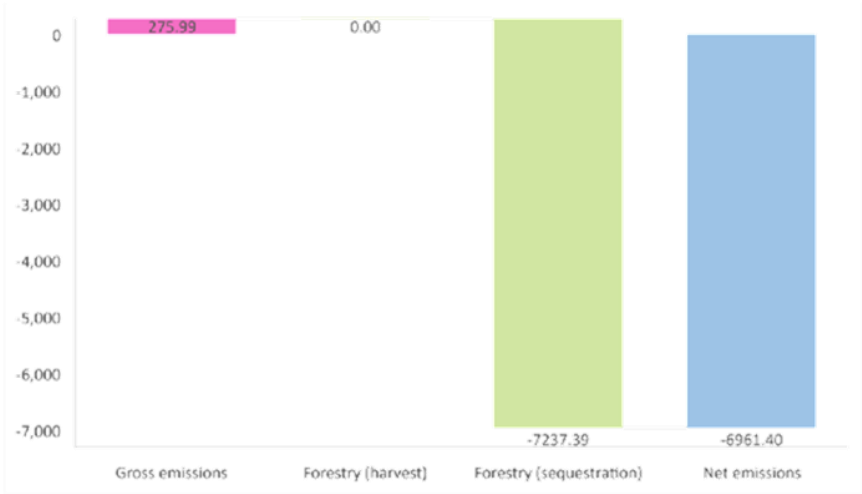


Figure 1: Gross versus Net emissions including forestry (tCO₂e)

	2018	2019	2020
Gross emissions per FTE (t CO₂e) 2018: 59.8 FTE 2019: 61.2 FTE 2020: 66.3 FTE	6.24	5.86	4.16
Gross emissions per capita (kg CO₂e) 2018: 9,440 2019: 9,690 2020: 9,888	39.50	37.01	27.91

Table 5: Emissions per FTE and per head of population

2 Introduction

This report is the annual greenhouse gas (GHG) emissions² inventory report for Carterton District Council. The inventory is a complete and accurate quantification of the amount of GHG emissions that can be directly attributed to the organisation's operations within the declared boundary and scope for the specified reporting period.

The inventory has been prepared in accordance with the requirements of the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004)* and *ISO 14064-1:2006 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*³.

3 Organisation Description

Carterton District Council (CDC) is the territorial authority for the Carterton District. CDC is located in the heart of the Wairarapa. The 30th of June 2020, CDC employed 66.3 FTEs (Full Time-Equivalent) and is responsible for water and wastewater, waste, local roads (excluding State Highway), streetlighting, parks and reserves, community facilities and performing statutory duties such as regulatory compliance.

The council is organised as shown below:

- Corporate services,
- Community services,
- Operations,
- Water,
- Parks and reserves,
- Regulatory.

² Throughout this document 'emissions' means GHG emissions.

³ Throughout this document 'GHG Protocol' means the GHG Protocol Corporate Accounting and Reporting Standard and 'ISO 14064- 1:2006' means the international standard Specification with Guidance at the Organizational Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.

4 Inventory boundaries

This inventory covers a period from January 2020 to December 2020.

4.1 Organisational boundaries

4.1.1 Organisational boundaries included for this reporting period

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2006 standards. The GHG Protocol allows two distinct approaches to consolidate GHG emissions: the equity share and control (financial or operational) approaches. We used an operational control approach to account for emissions.

This GHG inventory includes all the council's business units as shown in Figure 2: Organisational structure below.

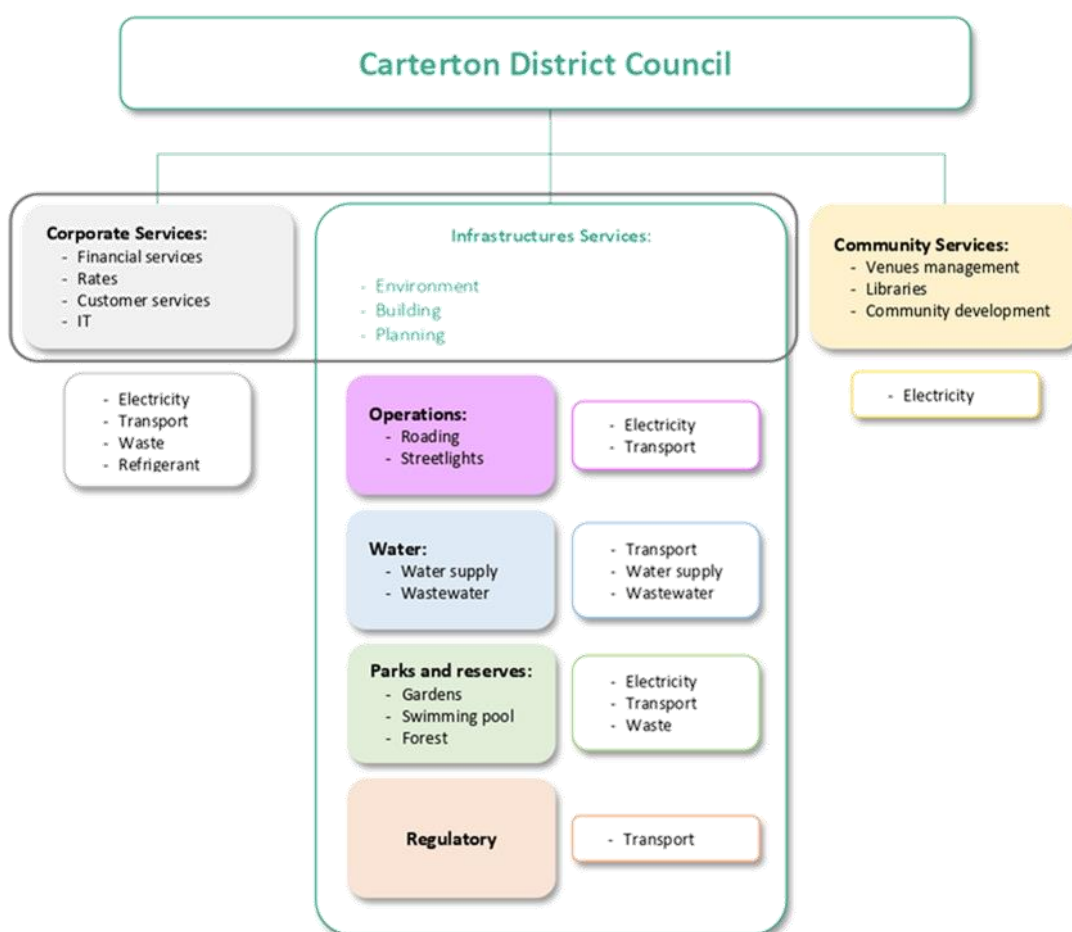


Figure 2: Organisational structure and emission sources

Environment, Building and Planning from Infrastructure services share the same building as Corporate services. Therefore, they have been aggregated under the same business unit "Corporate services".

4.1.2 Organisational business units excluded from inventory

Business unit	GHG emission source	Scope	Reason for exclusion
Community services - Properties	Electricity	Scope 2	Tenants pay their own power accounts
Operations - Waste management	Waste from the community	Scope 3	Outside of CDC operational control Contractor: Earth Care
Operations - Roading	Emissions from road maintenance	Scope 3	Outside of CDC operational control Contractor: Fulton Hogan

Table 6: Business units and GHG emission source excluded from this inventory

4.2 Reporting boundaries

4.2.1 GHG emission sources inclusions

The GHG emissions sources included in this inventory were identified with reference to the methodology in the *GHG Protocol and ISO14064-1:2006 standards*. As adapted from the *GHG Protocol*, these emissions were classified under the following categories:

- **Direct GHG emissions (Scope 1):** emissions from sources that are owned or controlled by the company (emissions from vehicles, refrigerant leaks)
- **Electricity indirect GHG emissions (Scope 2):** emissions from the generation of purchased electricity consumed by the company.
- **Other indirect GHG emissions (Scope 3):** emissions that occur as a consequence of the company's activities but from sources not owned or controlled by the company (waste, wastewater, energy transport and distribution losses, ...).

This inventory considers:

- Corporate services:
 - Electricity
 - Transport and distribution losses
 - Transport – Diesel
 - Transport – Petrol
 - Transport – Flights
 - Waste
 - Refrigerant
- Community services:
 - Electricity
 - Transport and distribution losses
- Operations:
 - Electricity – Other
 - Electricity – Streetlights
 - Transport and distribution losses
 - Transport – Diesel
 - Transport – Petrol

- Water:
 - Transport – Diesel
 - Transport – Petrol
 - Water supply
 - Wastewater treatment
- Parks and reserves:
 - Electricity
 - Transport and distribution losses
 - Transport – Diesel
 - Transport – Petrol
 - Green waste
- Regulatory:
 - Transport – Diesel
 - Transport – Petrol

4.2.2 GHG emission source exclusions

For more information, refer to Table 6: Business units and GHG emission source excluded from this inventory.

5 Data collection and uncertainties

Table 7 gives an overview of how data were collected for each GHG emissions source, the source of the data and an explanation of any uncertainties or assumptions.

A calculation methodology has been used for quantifying the emissions inventory using emissions source activity data multiplied by emission or removal factors. All emission factors (and uncertainties) were sourced from the Ministry for the Environment's 2020 *Measuring Emissions: A Guide for Organisations*.

Business Unit	GHG emission source	Scope	Data source	Data collection unit	Uncertainty (description)
Corporate services	Electricity	Scope 2	Electricity company	kWh	Low It is assumed that the meter readings were done correctly
	Transport and distribution losses	Scope 3			
Corporate services	Transport - Diesel	Scope 1	Fuel company	L	Low It is assumed that the supplier reports are complete and accurate
	Transport - Petrol	Scope 1			
	Transport - Flights	Scope 3	Finance team	Km	Low/Moderate It is assumed that the employees' reports are complete and accurate
Corporate services	Waste	Scope 3	Council officer	Kg	Moderate Estimation made by the staff in charge of the waste collection
Corporate services	Refrigerant	Scope 1	A/C company	Kg	Low It is assumed that the supplier data is complete and accurate
Community services	Electricity	Scope 2	Electricity company	kWh	Low It is assumed that the meter readings were done correctly
	Transport and distribution losses	Scope 3			
Operations	Electricity - other	Scope 2		kWh	Low

Business Unit	GHG emission source	Scope	Data source	Data collection unit	Uncertainty (description)
	Electricity - Streetlights	Scope 2	Electricity company		It is assumed that the meter readings were done correctly
	Transport and distribution losses	Scope 3			
Operations	Transport - Diesel	Scope 1	Fuel company	L	Low It is assumed that the supplier reports are complete and accurate
	Transport - Petrol	Scope 1			
Water	Water supply	Scope 3	Council officer	m ³	Low It is assumed that the data source is an appropriate representation of activities
	Wastewater treatment	Scope 3	Council officer	m ³	Low It is assumed that the data source is an appropriate representation of activities
Parks and reserves	Electricity	Scope 2	Electricity company	kWh	Low It is assumed that the meter readings were done correctly
	Transport and distribution losses	Scope 3			
Parks and reserves	Transport - Diesel	Scope 1	Fuel company	L	Low It is assumed that the supplier reports are complete and accurate
	Transport - Petrol	Scope 1			
Parks and reserves	Green waste	Scope 3	Council officer	Kg	Moderate Estimation made by the staff in charge of the green waste
Regulatory	Transport - Diesel	Scope 1	Fuel company	L	Low It is assumed that the supplier reports are complete and accurate
	Transport - Petrol	Scope 1			

Table 7: GHG emission sources, data collection and uncertainty

6 GHG emission calculations and results

6.1 Evolution of the GHG emissions

6.1.1 Base year

The first greenhouse gas inventory done for Carterton District Council was made in 2018 (January to December). It set up the baseline.

6.1.2 Evolution of the GHG emissions and significant emissions changes

Note #1: The emissions factors provided by MfE were updated in 2020. Therefore, emissions for 2018 and 2019 were updated.

Note #2: The district was in lock down level 3 and 4 between the 23rd of March 2020 and 14th May 2020 due to Covid-19 pandemic.

The gross emissions decreased by 26% between 2018 and 2020.

The emissions from the business units Corporate Services and Water Supply and Wastewater Treatment increased by 10% and 11%. The emissions from the business units Community Services, Operation Parks and Reserves and Regulatory decreased by 64%, 30%, 55% and 8%.

The scope 3 increased (6%) and scope 1 and 2 decreased (8% and 63% respectively).

The emissions from Electricity, Transport and Waste decreased (63%, 8% and 61% respectively) while the emissions coming from Wastewater and Water Supply increased (38% and 18% respectively).

Net emissions increased by almost 1.5%. Because CDC is a carbon negative organisation due to its forest, having a net emissions increase is positive (we sequestered more carbon than the previous years).

	Evolution 2018 - 2020
Corporate Services	+10.16%
Community Services	-63.68%
Operations	-29.54%
Water supply and Wastewater treatment	+10.92%
Parks and Reserves	-54.89%
Regulatory	-8.04%
GROSS EMISSIONS	-25.99%

Table 8: Changes for the emissions by business units between 2018 and 2020

	Evolution 2018 - 2020
Scope 1	-8.20%
Scope 2	-62.83%
Scope 3	+5.82%
GROSS EMISSIONS	-25.99%

Table 9: Changes for the emissions by scopes between 2018 and 2020

	Evolution 2018 - 2020
Electricity	-62.83%
Transport	-8.02%
Wastewater	+38.33%
Water supply	+18.07%
Waste	-61.16%
Refrigerant	0.00%
GROSS EMISSIONS	-25.99%

Table 10: Changes for the emissions by sources between 2018 and 2020

	Evolution 2018 - 2020
Gross emissions per FTE	-33.25%
Gross emissions per capita	-29.43%

Table 11: Changes for the emissions per FTE and per capita between 2018 and 2020

	Evolution 2018 - 2020
GROSS EMISSIONS	-25.99%
Sequestration (forest)	0%
Harvest emissions	0%
NET EMISSIONS	+1.41%

Table 12: Changes for the net emissions between 2018 and 2020

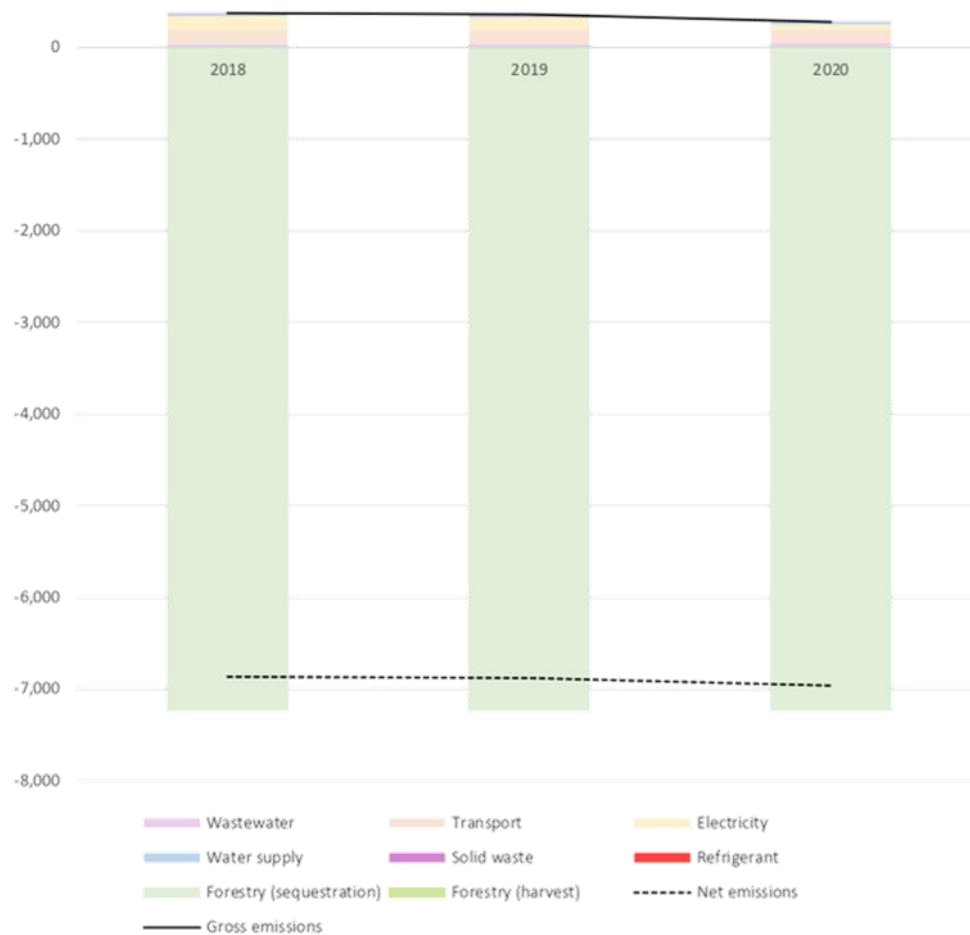


Figure 3: Annual emissions showing gross and net emissions (including forestry) since 2018

6.1.3 Evolution of the biogenic methane emissions

	2018	2019	2020	Evolution 2018 - 2020
Waste	2.30	2.30	2.95	+28%
Green waste	7.50	7.50	0.50	-93.33%
Wastewater	18.61	19.08	25.74	+38.33%
Total	28.41	28.88	29.19	+2.73%

Table 13: Biogenic methane emissions (tCH₄)

Biogenic methane from green waste was reduced due to the fact that the green waste is now being composted.

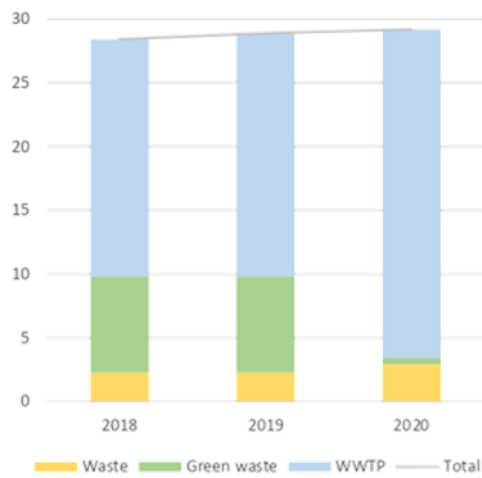


Figure 4: Biogenic methane emissions since 2018

6.2 Emissions for all seven GHGs

The seven GHG included in this inventory are:

- Carbon dioxide: CO₂
- Methane: CH₄
- Nitrous oxide: N₂O
- Hydrofluorocarbons: HFCs
- Perfluorocarbons: PFCs
- Sulfur hexafluoride: SF₆
- Nitrogen trifluoride: NF₃

	2018	2019	2020	Uncertainties
t CO₂ e	372.91	358.64	275.99	[240.73 ; 317.94]
t CO₂	315.66	301.06	214.28	214.28*
t CH₄	35.71	35.35	32.95	[21.11 ; 46.85]
t N₂O	21.55	22.22	28.76	[5.33 ; 56.81]
t HFCs	0	0	0	0
t PFCs	0	0	0	0
t SF₆	0	0	0	0
t NF₃	0	0	0	0

* Uncertainties exist but are not quantifiable

Table 14: Emissions for all seven GHGs

6.3 Gross emissions by scope, business unit and source

GHG emissions for Carterton District Council for 2020 are provided in the GHG Inventory summary section at the start of this report.

The following figures give an overview of where the gross emissions are occurring across the organisation.

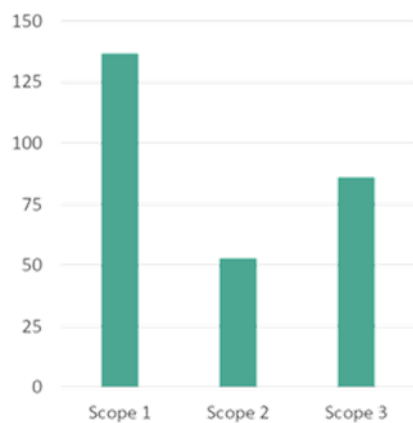


Figure 5: Gross emissions by scope (tCO₂e)

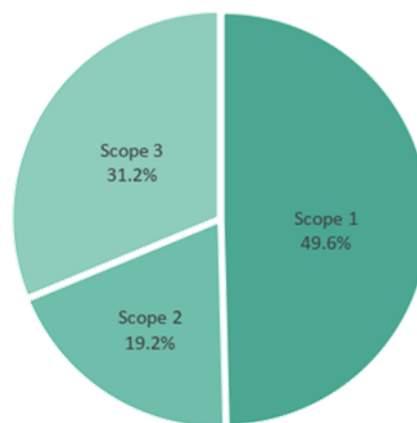


Figure 6: Gross emissions by scope (%)

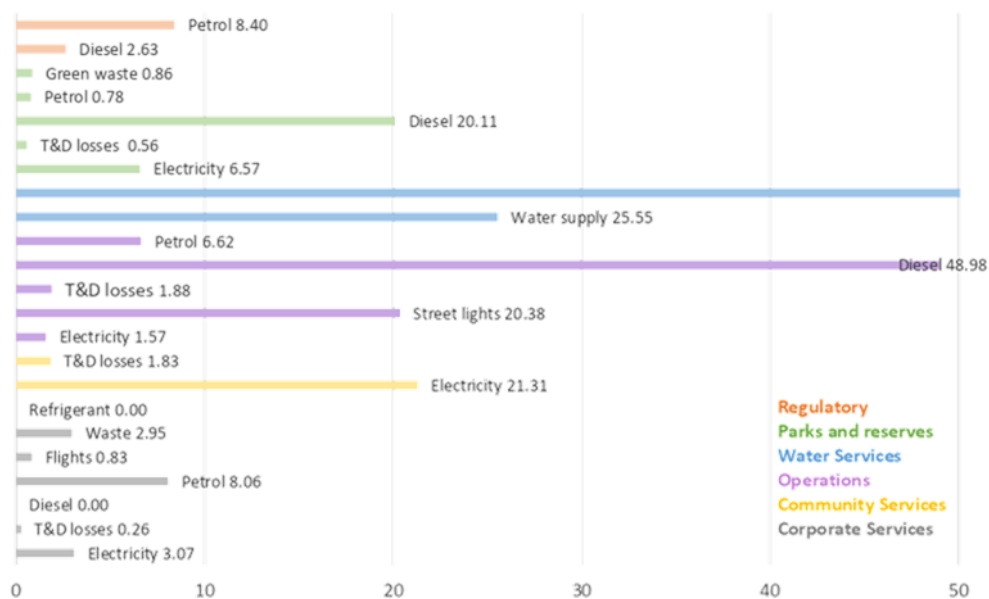


Figure 7: Gross emissions by business unit (tCO₂e)

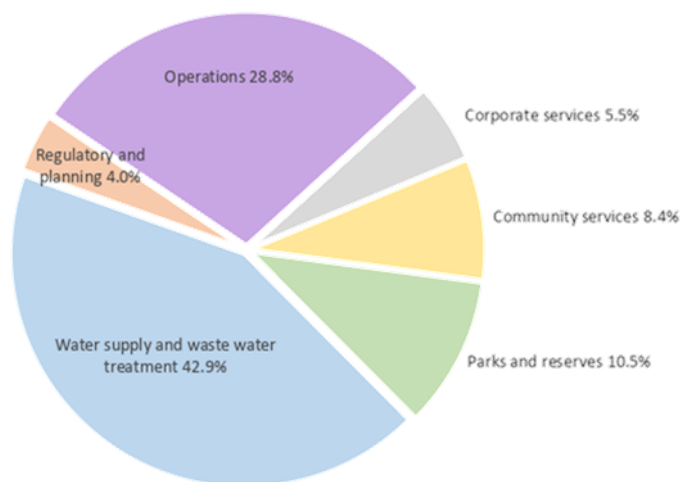


Figure 8: Gross emissions by business unit (%)

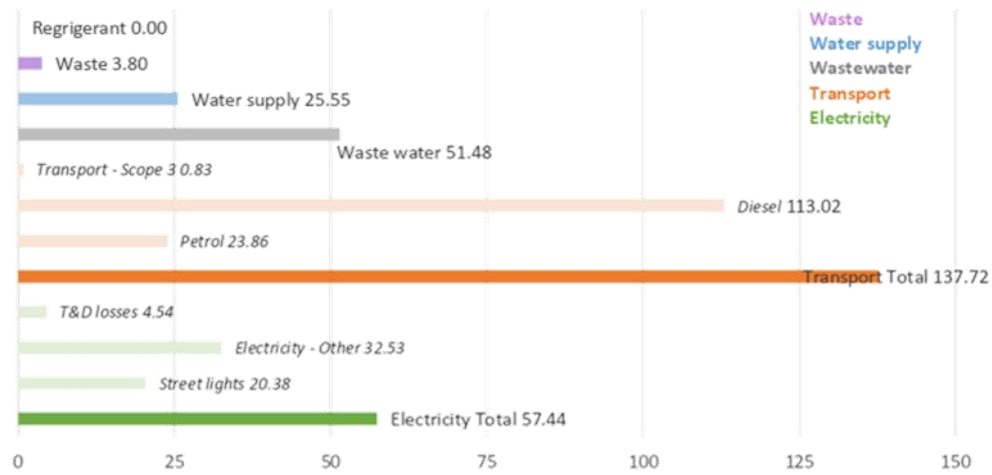


Figure 9: Gross emissions by source (tCO₂e)

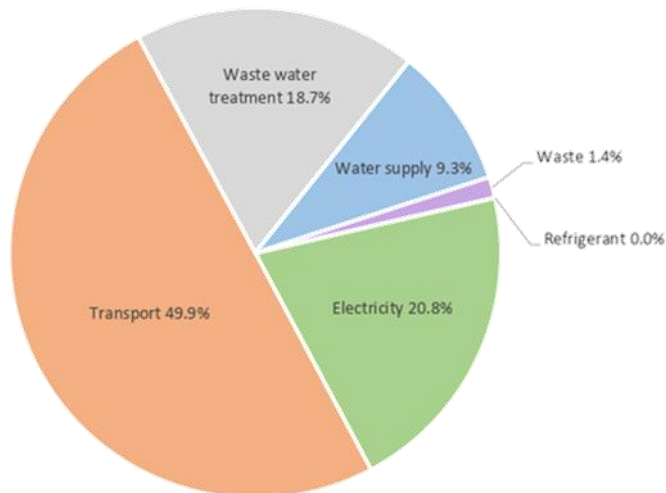


Figure 10: Gross emissions by source (%)

6.4 Emissions from biologically sequestered carbon

Carterton District Council owns a 350-ha forest in the Tararua Range which contains a net stocked area of 262.7 ha. The forest is classified as pre-1990 forest land, and consists mainly of Radiata Pine, with smaller areas of Manuka and cypress:

- Planted forest:
 - Radiata Pine – growth: 212.2 ha
 - Radiata Pine – old: 22.9 ha
 - Cypress – growth: 1.6 ha
- Natural forest:
 - Manuka – Regenerating: 26 ha

There was no harvesting in 2020.

		Units	t CO ₂ e	t CO ₂	t CH ₄	t N ₂ O
Planted forest	Growth	213.8 ha	-7,227.94	-7,227.94	n/a	n/a
Natural forest	Regenerating	26 ha	-9.46	-9.46	n/a	n/a
	Tall	0 ha	0	0	n/a	n/a
Harvest emissions	Planted forest	0 ha	0	0	n/a	n/a
	Native forest	0 ha	0	0	n/a	n/a
TOTAL			-7,237.39	-7,237.39	n/a	n/a

Table 15: Total CO₂ sequestered and emitted by forestry in 2020

7 Liabilities

7.1 GHG stocks held

HFCs, PFCs and SF₆ represent GHGs with high global warming potentials. Their accidental release could result in a large increase in emissions for the reporting period. Therefore, any GHG stocks are included in the greenhouse gas emissions inventory to identify significant liabilities and implement procedures for minimising the risk of their accidental release.

HFCs, PFCs and SF₆ represent GHGs with high global warming potentials. Their accidental release could result in a large increase in emissions for that year, and therefore the stock holdings are reported in this inventory (Table 16: HFCs, PFCs and SF₆ held by CDC).

Source	Amount held – January 2020	Amount held – December 2020	Potential liability
R410-A	39.1 kg	39.1 kg	81.6 tCO ₂ e
R32	1.27 kg	1.27 kg	0.9 tCO ₂ e
TOTAL			82.5 tCO₂e

Table 16: HFCs, PFCs and SF₆ held by CDC

7.2 Land-use change

Organisations that own land subject to land-use change may achieve sequestration of carbon dioxide through a change in the carbon stock on that land. If a sequestration is claimed, this also represents a liability in future years should fire, flood or other management activities release the stored carbon.

Land-use change has been included in this inventory. CDC owns a 213.8 ha of growing planted forest (mainly Radiata pine), 22.9 ha of old planted forest (Radiata pine) and 26 ha of natural forest (Manuka). The potential liability of the land-use change is 245,606.7 tCO₂e.

	t CO ₂ e	t CO ₂	t CH ₄	t N ₂ O
Carbon emission (deforestation) – Planted forest	224,061.4	224,061.4	n/a	n/a
Carbon emission (deforestation) – Native forest	21,545.3	21,545.3	n/a	n/a
TOTAL	245,606.7	245,606.7	n/a	n/a

Table 17: Potential liability of the land-use change

8 Methodology and references

8.1 Methodology

To do the greenhouse gas inventory, Carterton District Council used the Interactive Workbook made by the Ministry for Environment.

It is possible to download it here: <https://www.mfe.govt.nz/consultation/interactive-workbook-download>

We simply had to input our activity data (such as litres of fuel used, or kWh consumed) in this workbook to measure our greenhouse gas emissions.

This greenhouse gas inventory was made with the factors available in April 2021.

8.2 References

Measuring Emissions: A guide for Organisations – MfE, 2020

The Greenhouse Gas Protocol: A corporate accounting and reporting standard – World Business Council for Sustainable Development and World resources Institute, 2004 (revised)

ISO14064-1:2018. Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals – International Organization for Standardization, 2018 (revised)

Disclaimer:

The information in this greenhouse gas inventory is true and complete to the best of our knowledge. The calculation method used (MfE workbook and MfE factors), the inclusions and exclusions of this inventory may be different from other inventories and can explain the differences. The author and publisher disclaim any liability in connection with the use of this information.



7.8 LGNZ REMIT: PUPPY FARMING

1. PURPOSE

For the council to consider supporting a remit to the Local Government New Zealand Annual General Meeting on “puppy farming”.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

Porirua City Council has invited Carterton District Council to support a remit it is proposing for consideration at the Local Government New Zealand Annual General Meeting in July. The remit must be received by LGNZ by the 14 May, for inclusion in the AGM agenda. Any remits submitted must be supported by other Councils to be accepted for consideration.

4. DISCUSSION

The remit and supporting information, received by Porirua City Council, is in **Attachment 1**. The attachment outlines the issues relating to “puppy farming”, and the actions Porirua City Council wishes LGNZ to carry out, which is advocating to the Government to introduce “puppy farming” legislation to reform the dog breeding and pet shop industries and “better regulate the sale of dogs and puppies”.

5. OPTIONS

The Council can choose to either support the remit, or not. If the Council supports, the remit Carterton District Council will be named on the LGNZ AGM agenda as one of the supporting Councils.

If the Council decides not to support the remit, it can still vote in favour of it if it gets onto the AGM agenda.

6. NEXT STEPS

The decision of the Council will be reported to the Mayor of Porirua City Council.

7. CONSIDERATIONS

7.1 Climate change

The contents of the proposed “puppy farming” remit do not have any impacts on climate change.

7.2 Tāngata whenua

There are no issues of specific significance to tāngata whenua.

7.3 Financial impact

The subject of the remit, including the request to the government for future regulation of dog breeders, may have financial implications for local government, although at this time it is not certain if Councils will be involved with administering any future regulation.

7.4 Community Engagement requirements

There is no requirement to engage the community on whether the proposed remit should be supported. If the remit passes at the LGNZ AGM and is taken up by the government, there is likely to be public consultation through usual government processes.

7.5 Risks

There are no quantifiable risks related to this decision.

8. RECOMMENDATION

That the Council:

1. **Receives** the report.
2. **Agrees** to support Porirua City Council's proposed "puppy farming" remit to the AGM of Local Government New Zealand.

File Number: 127565

Author: Jane Davis, Chief Executive

Attachments: 1. PCC Proposed "Puppy Farming" Remit [↓](#)



Ref: LGNZ Policy Remit – Puppy Farming
Mayor Anita Baker
Mayor@porirua.govt.nz
04 237 5089

Mayor Greg Lang
Carterton District Council
Via email: mayor@cdc.govt.nz

27 April 2021

Dear Greg

Re: LGNZ Policy Remit Regarding Puppy Farming

During the recent review of our Dog Control Bylaw and Policy, the issue of puppy farming was raised as a matter of concern to our Council by two of my councillors. After seeking advice, we were advised that to implement any solution to this issue under the current legislation would be ultra vires.

The councillors proposed a remit to seek intervention from Government to change the legislation and ban the practice of 'puppy farming' was approved at a meeting of our Council on 1 April 2021. This remit is attached.

We are now seeking the support of four other councils, to enable the inclusion of this remit at the LGNZ AGM in July. We would appreciate if you could please put this remit in front of your council for their support.

Please feel free to contact me should you have any questions,

Ngā mihi

A handwritten signature in black ink, appearing to read 'Anita Baker', written over a light blue horizontal line.

Anita Baker
Mayor of Porirua City

Porirua City Council
PO Box 50218
Porirua 5240

04 237 5089
enquiries@porirua.govt.nz
porirua.govt.nz

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REMIT TO LGNZ

That LGNZ request the Government to introduce 'Puppy Farm' legislation to reform the dog breeding and pet shop industries in New Zealand and better regulate the sale of dogs and puppies.

Proposed by: Porirua City Council
Supported by: Carterton District Council

BACKGROUND INFORMATION AND RESEARCH

1. Nature of the issue

The sale of puppies has increased dramatically around the country with high prices being paid for sought after breeds. Around the country, investigations have uncovered squalid backyard operations with multiple dogs living in shocking conditions. Irresponsible breeding has resulted in genetic deformities. Mother dogs used for breeding are often subjected to multiple, consecutive pregnancies until they are of no longer use.

Many of these genetically deficient puppies are being used for breeding as they age, further adding to the problem with dogs often not showing signs of health conditions, (requiring costly veterinary treatment), until they are older.

2. Background to its being raised

Nationally, Dog Control and SPCA Officers have noticed increasing numbers of backyard breeding being undertaken as a money maker for unscrupulous breeders. Several breaches of the Animal Welfare Act have been detected concerning the housing, feeding and general care of the dogs concerned.

Some breeders cater to the popular dog of choice and in many communities around the country, this can be a menacing dog type or mix of a menacing dog type, with significant behavioural issues and the physical power to cause serious harm to people or other animals.

The issue is also observed in Australia with the State of Victoria adopting the Domestic Animals Amendment (Puppy Farms and Pet Shops) Act 2017. This Act addresses the following:

- limits the number of fertile female dog breeders can keep
- restricts pet shops to selling dogs and cats sourced from shelters, pounds or enrolled foster carers
- clarifies the role of foster carers
- defines 'recreational breeders' and 'microbreeders'
- confirms the definition of 'farm working dogs'
- introduces an animal sale permit system
- improves traceability of dogs through the establishment of a Pet Exchange Register
- strengthens pet advertisement offences.

In the absence of national legislation, territorial authorities such as Porirua City Council are unable to regulate the industry. Bylaws cannot trump legislation within an Act and as such requiring breeders to register puppies from breeding programmes would be 'ultra vires' to the requirement of age (3 months) for the registration of dogs under the Dog Control Act 1996. Bylaws can mitigate risk at a local level but do not provide national consistency.

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**3. New or existing policy**

This is a new policy

4. How the issue relates to objectives in the current Work Programme

This aligns to the LGNZ Three Year Business Plan (2019/20-2021/22), that recognises quality and community safety as a key social issue, with social issues being one of the five big issues for New Zealand councils. Specifically, the commitment to 'work alongside central government and iwi to address social issues and needs in our communities, including a rapidly growing and an ageing population, inequality, housing (including social housing) supply and quality, and community safety.

5. What work or action on the issue has been done on it and the outcome

As far as Porirua City Council is aware, Central Government has no plan to develop legislation or guidance for this issue.

As New Zealand-wide complaints and investigations continue to escalate about the poor practise of some breeders involved in puppy farming, a national approach is needed to make any substantive progress on regulating the industry.

6. Any existing relevant legislation, policy or practice

The Animal Welfare Act 1999 is currently the only legislative tool at the disposal of enforcement officers (mainly SPCA officers) and deals with animal welfare conditions. It does not adequately address specifics of dog 'puppy farm' breeding programmes, breeding female numbers etc.

7. Suggested course of action envisaged

That LGNZ calls on the Government to develop and implement national legislation to achieve national consistency for the unregulated 'puppy farming' industry in New Zealand.
It is suggested that LGNZ engage directly with relevant ministers and ministries to ensure Local Government has an appropriate role in the development of nationally consistent legislation.



7.9 LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT REQUESTS

1. PURPOSE

To inform the Council of the number of requests under the Local Government Official Information and Meetings Act (LGOIMA) 1987 received between 9 March and 6 May 2021.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

The Local Government Information and Meetings Act (LGOIMA) allows people to request official information held by local government agencies. It contains rules of how such requests should be handled and provides a right to complain to the Ombudsman in certain situations. The LGOIMA also has provisions governing the conduct of meetings.

The purpose of the Act is to increase the availability of official information held by agencies and promote the open and public transaction of business at meetings.

The purpose of LGOIMA are specified in Section 4:

4 Purposes

The purposes of this Act are, consistently with the principle of the Executive Government's responsibility to Parliament, -

(a) to increase progressively the availability of official information to the people of New Zealand in order -

(i) to enable their more effective participation in the making and administration of law and policies; and

(ii) to promote the accountability of Ministers of the Crown and officials, -

And thereby to enhance respect for the law and to promote the good government of New Zealand:

(b) to provide for proper access by each person to official information relating to that person:

(c) to protect official information to the extent consistent with the public interest and the preservation of personal privacy.

The information is not limited to documentary material, and includes material held in any format such as:

- written documents, reports, memoranda, letter, notes, emails and draft documents
- non-written documentary information, such as material stored on or generated by computers, including databases, video or tape recordings
- information, which is known to an agency, but which has not yet been recorded in writing or otherwise (including knowledge of a particular matter held by an officer, employee or member of an agency in their official capacity)
- documents and manuals which set out the policies, principles, rules or guidelines for decision making by an agency
- the reasons for any decisions that have been made about a person.

It doesn't matter where the information originated or is currently located, if it is held by the council it must be provided if requested.

Councils must respond to a requester 'as soon as reasonably practicable' and no later than 20 working days after the day on which the request was received. At Carterton District Council we acknowledge receipt of the request within the first working day. We respond promptly to requests and generally well ahead of the 20 working days.

Where a person requesting the information indicates urgency, we normally prioritise our response ahead of other work. This mainly relates to requests from the Media. Note: not all media requests for information are treated as LGOIMA requests.

All requests are recorded in a register and saved in Magiq Documents.

4. REPORTING LGOIMA REQUESTS TO COUNCIL

Attachment 1 contains the requests received from 9 March to 6 May 2021.

Included is the subject of the request, the response time and the number of requests over the period. As at 6 May 2021, we have six open requests.

During this period there were five email requests received that were captured as Spam. These requests were retrieved once the issue was discovered and this delay was explained to the submitters affected.

5. CONSIDERATIONS

5.1 Climate change

n/a

5.2 Tāngata whenua

n/a

5.3 Financial impact

There is no financial impact.

5.4 Community Engagement requirements

There are no community engagement requirements.

5.5 Risks

Nil.

6. RECOMMENDATION

That the Council:

1. **Receives** the report.

File Number: 127444

Author: Jane Davis, Chief Executive

Attachments: 1. LGOIMA Requests received for the period covering 9 March - 6 May 2021 [↓](#)

Requests Received	Responses to requests	Requests resulting in a complaint to ombudsman	Average number of working days to respond
29	23	0	10.3

Date Received	Organisation	Subject	Working Days to respond	Total per month
27 Jan		Good morning, I am writing to ask a question about the new developments down on Ashmore Park Road and Fantail Avenue, south of Brooklyn Road. The plans for both developments seem to allow for a pedestrian walkway between the Ashmore Park development and the Fantail/Hartley/Endelave development. This is something I would encourage as Carterton would definitely benefit from more pedestrian access routes. In particular the plans show a gap between 4 Fantail Avenue and 6 Fantail Avenue, and this also shows up on the Local Maps linked to from the CDC website. However, as those houses are currently being built (and the properties fenced) this does not appear to be being honoured. Do you know if providing a pedestrian walkway was a requirement of these developments? Do you know who owns the strip of land between 4 and 6 Fantail Avenue? It currently seems to display as roading rather than being included in a section. Regards, Thomas Beagle	5	1
12 March	Otago Business School - Otago University	<p>So, our revised request is for the following information.</p> <ul style="list-style-type: none"> An extract from your financial system of all costs that relate to “professional services” (a definition of what we consider professional services is below) for the past three years. 1 July 2017 to 30 June 2020. Details to be included – <ul style="list-style-type: none"> Consultant/contractor name Amount Date Service procured – invoice details or whatever is in your financial system is sufficient. I do not want to create a need for data manipulation outside of your system A copy of any procurement policy you have. <p>If any of this request requires manipulation of the data outside of your financial system, then please provide us with what you have and specify what components of this request you could not comply with. We need to get our students thinking about the data and how they can normalise it to be comparable anyways.</p>	20	
15 March		<p>I am writing to request information under the Local Government Official Information and Meetings Act with regards to Carterton’s urban water supply and the recent Urgent Boil Notice issued on Friday 12th March initially for 24 hours and then extended to Monday 16th March.</p> <p>Specifically, I am requesting the following information:</p> <ul style="list-style-type: none"> - The council procedures for notifying the public of public health issues including E Coli in the urban water supply. - Communication between council staff and elected representatives about the detection and notification of E Coli in the urban water supply. - What steps council took to advise Carterton Urban residents of the initial Urgent Boil notice and the subsequent extension. - Communication between council and the public health board regarding the event and the required extension of the boil notice. - E Coli results for the Carterton Urban Water Supply from 1 December 2020 until the lifting of the Boil Notice. <p>Our family and friends in Carterton did not receive or see any notification of an urgent boil notice until late Saturday evening. I walked the length of the town on Sunday morning and observed the following:</p> <ul style="list-style-type: none"> - No notices on the Carterton District Council Building - No notices on the Carterton Events Centre/Information Centre - No notices at the Police Station, Fire Station, or Carterton Medical Centre - One A3 notice in Green and Yellow in the top left entrance window to New World. - One A4 notice in Green and Yellow in the top left window of Café 42 - No other notices in any business in Carterton. - The Carrington Park community sign did have a message however the sign is faulty (second line is unreadable even close up) and the green illumination is unable to be seen during daylight driving South and completely obscured driving North. - No notices on public water fountains in Carrington Park, they were working. - No notices on the public toilets at Carrington Park. - No signs entering the Carterton Urban area via SH2 from the North or South. 	18	

Date Received	Organisation	Subject	Working Days to respond	Total per month
		If you have any questions about the information requested, please contact me as soon as practical. As a rate payer I receive all rates demands via email, all water supply consumption invoices via email and dog control has email and mobile numbers listed for us. Any of these methods would have provided an immediate notification to ourselves and our friends. None of these methods appear to have been used to advise a public health emergency with the urban water supply.		
15 March		Under the Official Information Act 1982 I request the results of the most recent test for nitrates in the bore water supply operated by the Carterton District Council. Please reply acknowledging recent of this request.	1	
17 March		I've been looking back at previous LTPs. The 2012-22 final adopted plan on page 81 under Water Supply states that a "demand management strategy has been developed". Can you please send me a copy of that strategy or point me to where I can find it.	12	
18 March	Stuff NZ	I'm writing to request the following information under the Local Government Official Information and Meetings Act 1987: How many unformed legal roads (aka paper roads) are there in the larger Wellington region? Whereabouts, by suburb, are these unformed legal roads? What is the total land mass they cover? Are there currently plans to develop any of these unformed legal roads into traditional residential roads? How many unformed legal roads have been developed into traditional residential roads over the last five years? Please let me know if you require clarity about any of these questions - or feel free to redirect my query if it has come to the wrong place.	11	
22 March		I'm emailing to make a Local Government Official Information and Meetings Act request. I'm hoping you can provide a bit of data about dog attacks and prosecutions under the Dog Control Act. Could you please provide the following information (broken down by year where possible): <ul style="list-style-type: none"> • Since 1998, how many dog attacks (against animals or humans) have been reported to the Council? • How many of the reported dog attacks have resulted in a prosecution against the dog's owner under s 57(1) of the Dog Control Act? • How many of those prosecutions have resulted in convictions under s 57(1)? • How many of the prosecutions resulted in dog destruction orders under s 57(3) of the Dog Control Act? • How does your Council Animal Control function decide whether a dog's owner should be prosecuted under s 57 of the Dog Control Act? • When conducting Dog Control Act prosecutions, does your Council use in-house legal counsel, or employ external counsel? I've prepared a spreadsheet (attached) which you can use to enter the requested data. The cells highlighted in green are the one's I'd like you to fill out. If you're after any clarification, or if there's anything you want to discuss, please feel free to contact me. You can reach me at 027 828 4285.	5	
22 March	Reset Group	We would like to request geospatial data on your council's three waters infrastructure under the Local Government Official Information and Meetings Act 1987. We would like to receive the following data: 1) Operational drinking water pipes 2) Operational wastewater pipes We would prefer that this data was supplied in an ESRI format if at all possible. If this information is available as part of your council's open data initiatives, then we would greatly appreciate it if you could email us the web address for the data.	11	
24 March		I wish to make a request under the Local Government Official Information and Meeting Act 1987 for the following information. I wish to know what properties in the Carterton District that are exempt from paying Rates	16	

Date Received	Organisation	Subject	Working Days to respond	Total per month
26 March		<ol style="list-style-type: none"> The number of residential swimming pools within Council boundaries as at 1st January 2014. The number of residential swimming pools within Council boundaries as at 1st January 2017. The number of residential swimming pools within Council boundaries as at 1st January 2020. The number of residential swimming pools within Council boundaries that had a pool inspection conducted on them between 1st January 2014 and 31st December 2016. The number of residential swimming pools within Council boundaries that did not have a pool inspection conducted on them between 1st January 2014 and 31st December 2016. The number of residential swimming pools within Council boundaries that failed a pool inspection conducted on them between 1st January 2014 and 31st December 2016. The number of residential swimming pools within Council boundaries that had a pool inspection conducted on them between 1st January 2017 and 31st December 2019. The number of residential swimming pools within Council boundaries that did not have a pool inspection conducted on them between 1st January 2017 and 31st December 2019. The number of residential swimming pools within Council boundaries that failed a pool inspection conducted on them between 1st January 2017 and 31st December 2019. The number of residential swimming pools within Council boundaries that failed a pool inspection conducted on them between 1st January 2017 and 31st December 2019 that had passed the most recent previous pool inspection conducted prior to 2017. For the residential swimming pools within Council boundaries that failed a pool inspection conducted on them between 1st January 2017 and 31st December 2019 that had passed a previous pool inspection conducted before 2017, provide the following additional information: <ol style="list-style-type: none"> Number that had made consented changes to the circumstances of the pool Number that had made unconsented changes to the circumstances of the pool Number that had no changes to the circumstances of the pool <p>For the purposes of providing information to meet this request, the expression “pool inspection” means any inspection, audit or other review of a residential swimming pool that would meet the statutory obligations required of Council under the legislation that came into effect from January 2017.</p>	19	
26 March	NZ Taxpayers Union	<ul style="list-style-type: none"> How many requests for financial information made by both the public and councillors were turned down or postponed beyond a four-week wait during the tenure of Jane Davis by the CEO and her office? Is the waste water treatment plant in Kapiti currently over budget and behind schedule? <ol style="list-style-type: none"> If so, by how much is it over budget? If so, how far is it behind schedule If so, whose initiative was the project If so, what role did Jane Davis play in the project, if any? <p>We do not wish to cause unnecessary expense or burden for your agency. Should clarification be required, please call or email. Similarly, if a request proves unnecessarily burdensome in form and we are likely to be able to adjust that request to be more specific or better suited to your information systems without losing the benefit of what is sought, please get in touch. If there is likely to be a delay in the assembly or provision of some of the information requested, please provide the balance as it becomes available.</p> <p>To avoid unnecessary printing and postage costs, we ask that you send a confirmation of receipt, the response and any other correspondence related to this email address. Please refer to “LGOIMA Request CC” in the subject line.</p>	13	

Date Received	Organisation	Subject	Working Days to respond	Total per month
29 March	NZ Taxpayers	<p>We request the following information:</p> <ul style="list-style-type: none"> The submission you made to Climate Change Commission Which advisors or consultants, if any did you use in relation to your submission? If you did use advisors or consultants, how much did you pay for their services? <p>We do not wish to cause unnecessary expense or burden for your agency. Should clarification be required, please call or email. Similarly, if a request proves unnecessarily burdensome in form and we are likely to be able to adjust that request to be more specific or better suited to your information systems without losing the benefit of what is sought, please get in touch. If there is likely to be a delay in the assembly or provision of some of the information requested, please provide the balance as it becomes available.</p> <p>To avoid unnecessary printing and postage costs, we ask that you send a confirmation of receipt, the response and any other correspondence related to this email address. Please refer to “CCC submission” in the subject line.</p>	5	
30 March	Massey University	<p>Dear Sir or Madam Official information request: charging for Local Government Official Information and Meetings Act requests Please supply the following information under the Local Government Official Information and Meetings Act (LGOIMA): 1. Does your organisation have a policy or guidelines in relation to charging requestors for supplying information under the LGOIMA? 2. If yes, please supply a written copy of the policy/guideline, including grounds for seeking costs for supplying information, charges for photocopying, scanning or other copying of information and the hourly rate for staff time in compiling LGOIMA requests? 3. If not, what does your organisation charge for photocopying, scanning or other copying of information and what is the hourly rate for staff time in compiling requests under the LGOIMA? In the 12 months from 01 January 2020 to December 31, 2020: 4. How many requests for information under the LGOIMA did your organisation receive? 5. Of these, in how many was the requestor advised that they would incur charges for copying and staff time, or any other reason? 6. In how many of these, did the requestor pay the required charge for supplying of information? 7. In total, how much did your organisation receive in payments for supplying information under the LGOIMA? 8. What were the largest 10 amounts paid by requestors in charges for fulfilling LGOIMA requests? If you need any more information from me, please let me know as soon as possible.</p>	20	
31 March		<p>I noticed in the supporting documentation for the ten-year plan consultation that provision has been made for a \$400000 loan to Wairarapa Water to help with consenting if needed.</p> <p>I was wondering if you could provide the following information to help me understand the proposal.</p> <ul style="list-style-type: none"> How long would the loan be for? Will CDC be charging an interest rate higher than the rate CDC can borrow money? Are there provisions for the loan to be paid back if the consent is declined? If the consent is approved, when does Wairarapa Water Ltd have to pay the loan back by? How much money has Carterton District Council contributed to Wairarapa water (or previous entities associated with the dam proposal) over the last 15 years? 	20	13
6 April		<p>Official Information Questions: 1. Total external legal spend. What was your total spend on external legal service fees & service providers in the years ended 30 June 2019 and 30 June 2020 respectively? 2. Amount incurred with each legal service provider (professional service providers IE- firms) also include suppliers such as “Brookers” (above \$5k) 3. For each of the years ended 30 June 2019 and 30 June 2020: (a) Legal team staffing numbers Headcount: how many lawyers were employed or engaged in a legal role by your organisation during each year: FTE lawyers: if different, how many full-time equivalent (FTE) such lawyers? (b) Non-legal staff in legal team/law department Headcount: how many non-legal staff were employed or engaged during each year in the legal team or otherwise directly associated with or supporting the legal staff in 3(a) above: FTE non-legal staff: if different, how many FTE such staff? 4. Total internal legal spend. In each year ended 30 June 2019 and 30 June 2020 what was your: Direct total investment on internal legal services, including all salaries & service providers?: The additional indirect costs of internal legal services? 5. Chief Legal Officer reporting. At what organisational level does your most senior lawyer report? ORGANISATIONAL FIGURES 6. Total staff numbers. In total, how many of the following were employed or otherwise utilised by your organisation as at 30 June 2019 and 30 June 2020 respectively? A) Total employees/staff in whatever capacity if different, the full-time equivalent (ie FTE) number of all such employees/staff 7. Total amount of legal “matters” outsourced to external providers for the organisation as at 30 June 2019 and 30 June 2020 respectively?</p>	21	

Date Received	Organisation	Subject	Working Days to respond	Total per month
7 April	New Zealand Taxpayers Union	<p>This is a request for Official Information under the Local Government Official Information and Meetings Act of 1987 in relation to the Carterton Clock Tower.</p> <p>We request the following information:</p> <ul style="list-style-type: none"> Please provide a breakdown of the following costs associated with the Carterton clock tower: <ul style="list-style-type: none"> Earthquake strengthening Repainting Mechanical repairs How much are the 'community lounge' upgrades associated with the grounds around the clock tower (such as landscaping or construction) estimated to cost? How confident was the council in the validity of the clock tower colour vote? <p>We do not wish to cause unnecessary expense or burden for your agency. Should clarification be required, please call or email. Similarly, if a request proves unnecessarily burdensome in form and we are likely to be able to adjust that request to be more specific or better suited to your information systems without losing the benefit of what is sought, please get in touch. If there is likely to be a delay in the assembly or provision of some of the information requested, please provide the balance as it becomes available.</p> <p>To avoid unnecessary printing and postage costs, we ask that you send a confirmation of receipt, the response and any other correspondence related to this email address. Please refer to "clock tower" in the subject line.</p>	13	
7 April	New Zealand Taxpayers Union	<p>We request the following information:</p> <ul style="list-style-type: none"> How many undisclosed settlements occurred since Jane Davies became CE? How much did these undisclosed settlements cost in total? How many of these undisclosed settlements were directly related to the CE? Please provide a breakdown of the bonuses paid to councilors in 2020 How much was the settlement in relation to the Smith/Holdbrook case. If you won't reveal how much, why? Who within the council received performance bonuses in 2020? <p>We do not wish to cause unnecessary expense or burden for your agency. Should clarification be required, please call or email. Similarly, if a request proves unnecessarily burdensome in form and we are likely to be able to adjust that request to be more specific or better suited to your information systems without losing the benefit of what is sought, please get in touch. If there is likely to be a delay in the assembly or provision of some of the information requested, please provide the balance as it becomes available.</p> <p>To avoid unnecessary printing and postage costs, we ask that you send a confirmation of receipt, the response and any other correspondence related to this email address. Please refer to "council payments" in the subject line.</p>	9	
14 April		Hi Can I please get a copy of the traffic management plan that was used for the cycle race on Longbush Rd on 15 Jan.	4	
15 April		<p>I'm in a meeting of the Hoeke/Snake Gully residents.</p> <p>A friend yesterday went into CDC and asked for a copy of the full and complete LTP and was told it was available on line.</p> <p>Sadly we have searched your web site and can't seem to find a copy of a "complete and detailed plan" of the "CDC 2021 - 2 LTP" showing details of the financials.</p> <p>Please treat this as a Local Government Official Information Act Request and provide me with a copy on Friday 16 April 2021 that Chris and I might be able to finalise our submission on the LTP ahead of the 19 April noon deadline.</p>	1	
19 April		<ol style="list-style-type: none"> Can you please provide a full financial cost breakdown(incurring and projected) of the WWTP upgrade inclusive of the initial consent acquisition process and subsequent Stages 1, 2, 3 through to commissioning of the plant, including all physical works cost variations (as advised to the governance team)? What are the projected ongoing costs annually to run the WWTP? What is the projected completion date, allowing for commissioning & testing? 	0	

Date Received	Organisation	Subject	Working Days to respond	Total per month
19 April		<p>I am making the following Official Information request for information that is either held or should be held by the Carterton District Council. The information I seek is as follows:</p> <ol style="list-style-type: none"> 1. The total estimated cost of repairs to the High Street clocktower at the time the proposal was considered and approved by the Carterton District Council. 2. The date of this approval. 3. The most recent estimate of the final cost of repairs to the clock tower - either reported to the Council or held by management. 4. The estimated cost of beautification works proposed for the area surrounding the clock tower. 5. The original estimated cost of the development of the sewerage works project and the date of this estimate as reported to and considered by the Council in making the decision to proceed. 6. The latest estimate of the projected final cost of the sewerage development project either as reported to Council in project management accountability reports or held by management. <p>In addition, I seek some information to assist in my consideration of the 10 year plan as follows:</p> <ol style="list-style-type: none"> 1. The estimated cost for infrastructure developments associated with the proposed eastern expansion of the town. 2. The proportion of such costs to be met by developers. 3. The proportion of such costs that will be met by ratepayers. 4. The estimated cost of the proposed redevelopment of the service centre from Holloway Street to Dalefield to accommodate the parking proposal. This should detail the capital cost of each project <p>- the formation of the car park including site clearance, and separately the estimated capital cost of the new facility to be constructed.</p> <ol style="list-style-type: none"> 5. The estimated cost of the new office accommodation to be provided for CDC staff. <p>Given that these issues all appear to be well advanced in the Council's thinking I assume that the relevant cost estimates I am seeking will be readily available as they undoubtedly formed part of the Council's decision-making process. There is some urgency in receipt of this information as I wish to have it available to me before public hearings on the 10 Year Plan are convened. If any aspect of my request is unclear, then please contact me on msburns@xtra.co.nz and I will get back to you promptly.</p>	5	
23 April		<p>I wish to make a request for information under the Local Government Official Information Act 1987 regarding the new kerb and channeling on Lincoln Road.</p> <p>I have concerns, along with my neighbours, over the impact this will have on our properties in terms of increased flood risk.</p> <p>The following is the information I would like:</p> <ol style="list-style-type: none"> 1. The timeline for the Lincoln Roding upgrade project between Victoria & Pembroke Streets and when it was put into the CDC roading programme? 2. Who was involved in the consultation process in the initial stages and was the GWRC consulted regarding the Waikakariki Stream and the possible impact on flooding? 3. All communication(correspondence) between CDC & Fulton Hogan regarding the Lincoln Road Curb & Channel upgrade including design work completed by CDC or Fulton Hogan. 4. All correspondence between Management and Councillor Steve Cretney and other concerned residents in regards to the Lincoln Road upgrade between Victoria Street & Pembroke Street. <p>I am happy to meet with you to discuss this request.</p> <p>I am also requesting a meeting onsite with Russell Keys and residents to discuss the situation.</p>		
28 April		<p>Please provide the following information at your earliest convenience from the latest figures available:</p> <p>name/sex/breed of dog and reason for euthanasia</p> <p>Method of euthanasia employed</p>	4	

Date Received	Organisation	Subject				Working Days to respond	Total per month	
29 April	ACT New Zealand	Has your council has discussed establishing a Māori ward or Māori constituency at a council meeting since the Local Electoral (Māori Wards and Māori Constituencies) Amendment Act 2021 came into effect on 2 March 2021? If the answer to this question is “yes”, please advise what further action your council resolved to take. If your council had already established a Māori ward or Māori constituency prior to this legislation coming into effect, please disregard this request.				3		
30 April		I am a Carterton resident and ratepayer. I am keen to get an understanding of the progress of the Water Treatment Upgrade project. The section on your site doesn’t seem to have any information other than pictures. Can you guide me where I can get information on: 1. What the project is expected to deliver when complete 2. The planned dates for completion, and how progress is against those dates 3. The planned budget, and current projections against that.						
3 May	GWE Consulting	We have been engaged by Kiwirail to gather information from each council in New Zealand with respect to tradewaste permits/consents held in their district. If you could provide us with a list of tradewaste permits/consents held by Kiwirail in your district, that would be most appreciated.						
3 May		1. Copies of all CDC decisions and rationale for its use and non-use of the Local Government NZ Local Government Funding Authority (LGFA) loan facilities since it became a ‘borrower’ member of the LGFA in the 2019/20 year[1]. 2. Full copy of the current CDC Financial Strategy 3. Full copy of all proposed changes to the future CDC Financial strategy for the next 10-years, additional to the very general disclosure in the draft 10-year LTP that is currently out for consultation 4. Full copies of the current and future CDC Financing strategy respectively broken down by the attached table: There is some urgency in receipt of this information as it has significant implications for consideration of the debt levels and debt servicing in the Draft LTP.						
continued			<div>1. Funding Source</div> <div>2. Funding amount (\$)</div> <div>3. Term</div> <div>4. Interest rate</div>	BNZ	LGFA	Other		
			<div>Immediate financing (i.e. overdraft type facility)</div> <div>• (enter description)</div> <div>• (enter description)</div>	<div>\$</div> <div>% interest rate</div>	<div>\$</div> <div>% interest rate</div>	<div>\$</div> <div>% interest rate</div>		
			<div>Short term loans (i.e. 12 months)</div> <div>• (enter description)</div> <div>• (enter description)</div>	<div>\$</div> <div>% interest rate</div>	<div>\$</div> <div>% interest rate</div>	<div>\$</div> <div>% interest rate</div>		
			<div>Long-term loans (i.e., Over 1 year including 30+ years)</div> <div>• (enter description)</div> <div>• (enter description)</div>	<div>\$</div> <div>% interest rate</div>	<div>\$</div> <div>% interest rate</div>	<div>\$</div> <div>% interest rate</div>		

Date Received	Organisation	Subject	Working Days to respond	Total per month
4 May		<ol style="list-style-type: none"> 1. Does the organisation carry out drugs and alcohol testing (among employees or other persons)? 2. If drug and alcohol testing does take place at the organisation: <ol style="list-style-type: none"> a. Who currently provides the testing service i.e., name of service provider(s)? b. For each (named) service provider: <ol style="list-style-type: none"> i. What is the nature of the drug & alcohol testing service delivered e.g., saliva, urine, breath and alcohol and synthetic cannabinoids? ii. In what geographic location(s) is the service delivered? iii. Is the service provided under contract? If yes: <ol style="list-style-type: none"> 1. How many contracts does the provider have with your organisation? 2. What is the term of that/those contract(s)? 3. What is the dollar value of that/those contract(s)? 4. Are there options for renewing that/those contract(s)? c. What organisation(s)/company(ies) previously conducted drug and alcohol testing for your organisation (repeat all of 'b' for previous service providers)? 		
5 May		<p>Please supply me with the following, as referred to in Carterton District Council's 10 Year Plan Consultation Document 2021-2031:</p> <ol style="list-style-type: none"> 1) The "early concept plans", and any accompanying information, of the Five Towns Trail priority trails: <ul style="list-style-type: none"> * Trail 1 Greytown to Carterton (estimated to cost \$295,000) * Trail 2 Carterton to Masterton (estimated to cost \$766,000) * Trail 3 Gladstone loop (including Dakins Road; estimated to cost \$3,470,000) * Trail 4 Carterton urban loop (estimated to cost \$670,000) 2) The names, professional credentials and experience in planning for walking and cycling of those responsible for, and also those who have contributed to, the drawing up of the above "early concept plans" and accompanying information. 3) The basis on which the above cost estimates have been made, including their sensitivity and risk of variation. 4) The comparison of costs and benefits to the community of implementation of the above "early concept plans", and the expenditure involved, used as justification for inclusion of these projects in Option A and Option B in the 10 Year Plan Consultation Document 2021-2031. 5) If no such comparison of costs and benefits has been undertaken, why this expenditure has been included in Option A and Option B above, despite such a comparison of costs and benefits not having been undertaken. 6) All formal minutes, or failing this informal notes taken by Council staff, of the Carterton Walking and Cycling Advisory Group and the Wairarapa Trails Action Group since August 2019; noting that the 2019-2022 Triennium Committee Terms of Reference specifies that Council will provide Group 'secretarial support'. 		15
		Requests not closed yet	6	



7.10 ELECTED REPRESENTATIVE ACCOUNTABILITY REPORT

1. PURPOSE

To provide a report on elected members' activities since the last Council meeting.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. BACKGROUND

Every eight weeks the elected members have the opportunity to update the activities they are involved with and activities carried out in their official capacity for the Council and the community.

4. RECOMMENDATION

That the Council:

1. **Receives** the report.

Notes the elected members' activity reports, which will be tabled at the meeting.

File Number: 127445

Author: Greg Lang, Mayor

Attachments: Nil



7.11 CHIEF EXECUTIVE'S REPORT

1. PURPOSE

To inform Council of officers' activities since the previous meeting held 17 March 2021.

2. SIGNIFICANCE

The matters for decision in this report are not considered to be of significance under the Significance and Engagement Policy.

3. INFRASTRUCTURE AND SERVICES / PLANNING AND REGULATORY SERVICES

For the period of March/April, council received 17 resource consent applications: two of these were land use consents, two were certificate of compliances and 13 were for subdivision. The 13 Subdivision applications lodged totalled 116 new lots. This is a significant increase in consent applications from the 2020 same time frame whereby there were six applications lodged with four being subdivision totalling 15 lots. This equates to a 775% increase in the number of lots and a 325% increase in applications.

Council officers are very busy with the Wairarapa Combined Plan Review and have been having weekly Teams meetings with the consultants working through the chapters for review. A report was provided to the Policy and Strategy Committee on the Eastern Growth feedback received and a further report with detailed analysis will be provided to the committee when completed.

3.1 Building Services

Tables 1 and 2 below show building consent numbers from March and April 2021 compared to the same relevant period in previous year.

Table 1: March 2020/21 Comparison

	Number of Consents received	Value of Building Work	Number of Consents received	Value of Building Work
	March 2020	March 2020	March 2021	March 2021
New (& prebuilt) House, Unit, Bach, Crib	12	4,573,000	7	3,112,000
New Other Buildings	1	16,000	-	-
Dwellings – alterations & additions	6	324,785	4	335,500
Domestic Fireplaces	12	46,719	4	18,000
Re-sited Houses	2	237,000	3	59,000
Domestic only – garages	3	66,000	4	102,980
Other outbuildings e.g. shed, workshop, sleep-out	1	40,000	3	104,088
Shops, restaurants – Alterations & additions	-	-	1	150,000
Swimming Pools	1	50,000	-	-
TOTAL	38	5,353,504	26	3,883,568

Table 2: April 2020/21 Comparison

	Number of Consents received	Value of Building Work	Number of Consents received	Value of Building Work
	April 2020	April 2020	April 2021	April 2021
New (& prebuilt) House, Unit, Bach, Crib	8	3,279,000	5	1,545,000
New Office/Retail Buildings	-	-	1	300,000
New Other Buildings	-	-	1	13,000
Dwellings – alterations & additions	3	100,000	6	236,000
Domestic Fireplaces	5	22,000	5	21,650
Domestic only – garages	1	16,000	4	238,000
Other outbuildings e.g. shed, workshop, sleep-out	4	603,000	2	52,000
Shops, restaurants – Alterations & additions	-	-	1	100,000
Swimming Pools & Spa Pools	-	-	2	75,000
TOTAL	21	4,020,000	27	2,580,650

Figure 1: Building consents issued 2018-2021

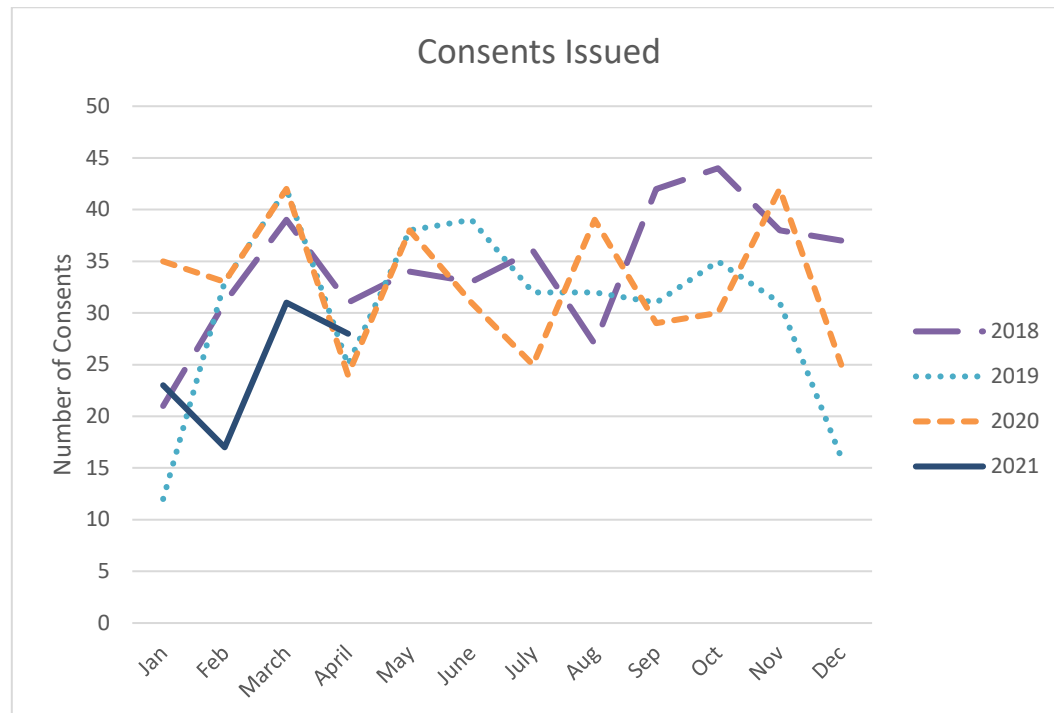
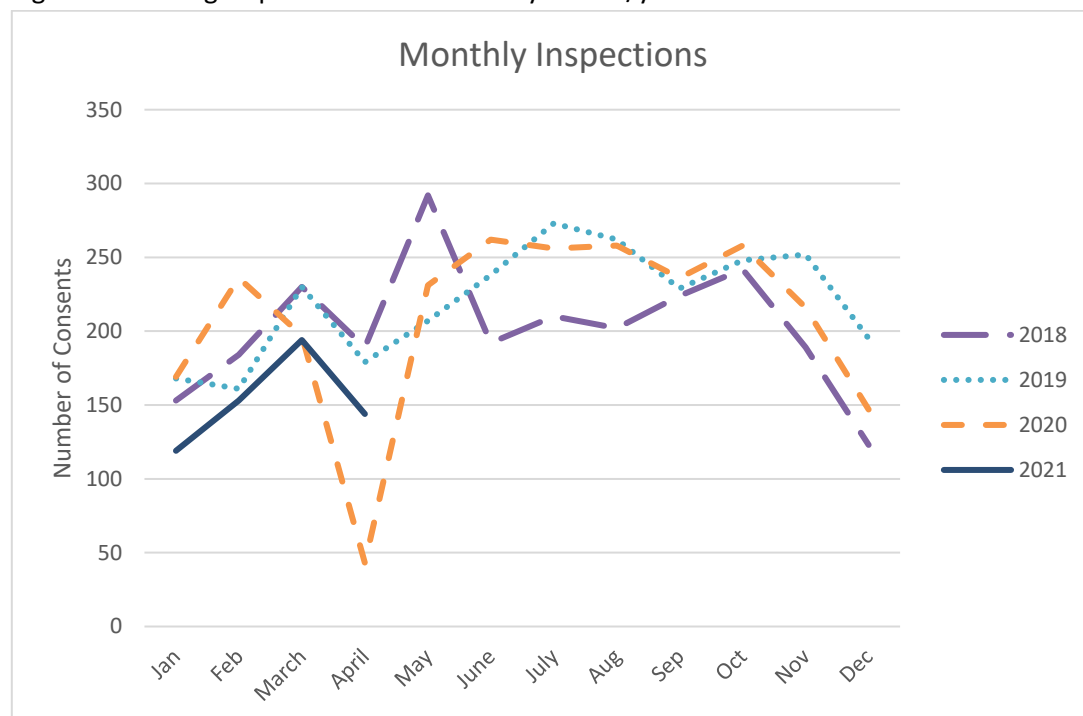


Figure 2: Building inspections undertaken by month/year



3.2 Liquor and Food licensing

There were 11 food license registrations in March and another seven due in April. The April list will have an experienced contractor providing assistance to the new Compliance Advisory Officer (CAO) who will then be confident in assessing the five additional new registration applications.

A new application for a mobile hairdresser was received in April and the CAO is working with the business owner to obtain registration.

There was no renewal of alcohol licenses in March or April but there was one new on-license, two off-licenses, and five specials.

3.3 Animal Management

There were six dogs impounded over the previous two months and five of those were returned to their owners. The remaining dog was rehomed through the SPCA.

Two infringements were sent to the courts for processing one of these was a failure to comply with the classification of menacing and the other was for a failure to register the dog.

Activity	
Dog Barking reports	11
Animal control Miscellaneous	2
Dog Roaming reports	15
Stock on road incidents	11
Dog Found	10
Dog Attack on Animal	1
Dog Rushing	4
Dog lost reports	7
Total	67

Of note is the planned build of Palmerston North City Council's new animal facility to cater for 40 animals, a shop front for dog equipment and a specialist education area with an expected cost of \$4.2m.

Carterton District Council are watching with interest Wellington City Council's trial of lifelong dog registration tags. The registration number remains with the dog for its lifetime. The initial cost of the tag would be higher but would reduce the amount of plastic waste and administration costs at dog registration time.

3.4 Wastewater Treatment Plant Upgrade Project

Storage Reservoirs Construction

We are getting closer to completion of the Wastewater Treatment Plant (WWTP) upgrade with the lining of the three large ponds nearing completion. This is scheduled to be completed by early June although the work is, and has been, heavily weather dependant. Even a gentle wind or light rain can delay the preparation or installation. The earthworks to flatten out the ground for the new centre pivot is complete. Below shows lining progress on the 20 April of all three ponds (Figure 1).



Figure 1 – 20 April 21 – All Pond's now have a majority of their liners installed

Stage 3 Works – Pumps and Pipework

Pipework from the existing WWTP to the new reservoirs was installed between September and November 2020. The remaining work connecting to the reservoirs can commence once the reservoirs are completed. Based on CHB's program pushing the completion date into winter a shutdown will be necessary, but the reservoirs can still be connected by the end of next summer within the consent timeframe.

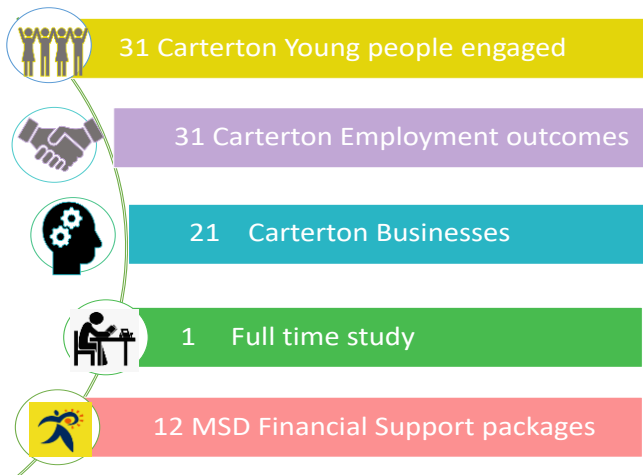
Ephemeral channel relocation

Included in the resource consent was the relocation of the existing ephemeral channel running between the southern boundary of the existing WWTP and Gallon Road. The work involved filling the old channel and excavating a new channel along the western boundary the farm.

4. COMMUNITY SERVICES

4.1 Community Support

Youth 2 Work Wairarapa & Mayors Task Force for Jobs



MTFJ
MAYORS TASKFORCE FOR JOBS

Carterton

Data Snapshot

October 2020 – May1 2021



Youth 2 Work Wairarapa team have been working hard across the region with 31 employment outcomes for Carterton people. If you are a business or know a young person looking for employment, please contact maria.m@youth2work.nz

School Holiday Programme

We have just completed our first School Holiday Programme for 2021. This year the school holiday programme went digital with electronic enrolment forms. We had 48 Carterton children attend over four days. Some of the highlights included crawling out of the house (FENZ simulator), Making craft things to take home, Dance/Gym and Crystal's cookies. We would like to thank all the people that made this programme happen, by volunteering their time, doing workshops with the kids and shuffling around their own work around to help make this a successful programme. Special mention goes to Jacqui Murray Dance School, Strength Nation, Wild Oats, FENZ, Rebecca Vergunst, Rob Stockley, Mayor Greg Lang, Cimone Grayson and Carterton District Library for running a variety of workshops with the children.

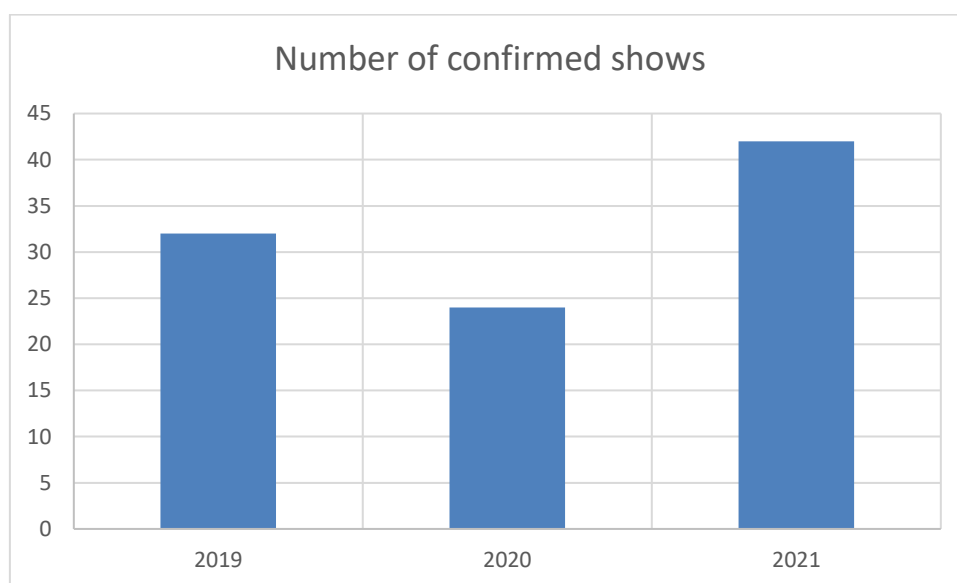


4.2 Event Centre Sales and Marketing

Shows are continuing to sell well. We are continuing to grow our relationships with theatre production companies and expanding our range of shows.

Indian Ink's show Mrs Krishna's Party was a huge success. After reviewing our audience feedback we approached Indian Ink to bring the show to Carterton Event Centre. This was their first venture outside of major cities and we were both thrilled with how incredibly well the show was received. The show attracted sponsorship from Mediaworks who gave \$10,000 of radio advertising across four stations around the lower North Island. This created great exposure for both the Event Centre and Indian Ink. Our audience, while predominately from the Wairarapa, also came from Kapiti, Wellington and Hastings.

I received a beautiful Facebook message from a local family who come from the same region in India as one of the performers. They moved from India to the Wairarapa just over 2 years ago – this is just a small snippet from her message; "I thoroughly enjoyed the show, felt I was back home for those 2 hours, it brought the festive mood to my mind. I came back home filled with happiness and I could not sleep."



Audience Feedback

We are very pleased to have had more positive audience feedback regarding our venue, the events we have coming and our front of house, bar and venue staff. Comments from our feedback surveys include:

"Awesome show amazing venue great staff over all it was PERFECT"

"We always enjoy coming to the Events Centre - its' a beautiful venue as well as being designed to enable a variety of events to be held."

"Exceptional show. Exceptional facility."

“This theatre space is proving to be the go-to theatre space in Wairarapa. Please continue to promote it and bring performance of any sort here. I have attended several events in Carterton since lockdown ended (I did before lockdown as well) and I see more and more people attending shows here. So much easier for us than travelling to Wellington.”

April was especially busy for us with 11 ticketed events. A couple of the events were on the same day which meant that our venue team, had to respond quickly to complete room turn overs and full stage changes all achieved in a matter of hours. Our venue team responded so well to the challenge and should be highly commended for their commitment to our audience’s comfort and expectations. These efforts have been very clearly recognised in our recent surveys.

Survey results for ambience/customer experience

June 2019 – July 2020	54% Satisfied
July 2020 – February 2021	81% Extremely satisfied
March 2021 – April 2021	91.6%Extremely satisfied

Survey results for customer service from the venue team

June 2019 – July 2020	84% Extremely satisfied
July 2020 – February 2021	91.4%Extremely satisfied
March 2021 – April 2021	94.4%Extremely satisfied

Charles Rooking Carter Awards – Fire & Ice

We received 55 nominations across the 5 categories for the Charles Rooking Carter awards. The judging panel have all received their booklets and will soon have the hard decision of choosing finalist and winners.

Carterton Heart of Winter Festival

The outdoor venue has been confirmed for the Ice Rink – Carterton Tennis Club.

A number of other events will be held at the Events Centre as well, concerts, a beer festival, theatre and a film premier are all confirmed. With the full schedule expected to be released mid-May.

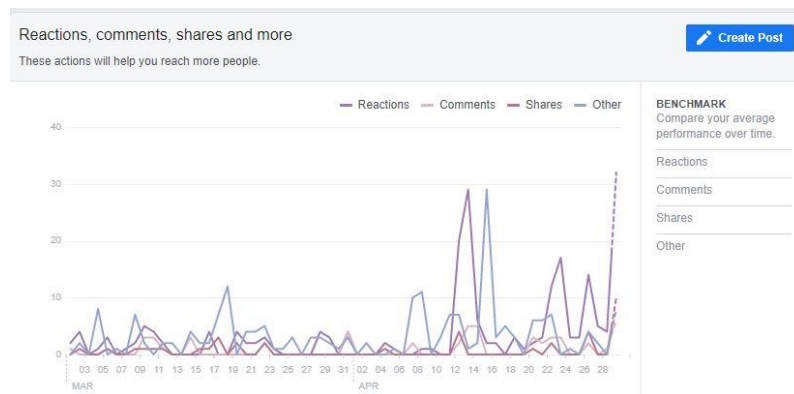
4.3 Social Media and EDM Insights and Analytics for Carterton Events Centre

Facebook events & engagement 1 December 2020 – Feb 2021.

Engagement

Facebook engagement is any action someone takes on our Facebook page or posts. The most common examples are likes, comments, and shares, but it can also

include checking in to our location or tagging us in a post. Facebook engagement matters because it can help extend our unpaid/organic reach.



Audience Growth – this reflects a 16% increase in Facebook page likes from 1 March to 30 April.



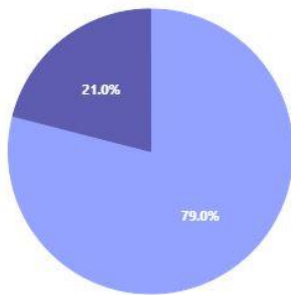
Instagram 1 March - 30 April 2021

We have been working on growing our Instagram following, as a younger event demographic is more engaged on this platform. It's slow and steady, but audience growth and engagement are increasing.



AUDIENCE BY GENDER

Female Male



AUDIENCE BY AGE

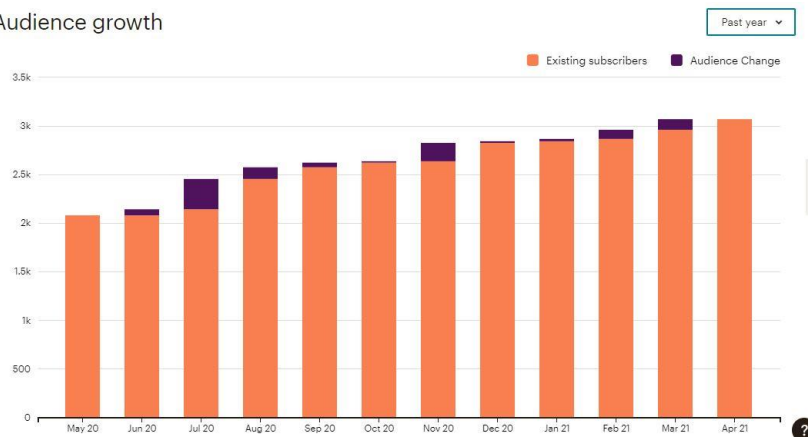
Female Male



EDM engagement and growth - Mailchimp

Our regular “Whats on” is a high performer in how our audience finds out what’s on at the Carterton Events Centre. We are performing well above industry average, and we’ve had a 55% growth in subscriptions to the email in the past 12 months.

Audience growth



4.4 Communications and Engagement

Draft Ten Year Plan 2021-2031 Consultation

The Council consulted on its draft Ten Year Plan from 19 March until 19 April. The consultation was communicated via the following means:

- A consultation document which was distributed via the Midweek newspaper. Extra copies were available at the Information Centre and Council office, as well as an online version on the council website. Copies were also distributed to local businesses.
- There were 17 organised consultation events. This included an expo held in the Te Mahau Foyer of the Events Centre so that people could easily access the key information about the draft plan and ask elected members any questions.
- All engagement activities were advertised on the Council website and via social media, as well as on posters at parks, in the council office and the Events Centre

with 2 QR codes which people can scan to either access the online version of the consultation document or make a submission online.

- Radio advertisements voiced by Mayor Lang and Deputy Mayor Vergunst encouraged people to make submissions and advised residents how they could get involved. There were interviews with Brent Gare on the MORE FM breakfast show to discuss the Long-Term Plan consultation.
- A Long-Term Plan page was set-up on the Council website as a one-stop shop for all information relating the Long-Term Plan process.
- The Council advertised in the Monthly Council News page in the Midweek newspaper.
- Mayor Lang used his mayoral column in the times-Age newspaper to discuss importance of taking part in the LTP consultation process.
- The 'Talking about Carterton's Future' Facebook Group page was be used for all things relating to the Long-Term Plan. The main Council page was still used for sharing the Long-Term Plan page posts, but the group page provided a separate space for community conversation away from the business as usual posts.
- An online survey was created using Survey Legend for people to make formal submissions. This was extremely well utilised.
- A short video explaining the 3 consultation items and how people can find out more and have their say.
- Full page advertisements in the Carterton Crier, the Times-Age and the Midweek.
- Articles on behalf of the Council in the Carterton Crier and the Gladstone newsletter.
- A whiteboard was set up in the Te Mahau Foyer of the Events Centre for people to leave anonymous feedback on the draft ten-year plan. This was recorded and presented to elected members to help their considerations.
- Three Facebook polls were conducted to gauge support for the Council's preferred option for each of the three consultation items.



Boil water notice

The Council put a considerable amount of effort into communicating the boil water notice both quickly and accurately in as many different ways possible that were available. This included the following actions:

- Issued media statement and FAQs on our website and social media channels (CDC and Information Centre), alerted local radio and national news media outlets (print, online and radio), updated electronic noticeboard, contacted local hospitality businesses via email and with face-to-face visits to drop off posters, media statement and FAQs, updated electronic noticeboard at Carrington Park, emailed all staff and elected members, notified local medical centre, DHB, neighbouring councils and Wellington Region Emergency Management Office and Regional Public Health. Emailed Age Concern

Wairarapa, Digital Seniors, Wairarapa Community Networks, Neighbourhood Support, all Carterton schools and preschools, requested New World to put up posters with QR code which goes straight to FAQs on our website, updated automatic question and answer function via Facebook messenger so people could get instant answers to questions. Received response from WREMO re text message alerts, advising the threshold to issue them is quite high and unlikely CDC would be approved to issue these for a boil water notice.

- The council contacted contractors to try and source electronic noticeboards to place at each end of town. As these were unavailable, the Council had two large signs printed for each end of town
- Council staff also replied directly to Facebook comments answering any questions people had.
- The Council attempted to access the ratepayer database of emails to send emails to alert of the boil water notice. Emails weren't sent to urban ratepayers for the first boil water notice but were sent 15 March onwards. The Council also emailed its newsletter subscribers. Initially this subscription base was just over 100 people but has now increased to 400
- The Council published articles about communicating the boil water notices in the April Carterton Crier, April Midweek and April quarterly newsletter which goes out with rates accounts to advise the importance of providing the council with email addresses so the Council can notify people directly if further circumstances require this.



General communications

Since the last report in March 2021, the council has focussed on the following:

- Changes to urban kerbside waste and recycling collections due to Easter and ANZAC day.
- Removal of the tree in front of the clocktower due to it raising the footpath and creating a trip hazard.
- The new picnic benches at Carrington Park which are wheelchair and mobility scooter friendly.
- Advertising Carterton's ANZAC day service.
- Advertising the working bees at Carrington Park and South End Park.
- Advertising the Carterton 2021 By-Election following the resignation of a councillor which created a vacancy. Communication included how to vote,

when the last day for voting was and where to find information about the three candidates.



4.5 Zero Waste

Para Kore Programme

Sam Te Tau continues to work with Te Awhina Community Hub, Te Kohanga Reo o Ngati Hamua, Te Kura Kaupapa Maori o Kahungunu, and Te Tau Whanau Papakainga. To support local Marae to work towards Zero Waste.

Zero Waste Education

This programme has been delivered to 8 schools across the Wairarapa reaching 1000 students since August 2020. Current schools continue to see the benefit of this programme, with sessions for term 2 and 3 are filling up quickly.



Sustainability Hub

Sustainability Hub was hosted by Gill Stewart from Enviroschools and supported by our Zero Waste Advisor. The theme was Zero Waste and Recycling this was attended by the Wairarapa ECE's held at Carterton Kindergarten.

This led to follow up visits with Martinborough Kindergarten to advise on waste and recycling solutions.

Waste Industry updates

- Wairarapa Solid Waste Bylaw came into effect 17th April 2021

- Waste Levy Expenditure Audits with Deloitte are near completion for all Wairarapa 3 Councils
- Ministry for the Environment Waste Minimisation Fund opened 30th April – 21st May 2021
- WasteMinz - Waste and Recycling Data Surveys have been completed for all three Wairarapa councils

5. HEALTH, SAFETY AND WELLBEING

The main focus continues to be the recruitment and induction of new staff, the review of the 2018-2021 Health & Safety Strategy, and the monitoring of staff wellbeing.

5.1 New staff

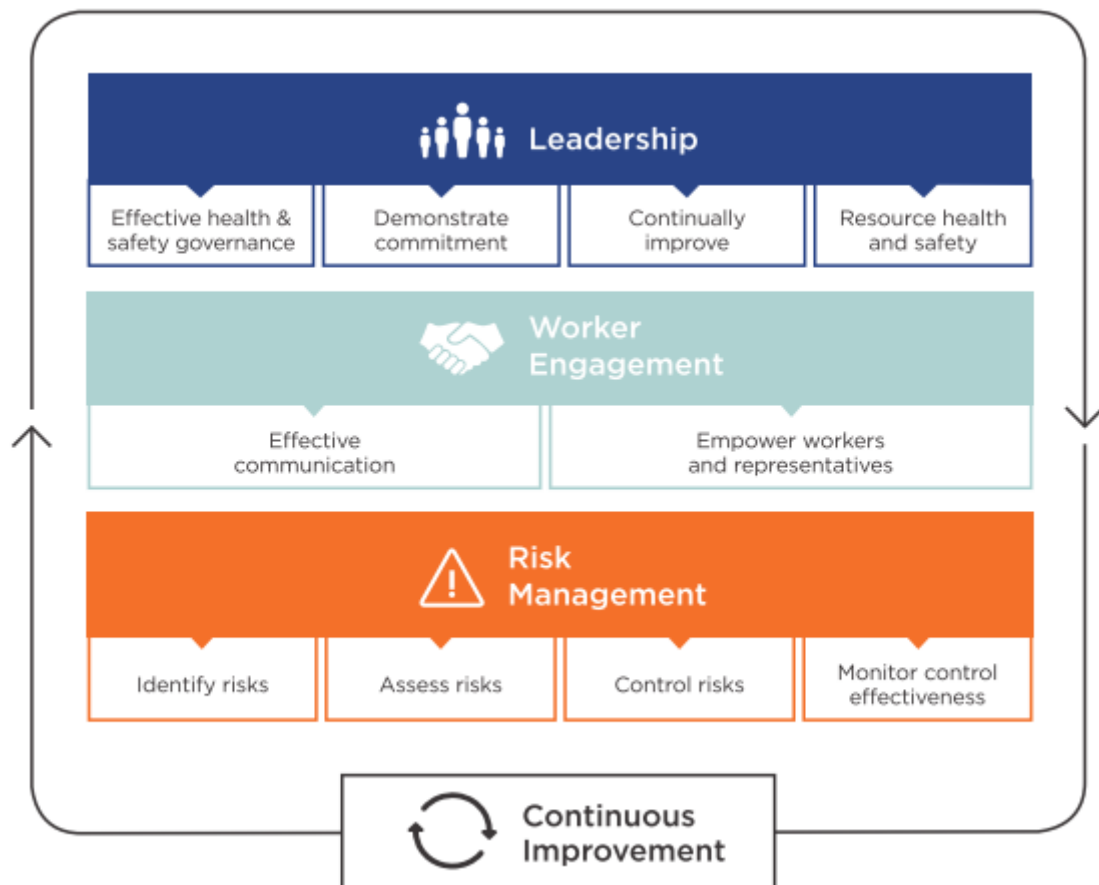
Since 4 March 2021, we have recruited five new permanent, and six casual and fixed term, staff members. The casual and fixed term employees include Work and Income Project in the Community Workers, licenced Event Centre Venue staff, and existing casual librarians backfilling permanent staff seconded to the National Library Programme.

Robust processes are in place to ensure all new staff are appropriately welcomed, inducted, and feel and act safely in their new roles.

5.2 Health & Safety Strategy

We are currently reviewing the 2018-2021 Health & Safety Strategy which includes a review of the strategy framework, an assessment of the progress and achievements, and the development of the 2021-2024 Strategy.

As part of the progress assessment and future strategy development, we will be undertaking a SafePlus survey with all staff. SafePlus offers a Government-endorsed model of what “good” health and safety practices and performance look like, and initiates positive and ongoing change based on three key elements and ten performance indicators:



The staff survey will help us assess our health and safety performance and provide tailored advice and guidance on improvements and focus areas.

5.3 Staff wellbeing

The Health & Safety Committee have raised staff wellbeing as a new risk to be monitored due to the exceptional circumstances that have impacted on the council over the past 12 months. These circumstances include the COVID-19 pandemic, a high number of staff vacancies, and increased work and service demands such as the development of the Long-Term Plan, E-Coli response, and the building industry growth.

We have previously highlighted the importance of staff wellbeing in the development of our Council Wellbeing Strategy, however the responsibility to provide a work environment that is without risk to physical and mental health and safety, is also quite clear in the Health and Safety At Work Act 2015. As well as affecting personal health, adverse wellbeing can result in stress and fatigue which may impact on work performance leading to poor judgement and decisions, critical mistakes, and work-place accidents.

The Health & Safety Committee, together with the Audit and Risk Committee, will be monitoring elimination and reduction initiatives underway.

6. RECOMMENDATION

That the Council:

1. **Receives** the report.

File Number: 127446

Author: Jane Davis, Chief Executive

Attachments: Nil

8 EXCLUSION OF THE PUBLIC

Nil

9 KARAKIA WHAKAMUTUNGA