greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

If calling please ask for: Democratic Services

27 October 2017

Environment Committee

Order Paper for the meeting of the Environment Committee to be held in the Nicholson Room, Copthorne Hotel, 100 Oriental Parade, Wellington on:

Wednesday, 1 November 2017 at 10.00am

Membership

Cr Kedgley (Chair)
Cr Brash (Deputy)

Cr Blakeley
Cr Gaylor
Cr Laidlaw
Cr McKinnon
Cr Ponter
Cr Swain

Cr Donaldson
Cr Laban
Cr Lamason
Cr Ogden
Cr Staples

Peter Gawith

Ihaia Puketapu

Recommendations in reports are not to be construed as Council policy until adopted by Council

Environment Committee

Order Paper for meeting to be held on Wednesday, 1 November 2017 in the Nicholson Room, Copthorne Hotel, 100 Oriental Parade, Wellington at 10.00am

Public Business

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Please note that these minutes remain unconfirmed until the meeting of the Environment Committee on 1 November 2017

Report 17.353
20/09/2017
File: CCAB-10-374

Minutes of the Environment Committee meeting held on Wednesday, 20 September 2017 in the Level 3 East meeting room, Westpac Stadium, Waterloo Quay, Wellington at 10.00am

Present

Councillors Kedgley (Chair), Brash (Deputy), Blakeley (until 11.40am), Donaldson, Gaylor, Laban, Laidlaw, Lamason, McKinnon, Ogden, Ponter, Staples and Swain.

Peter Gawith and Ihaia Puketapu.

Public Business

The Committee Chair welcomed Peter Gawith to the Committee.

1 **Apologies**

There were no apologies.

2 **Declarations of conflict of interest**

There were no declarations of conflict of interest.

3 **Public Participation**

There was no public participation.

4 **Confirmation of the public minutes of 9 August 2017**

Moved *(Cr Lamason/ Cr Blakeley)*

That the Committee confirms the public minutes of the meeting of 9 August 2017, Report 17.286.

The motion was **CARRIED.**

5 **Regional Climate Change Working Group**

Richie Singleton, Climate Change Advisor, and Dr Iain Dawe, Senior Policy Advisor (Hazards) spoke to the report.

Report 17.336 File ref: CCAB-10-369

Moved *(Cr Brash/ Cr Donaldson)*

That the Committee:

1. *Receives the report.*
2. *Notes the content of the report.*
3. *Recommends that Council:*
    i. *Agrees to the establishment of the Wellington Region Climate Change Working Group.*
    ii. *Appoints Cr Kedgley to the Wellington Region Climate Change Working Group and Cr Blakeley as the alternate.*
    iii. *Notes that recommended terms of reference for the Wellington Region Climate Change Working Group will be brought back to the Council and the Region's territorial authorities for agreement.*

The motion was **CARRIED.**

6 **Regional Pest Management Strategy 2002-2022 Operational Plan 2017/18**

Wayne O'Donnell, General Manager, Catchment Management, spoke to the report.

Report 17.343 File ref: BIOST-9-76

Moved *(Cr Brash/ Cr Staples)*

That the Committee:

1. *Receives the report*
2. *Notes the content of the report*
3. *Approves the proposed Operational Plan 2017/18 (Attachment 1) for the Regional Pest Management Strategy 2002-2022.*

The motion was **CARRIED.**

7 **Regional Trails Framework**

Amanda Cox, Manager, Parks, updated the Committee on the Regional Trails Framework.

The meeting adjourned at 11.10am and reconvened at 11.27am.

8 **General Managers' report to the Environment Committee meeting 20 September 2017**

Cr Blakeley left the meeting at 11.40am, during consideration of this item.

Report 17.306 File ref: CCAB-10-365

Moved *(Cr Donaldson/ Cr Staples)*

That the Committee:

1. *Receives the report.*
2. *Notes the content of the report.*
3. *Endorses the Enabling Catchment Communities Programme as an investment in community and capability resilience.*

The motion was **CARRIED.**

Noted: The committee requested:

- an update on the earthworks for the Transmission Gully Project at the next Committee meeting
- an update on the Wellington and Hutt Valley Whaitua at the next Committee meeting
- a joint workshop on the Whaitua process for members of the Environment Committee and Te Upoko Taiao – Natural Resources Plan Committee
- an update on the Marine and Coastal Area (Takutai Moana) Act 2011 at the next Committee meeting.

The meeting closed at 12.40pm.

Cr S Kedgley
(Chair)

Date:

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Report	**2017.317**
Date	18 October 2017
File	CCAB-10-385
Committee	**Environment**
Author	**Jacky Cox, Section Leader, Operations Planning**

Flood Protection Asset Management Report 2017/18

1. Purpose

To advise the Environment Committee of progress made with the Flood Protection department's asset management system, the overall physical condition of the flood protection infrastructural assets, and challenges for the future.

To seek confirmation from Council that they are satisfied that our infrastructural assets have been maintained to their agreed service level.

2. Background

The Flood Protection department is responsible for a variety of assets, including infrastructure, land and property, located on 15 river schemes[1] across the region. These assets have a total combined value of $386.3 million[2] and provide flood protection to the communities located on these floodplains and infrastructure supporting the whole region.

The department has established a comprehensive asset management system, which demonstrates that the service level of our infrastructural assets is:

- being maintained in an efficient and cost-effective manner,
- will perform as designed; and
- where required, are being enhanced.

[1] Flood Protection also manages 14 drainage schemes; these were not included in the revaluation as the schemes assets are owned by the landowners and not Greater Wellington Regional Council.
[2] As at June 2017

The Environment Committee has responsibility to monitor the maintenance and improvement of these assets for the Region's river schemes, corridors and associated watercourses on behalf of the Council.

3. Asset Management highlights and future challenges

Asset Management continues to be a focus for the department and good progress is being made in projects and system and business process improvements. Highlights for the year were:

- Completing the revaluation of Flood Protection assets. The total value of all assets, effective 30 June 2017, was $386,319,412. This figure comprises the following asset classes:

    - Infrastructure assets $340,593,716
    - Land $36,055,642
    - Property $9,238,000
    - Plant, Equipment and Chattels $432,054

    Since 2012, infrastructure assets have increased in value by $77,773,488.

- Continued improvements to the quality of our data through cleansing and rationalisation of the SAP Plant Maintenance and GIS asset databases as a result of condition assessments and required for the asset revaluation and the proposed new Enterprise Resource Planning (ERP)[3] system.

- Improvements to our mobile condition assessment app so that information on asset defects can be collected in the field. This information is then being used to inform work planning.

Looking to the future, the department is in a period of ongoing change driven by a number of factors, including:

- Redrafting of the Asset Management Plan (AMP) to focus on the service the assets provide rather than the physical assets themselves;
- Keeping up with technology and using this to our advantage;
- Implementation of the proposed new ERP system across GWRC; and
- The renewal of our river management resource consents.

[3] GWRC is currently in the process of replacing the ERP system SAP. An ERP system integrates areas such as asset management, planning, purchasing, inventory, sales, marketing, finance and human resources.

In 2017/18 we will continue to focus on our AMP, while developing system and business process improvements and progressing improvement projects that focus on defining our critical assets and developing specific plans for our complex assets such as the Porirua flood detention dams and the George Blundell Barrage Gates. A substantial portion of time will also be spent on the proposed new ERP system to ensure the asset management needs of the department are met.

4. Asset Condition

Asset condition is a measure of the physical state of the asset and is assessed visually by staff on an annual basis. Consistency between assessors is achieved through the application of guidance documents. Asset condition does not identify the criticality of the asset or whether the asset meets a service level or design standard; this is determined through other measures.

Condition information enables us to predict maintenance, renewal requirements and develop effective, proactive work programmes. Asset condition is critical to managing asset risk, because it is linked to the likelihood that the asset will physically fail.

4.1 Regional summary

In general, asset condition is not declining and the number of assets across the region that are in very good (1) to moderate (3) condition has remained constant from year to year as shown in **Figure 1** below.

Figure 1: Comparison of asset condition by year

Asset Condition	2016	2017
Very Good to Moderate (1-3)	85%	88%
Poor to Very Poor (4-5)	15%	12%
Total Asset Count	**6216**	**6230**

To give the Committee a sense of our asset profile and condition, a breakdown of asset condition by asset grouping and type is shown in **Figure 2 below.** A detailed discussion on the condition of these assets is provided in Section 4.2.

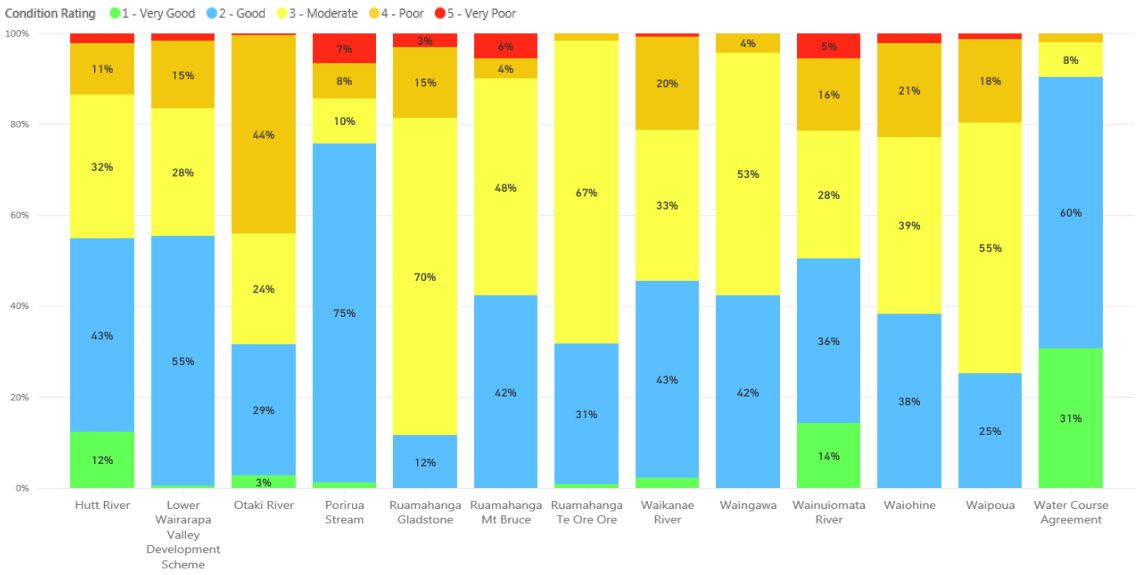
Figure 2: Asset condition by type

Asset Group	Asset Type	1 - Very Good	2 - Good	3 - Moderate	4 - Poor	5 - Very Poor	Total
Individual Structures	BARRAGE GATE				1		**1**
	BARRAGE CONTROLS		1				**1**
	BRIDGE	3	4		1		**7**
	DETENTION DAM		2				**2**
	DIVERSION CUT		2				**2**
	DRAIN	16	50	13			**79**
	DROP STRUCTURE		2				**2**
	DUCKSBILL STRUCTURE	1	1				**2**
	FLOODWAY SILL		9				**9**
	Total	**20**	**71**	**13**	**2**		**106**
Critical Assets	CULVERT	3	27	8	2		**40**
	FLOODGATE	18	80	20	18	4	**140**
	FLOODWALL	21	13	1			**35**
	STOPBANK	159	359	166	169	7	**860**
	TRAINING BANK	5	6	2			**13**
	WINGWALL	3	6				**9**
	Total	**209**	**491**	**197**	**189**	**11**	**1097**
Channel	CHANNEL	170	537	259	85	1	**1052**
	WEIR		11	5	3		**19**
	Total	**170**	**548**	**264**	**88**	**1**	**1071**
Berms - Amenity	FENCE	2	30	13	2	1	**48**
	GATE	5	7				**12**
	NATIVE PLANTING	26	51	26	4	1	**108**
	SEAT	12	11				**23**
	SIGN	5					**5**
	TRACK	166	292	54	15	1	**528**
	Total	**216**	**391**	**93**	**21**	**3**	**724**
Bank Edge - Vegetative	DEBRIS ARRESTOR	3	11	2	1	1	**18**
	DEBRIS FENCE	3	175	173	106	7	**464**
	WILLOW	12	300	540	193	12	**1057**
	Total	**18**	**486**	**715**	**300**	**20**	**1539**
Bank Edge - Structural	BLOCKLINE	5	21	8	2		**36**
	DEMOLITION LINE		6	6	3		**15**
	FASCINE		2				**2**
	FENCE RAIL IRON NET		15	16	3	4	**38**
	GROYNE	23	778	412	67	11	**1291**
	RIPRAP	34	226	41	7	3	**311**
	Total	**62**	**1048**	**483**	**82**	**18**	**1693**
Total		**695**	**3035**	**1765**	**682**	**53**	**6230**

4.2 Discussion

The split between condition ratings for various schemes tends to vary across the region as also shown in **Figure 3** below. This is to be expected due to the differing service levels the schemes provide and assets used to deliver that service. For example the Hutt Scheme takes a very structured, hard engineering approach as opposed to the majority of the Wairarapa Schemes that use soft, vegetative methods. **Figure 3** further confirms that most of our assets are in very good to moderate condition.

Figure 3: Comparison of asset condition by scheme



More detailed analysis at the asset group level does highlight that our bank edge vegetative assets are degrading in condition. This grouping is made up of willows and permeable structures such as debris fences and reflects a shift from the department in the use of debris fences and hence the maintenance of these structures. It also signals that more work is required to rejuvenate and replant our aging or poor willow stands. Recent operational inspections have also highlighted that we are finding the vegetative management approach for some reaches of our western schemes difficult to maintain due to river bed degradation and the undercutting of willows stands during flood events.

4.2.1 Critical assets

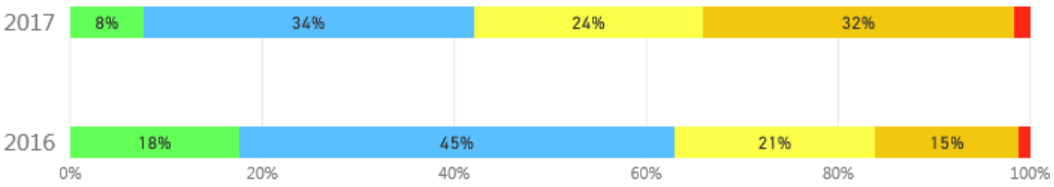
In terms of our critical assets of stopbanks, floodwalls and floodgates there has been a reduction in asset condition from 2016 to 2017 for stopbanks and floodgates. Floodwalls have remained the same. This is a result of the condition assessment guide being appropriately applied to reflect the actual condition of these assets. The Committee, however, can be confident that even though asset condition has changed we understand these assets and they will already be signalled for upgrade or there is an improvement project to collect more information to enable increased confidence in their condition.

(a) Stopbanks

Figure 4 shows that those stopbanks rated very good to moderate have reduced from 84% in 2016 to 66%. The poorly rated stopbanks are all located on schemes that have either an upgrade programme in place, an existing Floodplain Management Plan (FMP) or an FMP in development. These stopbanks are on:

- The lower section of the Otaki River. Ongoing and future management will be addressed through the FMP review currently underway.
- The Jim Cooke Park reach of the Waikanae River, which has recently been upgraded.
- The Ruamahanga Gladstone, Ruamahanga Mt Bruce and Waipoua River Schemes. Ongoing and future management will be addressed through the Te Kauru FMP currently under development.
- Lower Wairarapa Valley Development Scheme (LWVDS), which has a stopbank improvement programme in place.

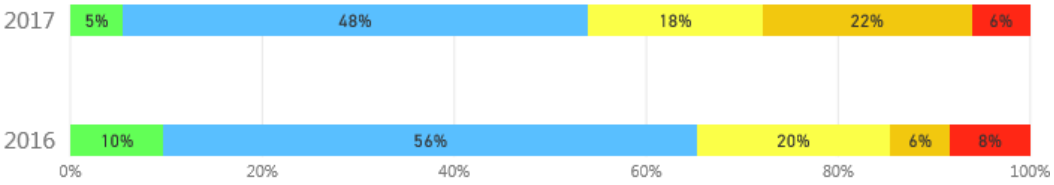
Figure 4: Comparison of stopbank condition from 2016 to 2017



(b) Floodgates

Figure 5 shows that those floodgates rated very good to moderate have reduced from 86% in 2016 to 71%. The poor condition floodgates are located on the LWVDS and are either under water or difficult to inspect resulting in us being less certain of their condition. A conservative approach has been taken to their assessment and an improvement project has been identified to gather better information and identify any remedial actions.

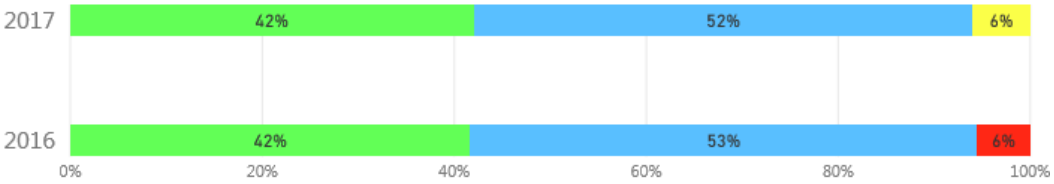
Figure 5: Comparison of floodgate condition from 2016 to 2017



(c) Floodwalls

Figure 6 shows the condition of our floodwalls has improved. The poor quality asset is on the Waipoua River Schemes. Ongoing and future management will be addressed through the Te Kauru FMP currently under development.

Figure 6: Comparison of floodwall condition from 2016 to 2017



5. Satisfactory maintenance of our assets

The Committee can be confident that our assets are being maintained to deliver their required level of service. This is demonstrated by:

- The annual condition assessment process, which shows that the majority of our assets are in very good to moderate condition.
- Confirmation by the various Scheme Advisory Committees and Friends Groups that they have been consulted and confirm that the Schemes are being maintained to their satisfaction.
- Sufficient financial provision has been made available through the maintenance budgets and scheme flood damage reserves to ensure completion of the maintenance programmes.

5.1 Community engagement

Across the region 15 river schemes are managed by Flood Protection. Staff report either to a Council Subcommittee, Scheme Advisory Committees[4] or Friends Groups who confirm that they are satisfied with the standard of maintenance. These groups include:

- Lower Ruamahanga Floodplain Management Advisory Committee
- Waingawa River Advisory Committee
- Upper Ruamahanga River - Mt Bruce Advisory Committee
- Upper Ruamahanga River Te Ore Ore Advisory Committee
- Upper Ruamahanga River Gladstone Advisory Committee

[4] The Waiohine River has no committee at present. A mix of GWRC, CDC and SWDC elected representatives met on 1 May 2017 to discuss future Waiohine governance, at that meeting they chose to accept and approve the work programme and finances for the Waiohine River scheme for 2017/18, after it was put to the community (including former scheme committee members and we received no concerns after a fortnight)

- Waipoua River Advisory Committee
- Taueru River Advisory Committees
- Whangaehu River Advisory Committee
- Kopuaranga River Advisory Committee
- Friends of the Otaki River
- Friends of the Waikanae River
- Hutt Valley Flood Management Subcommittee

During the year all Committees and Friends Groups confirmed resolutions stating that their respective river schemes had been maintained to their satisfaction.

5.2 Scheme budgets and flood damage reserves

A summary of the individual river schemes and total flood damage reserves are detailed in **Figure 7** below. While minor damage was incurred during recent flood events, this was funded from maintenance budgets without calling on contingency funds.

Figure 7: Scheme reserves to June 2017

	June 2017		
Scheme	**Scheme Reserve**	**Major Flood Investment Reserves**	**Total Reserves**
Lower Valley	1,910,056	1,350,264	3,260,320
Waiohine	698,812	44,534	743,345
Mount Bruce	73,956	10,094	84,050
Upper Mangatarere	36,322		36,322
Te Ore Ore	308,845	10,094	318,940
Gladstone	74,720	10,094	84,814
Waingawa	155,348	29,689	185,037
Waipoua	182,022	29,689	211,711
Kopuaranga	-30,848		-30,848
Taueru	7,171		7,171
Whangaehu	8,520		8,520
Eastern River Total	**3,424,923**	**1,484,459**	**4,909,383**
Western Rivers Total	**2,758,824**	**1,484,459**	**4,243,283**
Sub Total of River Schemes Reserves	**6,183,747**	**2,968,918**	**9,152,666**
GW Flood Contingency Reserve	2,247,333		2,247,333
GW Major Flood Investment		2,968,918	2,968,918
Total Reserves of River Schemes	**8,431,081**	**5,937,836**	**14,368,917**

This year, nine out of ten Wairarapa Scheme Advisory Committees recommended an increase in river scheme rates for 2017/18 to maintain and improve asset condition, fund necessary channel and berm maintenance works, and to build scheme reserves. The Kopuaranga River scheme recommended an 85% rate increase in 2015/16 and this was carried forward to 2017/18 in order to pay of the scheme debt earlier.

6. Consideration of Climate Change

The matters requiring decision in this report have been considered by officers in accordance with the process set out in the GWRC Climate Change Consideration Guide.

6.1 Mitigation assessment

Mitigation assessments are concerned with the effect of the matter on the climate (i.e. the greenhouse gas emissions generated or removed from the atmosphere as a consequence of the matter) and the actions taken to reduce, neutralise or enhance that effect.

The effect of any further works associated with the assets discussed in this report, and commissioned by GWRC, are subject to GWRC's corporate sustainability policy and/or procurement process, the latter of which is undergoing review and will encourage suppliers and contractors to minimise emissions.

6.2 Adaptation assessment

Adaptation assessments relate to the impacts of climate change (e.g. sea level rise or an increase in extreme weather events), and the actions taken to address or avoid those impacts.

Officers have considered the impacts of climate change in relation to the matter. The assets discussed in this report were developed over an extensive period of time, during which climate change projections (e.g. rainfall intensity, sea level rise etc) have evolved with the scientific community's understanding of how climate change will affect the Wellington region. Climate change projections were incorporated into the modelling that underpins relevant management plans and asset designs at the time they were developed.

7. The decision-making process and significance

The matters requiring decision in this report have been considered by officers against the requirements of Part 6 of the Local Government Act 2002.

7.1 Significance of the decision

Officers have considered the significance of the matter, taking into account the Council's significance and engagement policy and decision-making guidelines. Due to the procedural nature of this decision officers recommend that the matter be considered to have low significance.

Officers do not consider that a formal record outlining consideration of the decision-making process is required in this instance.

7.2 Engagement

Engagement on the matters contained in this report aligns with the level of significance assessed. Engagement has been undertaken in the Wairarapa River Advisory Committees and western river Friends' Groups. In accordance with the significance and engagement policy, no further engagement on the matters for decision is required.

8. Recommendations

That the Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report.*

3. ***Notes*** *the confirmation of the 15 Scheme Advisory Committees and Friends Groups that assets have been maintained to their satisfaction.*

4. ***Confirms*** *that the 15 River Management Schemes in the region have been maintained to a satisfactory level.*

Report prepared by:	Report approved by:	Report approved by
Jacky Cox Section Leader, Operations Planning	**Colin Munn** Team Leader, Operations	**Graeme Campbell** Manager, Flood Protection

Report approved by

Wayne O'Donnell
General Manager
Catchment Management

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Report	**17.394**
Date	6 October 2017
File	CCAB-10-379

Committee	**Environment**
Author	**Alistair J N Allan, Team Leader, FMP Implementation**

Floodplain Management Plan Implementation: Annual Progress Report to June 2017

1. Purpose

To advise the Environment Committee of progress made to June 2017, in implementing the Hutt, Otaki, Waikanae and Pinehaven Floodplain Management Plans, and the Lower Wairarapa Valley Development Scheme (LWVDS) upgrade.

2. Background

This is the fifteenth annual report on the implementation of the Western Floodplain Management Plans and the tenth annual report on the Wairarapa capital works.

2.1 Western Floodplain Management Plans

The Hutt, Otaki, Waikanae and Pinehaven Floodplain Management Plans (western FMPs) were completed in 2001, 1998, 1997 and 2016 respectively. They recommend structural, non-structural and environmental measures to reduce the flood risk to the respective floodplains and improve the environment. GWRC has adopted a 40-year time frame to fully implement the four FMPs. Implementation of the FMPs commenced in 2000 and $63.5million has been spent up to the end of June 2017. The current 2015-2025 Long Term Plan provides a further $73.4 million for implementing the four FMPs.

The main new project this year is the Pinehaven FMP. The FMP development for the Pinehaven Stream was completed in June 2016. The total estimated cost of the FMP works is $10 million and the implementation commenced in 2016/17. This is a joint GWRC/Upper Hutt City Council (UHCC) project with UHCC leading the implementation. GWRC currently funds 50% of these works through General and Targeted rates and UHCC fund the other 50% through their own rates. The LTP provides $5.6 million as the GWRC 50% share of total project cost (including inflation) for implementing the project.

Three properties have been purchased as the first steps in implementation of the Plan at a cost of $1.3 million.

UHCC has commenced the next stage of implementation and is undertaking preliminary design the structural works (channel improvement and culvert upgrades) and completion of the Pinehaven and Silverstream district plan change as part of Plan Change 42. Lodgement of consents for the commencement of structural works will not commence until UHCC has made its decision in favour of implementing the plan change.

A review of the Otaki FMP, completed in 1998, is also under way. Work on this review is not expected to be completed until 2019.

2.2 Wairarapa Capital Works

2.2.1 LWVDS

A major review of the LWVDS, completed in 2006, recommended a structural upgrade programme to improve the security of the flood defences in the lower Wairarapa valley. The original programme was for implementation over 8 years, commencing in 2007/08 and estimated to cost $8.82 million. Generally the work involved strengthening river bank protections and upgrading stopbanks on the Ruamahanga and Tauherenikau Rivers. In 2011, Council approved a revised cost estimate ($12.7 million in 2013 dollars) and extended the completion date to 2022. A total of $7.3 million has been spent to June 2017. The LTP plus additional funding approved by council provides a further $10 million to 2025 including budget for commencement of implementing outcomes from a new FMP proposed to be developed for the LWVDS. This period may be extended as LWVDSFMP will not be commenced until the Waiohine and Te Kāuru FMPs are completed.

2.2.2 Waiohine FMP

The Waiohine FMP development commenced in 2008/09. Community consultation on the draft FMP was completed, however the plan was rejected by the community. Officers have worked with CDC, SWDC and community leaders to form a joint working group to establish how a FMP will be completed.

Implementation will commence once the FMP is completed. Adjustments to the funding timing will be made through the 2018-28 LTP process. This will defer works to align with the forecast FMP completion dates. The 2015/25 GWRC LTP provides $10.5M for completing the project by 2020/21. Further strategic property purchase to assist delivery of the project will be considered if further opportunities arise.

2.2.3 Te Kāuru Upper Ruamahanga FMP

The process for developing a FMP for the upper Ruamahanga floodplain commenced in 2013/14. Implementation will commence once the FMP is completed. The GWRC LTP 2015/25 provides $12.5 million for completing the project by 2021/22. Adjustments to the funding timing will be made through the 2018/28 LTP process. This will defer works to align with the forecast FMP completion dates.

3. Summary Progress

The FMP implementation is progressing well, however deferral of projects has potential to extend FMP completion dates envisaged in the original FMP documents. The original targets for completion of the western projects by 2040 and the Wairarapa projects by 2025 are being reviewed and will be updated in 2017/18. The Waiohine and Te Kāuru projects which were due to commence have been delayed by the process needs to complete the FMPs, and the funding and scale of the RiverLink project in Te Awa Kairangi/Hutt River catchment may create need to defer other works. **Attachments 1 to 5** provide a summary by project of implementation progress. Table 1 below shows the summary of financial progress to date and the forecast to 2025. The progress shown in Table 2, as '% complete' to June 2017 and the forecast progress to 2025 was computed by discounting current dollars to dollars at the time of adoption of the respective FMPs.

A future issue with this methodology has been identified which would lead to a beyond complete, possibly greater than 200% of original target being reached. The current figures are largely unaffected by this future issue which would become visible during the period of the next LTP. As a result a new measure is being developed and has been presented in draft format and discussed with Audit NZ, this measure will be further developed and considered for incorporation in the 2018-2028 LTP. The issue is created by inflation effects, changes to the natural resources plan affecting project delivery costs, and changes to construction costs. This means that over time the relationship between project delivery costs developed in 2001 bear little resemblance to today and future project delivery costs. The proposed solution to this disconnects project delivery cost from project delivery benefit, and develops and assigns a fixed delivery benefit percentage to each project within the Hutt FMP that will not be affected by time or cost, thereby eliminating the issue.

Table 1: Expenditure Summary

River	Original FMP Total 40 year estimate ($M)[1]	Expenditure in 2016/17($M)[2]	Expenditure to June 2017($M)[2]	Total expenditure forecast to 2025 ($M)[2]
Te Awa Kairangi/Hutt	78.00[1]	10.4	52.7	110
Otaki	12.07[1]	0.0	8.3	17
Waikanae	8.69[1]	2.0	6.7	10
Pinehaven	5[1]	0. 1	0.7	5
Total western FMPS	**-**	**12.5**	**68.6**	**142**
LWVDS	8.8[1]	0.1	7.3	12.7
Waiohine	11.4[1]	0.8	1.5	12
Total Wairarapa	**-**	**0.9**	**8.7**	**29.4**
Total	**-**	**13.4**	**77.3**	**171**

Notes:

1. Hutt, Otaki, Waikanae and LWVDS budgets are based on 1999, 1998, 1997 and 2007 dollar (FMP dollars) values respectively. Waiohine and Pinehaven are 2008 and 2014 estimates.

2. Expenditure figures are the sum of expenditure to date in current dollars and the budget (indexed) provided in the current Annual plan. The figures shown are current, and have not been backdated to dollar values at the time the FMP's were developed.

Table 2: Progress Summary

The progress summary table was developed as a method to show progress towards completion of FMP outcomes. The method uses dollars spent as a proxy for a progress towards outcome indicator. The method has been identified as having issues that are exacerbated over time as described in section 3 of this report.

River	Budget/Expenditure FMP dollars		% Complete		
	Total original FMP estimate ($M) [1]	Expenditure to June 2017 ($M) (indexed to FMP dollars)	Actual to June 2017 in dollar terms	Forecast to June 2025 in dollar terms	June 2017 (Flood damages saved)
Te Awa Kairiangi/Hutt	78	52.7	46%	80%	35%
Otaki	12.07	5.9	49%	88%	70%
Waikanae	8.69	4.5	52%	81%	69%
LWVDS	12.7*	7.3	57%	100%	
Pinehaven	5	0.7	14%	100%	
Waiohine	11.4	1.5	13%	100%	

*LWVDS progress is on the basis of the 2013 estimate. LWVDS, Pinehaven and Waiohine expenditures are not discounted.

1. Hutt, Otaki, Waikanae and LWVDS budgets are based on 1999, 1998, 1997 and 2007 dollar (FMP dollars) values respectively. Waiohine and Pinehaven are 2008 and 2014 estimates.

3.1 Non-structural measures

The Hutt and Kapiti flood hazard information has been included in Hutt City and Kapiti District Plans. The Kapiti flood hazard has been amended to reflect the reduced flood risk from the Chrystalls stopbank and Jim Cooke Park realignment works. The Wairarapa flood hazard information has been included in the Wairarapa Combined District Plan. Inclusion of flood hazard information in the UHCC district plan is taking more time than originally planned. GWRC is continuing to support UHCC through its plan change process for Plan Change 42 and anticipate the outcome of this process during 2017/18 financial year.

3.2 Structural measures

3.2.1 Te Awa Kairangi/Hutt River

By the end of June 2017, $52.7 million had been spent on implementing the Hutt River FMP. The project is now about 46% complete on the basis of FMP dollars and progressing well.

The planning and design for the RiverLink project (City Centre stopbank and channel improvements) commenced in October 2012 and is progressing well.

The construction phase of this project is currently scheduled for commencement in 2020. However, programme alignment with Hutt City Council and the New Zealand Transport Agency will determine the final construction programme recommendation. Land purchase for the RiverLink project and strategic land purchase at other critical locations in the Hutt River are continuing.

The benefits in terms of flood damages saved are estimated at 35% on the basis of works completed to date to deliver the outcomes of the Hutt FMP. The benefits on the basis of flood damages saved will be 66% when the flood protection upgrade and Melling Bridge replacement components of the RiverLink project are completed.

3.2.2 Kapiti Rivers

By the end of June 2017, $15 million had been spent implementing the Kapiti FMPs. The Otaki and Waikanae FMPs are 49% and 52% complete respectively on the basis of FMP dollars.

In Otaki, the Chrystalls stopbanks, the Rangiuru floodgates, the Mangapouri culverts and about 52% of the river management works upstream of SH1 are complete.

In Waikanae, the Kauri Puriri works, Otaihanga Road raising, Jim Cooke Park realignment and part of Otaihanga edge protections are complete. About 59% of the planned river management works are now complete. The Jim Cooke park stopbank works were not complete in June 2017 as anticipated due to weather delays, however at the time of writing this report the works had been completed.

The benefits in terms of flood damages saved are estimated at 69% for Waikanae FMP and 70% for Otaki FMP on the basis of works completed to date.

3.2.3 LWVDS

Implementation of the LWVDS development works programme commenced in 2007/08. All works programmed up to June 2017, amounting to approximately 57% of the revised total project cost of $12.7 million, were completed. The total expenditure to June 2017 is $7.3 million.

3.3 Environmental enhancement works

Environmental enhancement works continue across all rivers, in conjunction with large capital work projects. These enhancement works are guided by the environmental strategies that exist for Te Awa Kairangi/Hutt, Otaki and Waikanae Rivers. These strategies generally include planting native trees, improving existing walkways or providing new amenity facilities.

3.3.1 Te Awa Kairangi/Hutt River

The Hutt River Environmental Strategy Review has continued through the year and the draft strategy and action plan entered its stakeholder consultation phase

in June 2017. The revised and updated plan is proposed to be recommended to the HVFMSC for approval in March/April 2018.

Improvements have been made to the reach of the river adjacent to Taita. This was accelerated by the planting of a memorial grove for Robin Maud, a community leader who drove many of the environmental and amenity improvement projects along the river. The area will see further enhancements designed in conjunction with the community in 2017/18, including track and trail safety and further planting.

A design has been developed for modifying and repairing the weir across the Waiwhetu Stream at St Ronans Avenue. The design proposed is greater than available budget, but has been provided to the Friends of the Waiwhetu stream for them to further develop and refine.

Support has continued for implementation of Friends of the River initiatives on the Otaki and Waikanae Rivers.

3.3.2 Waikanae River

A review of the Waikanae Environmental Strategy, undertaken as part of the 10 yearly review of the Waikanae FMP, was completed in 2016 and has been used to guide work carried out in 2017. An addendum to this strategy to create an action plan to drive the strategy outcomes will be added in 2017/18.

The planting plan associated with enhancement works that are part of the Jim Cook Park stopbank upgrade project is in development and will be implemented in 2017/18 following completion of the project earthworks.

3.4 Emergency Management

Most of the emergency management measures identified in the FMPs to enhance the existing systems have been completed. Providing flood warning to local authorities and selected land owners is continuing on an on-going basis. Our Flood Warning system has been reviewed and an implementation plan has been developed. Some of the projects in this plan will (subject to approval via Council's LTP process) involve capital expenditure for new infrastructure and upgraded warning systems under FMP implementation. This will be reported in future years once the projects have been confirmed.

3.5 FMP progress reviews

All three western FMPS have adopted a 40 year timeframe to fully implement with progress reviews proposed every 10 years. The 10 yearly progress review of the Waikanae FMP is now complete and the review of Otaki FMP has commenced. The programmed Hutt FMP review may need to be delayed until completion of the RiverLink project, or, alternatively, a partial review could commence in 2018/19.

4. 2016/17 Targets and achievements

Good progress was made on all FMP projects during 2016/17. A total of $13.4 million was spent during the year. The highlights for 2016/17 are summarised below.

4.1 Western FMPs

The RiverLink Project has made great progress with aligning HCC, NZTA and GWRC to create a joint project. This has resulted in a HCC and GWRC design that overlaps the aspirations of HCC with the delivery of flood protection by GWRC. This work has also created links to GWRC public transport and opportunities for improvements in Hutt City. The project is on track to make a recommendation to the Hutt Valley Flood Management Subcommittee in the third quarter of 2017/18. This will seek endorsement of preliminary design and for the project to proceed to detailed design and consent preparation. Property acquisition has continued, the project spending total property value just below forecast for 2016/17. The forecast property acquisition costs for the whole project have increased due to an inflated property market, this revised forecast will be recommend through the 2018-28 LTP processes. GWRC currently is acquiring property on a willing buyer/willing seller approach meaning the acquisition process is voluntary and subject to property owners approaching GWRC if they are interested in sale.

Land transfers for the Boulcott stopbank upgrade were completed, however an appeals period will remain in effect until 2017/18. Aside from some minor planting works this completes that project.

4.2 LWVDS

LWVDS FMP development is delayed until the Waiohine and Te Kāuru FMPs are completed. Only part of the scour protection work at Simmonds was done due to wet weather conditions. Whakawhiriwhiri Stream upgrade work is on hold due to landowner entry issues. Pukio East Stopbank realignment project was put on hold in order to develop technical guidelines for the design and construction of rural stopbanks, this will be applied region wide for stopbanks in rural areas.

5. 2017/18 works programme

5.1 Western FMPs

The total western FMP budget for 2017/18 is $17.5million. The key western FMP projects include:

- Follow up work with UHCC to complete the district plan change to include the revised Pinehaven Stream, Hutt River and Mangaroa flood hazard in the Upper Hutt district plan. This process is forecast to complete in Q2 2017/18
- Progressing the Preliminary Design for the Riverlink (Hutt River City Centre Upgrade Project) and progress with aligning programmes (NZTA, HCC, GWRC) of the project partners. Recommending that the subcommittee endorses Preliminary design in Q3 17/18 and that detail design and consent stage for the project commences in Q4 17/18
- Progressing property acquisition for the Riverlink project in alignment with the project property strategy.

- Completing the design for Hutt River interim edge protection adjacent to Port Road (upstream from the Waiwhetu Stream mouth to Seaview Road bridge).
- Completion of the Jim Cooke Park stopbank reconstruction project in the Waikanae River.
- Progressing with land entry negotiations for the lower Waitohu Stream channel works.
- Implementing the channel capacity improvements for the Pinehaven FMP.
- Completion of Hutt River Environmental Strategy review.
- Addendum of an Action Plan to the Waikanae River Environmental Strategy to establish projects that will delivery strategy outcomes.

5.2 Wairarapa

The total budget for 2017/18 is $1.0 million. The key projects include:

- Commence assessment of the Tauherenikau River gravel build up criticality;
- Tauanui River diversion, gravel interception works;
- Completion of the Pukio East Dairy Ltd stopbank relocation project, including landowner negotiations;
- Continue landowner negotiations for the Whakawhiriwhiri Stream drainage improvement works using provisions of the SCRCA compulsory entry provisions;
- Progress development of a new Waiohine FMP with the new Project Team and Steering Group. Implementation remains on hold until completion and endorsement of the FMP is achieved;
- Te Kāuru Upper Ruamahanga FMP implementation remains on hold until completion and endorsement of the FMP is achieved.

6. Activities proposed to 2017 to 2025

The Flood Protection 2016-2025 Business Plan provides a total of $129 million to implement the Hutt, Otaki, Waikanae, Pinehaven, Waiohine and Te Kauru FMPs and LWVDS development works. The programme also includes completing the 10 yearly progress reviews of the western FMPs.

These figures are currently being reviewed and updated to feed into the 2018-28 LTP. There will be recommendations to defer some projects.

6.1 Hutt

The programme provides for progressing with upgrading of all stopbanks on both banks of Te Awa Kairangi/Hutt River and the river channel from Kennedy Good Bridge to Ewen Bridge to provide the Hutt River FMP recommended standard of protection to the Hutt CBD, the central residential areas and the

western residential areas from Melling to Petone. The project is currently scheduled for completion by 2025. However, the timing for completion is dependent on land acquisition, funding and progress with HCC's Making Places project and NZTA's Melling Intersection Investigations Project.

The projects programmed for Lower Hutt also include completion of the Waiwhetu FMP and works in the river channel from KGB to Taita in Te Awa Kairangi/Hutt River. No budget has been included for the implementation of the outcomes of the Waiwhetu FMP because of the uncertainty over any potential measures necessary or being reasonably able to be implemented.

Te Awa Kairangi/Hutt River projects programmed for Upper Hutt include the Maoribank river bed stabilisation, Ebdentown edge protection works and Pinehaven Stream improvements.

Adjustments to these work programmes will be included in the 2018-28 LTP.

6.2 Waikanae

In Waikanae further environmental enhancement works associated with the completed Jim Cooke Park project will continue through the period. Investigations on the remaining FMP works will continue and an addendum will be added to the Waikanae river environmental strategy to add an action plan component to clarify delivery of the strategy.

6.3 Otaki

The programme provides for completing the Lower Waitohu Stream project, the south bank and north stopbank improvements and further bank edge protection works. Further environmental enhancement works will continue through the period.

6.4 Wairarapa

The programme of work provides for completing the Waiohine Project by 2021 and the LWVDS development works schedule by 2025. Te Kāuru FMP implementation is currently programmed to commence in 2017/18 for completion by 2023.

These programmes will be adjusted through the 2018/28 LTP to accommodate the changes in processes required to complete and seek endorsement of the Waiohine and Te Kauru FMPs. This will require deferral of the commencement of implementation of these projects

7. Communication

A copy of this report will be sent to Territorial Authorities in the Region for their information.

8. Consideration of Climate Change

No decision is being sought in this report.

The matter/s addressed in this report have been considered by officers in accordance with the process set out in the GWRC Climate Change Consideration Guide.

8.1 Mitigation assessment

Mitigation assessments are concerned with the effect of the matter on the climate (i.e. the greenhouse gas emissions generated or removed from the atmosphere as a consequence of the matter) and the actions taken to reduce, neutralise or enhance that effect.

The effect of any works progressed under these plans and commissioned by GWRC will be addressed via GWRC's procurement process which is undergoing review in 2017 and will encourage suppliers and contractors to minimise emissions.

8.2 Adaptation assessment

Adaptation assessments relate to the impacts of climate change (e.g. sea level rise or an increase in extreme weather events), and the actions taken to address or avoid those impacts.

Climate change projections have been incorporated into the modelling that underpins the Floodplain Management Plans and designs of new flood protection projects, and is therefore an integral component of the associated designs and operational works.

9. The decision-making process and significance

No decision is being sought in this report.

This report provides an update on progress made with implementing the floodplain management projects and confirms that we are meeting the service improvement plans set out in the Council's Long Term Plan.

9.1 Engagement

Engagement on this matter is unnecessary.

10. Recommendations

That the Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report.*

3. ***Recommends*** *that a copy of the report be sent to the Region's territorial authorities*

Report prepared by:	Report approved by:	Report approved by:
Alistair J N Allan Team Leader, FMP Implementation	**Graeme Campbell** Manager, Flood Protection	**Wayne O'Donnell** General Manager, Catchment Management

Attachment 1 Hutt FMP Summary Progress Table
Attachment 2 Otaki FMP Summary Progress Table
Attachment 3 Waikanae FMP Summary Progress Table
Attachment 4 LWVDS Development Work Summary Progress Table
Attachment 5 Pinehaven FMP Work Summary Progress Table

Attachment 1 to Report 17.394

Hutt FMP Summary Progress Table

Work Area	Plan Achievements		Programme	
Structural	**Completed to June 2016**	**Completed 2016/17**	**Proposed for 2017/18**	**Proposed in 2015/2025 LTP**
Non-structural measures				
District Plan measures	Completed Hutt City Plan change	The proposed UHCC District Plan change 42 amended to include Mangaroa and Pinehaven flood hazard.	Follow up work with the UHCC plan change	Complete UHCC plan change 42
Emergency Management Measures	Completed HRFMP projects	A review of flood warning services has commenced	Further improvements to flood warning services proposed with the improvements in flood forecasting information	
Voluntary Actions	Hutt River Flood Hazard Fact Sheet	Ongoing Providing hazard information	Ongoing Providing hazard information	Ongoing Providing hazard information
Structural Measures				
River Mouth to Kennedy Good Bridge				
Ava to Ewen Project	River realignment and stopbank upgrades completed			
Boulcott/Hutt stopbank	Stopbank construction completed	Land transfers completed including landscaping works		
RiverLink City Centre Upgrade Project	Gained Council approval of a preferred integrated option for the preliminary design and costing	Progressed land acquisition, progressed preliminary design, improved alignment between HCC, GWRC and NZTA	Complete the preliminary design and seek council approval to progress to the NOR/consent phase	Progress with the construction of RiverLink (City Centre Upgrade Project).
Estuary to Ava Bridge			Strategic land purchase if land owners offer to sell	Progress with designing Ava to Estuary stopbank upgrade works
Kennedy Good Bridge to Silverstream Bridge				
Belmont Edge protections and Norfolk Street flood gate		Completed edge protections to reduce erosion risk	Repairs to edge protections and enhancement planting	Progress with edge protection works
Principal stopbanks from KGB to Pomare and associated channel works				No budget yet (post 2025) Stopbanks are in good condition and only minor works are necessary

Silverstream to Maoribank				
Whirinaki Crescent (LB)	Completed			
Ebdentown rock lining	Progressed with the concept design and negotiations with NZTA	Completed edge protections and planting works		
Principal stopbanks from Trentham to Maoribank and associated channel works				No budget yet (post 2025) Stopbanks are generally adequate except for a short length upstream of the Moonshine Bridge
Maoribank to Gemstone Drive				
Maoribank Riverbed stabilisation	Completed investigations and developed a management strategy. Completed urgent repair works			Complete project
Bridge Road edge protections	Edge protection works completed			
Akatarawa/Gemstone stopbanks				No budget yet (post 2025)
Environmental Strategy and FMP/HRES review				
Ranger Service	Continue with ranger service	Continue with ranger service	Continue with ranger service	Continue with ranger service
Enhancement works				
Ava to Ewen	Completed planting, walkways, the viewing platform, Inanga spawning habitat and lighting along the stopbanks			
Belmont	Completed all landscaping works			
Whirinaki Crescent	Completed landscaping works			
Bridge Road/Ebdentown	Completed planting		Complete planting	
Boulcott/Hutt	Progressed with golf course landscaping, and completed landscaping and planting	Completed landscape works at Connolly Street		Ongoing maintenance
Hutt River Trail				
Estuary Bridge Underpass	Completed			
Planting Native Trees	Completed planting of natives associated with completed construction projects	Planting and maintenance continued	Continue planting natives	Continue planting natives
HRFMP progress Review				Complete review

HRES Review (Hutt River Environmental Strategy Action Plan)	Commenced review	Review of HRESAP and reissued draft to stakeholders and partners. Added action plan component	Complete review and seek subcommittee endorsement of HRESAP	

Attachment 2 to Report 17.394

Otaki FMP Summary Progress Table

Work Area	Plan Achievements		Programme	
Structural	**Completed to June 2016**	**Completed 2016/17**	**Proposed for 2017/18**	**Proposed in 2015/2025 LTP**
Chrystalls				
Stopbank	Completed 2000			
Extended Stopbank	Construction and land purchase completed			
Rangiuru Floodgates	Completed 2002			
Lower Waitohu Stream Project includes South Waitohu and Convent Road improvements	Developed flood mitigation options and progressed with land entry negotiations	Progress land entry negotiations	Progress with land entry negotiations	Complete stream channel improvements and low stopbank at 74 Convent Road and South Waitohu stopbank
North Bank Improvements				Complete
House Raising				
Lethbridge (02)				No budget yet
Rangiuru (22)				No budget yet
South Waitohu (06)		One house raising assistance enquiry received	Progress house raising assistance enquiry	No budget yet
Mangapouri Stream				No budget yet
Culverts (by KCDC)	3 Culverts			No further budget
Stream widening				No budget yet
South Bank Stopbank	Investigated conceptual options for relocating the stopbank			Complete works
Harpers Stopbank			Review business case	No budget yet
Lutz Upper and Lower Stopbank	Completed 1999			
Katihiku Floodgates				No budget yet
Seaward Extension			Progress concept design	No budget yet
River Management				
Katihiku	Concept designs completed			Progress
Gas Line	Concept designs completed			Progress
Batching/Campbells	Lethbridge edge protections completed			Progress
Bridges	Completed in 2009/10			
Ballast/Tracey	Edge protections at Traceys completed	Repairs to Traceys Groynes		
Chrystalls Bend	Completed 1994		Assist PP2O project to design upgrade	

			Chrystalls Extended stopbank as mitigation of SH1 construction effects	
Hughes	North Bank only Concept designs completed			Progress
Hughes/Lutz	North Bank only Concept designs completed			
Taylor/Mansell	North Bank only Concept designs completed			
Lower Gorge				No budget yet
Non-structural				
Non-structural in KCDC DP	Completed 1997 with updates in 2004 and 2009			Update as required
GWRC Advice	Ongoing	Ongoing	Ongoing	Ongoing
Community Preparedness	Achieved	Ongoing	Ongoing	Ongoing
Environmental Strategy				
Mouth	Weed clearing completed on north bank	Planting and maintenance Ongoing	Ongoing	Ongoing
Chrystalls Bend	Completed 1995 Further enhancement completed 2011			
Walkway through Winstones	Completed 2004		Assist PP2O project with designs for Chrystalls Extended stopbank upgrade and walkway improvements	
Walkway to Chrystalls	Completed including the section under SH1 and rail bridge		Assist PP2O project with designs for Chrystalls Extended stopbank upgrade and walkway improvements	
Walkway to Rahui				Continue with land entry negotiations
Environmental Strategy	Prepared 1999		Commence review following completion of FMP review	Complete review
Friends initiatives	Ongoing support	Ongoing support	Ongoing support	Ongoing support
FMP Review				
FMP review		Review commenced	Complete Review	Complete review

Attachment 3 to Report 17.394

Waikanae FMP Summary Progress Table

Work Area	Plan Achievements		Programme	
Structural	**Completed to June 2016**	**Completed 2016/17**	**Proposed for 2017/18**	**Proposed in 2015-2025 LTP**
Kauri-Puriri Works				
Stopbank	Completed 1997			
Greenaway Road Raising	Completed 1997			
Remove Riverside Lodge	Completed 1997			
Chillingworth Stopbank	Completed 1997			
Jim Cooke Park Stopbank reconstruction	Completed consultation and gained Council approval of a preferred option	Complete construction	Complete environmental enhancement and mitigation planting	Complete???
Otaihanga Road Raising				
Stage 1	Completed 2000			
Stage 2	Deferred			
Stage 3	Completed 2003			
House Raising				
73 Makora Rd	Completed 2006			
11 & 13 Toroa Rd	Completed 2000			
15 Toroa Rd	Completed 2006			
21 Makora Rd	Completed 2006			
61 Makora Rd	Deferred			
1 -17 Makora Rd	1 house raised (Boating Club)			No further house raising budgeted
Lion Park Ringbank				No budget yet
Waikanae Beach				
Golf Course Stopbank				Progress
Lengthen Fieldway Bridge				Progress
River Management				
Mouth				Progress
Otaihanga	Rock edge protection 220 m completed			Progress
El Rancho	Completed 1997			
Greenaway Road				
Jim Cooke Park	Completed 2008			
River Glade	Completed 2000			
Kebbels	Completed 2000			
Edgewater Park	Completed 2000			
State Highway One	Completed 2000			

Non-structural				
Non-structural in KCDC DP	Completed 1997 with updates in 2004 & 2007		Prepare information to assist future plan change	Update as required
GWRC Advice	Ongoing	Ongoing	Ongoing	Ongoing
Community Preparedness	Ongoing	Ongoing	Ongoing	Ongoing
Environmental Strategy				
Pukekawa Reserve	Completed 1997			
SH1 to Maple Lane	Completed 2000			
Jim Cooke Park	Footbridge completed		Complete enhancement planting plan. Including removal of dangerous trees	
General	Tree clearing and track maintenance	Tree clearing and track maintenance	Tree clearing and track maintenance	Supporting Friends initiatives
Ecological Strategy	Prepared 1999	On going	On going	On going
Environmental Strategy	Published the reviewed strategy		Implementation Add action plan addendum to environmental strategy	On going
FMP Review				
FMP Review	Completed			

Attachment 4 to Report 17.394

LWVDS Development Work Summary Progress Table

Work Area	Plan Achievements		Programme	
Structural	**Completed to June 2016**	**Completed 2016/17**	**Proposed for 2017/18**	**Proposed in 2015/2025 LTP**
Ruamahanga River				
Stopbank shifting	80%		10%	100%
Top up stopbank	50%		Complete	
Tauherenikau River				
Stopbank upgrade	100%			
Turanganui River				
Stopbank upgrade	100%			
Tauanui River				
Stopbank construction/shifting	60%		40%	Complete
River Management				
Ruamahanga River				
Waiohine to Waihenga - Willow buffer zone Bank Protection Fencing	 100% 100%	 80%	 5%	 Complete
Waihenga to Tuhitarata – Removal of overburden from berm		40%		This work to be undertaken with future FMP stopbank shifting work
Tuhitarata to Lake Onoke – Boulder rip rap Planting	 100%	85%	Complete	Complete
Tauherenikau River Willow buffer zone Fencing	 100% 100%			
Tributaries Willow buffer zone Land purchase Whakawhiriwhiri	 100% 100%	 20%	 80% - continued landowner entry negotiations may further delay completion	 Complete
Non-structural				
No non-structural work				
Environmental Enhancement (Native Planting)				
Ruamahanga River	90%	5%		Complete
Whakawhiriwhiri Stream			Continued landowner entry negotiations may further delay completion	Complete

FMP Review				
FMP review				Complete review – review is likely to be postponed due to completion of the Te Kauru and Waiohine FMPs

Attachment 5 to Report 17.394

Pinehaven FMP Work Summary Progress Table

Work Area	Plan Achievements		Programme	
Structural	**Completed to June 2016**	**Completed 2016/17**	**Proposed for 2017/18**	**Proposed in 2015/2025 LTP**
1. Pinehaven bypass culvert to Sunbrae Drive			Design for construction and consents	Complete
2. Sunbrae Drive to Pinehaven Road			Design for construction and consents	Complete
3. Pinehaven Road to Pinehaven Reserve			Design for construction and consents	Complete
4. Upper Catchment				Complete
5. Strategic land purchase	3 of 3 full properties purchased		Secure land entry requirements to enable structural works, may require partial property purchase	Complete
Non-structural				
Plan Change 42			Plan Change 42 completed by UHCC	Complete – required prior to commencement of structural works
Upper catchment private crossing improvements – community led project				To be scheduled in 2021-31 LTP
Environmental Enhancement				
Willow park enhancements				Complete
Pinehaven Reserve enhancements				Complete - Community led project
FMP Review				
FMP review				To be scheduled in 2021-2031 LTP

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Report	2017.428
Date	10 October 2017
File	CCAB-10-390
Committee	**Environment Committee**
Author	**Tim Gale, Biosecurity Policy Advisor**
	Davor Bejakovich, Manager, Biosecurity

Regional Pest Management Strategy 2002-2022: Operational Plan Report 2016/17

1. Purpose

To report on the performance of the 2016/17 Operational Plan for the implementation of the Regional Pest Management Strategy 2002-2022.

2. Background

Greater Wellington Regional Council (GWRC) is responsible for the Wellington Regional Pest Management Strategy 2002-2022 (RPMS). The Council approved the current RPMS on 17 September 2002.

In 2012 the Biosecurity Act 1993 (the Act) was amended. One change was to replace Regional Pest Management Strategies with Regional Pest Management Plans. The Current Strategy is deemed to be a Regional Pest Management Plan.

Under Section 100B of the Biosecurity Act 1993, Council is required to prepare an annual Operational Plan outlining the activities under the RPMS. Following the end of the financial year, Council is required to produce an Operational Plan Report, detailing the results of the Operational Plan.

The Operational Plan Report is made available to the public and a copy forwarded to the relevant Minister(s).

3. The Operational Plan Report

During 2016/17 the Biosecurity Department continued implementation of the RPMS as outlined in the Operational Plan 2016/17. Control activities are based on the biology of the pest plant and pest animal species and best practice pest control methodology. Resources are allocated according to the impact of the species and the subsequent requirements of the management programmes.

The control and management regime for each pest species is considered against the impacts, spread, costs and benefits of the species. All pests in the strategy are

listed in one of five management categories; Regional Surveillance, Containment, Total Control, Suppression and Site-Led. The majority of resources continued to be allocated to the Total Control and Site-Led species.

i. **Total Control**
Intensive surveys for Total Control plant species were undertaken across the region, with 65 new sites of Total Control species discovered. Of the 1,234 Total Control sites, 1,133 were inspected at least once during the year and any plants found were controlled. Currently 455 of the Total Control sites are determined as having the target species eradicated.

ii. **Biocontrol**
Staff worked with ten different species of biocontrol agents during the year. This includes beetles to control tradescantia and green thistles, the broom gall mite, the Buddleia leaf weevil, Scotch thistle gall fly, and the Japanese Honshu white admiral butterfly to control Japanese honeysuckle.

iii. **Rooks**
The Total Control rook programme in 2016/2017 was successfully undertaken, with the number of active nests requiring treatment having being reduced from 150 in 2009/10 to 33 in 2016/17. The programme is aiming to achieve total control of rooks in the region by 2025.

iv. **Rabbits**
The successful suppression of feral rabbits continues across the region with numbers remaining at low levels overall, with small pockets of rabbits persisting around traditional hotspots. The rabbit haemorrhagic disease virus (RHDV) continues to cycle naturally in the wild rabbit population assisting with the management of rabbit numbers.

v. **Regional Possum Predator Control Programme (RPPCP)**
We controlled possums across approximately 111,300 ha of the Wellington Region during the 2016/17 year. The monitoring results for the controlled areas indicate we are keeping possum numbers at very low levels, and below the target of 5% Residual Trap Catch.

vi. **Site-Led**
Site-Led programmes remain the primary focus of the RPMS with successful management of a wide range of plant and animal pests in specific sites. This year, control work was undertaken at all 58 Key Native Ecosystem (KNE) sites across the region. Trials with non-toxic Goodnature traps are starting to produce worthwhile findings and results in some of these areas. The long-running KNE programme, now administered by the Biodiversity Department, continues to be successfully implemented.

vii. **Relationships**
An essential part of implementing the Strategy is successful relationship building and providing advice and education to the community. The Biosecurity Department retains strong partnerships with central and local government, iwi, science providers, community groups and the general public.

viii. **Advice and Education**
Advice and education remain an important tool to ensure that the public are aware of their responsibilities under the RPMS, and can access resources and information for successful pest management. With the announcement of Predator Free NZ 2050 in 2016, community groups are emerging throughout the region leading to an increased demand for resources.

ix. **Public enquiries**
Enquiries from the public remain an important part of the RPMS, with 581 requests for information, advice and assistance processed by our staff during the 2016/17 year. Many of these required site visits or inspections, often followed by control advice and sale of equipment. The GWRC website continued to receive regular enquiries seeking information and advice on pest management.

The attached 2016/17 RPMS Operational Plan Report further details the achievements against the objectives of the Operational Plan, and lists the spending and outcomes of the control programmes.

4. Communication

Public notices will be issued to inform the public that the RPMS Operational Plan Report 2016/17 is available for inspection. Copies will be forwarded to the appropriate Minister(s) for their review and comment.

5. Consideration of Climate Change

The matters requiring decision in this report have been considered by officers in accordance with the process set out in the GWRC Climate Change Consideration Guide.

5.1 Mitigation assessment

Mitigation assessments are concerned with the effect of the matter on the climate (i.e. the greenhouse gas emissions generated or removed from the atmosphere as a consequence of the matter) and the actions taken to reduce, neutralise or enhance that effect.

Operational emissions associated with biosecurity operations are measured and reported via the GWRC Carbon Inventory and subject to the emissions reduction initiatives set out in the GWRC Corporate Sustainability Action Plan.

GWRC's role in enabling forests in the region to draw CO2 down from the atmosphere (carbon sequestration) is significant. Biosecurity operations contribute to protecting native forest and vegetation by maintaining large scale pest animal management programmes.

Possum control and KNE programmes help maintain the carbon sequestration capacity of forests located within the 159,000 ha under GWRC control (the KNE programme encompasses 48,000 ha of mostly forest ecosystems and regional possum control covers over 111,000 ha of the region). Trees planted through biodiversity and parks programmes along with erosion control initiatives have resulted in thousands of new trees being planted each year.

5.2 Adaptation assessment

Adaptation assessments relate to the impacts of climate change (e.g. sea level rise or an increase in extreme weather events), and the actions taken to address or avoid those impacts.

Biosecurity threats are expected to increase as the climate in the Wellington Region continues to change. Future challenges will include new exotic pests, weeds and diseases which have previously not been able to flourish becoming established. The potential establishment of subtropical pests and current seasonal immigrants are of greatest concern, along with taxa that are already recognised as high risk.

Biosecurity impacts related to climate change will be considered in greater detail when the Regional Pest Management Strategy is reviewed. Subsequent Operational Plans will address threats identified in that Strategy, as well as options for managing the effects climate change is expected to have on the departments operations (for example severe weather can impact service delivery of aerial and ground based pest control).

6. The decision-making process and significance

The matters requiring decision in this report has been considered by officers against the requirements of Part 6 of the Local Government Act 2002.

6.1 Significance of the decision

Officers have considered the significance of the matter, taking the Council's significance policy and decision making guidelines into account. Officers recommend that the matter is considered to have low significance.

Officers do not consider that a formal record outlining consideration of the decision-making process is required in this instance.

7. Recommendations

That the Committee:

1. ***Receives*** *the report.*
2. ***Notes*** *the contents of the report.*
3. ***Approves*** *the Operational Plan Report 2016/17 (Attachment 1) for the Regional Pest Management Strategy 2002-2022.*
4. ***Notes*** *that a copy of the Operational Plan Report 2016/17 will be forwarded to the relevant Ministers.*
5. ***Notes*** *that the Operational Plan Report 2016/17 will be made available for public inspection.*

Report prepared by:	Report approved by:	Report approved by:
Tim Gale Biosecurity Policy Advisor	**Davor Bejakovich** Manager, Biosecurity	**Wayne O'Donnell** General Manager, Catchment Management Group

Attachment 1: Operational Plan Report 2016/17 for the Regional Pest Management Strategy 2002-2022

Attachment 1 to Report 17.428

Regional Pest Management Strategy – Operational Plan Report 2016/17

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Regional Pest Management Strategy 2002-2022

Pest Animals and Pest Plants

Operational Plan Report 2016/17

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1. Introduction

1.1 Biosecurity at the Greater Wellington Regional Council

The Wellington region is under threat from a number of pest animal and plant species. The Greater Wellington Regional Council (GWRC) is involved in the control of unwanted plants and animals because:

- many of New Zealand's native plants and animals cannot co-exist with introduced species. In areas of high biodiversity value, pest plants and pest animals need to be controlled to protect vulnerable ecosystems.
- pest plants and pest animals cause considerable economic loss in many of New Zealand's primary industries. Pest management is essential to the success of our agricultural and horticultural industries.
- pest plants and pest animals are a nuisance to many aspects of rural and urban life, inhibiting the ability of people to enjoy their properties and inhibiting their wellbeing.

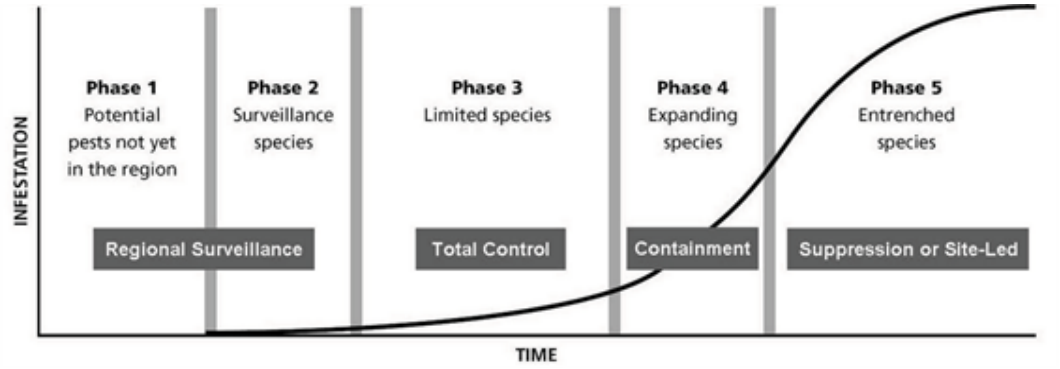
The Regional Pest Management Strategy 2002-2022 (RPMS) provides the strategic and statutory framework for effective pest management in the Wellington region. The central focus of the RPMS is on mitigating pest threats to society, to farming and agriculture in general, and supporting indigenous biodiversity and the ecological health of our ecosystems. There are two major objectives:

1. to minimise the actual and potential adverse and unintended effect of pests on the environment and the community; and
2. to maximise the effectiveness of individual pest management programmes through a regionally coordinated response.

Many advances in the effective management of a wide range of pest plants and pest animals have been made during the life of the Strategy. In response, indigenous biodiversity has been enhanced and local economic values protected over large parts of the region. The ability for this to be achieved was due to support from landowners, care groups and Territorial Local Authorities (TLA).

1.2 How the pest species are decided

A cost-benefit analysis (CBA) is undertaken for all species proposed for the strategy. This process decides what control, if any, is to be undertaken and what level of management is needed for the species. The CBA works in conjunction with the infestation curve (Table 1), which designates the different management policies.



Graph 1.Pest infestation curve.

Infestation phase	Phase characteristics	Management policies
Phase 1	Potential pest not currently in the region	Regional Surveillance
Phase 2	Recent arrival limited in distribution	Regional Surveillance
Phase 3	Limited in distribution and density	Total Control
Phase 4	Established but have not reached full distribution	Containment
Phase 5	Widespread or entrenched in most or all available habitat	Suppression or Site-Led

Table 1. Phases of regional pest infestation through time.

1.3 Purpose of the Operational Plan Report

This document reports against the achievements and outcomes of GWRC's biosecurity related activities. The work programme was set by the RPMS Operational Plan 2016/17 and aligns with the GWRC Annual Plan, which sets overall priorities and work programmes for the organisation.

Implementation of the RPMS requires resources. Our obligation to the community is to ensure these resources are used as efficiently and effectively as possible. This report provides some detail regarding how and where those resources were applied in the 2016/17 year.

The report is structured in two parts:

Part One - Pest Animals

Part Two - Pest Plants

The content is organised to align with the Operational Plan 2016/17. In the Pest Animal and Pest Plant sections the aim, cost, means of achievement, and the actual performance is reported on for each pest species or management category.

Part One: Pest Animals

Species Led Programmes

2. Surveillance Species

Aim: To prevent the establishment or minimise the impact, and prevent the further spread, of animal surveillance species in the region.

Means of achievement

Provide information and publicity to enhance public awareness of the surveillance species. The species in this category are Argentine ants, Australian subterranean termites, Darwin's ant, rainbow skink and red-eared slider turtle.

Actual performance

There were no new reports of any surveillance species and there was no demand for additional information on surveillance species during 2016/17.

3. Total Control – Rooks

Aim: To manage rooks as a Total Control category pest to levels that protects production systems at a cost of $99,000.

Annual cost: The cost of rook management (surveys, research, compliance, education) for the region was $57,000.

Means of achievement

Undertake direct control by service delivery where rooks are known to exist.

Actual performance

Eleven breeding rookeries were identified in the Wairarapa during 2016/17. This is the same number recorded in the previous two years. Between monitoring and control there were strong periods of north westerly winds but fortunately no nesting disruption appeared evident at active rookeries. Unsettled weather delayed the first round of nest baiting by several days, but 20 nests containing eggs or chicks were treated at the eleven rookeries on the 20th October. A subsequent baiting was carried out on the 1st November where a further 13 nests holding eggs or chicks were treated. The male rook is responsible for nest building and there has been an increasing trend of fresh but unused nests seen at active rookeries both in Horizon's and Greater Wellington regions. We feel that this is a reflection of the imbalance of males to females from years of repeated nest control. This year, 50 fresh but unused nests were recorded at the active rookeries.

The rook control programme remains on track to achieve total control of rooks in the Wellington region by 2025. The number of treated nests has reduced from 150 in 2009/10 to 33 in 2016/17.

For a number of years GWRC have not received any reports of rook damage to crops in arable farming regions. This indicates the success of the aerial baiting strategy.

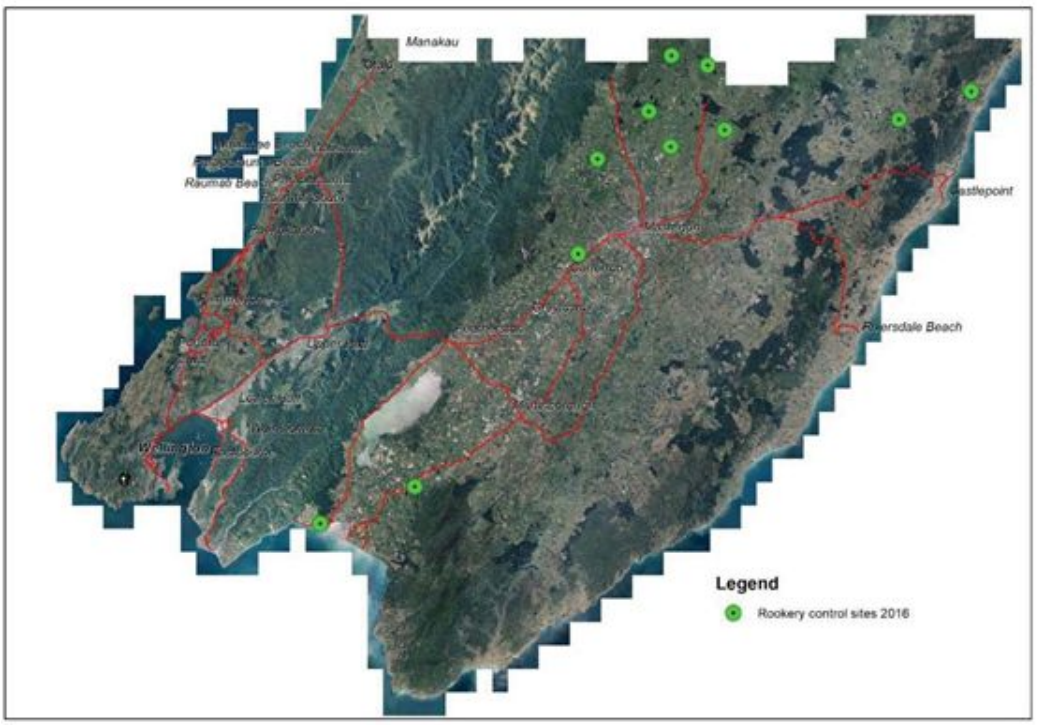
Means of achievement

Annually survey rook populations in areas where they are known to exist, and where new infestations are reported.

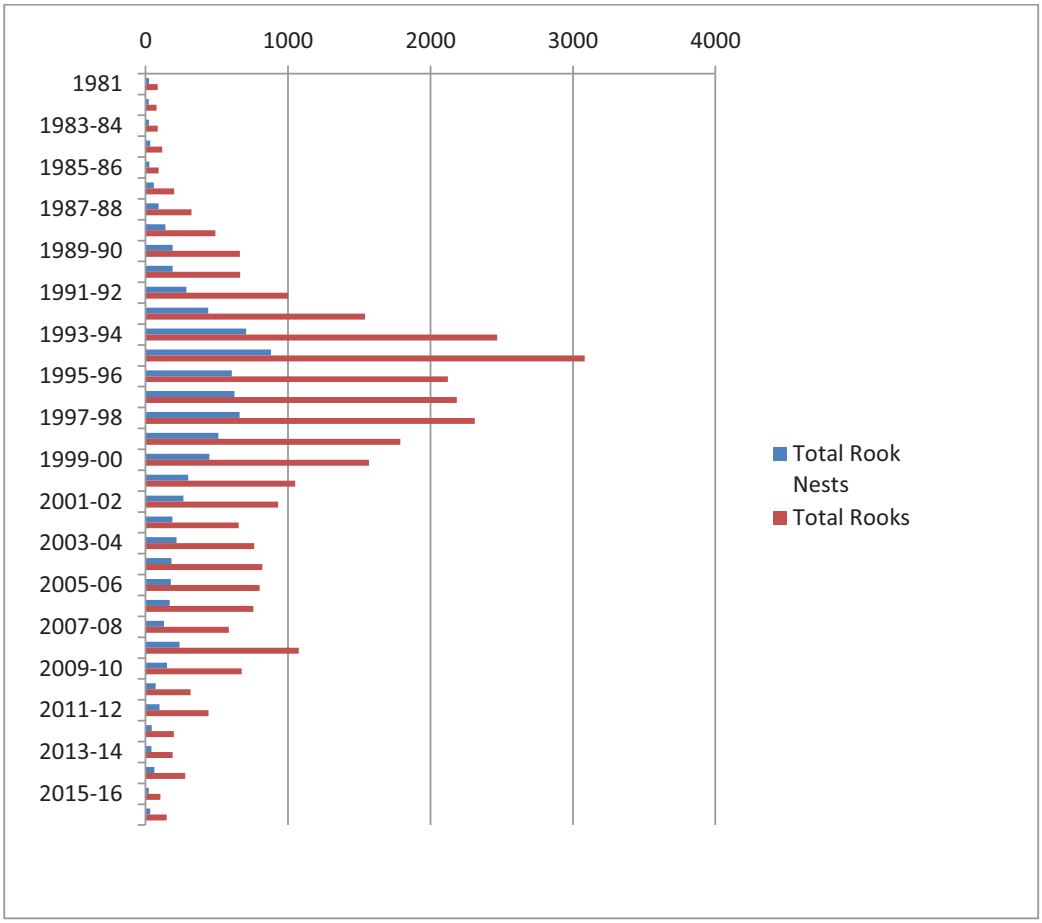
Actual performance

There are presently 116 known rookery sites in the region, both historical and current. All known sites were visited to determine the presence or absence of rooks. Areas of likely habitat are also surveyed from helicopter when travelling to known rookeries with the aim of locating new colonies. Some ground surveys are followed by an aerial survey in spring to check for the presence/absence of nests with eggs or chicks.

The rook programme relies heavily on the public and landowners in the region to help with locating rooks. The control programme is publicised annually in newspapers urging the public to report sightings. This year one new rookery was detected while checking historic rookeries. Four new rookeries were reported by the public. Alongside this, two old rookeries had reactivated with the balance still active since control of the previous year. All rookeries were relatively small in size.



Map 1. Rookeries treated during the 2016 season.



Graph 2. Total number of rookeries and number of rooks (estimated) in the Wellington region.

Means of achievement

Ensure compliance with the RPMS rules.

Actual performance

The advertising campaign continues to remind landowners of their responsibilities when managing rooks. Private attempts at rook control can lead to rookery fragmentation and dispersal over a wider area. Rooks may also become bait shy if poisoning is attempted using inappropriate methods and baits. Public and landowner education is the key to ensure control is managed by GWRC.

Means of achievement

Encourage Horizons Regional Council to actively pursue management of rooks within their region that complements GWRC's Total Control programme.

Actual performance

Horizons Regional Council was actively involved in aerial nest baiting in the 2016/17 year. Both GWRC and Horizons have cooperated in the annual joint nest baiting programme on both sides of the regional boundary. The programme is designed to prevent the southward migration of rooks into the Wairarapa.

4. Suppression Species – Rabbits

Aim: **To minimise the adverse impacts of feral rabbits throughout the region at a cost of $176,000.**

Annual Cost: **The cost of rabbit management (surveys, service delivery, biological control, compliance, education and research) for the region was $185,000.**

Means of achievement

Undertake direct control to manage rabbits on riverbeds, esplanades or similar public commons to ensure that rabbits do not exceed Level 5 of the Modified McLean Scale.

Actual performance

There were no situations in the region that required regulatory intervention. Most rabbit control undertaken during the year was to protect new plantings in re-vegetation projects by care groups, Territorial Local Authorities and private land owners. Regular night shooting in parks, reserves, beaches and cemeteries was undertaken for Wellington City Council (WCC), Hutt City Council (HCC) and Kapiti Coast District Council (KCDC) and GWRC's Akura Nursery. Costs for these activities were fully recovered. The use of the thermal imaging equipment has made these operations significantly more effective.

Means of achievement

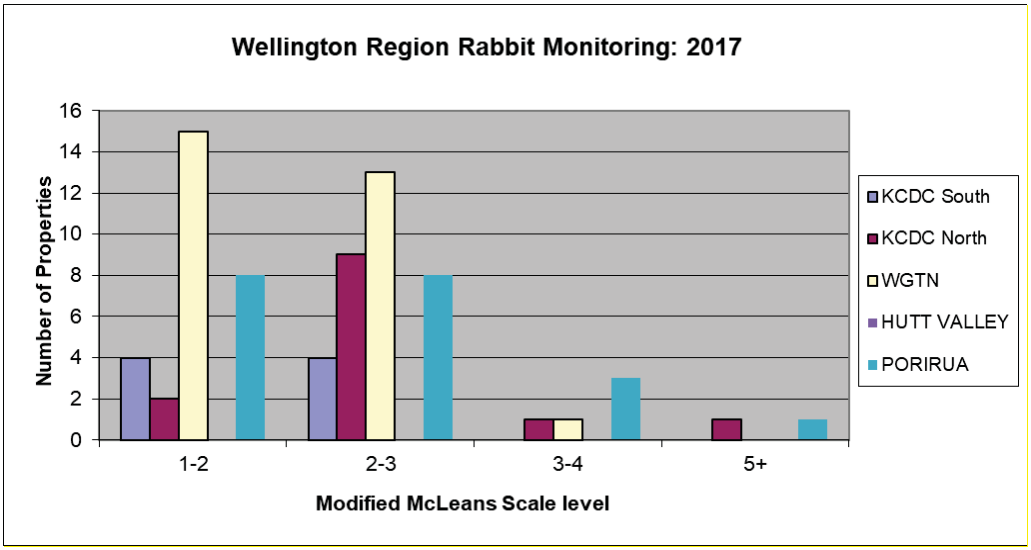
Survey land in high to extreme rabbit prone areas to determine the extent of rabbit infestation.

Actual performance

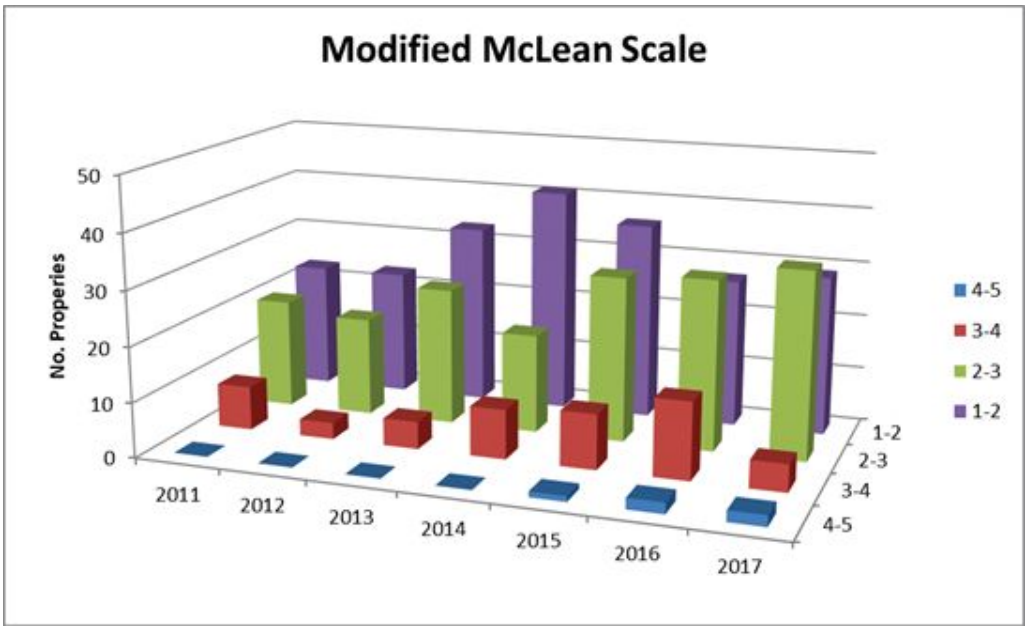
A daytime survey of the Tauherenikau River and the adjacent properties was completed in January 2016 with rabbit numbers being very low. These surveys assessed rabbit abundance between Level 2 & 3 on the Modified McLean Scale. Rabbits appeared to be in similar numbers as in 2013. This river system historically produced hordes of rabbits that spread onto neighbouring stony free-draining farmland requiring periodic poisoning programmes to control numbers. The last intensive poisoning campaign was undertaken in the summer of 1993.

The rabbit prone areas of the Kapiti Coast, Wellington City and the Hutt Valley were monitored in late May – June 2017. Inspections have shown that rabbit numbers are again low in most areas, with small pockets of rabbits persisting around traditional hotspots. Grass growth and wet conditions have continued through the autumn making for unsuitable habitat for rabbits in many areas.

Due to extremely wet weather, Pindone rabbit poisoning jobs have not progressed. The rabbit haemorrhagic disease (RHD) continues to cycle naturally over most of the Wellington region.



Graph 3. Modified McLeans Scale Level.



Graph 4. Rabbit property survey results 2011 – 2017.

Means of achievement

Release biological control agents for the control of feral rabbits when appropriate.

Actual performance

A new strain of rabbit haemorrhagic disease virus (RHDV) known as RHDV1-K5 has been approved for registration in Australia by the Australian Pesticides and Veterinary Medicines Authority. The Australian release of RHDV1-K5 happened in March 2017.

RHDV1-K5 is a potentially significant biological control tool for pest rabbits in New Zealand. While exact figures are unknown, it is expected that there will be improved "knockdown" (deaths) in areas where the current strain of RHDV is less effective.

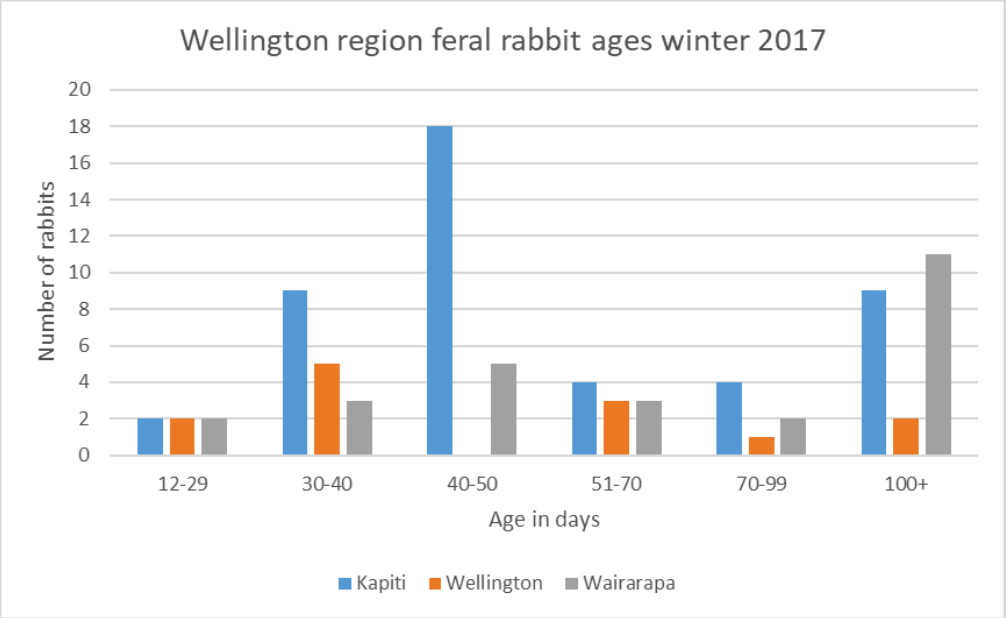
The New Zealand Rabbit Coordination Group (RCG) is co-ordinating the approvals processes. RCG includes representatives from regional and district councils, Federated Farmers, the Ministry for Primary industries, the Department of Conservation, and Land Information New Zealand. The approvals process is being run in parallel with a Landcare Research Sustainable Farming Fund project to prepare a release strategy for RHDV1-K5. This will help participating regional and district councils to effectively release RHDV1-K5 in rabbit-prone areas of New Zealand. The strategy will also include pre and post release monitoring to measure impacts and inform future research. GWRC will lead the releases in the Wellington region in 2018.

Means of achievement

Support research initiatives including biological control.

Actual performance

Annual rabbit blood sampling was conducted throughout the region on various parks, reserves and private land to assess immunity for RHDV. Landcare Research has also requested that we collect eyeballs for aging and will be using the RHDV antibody blood sampling results to cross reference age information. High immunity was present in the northern areas of the Kapiti Coast.

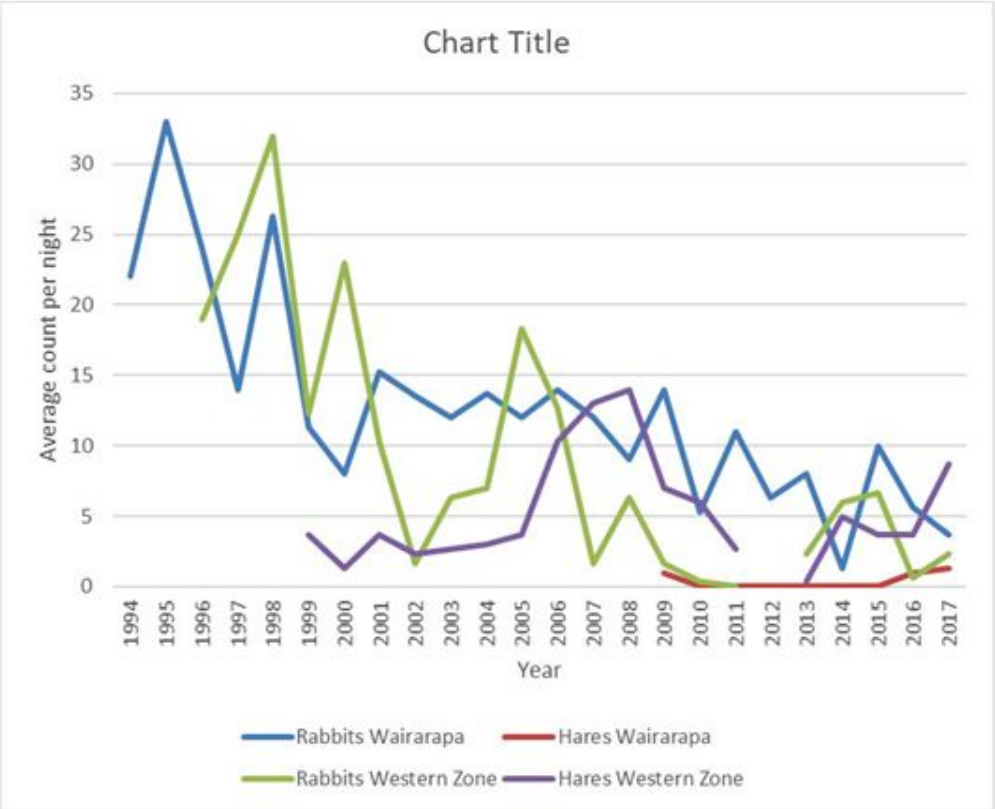


Graph 5. Feral rabbit ages – winter 2017.

Rabbit trend monitoring

Rabbit and hare night counts are conducted between May and July each year in Queen Elizabeth Park (QEP) on the Kapiti coast, and on the Tora coast in the Wairarapa. The aim of the monitoring is to determine the rabbit and hare populations at these two sites in the absence of formal control.

The average number of rabbits counted has declined this year in Tora but increased at QEP. Hare numbers have made an increase, particularly at QEP.



Graph 6. Average count of rabbits and hares on the Tora Coast, Wairarapa and QEP, and Kapiti over three nights counting at 25 stations.

5. Site-Led Species – Magpies

Aim: **To manage magpies to minimise adverse environmental and human health impacts in the Wellington region at a cost of $55,000.**

Annual Cost: **The cost of magpie management to minimise adverse environmental and health impacts for the region was $52,700.**

Means of achievement

Undertake direct control of magpies where there is known to be a threat of injury to members of the public, or, complaint(s) are made to that effect within 10 working days.

Actual performance

Five complaints were logged regarding magpies attacking. All complaints were responded to within 10 working days by removing or destroying the magpie(s) involved.

Means of achievement

Respond to landowners wanting to undertake magpie control within 15 working days of receiving a request for information and/or assistance.

Actual performance

Forty six calls were received during the 2016/17 year and all calls had response times within 10 working days. Staff provided advice on best practice trapping techniques to maximise catches, and had loan traps available. Supplying live magpie call birds with traps no longer occurs, as other methods are being investigated to see if they can achieve the same results.

Image 1. Multi-catch magpie trap loaned to private landowners full of caught magpies.

6. Site-Led Species – Human Health – Wasps

Aim: **To minimise the adverse human health and environmental impacts of wasps at selected sites at a cost of $4,000.**

Annual Cost: **The cost of wasp management to minimise the adverse human health and environmental impacts for the region was $9,000.**

Means of achievement

Provide advice and education to occupiers wanting to undertake wasp control.

Actual performance

GWRC continues to contribute funding to the National Wasp Research Collective. The research focussed on the potential biocontrol agents and a mite recently found on Vespula wasps in New Zealand as a form of biocontrol. The Sustainable Farming Fund programme led by Landcare Research in conjunction with a support group in the upper South Island has been awarded funding for another three years to enable the identification of novel biocontrol agents for wasps that have not been used elsewhere. There will undoubtedly be other wasp-infested nations watching with interest.

This project initially explored the potential for a mite, *Pneumolaelaps niutirani,* found on the wings of wasps to provide perpetual control at a landscape scale. While it was found that this was unlikely to be effective as a classic biocontrol, the work with the mite, in conjunction with wasp-specific pathogens will continue under the Biological Heritage National Science Challenge. In addition, the Collective re-introduced new genetic stock of the parasitoid *Sphecophaga* from the UK. These parasitic wasps are currently in quarantine at Lincoln and field releases are anticipated in spring 2017.

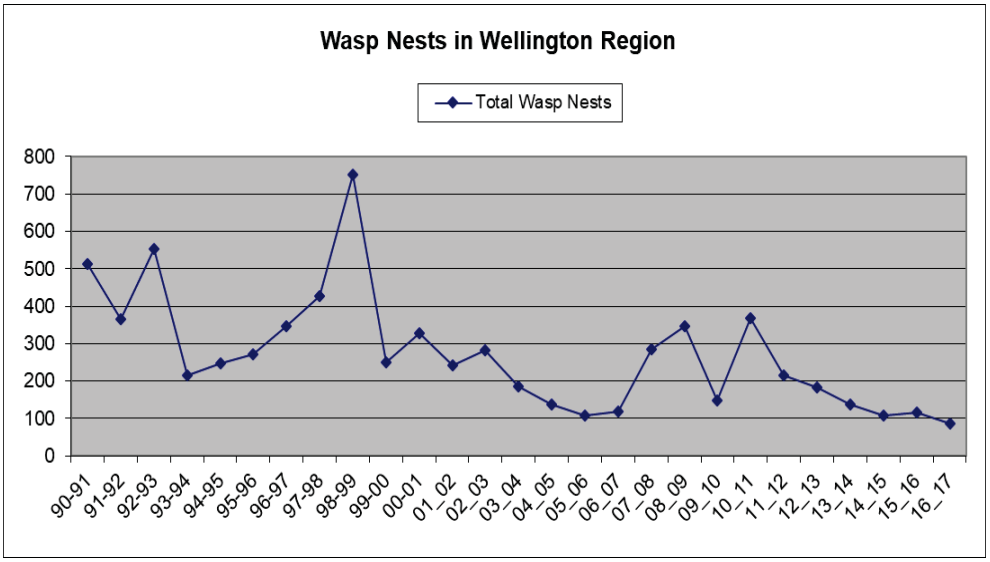
Wasp season 2016/17

There were three complaints from occupiers about neighbouring wasp nests affecting them. This low number of calls has been consistent in recent years.

Various Territorial Local Authorities, DOC and GWRC respond to wasp nest nuisance calls within the Wellington region. All calls have been recorded in the 'Wasp Nest Register' since 1990/91. A downward trend of wasp complaints has continued in the last several years (Graph 6), with the 2016/17 year being very quiet due to damp climatic conditions.

All Biosecurity Department Pest Animals staff became registered users of the new wasp bait Vespex which came on the market in December 2015. A field training trial was planned, but due to low wasp numbers this opportunity never presented itself.

The large willow aphid infestations in the region are likely to drive wasp numbers up with the right climatic conditions. The aphids cause the secretion of large amounts of honeydew from willow trees, creating a food source for wasps, which leads to increased wasp activity near areas with willow trees. With the availability of Vespex, controlling increased wasp numbers in these situations is now possible.



Graph 7. Wasp nuisance nest calls for the Wellington Region.

7. Site-Led – Key Native Ecosystems (KNE), Reserves and Forest Health

Aim: **To protect indigenous biodiversity in a comprehensive selection of Key Native Ecosystems and reserves at a cost of $1,634,000.**

Annual Cost: **The cost to achieve a measurable improvement in the ecological health and diversity of Key Native Ecosystems and reserves through pest animal control was $1,681,000.**

Means of achievement

Establish and implement integrated pest management plans for all KNE sites and selected reserves.

Actual performance

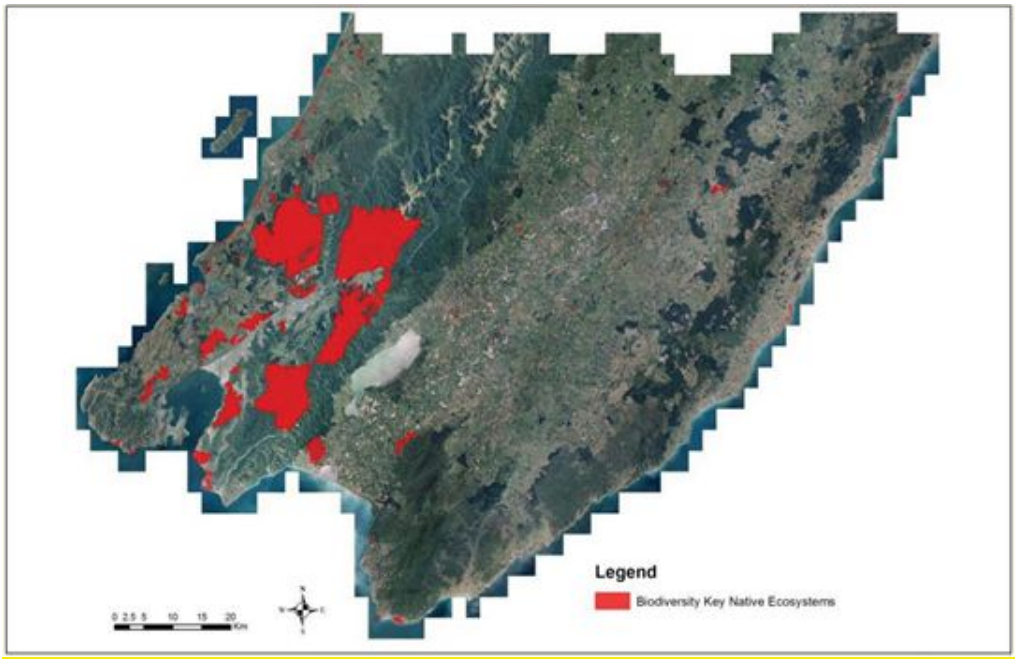
Three year KNE plans are being produced for all 58 KNE sites that identify pest management requirements at each KNE site. As of June 2017, 52 KNE plans have been produced.

Means of achievement

Undertake direct control by service delivery of pests identified in the management plan for each KNE site.

Actual performance

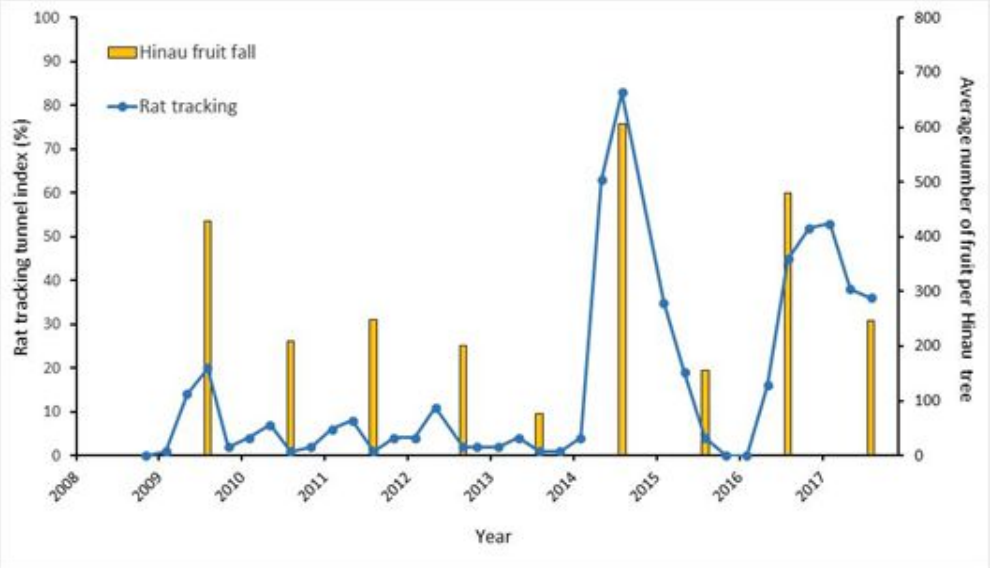
During the 2016/17 year, pest animal control of possums, rats and/or mustelids was undertaken at 52 of the 58 KNE sites (for more information see attached KNE report).



Map 2. Sites managed as part of GWRC's Key Native Ecosystem (KNE) programme in the Wellington Region 2016/17.

Wainuiomata Mainland Island

Wainuiomata Mainland Island has had its second highest recorded Hinau fruit fall (mast event) (Graph 7). When this happens, rats immigrating from outside the area end up in a land of plentiful food and ideal breeding conditions, meaning there is no need to search for food (such as poison bait in bait stations) until the fruit supply has dried up. This is exactly what occurred, and now the fruit is starting to dry up bait is now being consumed again, which should lead to lower rat tracking rates, which have been high this spring/summer.



Graph 8. Hinau fruit-fall vs rat tracking rate in Wainuiomata Mainland Island 2008-2017.

GWRC have recently obtained permission from Wellington Water to use loose pellet bait in bait stations which is a lot more effective than the block baits we have been historically restricted to. Additional strategies are needed to combat the mast years as the number one tool, aerially applied 1080, is not always available for use in this water catchment area. For example, this year following contamination of the Hutt aquifer, Wellington Water required continuous supply from the Wainuiomata River intake, therefore aerially applied 1080 could not be used.

It appears the more we improve the forest through pest control, and the better the forest flowers and fruits, the harder it will be in the future to control pests with the increasingly abundant food source. Investment in new tools is essential is NZ is to achieve predator free status.

Whitireia Park

Possums (and hares) were eradicated from Whitireia Park by GWRC in 2003. A network of bait stations and regular night surveys are maintained to ensure possums do not re-establish. The importance of these regular night surveys was highlighted in August when GWRC staff undertaking a routine survey at Whitireia Park sighted and shot a possum on the cliffs. This possum would have travelled at least 15km away through a mine field of bait stations and traps, unless it was illegally released.

Image 2. Whitireia Park KNE intruder.

Means of achievement

Where KNE sites are identified on TLA land, seek funding from the relevant authority to form financial partnerships.

Actual performance

GWRC maintains good working relationships with all of the regional TLAs, including a number of shared funding agreements for pest management. Memoranda of Understanding (MOU) provide a formal platform for these relationships. The MOU is prepared and agreed between GWRC's Biodiversity and Biosecurity departments and the relevant TLAs (annual agreements – Hutt City Council, Upper Hutt City Council, Kapiti Coast District Council, Porirua City Council; longer term agreements – Masterton District Council, Wellington City Council). The parties agree to support biodiversity and optimise ecological health within the relevant territories. This is further confirmed and supported by agreeing pest control work and budgets in each KNE plan.

Means of achievement

Coordinate site management with other biodiversity initiatives, where possible.

Actual performance

KNE plans identify all management partners and relevant stakeholders and GWRC works collaboratively with these groups to coordinate site management.

Pest animal control is undertaken with volunteers to assist them in achieving a range of biodiversity based objectives. This continues in a wide range of TLA reserves and KNEs across the region.

Means of achievement

Undertake direct control of feral and unwanted cats by service delivery as part of the integrated pest management of KNE and other selected sites.

Actual performance

Feral and unwanted cats are actively managed in 19 KNE sites within the Wellington region. These sites are predominantly rural, as the high number of domestic cats in urban areas prevents the use of current cat management techniques. GWRC also works in conjunction with TLA's and private landowners to manage feral and unwanted cat populations. Feral cats are the most persistent predator species under ongoing control, with high numbers continuing to be captured in KNE management sites that have had years of control.

Means of achievement

Work with communities to remove populations of stray or unwanted cats.

Actual performance

Individuals who wish to remove stray or feral cats from their own land are given advice on control options, offer of materials at cost price or referred to commercial pest management operators.

WCC have had bylaw changes to introduce compulsory microchipping. Until pet cats can be identified, control of feral or stray populations is almost impossible anywhere near urban areas. GWRC has also been involved in creating the Draft New Zealand National Cat Management Strategy and unsuccessfully submitted on the Upper Hutt City Council animal bylaws to bring in compulsory cat microchipping.

Means of achievement

Reduce densities of select Site-led biodiversity species (feral deer, feral goats, and feral pigs) in KNE sites and TLA reserves.

Actual performance

GWRC employs professional hunters to control ungulates in a number of KNE sites within our regional park and water supply catchment network. Total tally for the year was 290 feral goats, 121 feral pigs and 59 feral deer.

GWRC staff have undertaken feral goat control in several KNE sites and assisted WCC with pig control work around urban areas.

Fallow deer numbers continue to expand in the Wairarapa and parts of the Hutt Valley. The animals are seen as a welcome addition by some landowners, while others express concern at damage to agricultural crops and bush remnants. Wellington has a large hunter population and the majority of deer management is undertaken by private hunting.

Requests for pig traps or advice have been higher this year, with traps being on loan most of the time. The wet year has made for ideal conditions for pigs to turn over pastures when looking for food.

Means of achievement

Facilitate the involvement of community groups, where appropriate.

Actual performance

GWRC has been involved with community groups undertaking pest control for many years. Several KNE sites benefit significantly from the enthusiasm and resources of community groups. Groups have been carrying out plantings, pest control, and ecological surveys and fundraising to support the management of KNE sites.

Pest control involvement continued in 2016/17 with Biosecurity having involvement with groups participating at 23 sites and private landowners doing their own control at four sites in the KNE programme and numerous other QEII covenant sites.

Predator Free Wellington

Predator Free NZ 2050 – the ambitious goal to rid all of New Zealand of rats, stoats, and possums by 2050 – was announced by the Government in early 2016. Wellington City Council, Greater Wellington Regional Council and the NEXT Foundation are partnering to make Wellington, New Zealand's first predator-free city. The primary aim, agreed by these partners, is to reduce and maintain possums, rats and mustelids to zero in Wellington City. This target will best enable the restoration of wildlife, and improve urban ecological resilience to a state that reflects

the values and aspirations of the Wellington City community, and aligns with achieving the Predator Free NZ 2050 aspiration. Another expected project outcome is that it inspires other urban communities and investors to address NZ's predator control challenges at landscape scale within urban/rural environments.

The initial focus of the project will be on eradicating rats and mustelids from Miramar Peninsula. Miramar Peninsula is geographically well positioned to attempt a rat and mustelid eradication (possums were eradicated in 2006).

GWRC staff have been involved with:

- initial phases of organising work streams, focusing on eradication aspects
- preparing a draft scoping document
- preparing a draft eradication plan and price to clear Miramar Peninsula of rats and mustelids
- humaneness trap testing with Landcare Research on the SnapE trap using the National Animal Welfare Advisory Committee (NAWAC) guidelines for assessing the welfare performance of restraining and kill traps
- planning and implementing a 200m x 200m chew card monitor across the Miramar Peninsula and Wellington International Airport land with the assistance of volunteers to assess the pre control predator numbers
- preparing a monitoring plan for the Predator Free Wellington project, incorporating detection monitoring and outcome monitoring to assess the benefits of the programme for local native species.

Image 3. Ship rat caught in SnapE trap pre-testing assessment.

Means of achievement

Monitor site recovery using a range of ecological indicators.

Actual performance

In order to better understand pest mammal dynamics and to ensure that small mammal control is effective, monitoring of rodents and mustelids is carried out at a sub-set of KNE sites. Small mammal monitoring was conducted at eight KNE sites (Map 3) during 2016/17.

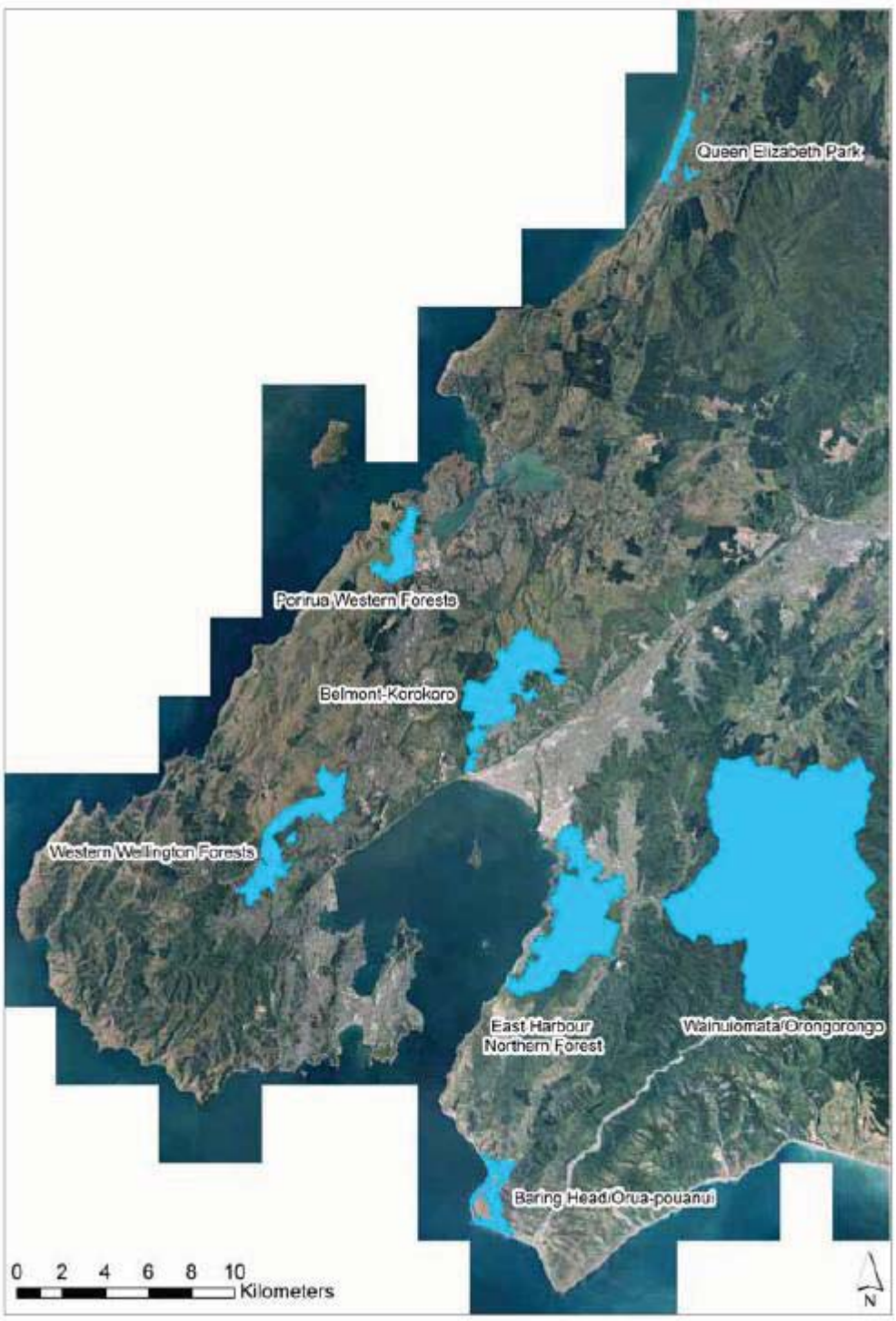
In the Wainuiomata/Orongorongo KNE site, rat tracking rates have remained high since the mast event in 2016. In the Mainland Island area rats were reduced to 38% tracking in May after being above 50% tracking for the previous three surveys. Unlike the previous mast in 2014, rat tracking rates have remained high going into the bird breeding season. In contrast the non-treatment (control) area continues to show an increase in rat tracking rates reaching 88% in May. Mice tracking rates have declined to very low levels in the Mainland Island and have remained low in the non-treatment area. This may be due to the extreme rat tracking rates interfering with mice activity.

In the East Harbour Northern Forest KNE rat numbers have also been high since the mast event in 2016. The rat tracking rate in the non-treatment area has decreased from its peak of 70% (August and November 2016) to 40% in May. In the Mainland Island rats peaked at 38% (May 2016) and for the last two monitors have been under 10% (6% and 8% respectively). Mice tracking rates also rose during the mast and have since reduced and have stabilised around the 20% tracking rate in both the Mainland Island and the non-treatment areas.

The tracking rates for rats were relatively low in all other monitored forest sites that were not affected by mast events. Belmont Korokoro (23%) Wellington Western Forests – Otari (2%), Wellington Western Forests – Johnsonville Park (10%), Porirua Western Forests (3%) KNE sites.

Hedgehog control at Baring Head/Ōrua-pouanui does not appear to be making a difference to the hedgehog abundance at the site, with the latest tracking rate recorded as 55%. Tracking rates have fluctuated between 40% and 80% since 2011.

Possum monitoring was carried out in one KNE site in the 2016/17 year. Across the whole Wainuiomata/Orongorongo KNE site (7,364 ha) the residual trap catch was 2.5% (21 possums) and within the 1,200 ha Mainland Island the residual trap catch was 1.0% (4 possums). Residual trap catches of possums has been below the 5% target since the area had its second aerial 1080 application in 2005.



Map 3: Key Native Ecosystem small mammal monitoring sites.

8. Site-Led – Biodiversity – Possum

Aim: **To minimise the adverse impacts of possums in areas of ecological significance (outside of the KNE programme) and maintain accrued biodiversity and economic gains in the Wellington region at a cost of $121,000.**

Annual cost: **The cost for minimising the adverse impacts of possums in ecologically significant areas and maintaining current biodiversity and economic gains in the Wellington region was $150,000.**

Means of achievement

Undertake direct control by service delivery in sites of ecological significance (outside of the KNE programme) in agreement with the landowner/occupier.

Actual performance

GWRC supported landowners who undertook possum control in QEII covenanted sites across the region. Bait, traps and advice are provided by Biosecurity staff through the local QEII representatives, with the Biodiversity department covering the cost of the equipment up to $4000.

Service Delivery - Cost Recovery

GWRC undertakes a range of advice and cost recovery possum and rat control work outside the KNE programme for local TLAs and private landowners.

TLA work undertaken for:	Number of control sites	Target pest animals controlled	Cost recovered
Wellington City Council	19	Possums, rats, mustelids	$163,000
Hutt City Council	3	Possums and rats	$28,000
Kapiti Coast District Council	3	Possums, rats, mustelids	$7,000
		Total	**$198,000.00**

Table 2. Cost recovery work undertaken for Territorial Local Authorities.

Means of achievement

Provide a referral or cost recovery service to landowners/occupiers who require possum control.

Actual performance

GWRC provides assistance and advice on the management of possums to individual property owners, usually in urban or peri-urban situations, with materials at cost price. Assistance is usually with the intent that the occupier can self-manage any future possum problems. Nuisance possums can sometimes be managed in conjunction with, or, as an extension to our existing possum control areas.

9. Goodnature Trap Trials

9.1 Johnsonville Park

In the bid to improve pest animal control methodology, GWRC is continually experimenting with new control techniques always aiming to achieve more effective control and minimise the use of toxins. In Johnsonville Park attempts are being made to get the Goodnature A24 traps working at greater spacing than recommended for the traps, but with the same spacing as poison bait stations. This has been an ongoing project for over four years, trialling innovative solutions. We now have enough information to prove that the A24 traps spaced at 150m intervals cannot maintain rat numbers at our target 5% tracking rate, therefore the next phase is to move the traps closer together at 100m intervals. Through our collaboration with the manufacturer, trap and lure reliability improved significantly.

Image 4. A24 customer at Johnsonville Park.

Image 5. Ramp system to allow hedgehog kills to roll away from the trap entrance (Goodnature A24 traps).

9.2 Te Ahumairangi

On Te Ahumairangi (Tinakori Hill), A24 traps for rat control were installed in July 2017. Rats have been maintained at undetectable levels since November 2016. The trapping grid is tighter than a poison bait station network. Reinvasion may be limited due to the bait station network around the perimeter. The proposed next phase is to remove the protection of the toxic bait buffer and install A24s in this area at the same 150 x 75m spacing to see if it can hold the line with the re-invasion from urban areas. We have sought additional funding from WCC for this extension.

9.3 Project HALO

The network of A12 traps in this area is failing to control possums with the current hands-off approach. Each time traps are serviced (freshly lured and baited) there is a spike in kills. Further lure and trigger development needs to occur for the A12 to be a long-term effective control option.

A24 and A12 traps have been installed along the Zealandia fence as part of the Wellington City Council funded Project HALO operation. Initially the traps were allocated for some private land within the HALO area but landowners changed and access was denied. Should the fence be damaged in a storm, these traps will help to reduce incursions; particularly rats.

10. Site-Led – Mt Bruce – Pukaha Predator Buffer

Aim: **Complement the native flora and fauna restoration programme undertaken by the Department of Conservation (DOC), Rangitāne o Wairarapa and the National Wildlife Trust at the Mt Bruce Pukaha Scenic Reserve at a cost of $62,000.**

Annual Cost: **The cost for the predator control programme within the buffer for the 2016/17 financial year was $108,000.**

The main objective of the Pukaha predator buffer is to maintain all predator numbers at very low levels within the buffer area and to reduce re-infestation by predators into the Mt Bruce reserve. These control operations benefit a wide range of flora and fauna within the reserve. The focus is particularly on helping the survival of reintroduced endangered native bird species such as kaka, kokako and kiwi. The predator species targeted for control are possums, cats, mustelids, hedgehogs and rats.

The predator traps in the 2,200 ha farmland buffer around Pukaha/Mt Bruce National Wildlife Centre are targeted to catch mustelids and cats. In a review conducted by Boffa Miskell on behalf of the Pukaha Board, an additional 53 sites have been identified as gaps in the Pukaha/Mt Bruce (north & south of the buffer area). DOC250 traps and Timms traps were installed at these sites, bringing the number of control sites to 206. During the year 19 ferrets and seven stoats were trapped. In addition 94 cats were either trapped or shot. Possums were targeted by using brodifacoum in bait stations.

Celium Electronic Node Trial

A trial of Celium electronic wireless sensor nodes attached to traps was planned for the Pukaha/Mt Bruce buffer operation. Due to our requirements for the trap activation system, further design and development was necessary, meaning we only received the equipment late in the year. The installation of nodes to all traps within the Pukaha buffer is now planned for 2017/18. Alongside the node installation, two hub units to transmit information will be installed. This data will then be sent to a website where staff can identify which traps have been activated and need servicing.

The Celium electronic node trial has the potential to increase our knowledge about the frequency and the timing of trap catches and is likely to increase our efficiency and better planning of future servicing intervals. The information from the trial will be of significant benefit when providing advice to landowners and care groups who wish to utilise this technology in the future.

Image 6. Celium electronic wireless sensor nodes attached to Timms trap and DOC250 trap.

11. Site-Led – Regional Possum Predator Control Programme (RPPCP)

Aim: **To minimise the adverse impacts of possums in areas declared Bovine Tb free or in areas which are outside of the Tb Free New Zealand programme at a cost of $1,250,000.**

Annual cost: **The cost for minimising the adverse impacts of possums in the RPPCP areas of the Wellington region was $ 1,187,000.**

Means of achievement

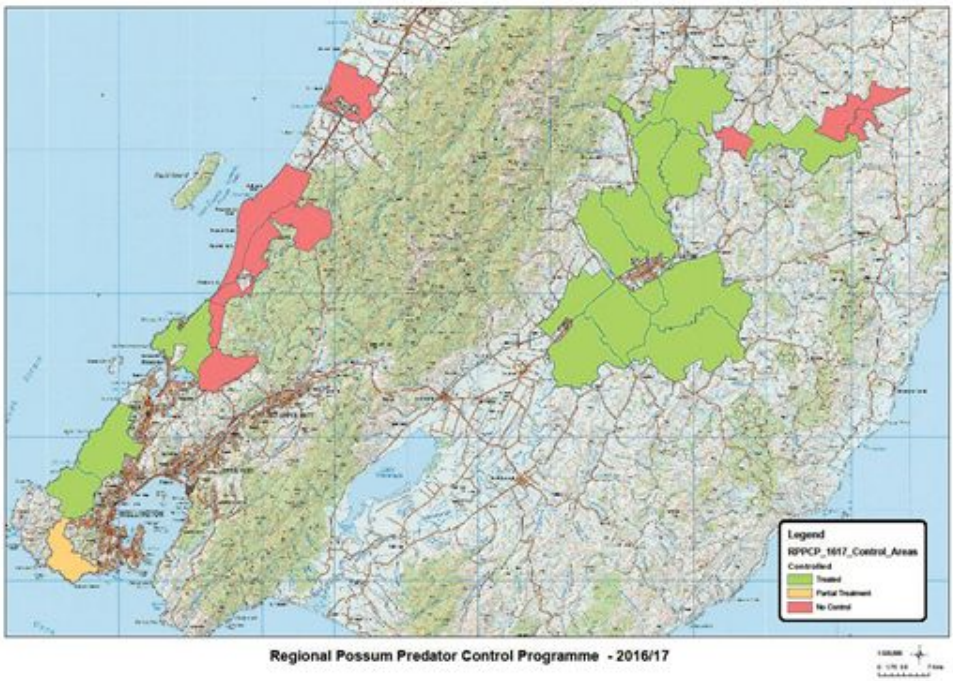
(i) Address the adverse impacts of possums in bovine Tb free areas for catchment functions, biodiversity and economic prosperity

(ii) Maintain a possum residual trap catch (RTC) of 5% or lower across the Wellington region in areas which have been declared bovine Tb free

(iii) Commence possum control in areas not included within the Tb Free New Zealand programme.

Actual performance

The Regional Possum Predator Control Programme (RPPCP) for the Wellington Region covered approximately 111,300 ha (2,200 hectares of this area is part of the Mt. Bruce Pukaha predator buffer). In the 2016/17 year 81,700 hectares were treated for possum control. Twelve projects were monitored and the annual Residual Trap Catch index was 2.0% (vs maximum of 5%).



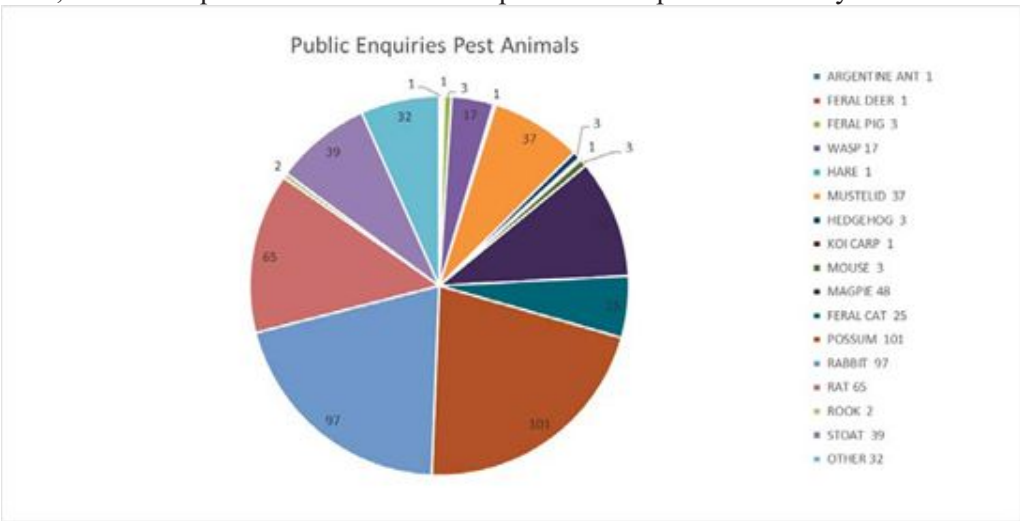
Map 4. Regional Possum Predator Control Programme 2016-17.

12. Public Enquiries

Responding to public enquiries is a significant focus of the Operational Plan. This year we received and processed 476 public pest animal related enquires, compared to 611 the previous year.

The reduction in enquiries logged is predominantly due to changes in the screening process by the customer contact team, and the integration of the Ozone system.

The ICT department has integrated Biosecurity into the Ozone database which other departments within GWRC use. This new data base is a leap forward technology-wise, but still requires some tweaks and updates for improved usability.



Graph 9. Client response activity Pest Animals 2016-17 year.

Part Two: Pest Plants

13. Regional Surveillance Species

Aim: **To determine the distribution and means of control for Regional Surveillance pest plants within the Wellington region at a cost of $256,000.**

Annual cost: **The cost of managing Regional Surveillance plants throughout the region during 2016/17 was $270,000.**

Means of achievement

Identify new sites of Regional Surveillance pest plants by GWRC staff, the public, or through the Regional Surveillance programme.

Actual performance

There are 34 Regional Surveillance species listed in the RPMS. To date, only the 12 species below have been discovered in the Wellington region (Table 4).

Eleven new sites with a Regional Surveillance species infestation were discovered this year: Asiatic knotweed (2), chocolate vine (4), purple loosestrife (2), Senegal tea (2) and one white edged nightshade. This brings the total number of known sites with Regional Surveillance species in the last 10 years to 294.

Plant name	Number of sites
African fountain grass	1
Asiatic knotweed	29
Bomarea	26
Cape tulip	34
Chilean flame creeper	3
Chocolate vine	140
Nassella tussock	1
Purple loosestrife	26
Senegal tea	14
Spartina	2
Water hyacinth	6
White edged nightshade	12
Total:	**294**

Table 3. Number of sites with Regional Surveillance species in the Wellington region over the previous 10 years

Means of achievement

Undertake a control trial programme on selected Regional Surveillance pest plants within the region.

Actual performance

After surveying for spartina at Lake Onoke and the upper Ruamahunga to Barrage gates, one main infestation was found at Pauls Bank, and subsequently controlled by contractors managed by DOC. Two outlier infestations were also found within Lake

Onoke and were controlled by our staff. Follow up surveys will be conducted in the future.

The majority of purple loosestrife infestations in the Kapiti area were destroyed during the building of the new Paraparaumu – Otaki motorway. Other known infestations did not germinate this year due to the unusually high water table in Kapiti.

Means of achievement

Use biological control agents where appropriate, and support relevant biological control research initiatives.

Actual performance

GWRC is part of the National Biological Control Collective (NBCC) along with a number of other councils, DOC and Landcare Research. The NBCC is currently funding research into biocontrol agents for a range of pest plants including some Regional Surveillance species.

Means of achievement

Provide information and publicity to enhance public awareness of the threat posed by Surveillance species to the region.

Actual performance

A factsheet for each Regional Surveillance species can be found on the GWRC website.

The Ministry for Primary Industries (MPI) continued their funding of the Check, Clean and Dry (CCD) programme for the ninth consecutive year. The aim of the programme is to raise public awareness of didymo and other freshwater pest species, and the risk they pose to our waterways. A regional advocate is employed to engage with the public by targeting high-use areas of our rivers and attending specialist outdoor events. Information is given out to relevant organisations, businesses and clubs.

Image 7. CCD advocate Margot Balfour refilling the spray bottles at the spray station, Waiohine Gorge.

14. Total Control Species

Aim: **To control all Total Control species within the Wellington region at a cost of $344,000.**

Annual cost: **The cost of managing Total Control plants throughout the region during 2016/17 was $363,000.**

Means of achievement

Identify new sites of Total Control species through incidental reports by GWRC staff, the public, or through the Regional Surveillance programme.

Actual performance

This year 65 new sites of Total Control species were discovered (two Bathurst bur, 24 blue passionflower, one climbing spindleberry, perennial nettle and Saffron thistle, 33 moth plant and three woolly nightshade). This brings the overall number of Total Control species sites to 1,234 (Table 5).

This year 2,115 individual properties were inspected during Total Control species delimiting surveys. Delimiting surveys require the inspection of all properties within a specified distance, usually 100m, from a known infestation site in an attempt to locate further sites of a targeted species.

Plant name	Number of sites
African feathergrass	102
Bathurst bur	16
Blue passionflower	462
Climbing spindleberry	65
Eelgrass	91
Moth plant	250
Perennial nettle	90
Saffron thistle	10
Woolly nightshade	148
Total:	**1234**

Table 4. Number of sites of Total Control species in the Wellington region.

Means of achievement

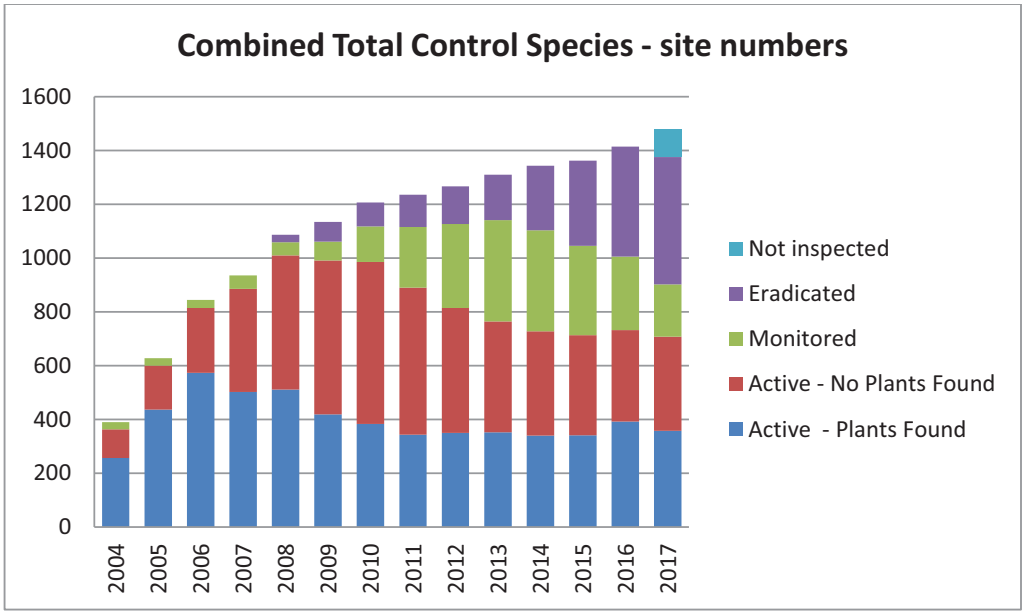
Undertake direct control by service delivery of all Total Control species at all known sites within the region on an annual basis.

Actual performance

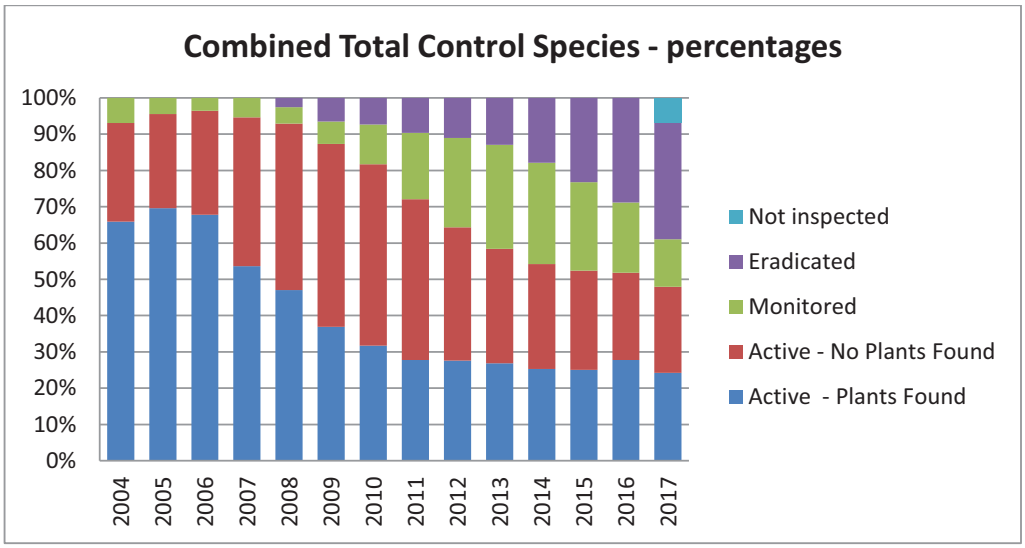
All Total Control sites were inspected at least once during the year and any plants found were controlled. Some sites required multiple inspections due to the plants reproductive capabilities i.e. species that can seed a number of times in a growing season.

Due to the region experiencing the wettest spring and summer in 30 years some annual species such as Bathurst bur were very late germinating, then quickly went to seed. Planned inspections and control operations had to be delayed accordingly and some plants had already set seed before they could be located and destroyed.

Despite wet soils and colder temperatures throughout the 2016/17 season retarding growth and practically halving the time between germination and seeding for some of the annual species, good progress is being made with the eradication programme. At the current Total Control sites, the target species at 455 of the 1,234 sites were determined eradicated. A further 252 sites had no plants this year and 186 of these properties have entered into the monitoring phase.



Graph 10. The status of Total Control species in the Wellington region.



Graph 11. Status of Total Control species (%).

Means of achievement

Annually inspect all plant outlets and markets within the region for the sale and or propagation of Total Control species.

Actual performance

Thirty five of the larger plant outlets and markets in the region were inspected for plant species listed in the RPMS and National Pest Plant Accord (NPPA). All were compliant.

Means of achievement

Use biological control agents where appropriate, and support relevant biological control research initiatives.

Actual performance

The NBCC is currently undertaking research into finding suitable biocontrol agents for two Total Control species; moth plant and woolly nightshade.

The woolly nightshade lace bug *(Gargaphia decoris)* was released in 2010 and has established in some areas of the country, causing significant damage to target species. Due to there being a very low prevalence of woolly nightshade in the region, the lace bug is unlikely to be released here in the immediate future.

The moth plant beetle (*Colaspis argentinensis)* was approved for release in 2011 but no releases have been made to date. Landcare Research is waiting for export permits to be granted by Argentinian authorities, before the beetles can be brought into New Zealand.

The moth plant rust fungus *(Puccinia araujiae)* was approved for release in 2015 but no releases have been made to date. Due to there being a very low incidence of moth plant in the region, these biocontrol agents are unlikely to be released here in the immediate future.

15. Containment Species

Aim: **To control all Containment species outside the Containment zones within the Wellington region at a cost of $277,000.**

Annual cost: **The cost of managing Containment plants throughout the region during 2016/17 was $179,000.**

Means of achievement

Undertake direct control by service delivery of Containment species outside the Containment zone within the region on an annual basis.

Actual Performance

Biosecurity staff continue to inspect and control all known boneseed sites outside areas determined as containment zones. The programme has made considerable progress in reducing the number of boneseed plants setting seed, with the team often

working in difficult terrain and under demanding conditions. Control areas are located in coastal Wairarapa, Titahi Bay and on Wellington's south coast.

Image 8: Aerial control of boneseed continues on the coastal escarpment at Ngawi, South Wairarapa.

Means of achievement

Provide information and publicity to enhance public awareness of the threat posed by the Containment species to the region.

Actual performance

The GWRC website includes information on all Containment species. Boneseed signage remains in place in selected areas of coastal Wairarapa.

A factsheet on boneseed is available online; this is also used as a poster in selected coastal shops and farm stores to inform the public of the threat posed by this plant.

Means of achievement

Identify new sites of Containment species outside the Containment zones through incidental reports by GWRC staff, the public, or through the Regional Surveillance programme.

Actual performance

Boneseed, evergreen buckthorn and sweet pea shrub were controlled whenever they were found outside the containment zones. This mainly occurred on dunes and escarpment ecosystems.

Means of achievement

Use biological control agents where appropriate, and support relevant biological control research initiatives.

Actual performance

The boneseed leaf roller caterpillar *(Totrix s.l.sp. chrysanthemoides)* has been released in previous years within the Wellington and Porirua coastal escarpments, but failed to establish likely due to predation by ants and wasps. Some damage to boneseed plants were observed, however no leaf roller caterpillars or moths were seen so staff are unsure if they are responsible for the damage. Landcare Research and NBCC continue to look for suitable biocontrol agents for boneseed.

16. Site-Led Boundary Control, Suppression and Human Health Species

Aim: **To minimise the adverse impacts of Site-led boundary control species and the risk to human health of species in specific situations throughout the Wellington region at a cost of $389,000.**

Annual cost: **The cost of managing Site-led boundary control plants throughout the region during 2016/17 was $194,000.**

Means of achievement

Action complaints received to comply with the RPMS rules.

Actual performance

Staff responded to 105 enquiries during the year about a number of other exotic species, with the majority of enquiries regarding old man's beard. Of the 105 enquiries, 22 were complaints regarding Boundary Control species: old man's beard (14), blackberry (3), gorse (2), fennel (1), ivy (1) and wild ginger (1).

Service delivery (control by our staff) is often the most cost effective way to deal with a complaint from a member of the public. Unfortunately, repeated visits and significant staff time was often required to ensure compliance with the RPMS rules. One enquiry required further enforcement and issuing a notice of direction. Our involvement with Boundary Control species is part of our RPMP review.

Means of achievement

Use biological control agents where appropriate, and support relevant biological control research initiatives.

Actual performance

NBCC continues research into finding suitable biocontrol agents for a number of Site-led species including: banana passionfruit, nodding thistle, old man's beard and wild ginger. Landcare Research is continuing trials of a shoot mining fly for wild ginger which mines the stem. Work on this has been on hold but was set to resume in September 2017.

17. Site-Led – Key Native Ecosystems (KNE), Reserves and Forest Health

Aim: **To protect indigenous biodiversity in a comprehensive selection of Key Native Ecosystems and reserves at a cost of $859,000.**

Annual Cost: **The cost to achieve a measurable improvement in the ecological health and diversity of Key Native Ecosystems and reserves through pest plant control was $1,119.000.**

Means of achievement

Undertake direct control by service delivery of pests identified in the management plan for KNEs and Reserves.

Actual Performance

This year, control work was undertaken at 58 KNE sites across the region. The work was either carried out by external contractors or by our staff depending on the scope of the work. Biosecurity staff also worked collaboratively with DOC as agreed in a Memorandum of Understanding between the two organisations to control a variety of pest plants including willows, alders and gunnera in Wairarapa Moana, and spartina grass at Lake Onoke.

Image 9: Biosecurity Department's field team control valerian on Wellington's South Coast.

Means of achievement

Co-ordinate site management with other biodiversity initiatives where possible.

Actual performance

In addition to the work that GWRC completed in KNE's and reserves this year, staff worked on a number of other biodiversity initiatives. These included working with:

- The GWRC Biodiversity Department on a range of biodiversity projects including planting and follow up weed control after planting;
- DOC and the Biodiversity Department on aerial spray operations on alder and willow species around Lake Wairarapa;
- QEII and Kiwirail at Taupo Swamp controlling multiple pest plant species infesting this area;
- DOC surveying and controlling the pest plant gunnera along the Tauherenikau River; and
- Hutt City Council on controlling boneseed, marram grass, and horned poppy at Parangarahu lakes.

18. Biological Control

Staff worked with ten different species of biocontrol agents during the year. This work included releasing and transferring agents, and monitoring their establishment and spread.

There are three species of beetles that attack tradescantia in the region: the tradescantia leaf beetle (*Neolema ogloblini*), the tradescantia tip beetle (*Neolema abbreviata*) and the tradescantia stem beetle (*Lema basicostata*). Each of the beetles targets a different part of the plant to systematically weaken it in an effort to minimise its impact. The tradescantia leaf beetle and the corresponding plant damage have not been seen at release sites to date. Three releases of the tradescantia leaf beetle were made this year, two in a shade house in a QEII covenant block near Martinborough and one in Otaki which was an addition to a previous successful release.

There were six transfers of the green thistle beetle (*Cassida rubiginosa*) made this year in the Wairarapa. Over 30,000 beetles have been collected from the main harvest site at Rangitumau in Masterton in recent years, which has left the site seriously depleted of beetles to transfer. Site visits have been made to potential harvest sites for the 2017/18 season. The waiting list for the green thistle beetle has 36 landowners on it, highlighting the success of the agent.

The monitoring programme in conjunction with AgResearch was continued this year showing varying success at the seven monitoring sites across Wairarapa and Upper Hutt. Seven sites are monitored monthly from October through to March and climatic conditions are also collected by AgResearch.

Sixteens transfers of broom gall mites (*Aceria genistae*) were made throughout the region and previous release sites were also inspected to prospect for new harvest

sites. Establishment results have been positive for this agent, with some plants becoming heavily infested and subsequently dying.

Buddleia leaf weevil (*Cleopus japonicus*) was transferred to nine new sites in the region. This agent continues to do well and significant impacts have been observed at various sites around the region, at release sites and also up to 2km away from release sites, which highlights their success in the region.

Three transfers were made of the Scotch thistle gall fly *(Urophora stylata)*, all within the Wairarapa. This agent has been slow to show effects at long-standing release sites**.**

Image 10. Two green thistle beetles and their damage on a Californian thistle at Rangitumau.

One new agent was released into the region this year. The Japanese Honshu white admiral butterfly was released (to control Japanese honeysuckle) at a site in Akatarawa Road throughout January and February. This is the first time they have been used as biocontrol agents anywhere in the world. This site will be closely monitored for establishment and impacts. As the lead organisation for the National Assessment Protocol, GWRC is responsible for collecting data from other release sites throughout the country to correlate results.

Image 11. The new biocontrol agent: the Japanese Honshu white admiral butterfly.

A biocontrol day was held with Lynley Hayes (Science Team Leader, Landcare Research) to refresh Pest Plant staff on the principles of biocontrol and monitoring activities being undertaken in the region. It was a good chance to familiarise staff with the agents that have been released.

19. National Interest Pest Response Programme (NIPR)

GWRC is part of the Ministry for Primary Industries led national programme to eradicate Manchurian wild rice (MWR) and Cape tulip from New Zealand. GWRC delivers pest plant control management for these two species on behalf of MPI.

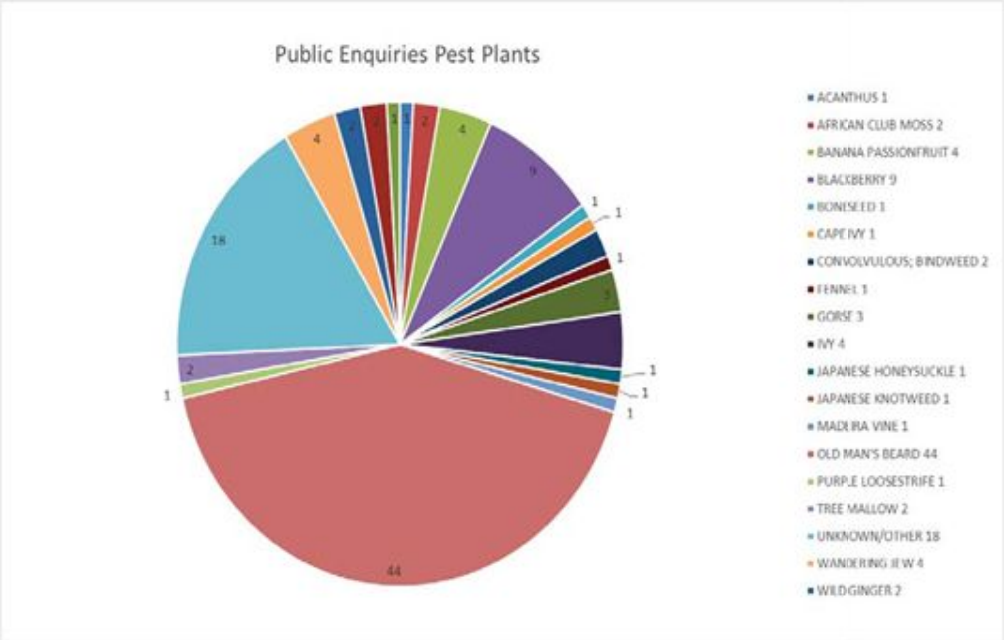
There is one site of MWR in the region at Te Harakeke swamp in Waikanae. This was surveyed and controlled using a helicopter, and staff undertook ground control in areas close to housing. Infestations, now significantly reduced in size and number of plants continue to be very difficult to control, due to changes in water level, accessibility and infestations being obscured by vegetation.

There are two active Cape tulip sites in the region. GWRC staff inspected these sites on two separate occasions and no plants were found.

20. Public Enquiries

This year Pest Plants staff received and responded to 105 public enquires, compared to 199 the previous year.

The reduction in enquiries logged is predominantly due to changes in the screening process by the customer contact team, and the integration of the Ozone system. Lot of the public enquires that were not directly biosecurity related are now referred to the right department or other authorities.



Graph 12: Client response activity Pest Plants 2016-17 year.

Appendix 1 – Biocontrol agents released in the Wellington Region

Agent species name	First released	Total number of known sites	Overall agent status
Boneseed agents			
Boneseed leaf roller	2007	8	suspect failure
Broom agents			
Broom gall mite	2009	700+	established
Broom leaf beetle	2009	3	uncertain
Broom psyllid	1995	400+	widespread
Broom seed beetle	1994	200+	widespread
Broom shoot moth	2008	3	uncertain
Buddleia agents			
Buddleia leaf weevil	2007	100+	established
Darwin's barberry agents			
Darwin's barberry seed weevil	2015	2	Uncertain
Gorse agents			
Gorse colonial hard shoot moth	2002	4	failed
Gorse pod moth	1997	abundant	widespread
Gorse soft shoot moth	2007	4	uncertain
Gorse spider mite	1989	abundant	widespread
Gorse thrips	1990	abundant	widespread
Japanese Honeysuckle			
Japanese Honshu white admiral butterfly	2017	1	First year released
Mistflower agents			
Mistflower gall fly	2001	2	established
Mistflower fungus	2009	1	established
Old man's beard agents			
Old man's beard leaf fungus	1997	4	failed
Old man's beard leaf miner	1995	abundant	widespread
Old man's beard sawfly	2002	2	failed
Privet agents			
Privet lace bug	2015	1	Uncertain
Ragwort agents			
Cinnabar moth	2006	abundant	widespread
Ragwort plume moth	2012	3	established
Ragwort flea beetle	1988	abundant	widespread
Thistle agents			
Californian thistle flea beetle	1994	2	failed
Californian thistle gall fly	2006	1	failed
Californian thistle leaf beetle	1993	3	failed
Californian thistle stem miner	2010	2	uncertain
Green thistle beetle	2008	221	established
Nodding thistle receptacle weevil	1972	abundant	widespread
Nodding thistle crown weevil	1990	4	established
Nodding thistle gall fly	2005	2	established
Scotch thistle gall fly	2005	52	established
Tradescantia agents			
Tradescantia leaf beetle	2011	6	established
Tradescantia stem beetle	2012	5	uncertain
Tradescantia tip beetle	2013	5	uncertain
TOTALS:		**1735+**	

The Greater Wellington Regional Council's purpose is to enrich life in the Wellington Region by building resilient, connected and prosperous communities, protecting and enhancing our natural assets, and inspiring pride in what makes us unique

For more information, contact the Wellington Regional Council:

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October 2017

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Report	**2017.420**
Date	18 October 2017
File	CCAB-10-383
Committee	**Environment Committee**
Author	**Tim Porteous, Manager, Biodiversity**

Key Native Ecosystem Programme: Annual Report 2016/17

1. Purpose

To provide the Committee with an overview of the Key Native Ecosystem (KNE) programme and its achievements in the 2016/17 year.

2. Background

The KNE programme is a non-regulatory voluntary programme that seeks to protect some of the best examples of original (pre-human) ecosystem types in the Wellington Region. It does this by managing, reducing or removing threats to their ecological values. Sites with the highest biodiversity values in the Region (outside of the Crown estate) have been selected for management.

The Biodiversity department actively manages KNE sites on GWRC, Territorial Authority and private land across the Wellington Region. Managing the sites involves working with landowners, community and iwi, other key stakeholders and management partners to undertake planning, active management and monitoring for the programme. The types of management activities that are carried out include pest control, fencing, planting, and monitoring pest levels.

There are fifty-eight KNE sites in the programme and their management is guided by three-year KNE plans prepared by the Biodiversity department, an example of which is included (**Attachment 2**).

3. Relationship to Biosecurity programmes

While the Biodiversity department determines what management activities are required to achieve the restoration objectives set for each KNE site, much of the "on the ground" work to achieve these objectives is delivered by our Biosecurity department. Pest plant and pest animal control activities are the most common management activities undertaken at KNE sites. This expenditure is currently accounted for in the annual Regional Pest Management Strategy Operational

Plan, however the format of that document does not allow for detailed reporting on this "flagship" biodiversity programme.

The report "Key Native Ecosystem programme: Annual Report 2016/17" **Attachment 1**, provides a summary of activities under this programme and some of the programme achievements in the 2016/17 year.

4. Consideration of Climate Change

The matters addressed in this report are of a procedural nature, and there is no need to conduct a climate change assessment.

5. The decision-making process and significance

No decision is being sought in this report. This report is for Councillors to receive an update on the KNE programme.

5.1 Engagement

Engagement on this matter is unnecessary.

6. Recommendations

That the Committee:

1. ***Receives** the report.*

2. ***Notes** the content of the report.*

Report prepared by:	Report approved by:
Tim Porteous	**Wayne O'Donnell**
Manager, Biodiversity	General Manager
Catchment Management Group	Catchment Management Group

Attachment 1 Key Native Ecosystem programme: Annual Report 2016/17
Attachment 2 Key Native Ecosystem Plan for Hutt Water Collection Area

Attachment 1 to report 17.420

The Key Native Ecosystem Programme Annual Report 2016/17

1. Introduction

The Wellington region's native biodiversity has declined since human settlement and the ecosystems that support biodiversity face ongoing threats and pressures. Regional councils have responsibility for maintaining indigenous biodiversity, as well as protecting significant vegetation and habitats of threatened species, under the Resource Management Act 1991 (RMA).

Greater Wellington Regional Council's (GWRC) Biodiversity Strategy sets a framework that guides how GWRC protects and manages biodiversity in the Wellington region to work towards our overall vision for the region.

GWRC's vision for biodiversity

Healthy ecosystems thrive in the Wellington region and provide habitat for native biodiversity

The Strategy provides a common focus across the council's departments and guides activities relating to biodiversity. The vision is underpinned by four operating principles and three strategic goals. Goal One drives the delivery of the Key Native Ecosystem (KNE) Programme.

Goal One

Areas of high biodiversity value are protected or restored

2. Key Native Ecosystem Programme

The KNE programme was initiated in 2002 in response to the New Zealand Biodiversity Strategy (2000), with the aim of protecting and enhancing native flora and fauna in selected sites throughout the Wellington region. This programme covered territorial reserves and private land and initially started as a pest animal control programme, with pest plant control added at a later date.

The KNE programme is a non-regulatory voluntary programme that seeks to protect some of the best examples of original (pre-human) ecosystem types in the Wellington region by managing, reducing, or removing threats to their ecological values.

Sites with the highest biodiversity values have been identified and prioritised for management. The KNE site selection process resulted in the inclusion of 58 sites in the KNE programme covering approximately 48,000 ha and representing a multitude of

ecosystem types from wetlands, dunes, forest, sub-alpine and cliff ecosystem types across the region (see Table 1 and Figure 1).
These ecosystems include; acutely threatened forest ecosystem types such as kahikatea, pukatea forest (where only 1% of the original extent remains today and of that figure 11% is contained within the KNE programme's management); 49 of the 212 scheduled significant and outstanding natural wetlands in the proposed Natural Resources Plan (23%) and 15 KNE sites within the regional park network.

Table 1: Area of land within the KNE programme by territorial authority

Territorial authority	Area (ha)
Carterton District Council	81
Hutt City Council	9,286
Kapiti Coast District Council	1,634
Masterton District Council	492
Porirua City Council	701
South Wairarapa District Council	1,883
Tararua District Council	118
Upper Hutt City Council	33,034
Wellington City Council	865
	48,094

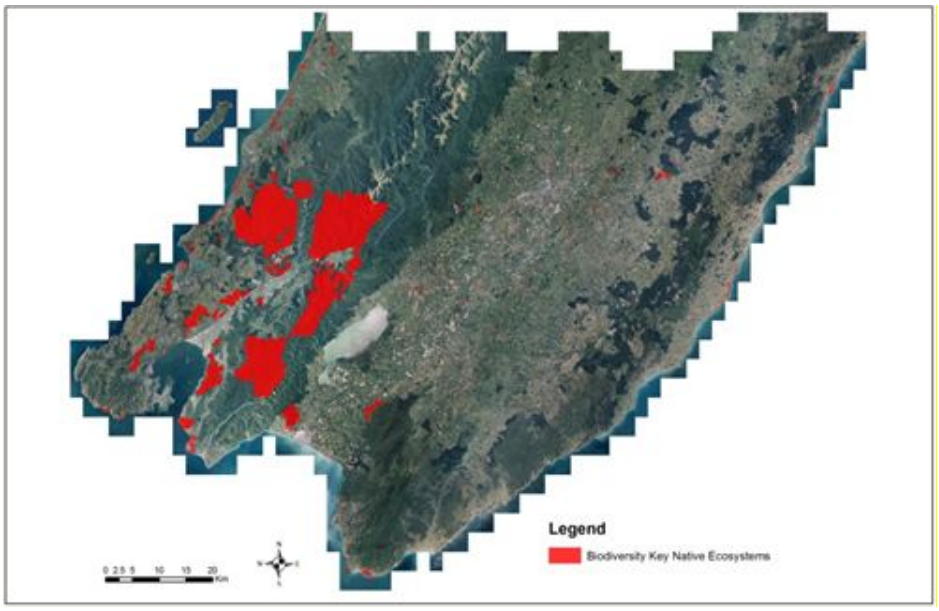

Figure 1: Sites managed as part of GWRC's Key Native Ecosystem (KNE) programme in the Wellington Region 2016/17

KNE sites can be located on private or publically owned land. However, land managed by the Department of Conservation (DOC) is generally excluded from this programme. KNE sites vary considerably in size, from small forest remnants (Lower Waikanae Forest Remnants KNE site; 6 ha) to large forest blocks (Akatarawa Forest KNE site; 12,400 ha).

3. Operational work in 2016-17

In general the Biodiversity department undertakes the overall identification and planning for management of KNE sites and provides the rationale for the investment. The operational planning and delivery of pest control is undertaken by the Biosecurity department with the funding supplied by the Biodiversity department. The Biodiversity department coordinates other management activities such as fencing and revegetation, and supporting community groups in these activities.

The KNE programme is mainly funded by the Biodiversity department (88%) with substantial contributions made by some territorial authorities (see Table 2). Territorial authorities often spend more money on their reserves that is not accounted for here. They also often coordinate community groups.

Table 2: 2016/17 budget allocated for the KNE programme by territorial authority

Territorial authority	Pest animal control ($)	Pest plant control ($)	Other management ($)	TOTAL ($)
Carterton District Council	5,400	7,500	750	13,650
Hutt City Council	418,300	202,100	8,000	628,400
Kapiti Coast District Council	45,200	138,000	18,950	202,150
Masterton District Council	27,900	29,700	18,250	75,850
Porirua City Council	59,400	72,200	5,550	137,150
South Wairarapa District Council	63,600	36,500	7,000	107,100
Tararua District Council	0	2,500	0	2,500
Upper Hutt City Council	117,850	63,500	500	181,850
Wellington City Council	49,350	10,000	5,000	64,350
	787,000	**562,000**	**64,000**	**1,413,000**

4. KNE plans development in 2016-17

KNE sites are managed in accordance with three-year KNE plans, prepared by the GWRC's Biodiversity department in collaboration with the Biosecurity department, landowners, tangata whenua and other partners. These plans outline the ecological values, threats, and management objectives for sites and describe operational activities such as ecological weed and pest animal control. An example of a KNE plan is appended to this report.

KNE plans are reviewed regularly to ensure the activities undertaken to protect and restore the KNE site are informed by experience and improved knowledge about the site.

In the course of the year 14 KNE plans were published. They were prepared for the following sites:

- Belmont-Korokoro
- Homewood Coastal Plains
- Hutt Water Collection Area
- Mātaikonā Coast
- Otepua-Paruāuku Wetlands
- Rewanui
- Riversdale-Orui Coast
- Ruamāhanga River Terraces
- Taupō Swamp
- Te Horo Forest Remnant
- Tora Coast Bush
- Waterfall Road Bush
- Wellington South Coast
- Whangaimoana Coast

5. Monitoring the KNE Programme in 2016-17

Regular monitoring is carried out by the Environmental Science department to determine the effectiveness of the pest animal control efforts in the KNE programme. The results of this monitoring are extrapolated to represent the whole KNE programme as not all KNE sites are able to be monitored. Monitoring is undertaken at a sub-set of eight monitoring areas, across seven KNE sites (see Figure 2). Six of these monitoring areas are dominated by forest and the other two are coastal sites.

Small mammal (rats, mice, mustelids and hedgehogs) monitoring using tracking tunnels is undertaken at all these sites on an annual basis. Possum monitoring using either traps or waxtags is undertaken on a four yearly cycle with the Wainuiomata/Orongorongo (including the Wainuiomata Mainland Island) KNE site monitored in 2016/17.

5.1 Small mammal monitoring results

The Wainuiomata/Orongorongo KNE site rat tracking rates remained high following the fruit/seed mast event in 2016. The non-treatment (control) area continued to show an increase in rat tracking rates reaching 88% in May 2017. In contrast, in the Mainland Island rats were reduced to 38% tracking in May 2017 after being above 50% tracking for the previous three surveys. Unlike the previous mast in 2014, rat tracking rates remained high going into the bird breeding season. Mice tracking rates have declined to very low levels in the Mainland Island and have remained low in the non-treatment area. This may be due to the extreme rat tracking rates interfering with mice activity.

The East Harbour Northern Forest KNE site rat numbers have also been high since the mast event in 2016. The rat tracking rate in the non-treatment area has decreased from its peak of 70% (August and November 2016) to 40% in May 2017. In the East Harbour Mainland Island rats peaked at 38% (May 2016) and for the last two monitors (February and May 2017) have been under 10% (6% and 8% respectively). Mice tracking rates also

rose during the mast and have since reduced and have stabilised around the 20% tracking rate in both the Mainland Island and the non-treatment areas.

The tracking rates for rats were relatively low in all other monitored forest sites, that appeared not to be affected by mast events; Belmont Korokoro (23%) Wellington Western Forests – Otari (2%), Wellington Western Forests – Johnsonville Park (10%), Porirua Western Forests (3%) KNE sites.

Hedgehog control at Baring Head/Ōrua-pouanui does not appear to be making a difference to the hedgehog abundance at the site, with the latest tracking rate recorded as 55%. Tracking rates have fluctuated between 40% and 80% since 2011.

5.2 Possum monitoring results

Possum monitoring was carried out in one KNE site in 2016/17. Across the whole Wainuiomata/Orongorongo KNE site (7,364 ha) the residual trap catch was 2.5% (21 possums) and within the 1,200 ha Wainuiomata Mainland Island the residual trap catch was 1.0% (4 possums). Residual trap catches of possums has been below the 5% target since the area had its second aerial 1080 application in 2005.

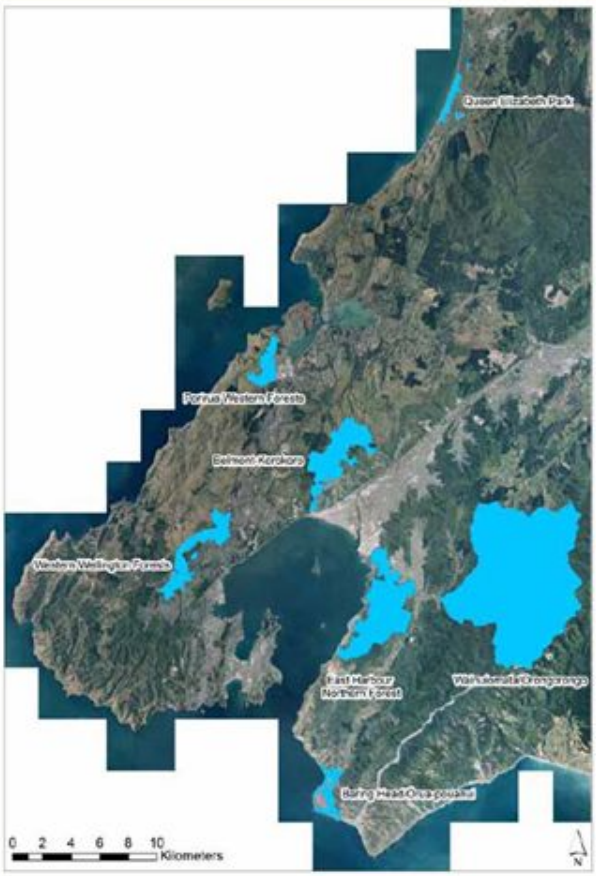

Figure 2: Key Native Ecosystem mammal monitoring sites.

6. KNE programme achievement against objectives in 2016-17

Management objectives are set for all KNE sites and are identified within the KNE plans. Management activities are targeted towards the stated objectives and respond to the threats at the site. Some examples of ecological management objectives are:

- To improve the structure and function of plant communities
- To improve habitat for native birds

Each year we assess whether we have made progress towards achieving our objectives. In 2016/17 the KNE programme achieved progress towards 97% (139 of 144) of the ecological objectives set in published KNE plans.

7. Challenges for the programme

During the year it has become clear that we face some challenges in the future. They include:

- There are increasing costs from contractors and the programme has a flat line budget. This may limit the amount of work we can do to stay within the existing budget. For example, we may need to reduce the number of services we do for the pest animal control networks at some sites.

- People and communities are becoming more concerned about the use of toxins and chemicals for a variety of reasons (eg. cultural, animal rights, organic farming, and ecotoxicity).

- Responding to mast years at Wainuiomata/Orongorongo KNE site (Mainland Island). Mast years occur when forests produce a higher abundance of fruit/seed than normal, which drive rat populations to higher levels than usual which has negative consequences for native biodiversity.

- Beyond the 58 sites under ecological management in the KNE programme. There are further sites with high biodiversity values in the region currently receiving no/inadequate management support. It is likely that the values in these sites will be declining.

Attachment 2 to Report 17.420

Key Native Ecosystem Plan for Hutt Water Collection Area

2016-2019

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Contents

1. Hutt Water Collection Area

The Hutt Water Collection Area is set aside and managed under the Wellington Regional Water Board Act 1972 for water collection purposes. Management of the area is also guided by the National Environmental Standards for Sources of Human Drinking Water (2008), drinking water standards, a water safety plan and a number of statutory and strategic plans. In 2016 an overarching management plan for the Hutt and Wainuiomata/Orongorongo Water Collection Areas[1] was developed to outline goals, objectives and actions to guide and inform the management of the water collections areas and operational plans, such as this Key Native Ecosystem (KNE) plan. The water collection area management plan identifies five goals:

1. *Maximise the **quality** of raw water and minimise the extent of water treatment required*
2. *Manage threats to water **supply** to maintain volumes of raw water*
3. *Maintain and enhance the significant **ecosystem and biodiversity values** of the water collection areas*
4. *Maintain the **cultural heritage** values of the water collection areas, including managed **recreational access***
5. *Maintain **collaborative working relationships** between management agencies and with others to achieve water quality, supply and biodiversity objectives*

These goals are relevant to this KNE plan as the outcomes of biodiversity management are a key component in the delivery of the Water Collection Management Plan's objectives. Optimum water quality is achieved via healthy aquatic and terrestrial ecosystems, and managing the key threats to water quality and supply also supports biodiversity objectives. For example, maintaining low numbers of pest animals such as deer and goats reduces the risk of water contamination by protozoa such as cryptosporidium and giardia (which they can carry) and also reduces the loss of vegetation cover that can contribute to soil erosion, thereby threatening water quality.

2. The Key Native Ecosystem programme

The Wellington region's native biodiversity has declined since people arrived and the ecosystems that support it face ongoing threats and pressures. Regional councils have responsibility for maintaining indigenous biodiversity, as well as protecting significant vegetation and habitats of threatened species, under the Resource Management Act 1991 (RMA).

Greater Wellington Regional Council's (GWRC) Biodiversity Strategy (2016)[2] sets a framework that guides how GWRC protects and manages biodiversity in the Wellington region to work towards the vision below.

GWRC's vision for biodiversity

Healthy ecosystems thrive in the Wellington region and provide habitat for native biodiversity

The Strategy provides a common focus across the council's departments and guides activities relating to biodiversity under this overarching vision, which is underpinned by four operating principles and three strategic goals. Goal One drives the delivery of the Key Native Ecosystem (KNE) programme.

Goal One

Areas of high biodiversity value are protected or restored

The KNE programme is a non-regulatory voluntary programme that seeks to protect some of the best examples of original (pre-human) ecosystem types in the Wellington region by managing, reducing, or removing threats to their ecological values. Sites with the highest biodiversity values have been identified and prioritised for management. Sites are identified as of high biodiversity value for the purposes of the KNE programme by applying the four ecological significance criteria described below.

Representativeness	Rarity/ Distinctiveness	Diversity	Ecological context
The extent to which ecosystems and habitats represent those that were once typical in the region but are no longer common place	Whether ecosystems contain Threatened/At-risk species, or species at their geographic limit, or whether rare or uncommon ecosystems are present	The levels of natural ecosystem diversity present ie, two or more original ecosystem types present	Whether the site provides important core habitat, has high species diversity, or includes an ecosystem identified as a national priority for protection

A site must be identified as ecologically significant using the above criteria and be considered sustainable for management in order to be considered for inclusion in the KNE programme. Sustainable for the purposes of the KNE programme is defined as: a

2

site where the key ecological processes remain intact or continue to influence the site and resilience of the ecosystem is likely under some realistic level of management.

KNE sites can be located on private or publically owned land. However, land managed by the Department of Conservation (DOC) is generally excluded from this programme.

KNE sites are managed in accordance with three-year KNE plans, such as this one, prepared by the GWRC's Biodiversity department in collaboration with the landowners and other stakeholders. These plans outline the ecological values, threats, and management objectives for sites and describe operational activities such as ecological weed and pest animal control. KNE plans are reviewed regularly to ensure the activities undertaken to protect and restore the KNE site are informed by experience and improved knowledge about the site.

3. Hutt Water Collection Area Key Native Ecosystem site

The Hutt Water Collection Area KNE site is located in the southern foothills of the Tararua Range approximately 13km north-east of Upper Hutt City and 13km south-east of Waikanae (see Appendix 1, Map 1). It encompasses the headwaters of Te Awa Kairangi/Hutt River including the catchments of the Eastern Hutt River, Western Hutt River and Kerekere Stream. The KNE site adjoins the Tararua Forest Park to the north and east, and Kaitoke Regional Park KNE site to the south.

The KNE site is approximately 8,740 hectares in size and is one of the largest forest areas containing original forest types in the Wellington region. Its management as a protected water supply area has resulted in site's condition being very good compared to other areas of similar habitat in the region. The terrain is mountainous and rugged, broken by multiple streams and narrow, steep-sided ridges. The hilltops are extremely exposed to the north-west and the south and have a reputation for high winds, fog and sudden weather changes. Most of the site is relatively remote with only very limited vehicle access and no formed walking tracks. These characteristics and proximity to Wellington's population make it an ideal site for water collection purposes.

4. Landowners, management partners and stakeholders

GWRC works in collaboration with landowners, management partners and stakeholders where appropriate to achieve shared objectives for the site. GWRC also recognises that effective working relationships are critical for achieving the management objectives for each KNE site. In preparing this plan GWRC has sought input from landowners, management partners and relevant stakeholders, and will continue to involve them as the plan is implemented.

4.1. Landowner

All land within the KNE site is owned by or vested in GWRC and has been set aside exclusively for harvesting water for supply to the cities of Wellington, Porirua, Lower Hutt and Upper Hutt.

4.2. Management partners

Management partners are those that fund or have an active role in the implementation of the KNE plan or the management of the site. The management partners to this plan are Wellington Water Limited (Wellington Water) and GWRC's Parks, Biodiversity and Biosecurity departments, who operate under service level agreements with Wellington Water.

Wellington Water manages the water supply in accordance with the Hutt and Wainuiomata/Orongorongo Water Collection Areas Management Plan[3]. This plan identifies the broad scale management required to protect biodiversity values of the site which play a role in providing quality source water (e.g, a complete native forest structure). This KNE plan provides further detail of management activities being implemented to protect those biodiversity values. Wellington Water funds most of the management activities detailed within this KNE plan. They also maintain water supply assets and the associated infrastructure, including the section of road leading to a transmission repeater.

The Biodiversity department is the overarching lead department for GWRC on the coordination of biodiversity management activities and advice within the KNE site. The Biosecurity department coordinates and carries out pest control activities. The Parks department manages recreational access and maintains facilities such as the access roads, a suspension bridge and an emergency shelter.

4.3. Stakeholders

GWRC's Environmental Science department carries out environmental monitoring within the KNE site as part of the DOC's Project Kākā: Tararua Nature Recovery and other environmental monitoring programmes. The information provided by these monitoring programmes help to guide management decisions.

The KNE site is used by small numbers of recreational and commercial hunters, and trampers.

5. Ecological values

This section describes the various ecological components and attributes that make the KNE site important. These factors determine the site's value at a regional scale and how managing it contributes to the maintenance of regional biodiversity.

5.1. Ecological designations

Table 1, below, lists ecological designations at all or part of the Hutt Water Collection Area KNE site.

Table 1: Designations within the Hutt Water Collection Area KNE site

Designation level	Type of designation
Regional	Parts of the KNE site are scheduled under GWRC's proposed Natural Resources Plan (PNRP) as Ecosystems and Habitats with Significant Indigenous Biodiversity Values. These are: • A river with outstanding indigenous ecosystem values: Te Awa Kairangi/Hutt River (Schedule A1) • A wetland with outstanding indigenous biodiversity values: Maymorn Wetlands (Schedule A3) • Rivers with significant indigenous ecosystems: all streams and tributaries of Te Awa Kairangi/Hutt River (Schedule F1)
Other	Parts of the KNE site is scheduled under GWRC's PNRP as: • Ngā Taonga Nui a Kiwa: Te Awa Kairangi/Hutt River (Schedule B) The entire KNE site is gazetted for water supply purposes.

5.2. Ecological significance

The Hutt Water Collection Area KNE site is considered to be regionally important because:

- It contains **representative** ecosystems that were once more common in the region
- It contains ecological features that are **rare or distinctive** in the region
- It contains high levels of ecosystem **diversity**, with many ecosystem types represented within the KNE site boundary, including one naturally uncommon ecosystem
- Its **ecological context** is valuable at the landscape scale as it contains a variety of inter-connected habitats and, provides core seasonal habitat for threatened indigenous bird species within the KNE site.

Representativeness

The vegetation types within the KNE site have remained largely unchanged since the time of European settlement so are highly representative of the original vegetation types[4]. The Singers and Rogers (2014)[5] classification of pre-human forest vegetation indicates the KNE site would have comprised of a number of different forest types including kamahi, broadleaved, podocarp forest (MF8), red beech, podocarp forest (CLF9), red beech, silver beech forest (CLF10), and silver beech forest (CLF11).

The Threatened Environment Classification system[6] indicates that most of the Eastern Hutt River terraces are in an environment type that is classified as At Risk. Nationally this type of environment has only 20-30% of its indigenous vegetation cover remaining (see Appendix 1, Map 2).

Rarity/distinctiveness

There are four wetlands present within the KNE site: Phillips Stream marsh, upper Eastern Hutt fen, Maymorn Ridge marsh and Maymorn Ridge bog. The latter two together constitute the Maymorn Wetlands that is scheduled as an outstanding wetland in the PNRP (see Appendix 1, Map 3). These wetlands are some of the most intact wetlands in the region due to their remote location and inaccessibility[7]. Wetlands are now considered an uncommon habitat type in the Wellington region with less than 3% remaining of their original extent[8]. The Maymorn Ridge bog is an example of a domed bog which is considered a naturally uncommon ecosystem type with a threat status of Endangered[9].

New Zealand's national threat classification system[10] lists two plant, six bird and five fish species as nationally Threatened or At-Risk within the KNE site. Nine plant species present have also been listed as regionally threatened. Nationally Threatened species are listed in Appendix 2 and regionally threatened species in Appendix 3.

Diversity

The KNE site is a very ecological diverse area with several different forest types, four wetlands, numerous major and minor watercourses, and sub-alpine and alpine floral associations present, making it very ecological diverse area.

Ecological context

The KNE site is one of the largest areas of original forest in the Wellington region supporting large populations of native birds, including breeding habitat for Threatened and At-Risk species. The KNE site is contiguous with other large areas of similar habitat. The KNE site contains all of the headwaters of Te Awa Kairangi/Hutt River providing a rare opportunity to carry out management at a catchment scale.

5.3. Ecological features

The KNE site lies within the Tararua ecological district[11] which is mainly characterised by:

- Steep, high, dissected hills and mountains, heavily faulted and broken by major rivers with steep hill slopes dropping to small river flats
- Triassic-Jurassic greywacke, argillite and bedded alternating greywacke and argillite geology, and steepland soils from shallow, stony and strongly leached greywacke to podzolised with low natural fertility
- Predominantly westerly winds with gale force strength common, low cloud covering the ranges for prolonged periods, and high rainfall.

Habitats (vegetation)

Vegetation on the valley floors is dominated by a canopy of hīnau (*Elaeocarpus dentatus*) and kāmahi (*Weinmannia racemosa*) with emergent rimu (*Dacrydium cupressinum*) and rātā (*Metrosideros robusta* and *M.umbellata*). At around 400m above sea level (asl) red beech (*Fuscospora fusca*) enters the forest mix and begins to dominate. At around 800m asl, red beech-silver beech (*Lophozonia menziesii*) forest is dominant, before silver beech dominates above 900m asl. The treeline is at around 1,100m asl.

Ridge-top sub-alpine plant communities are found near Renata and Alpha peaks. These peaks are on the KNE site's northern boundary. Stunted silver beech, leatherwood (*Olearia colensoi*) and *Dracophyllum filifolium* overtop the snow tussock *Chionochloa flavescens*, snowberry species (*Gaultheria* spp.), cushion grasses and sundew species (*Drosera* spp).

Ridge-top elfin forest is present on the main ridge-lines from Renata to Elder, Hells Gate to Omega and Maymorn to Pukeruru (see Appendix 1, Map 1). These areas are subject to cold winds, dense clouds, high rainfall and snow in winter. They have similar canopy dominants as in the ridge-top subalpine communities, but mountain flax (*Phormium cookianum*), haumakaroa (*Raukaua simplex*), ferns, coprosmas and many other species are also found. Wet turf is also frequently present.

Snowgrass areas and fellfields are found above the alpine scrub belt on Mt Alpha and Mt Aston ridge tops, and on Quoin Ridge. Leatherwood, porcupine scrub (*Melicytus alpinus*) and *Dracophyllum* spp. are present. Snowgrass species include *Chionochloa flavescens* and *C. conspicua*, while other common species include mountain astelia (*Astelia cockaynei*), daisy species (*Celmisia* spp), mountain buttercup (*Ranunculus insignis)* and *Gaultheria* spp.

No logging has occurred within the KNE site, but fires have altered the forest composition in patches. Although the general forest types have remained unchanged, their compositions have been significantly modified by the impacts of browsing feral goats (*Capra hircus*) and red deer (*Cervus elaphus*).

Species

Plants

Areas of vegetation identified as ecologically important include the alpine and sub-alpine plant associations; the tree fuchsia (*Fuchsia excorticata*) forests located in gully heads around Quoin Ridge, Alpha peak, on the Eastern slopes between Renata Forks and Hutt Forks; and areas of podocarp forest[12].

Other vegetated areas of ecological interest are the locations of past fires on Quoin and Marchant ridges. These areas have not yet recovered their original beech forest and so are of scientific interest as examples of unmodified natural succession.

Southern rātā, uncommon in the North Island, can be found on Maymorn Ridge and in the vicinity of Renata Hut and the old Dobson's Hut on Marchant Ridge. Northern rātā is plentiful.

Birds

All of the fifteen native forest bird species that have survived naturally in the Wellington region have been recorded in the KNE site. These include kākā (*Nestor meridionalis*), red and yellow crowned parakeet/kākāriki (*Cyanoramphus auriceps* and *C. novaezelandiae*), whitehead (*Mohoua* novaeseelandiae), rifleman (*Acanthisitta chloris*) and New Zealand falcon (*Falco novaeseelandiae*)[13].

Reptiles

Ngahere gecko (*Mokopirirakau* "southern North Island") is the only lizard species that has been recorded in the KNE site. However, it is likely that barking geckos (*Naultinus punctatus*) and northern grass skinks (*Oligosoma polychroma*) are also present, as these species have been recorded within 600m of the KNE site[14].

Fish (including Kōura/freshwater crayfish)

Ten species of native fish have been recorded in the KNE site[15]. However, the large weir at Kaitoke appears to have restricted the range of all but two of these species, the shortjaw kōkopu (*Galaxias postvectis*) and kōaro (*G. brevipinnis*) to the lower reaches of the on Te Awa Kairangi/Hutt River.

Kōura (*Paranephrops planifrons*) are also known to be present.

6. Threats to ecological values at the KNE site

Ecological values can be threatened by human activities, and by introduced animals and plants that change ecosystem dynamics. The key to protecting and restoring biodiversity as part of the KNE programme is to manage threats to the ecological values at each KNE site.

6.1. Key threats

Pest animals, ecological weeds and human activities are or have the potential to adversely impact the ecological values of the KNE site the by association the water quality and supply. The most significant threats come from pest animals, in particular possums (*Trichosurus vulpecula*), feral goats, red deer, rats (*Rattus* spp.) and stoats (*Mustela erminea*).

Possums are managed to very low numbers across the water collection area by regular aerial control operations. This management is required because possums, if left uncontrolled will over-browse the canopy until their preferred plant species can no longer recover. Preferred species in the KNE site include northern rātā, southern rātā and tree fuchsia. Ongoing control of possums is required at regular intervals as they will reinvade the KNE site from surrounding areas where they are not managed. Without this management possum numbers will increase to levels that will affect forest vitality.

Feral goats, red deer and pigs are all present in moderate numbers and are inhibiting regeneration of the forest understory and contributing to risks of water contamination. It appears that feral goats and red deer have significantly modified the forest composition. Species palatable to goats and deer have declined and are in some cases now rare. It is likely that some plant species palatable to exotic browsers have become locally extinct. The feeding behaviour of feral pigs (ie, rooting up the forest floor in search of roots and invertebrates) disturb the soil causing sediment run off into watercourses.

Rats and stoats are currently present in moderate numbers. Both are reduced to extremely low densities immediately after aerial possum control operations, but rat densities increase to between 15% and 50% TTI (tracking tunnel index) and mustelid densities to between 10% and 35% TTI[16] within eighteen months of aerial control operations. These species are likely to be impacting native bird, invertebrate and lizard populations.

The large weir within the KNE site on Te Awa Kairangi/Hutt River (approximately seven metres high) whilst an important part of the water supply infrastructure appears to be preventing the passage of most native fish species to very large areas of potential habitat. Seven species of native fish recorded below the weir have not been recorded in any other part of Te Awa Kairangi/Hutt River catchment above the weir. It appears the weir is too high and steep for most native fish species to climb.

The KNE site is notable for having very few and only small infestations of ecological weeds. However, these infestations will spread if left uncontrolled.

While the key threats discussed in this section are recognised as the most significant, a number of other threats to the KNE site's values have also been identified. Table 2

presents a summary of all known threats to the Hutt Water Collection Area KNE site (including those discussed above), detailing which operational areas they affect, how each threat impacts on ecological values, and whether they will be addressed by management activities.

Table 2: Summary of all threats to ecological values present at the Hutt Water Collection Area KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Ecological weeds		
EW-1	Woody weed species displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key weed species present are gorse (*Ulex europaeus*) and Himalayan honeysuckle (*Leycesteria formosa*).	A, B
EW-2	Ground covering ecological weeds smother and displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key weed species present is lotus (*Lotus pendunculatus*).	C
Pest animals		
PA-1*	House mice (*Mus musculus*) browse native fruit, seeds and vegetation, and prey on invertebrates. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and small eggs and nestlings[17,18].	Entire KNE site
PA-2*	Rats (*Rattus* spp.) browse native fruit, seeds and vegetation. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and native birds[19,20].	Entire KNE site
PA-3*	Hedgehogs (*Erinaceus europaeus*) prey on native invertebrates[21], lizards[22] and the eggs[23] and chicks of ground-nesting birds[24].	Entire KNE site
PA-4	Possums (*Trichosurus vulpecula*) browse palatable canopy vegetation until it can no longer recover[25,26]. This destroys the forest's structure, diversity and function. Possums may also prey on native birds[27] and invertebrates.	Entire KNE site
PA-5*	Mustelids (stoats[28,29] (*Mustela erminea*), ferrets[30,31] (*M. furo*) and weasels[32,33] (*M. nivalis*)) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions.	Entire KNE site
PA-6*	Feral cats (*Felis catus*) prey on native birds[34], lizards[35] and invertebrates[36], reducing native fauna breeding success and potentially causing local extinctions[37].	Entire KNE site
PA-7	Feral goats (*Capra hircus*) browsing affects the composition and biomass of native vegetation in the understory tiers of forest habitats, preventing regeneration of the most palatable understory species and reducing species diversity[38].	Entire KNE site
PA-8	Red deer (*Cervus elaphus)* browse the forest understory and can significantly change vegetation composition by preferential browsing and preventing regeneration[39,40,41].	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
PA-9	Feral pigs (*Sus scrofa*) root up the soil and eat roots, invertebrates, seeds and native plants preventing forest regeneration[42].	Entire KNE site
PA-10*	Wasps (*Vespula* spp.) adversely impact native invertebrates and birds through predation and competition for food resources. They also affect nutrient cycles in beech forests[43].	Entire KNE site
PA-11*	Brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) prey on native fish and compete with them for food resources[44].	Entire KNE site
PA-12*	Eastern rosella (*Platycercus eximius*) parakeets are known to out-compete native red-crowned parakeets for nest-sites and are a vector of avian diseases. The continued presence of eastern rosella in the KNE site could limit the ability of red crowned parakeets to establish functional populations[45,46].	Entire KNE site
Human activities		
HA-1	Recreational use such as hunting and tramping can cause the accidental introduction of weed species through the carriage of seeds and plant fragments on clothing, equipment and dogs.	Entire KNE site
HA-2	Road and track maintenance, the installation of structures, ecological monitoring and other management activities can all cause the accidental introduction of weed species through the carriage of seeds and plant fragments on machinery, equipment and clothing.	Entire KNE site
HA-3	Fire can be destructive to native flora and fauna and create conditions for pest plant invasion.	Entire KNE site
HA-4*	A large weir on Te Awa Kairangi/Hutt River within the KNE site is preventing or restricting the access of most native fish species to most of the habitat within the KNE site and may be preventing some migrating fish from completing their life-cycle.	At the lower end of Te Awa Kairangi/Hutt River within the KNE site
Other threats		
OT-1*	A lack of legal protection can leave a site at risk of future development or destruction and resources invested in the KNE site may be wasted. Whilst gazetted for water supply, no part of the KNE site is legally protected.	Entire KNE site

*Threats marked with an asterisk are not addressed by actions in the operational plan.

The codes alongside each threat correspond to activities listed in the operational plan (Table 3), and are used to ensure that actions taken are targeted to specific threats. A map of operational areas can be found in Appendix 1 (see Map 4).

7. Management objectives

Objectives help to ensure that management activities carried out are actually contributing to improvements in the ecological condition of the site.

The following objectives will guide the management activities at the Hutt Water Collection Area KNE site.

1. **To maintain a healthy terrestrial ecosystem for achieving optimum water quality and increased resilience to threats**
2. **To improve the structure* and function† of native plant communities**
3. **To improve the habitat for native birds**

* The living and non-living physical features of an ecosystem. This includes the size, shape, complexity, condition and the diversity of species and habitats within the ecosystem.
† The biological processes that occur in an ecosystem. This includes seed dispersal, natural regeneration and the provision of food and habitat for animals.

8. Management activities

Management activities are targeted to work towards the objectives above (Section 6) by responding to the threats outlined in Section 5. The broad approach to management activities is described briefly below, and specific actions, with budget figures attached, are set out in the operational plan (Table 3).

It is important to note that not all threats identified in Section 5 can be adequately addressed. This can be for a number of reasons including financial, legal, or capacity restrictions.

The broad approach to managing biodiversity values within the KNE site is to control all ecological weeds and the most threatening pest animals to sufficiently low levels to enable effective regeneration and succession of the native forest cover and to support viable populations of native bird species. Some human activities that could have an impact on biodiversity values will also be managed. Available resources won't allow for all pest animals to be controlled. However the level of management that will be carried out will allow progress towards the above objectives.

8.1. Ecological weed control

The aim of ecological weed control is to protect the integrity and function of the native plant communities present in order to maintain a healthy terrestrial ecosystem. To achieve this all infestations of ecological weeds will be contained and controlled to stop them spreading into open areas such as river flats and slips. As there are currently only a few small infestations (see Appendix 1, Map 4, operational areas A, B and C), this approach may result in the complete elimination of all current infestations in the medium term. Apart from work identified as being undertaken the Parks department, all other ecological weed control will undertake by the GWRC Biosecurity department.

All identified ecological weeds will be controlled annually before they set seed. The weed seed bank in these areas will be reduced over time as existing weed seeds germinate and the resulting plants are controlled before seeding.

Ecological weed species that are present and will be controlled are gorse (operational areas A, B and C), Himalayan honeysuckle (operational area B) and lotus (isolated areas within operational area C). Lotus will be searched for in the vicinity of historic observations to confirm or effect the elimination of this species. Gorse control in operational area C, in the vicinity of the Eastern Hutt access road will be additional to that undertaken by the GWRC Parks department as part of their road side weed control programme. While the Parks department will control gorse on the immediate road edges, the Biodiversity department will fund control of all other gorse plants growing between the road edge and the bush margin.

8.2. Pest animal control

The aim of pest animal control is to reduce the impacts of mammalian browsers (possums, deer, pigs and goats) on native forest understory regeneration and native plant diversity and function. This will in turn maintain a healthy terrestrial ecosystem and improve the habitat for native birds including threatened species. Controlling possums and pigs will also reduce their predation of native birds and invertebrates.

Aerially-sown 1080

Possums will be controlled on a regular basis throughout the KNE site to keep the overall possum population density below 5% residual trap catch (RTC). This will be achieved by continuing the current cyclic use of aerially-sown 1080 (sodium fluoroacetate) toxic bait.

An aerial possum control operation was last carried out in August 2014. A subsequent operation will be carried out in this area when monitoring indicates that possum populations have grown to a level in the vicinity of 5% RTC or above, or the equivalent BMI (bite mark index). The results gained from monitoring carried out within the KNE site, as part of the Project Kākā: Tararua Nature Recovery will be used to provide this information. Past monitoring results have shown that a 5% RTC or above is likely to occur around five years after the last operation, so it is anticipated that the next operation will be required in 2019.

The aerially-sown 1080 operation will be carried out in winter 2019 with the operations running over two financial years. The planning and purchase of materials will be undertaken in the third year of this plan and the sowing of both the pre-feed and toxic baits in the first quarter of the following financial year (and beyond the time frame of this KNE plan). This timing will be used as it has been proven that poisoning operations are most effective when carried out around the middle of winter and will have the least disruption to Wellington Water's water supply activities.

An aerially-sown 1080 operation will also be carried out in the adjacent Kaitoke Regional Park KNE site simultaneously with this operation. Possum population monitoring will be conducted with the Kaitoke Regional Park KNE site to assess the effectiveness of the both 1080 operations.

Research and monitoring of rat and mustelid (ferrets, stoats and weasels) populations after past possum control operations has shown that these operations effectively control these species to very low levels. However this control is short lived with populations returning to pre-control levels within eighteen months[47]. It is hoped that

native plants and animals will receive some benefit from these periods of reduced threats. No additional targeted rat or mustelid control will be undertaken in this operational area.

Hunting

Feral goats, pigs and deer will be culled annually using a combination of ground and aerial hunting, targeting areas most frequented by the different species. The target aim of the culling operations will be to reduce and keep populations to a level at which a professional hunter can find and destroy no more than one animal per eight hours of hunting on foot, or five animals per one hour of hunting from a helicopter. It is considered that populations at this level will have a negligible impact on native plant regeneration and survival. The annual budget allocated to this work allows for 28 days of ground based hunting combined with nine hours of aerial hunting and helicopter support, ie, ferrying hunters in and out of remote parts of the site.

8.3. Human activities

Biosecurity guidelines[48] are used by all GWRC personnel when entering and working in the KNE site. Procedures involve checking for and removing seeds and plant fragments from vehicles, equipment and clothing before entering the site. A condensed and more specific version of the guidelines will be developed by the Biodiversity department and distributed to recreational and commercial users of the KNE site. These guidelines are issued with permits and provided to other users when the opportunity arises.

To reduce the risk of uncontrolled fires occurring in the KNE site, the Hutt and Wainuiomata/Orongorongo Water Collection Area Management Plan[49] identifies that open fires and camping are not permitted. This policy is communicated to users through the site information brochure and signage.

9. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for the KNE site, and their timing and cost over the three-year period from 1 July 2016 to 30 June 2019. The budget for the 2017/18 and 2018/19 years are indicative only and subject to change. A map of operational areas can be found in Appendix 1 (see Map 4).

Table 4: Three-year operational plan for the Hutt Water Collection Area KNE site

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2016/17	2017/18	2018/19
1,2	EW-1	Ecological weed control	A	GWRC Biosecurity department	Control gorse on true right of the Eastern Hutt River near the eastern end of the gut buster track.	All gorse plants are controlled prior to seeding	1,200	1,200	1,200
1,2	EW-1	Ecological weed control	B	GWRC Biosecurity department	Control gorse and Himalayan honeysuckle on the true left of the Eastern Hutt River from the Hutt Forks up-stream to about 500 metres north of the old hydrology tower.	All gorse and Himalayan honeysuckle plants are controlled prior to seeding	1,100	1,100	1,100
1,2	EW-1 EW-2	Ecological weed control	C	GWRC Biosecurity department	Control gorse and lotus on the bush margin in the vicinity of the Eastern Hutt access road (additional to the Parks department's roadside spraying programme).	All gorse and lotus plants are controlled prior to seeding	600	600	600

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2016/17	2017/18	2018/19
1,2,3	PA-4	Pest animal control	Entire KNE	GWRC Biosecurity department	Undertake planning of aerial 1080 possum control operation and purchase bait. (Actual operation will be carried out in the following financial year). This operation will only be carried out when the possum population has grown to a level in the vicinity of 5% RTC* or above, or the equivalent BMI†. The earliest the operation is likely to be carried out is July 2019.	Possums <5% RTC or equivalent BMI	Nil	Nil	115,000
1,2	PA-7 PA-8	Pest animal control	Entire KNE	GWRC Biosecurity department	Control goats and deer, targeting goat and deer preferred areas.	Maintain goat and deer populations to below 1 goat or deer culled per 8 hours of ground hunting or five animals per one hour of helicopter hunting	26,000	26,000	26,000
1,2	PA-9	Pest animal control	Entire KNE	GWRC Biosecurity department	Control pigs, targeting the most pig-preferred areas and at the time of year when they are most prevalent.	Maintain pig population to below 1 pig culled per 8 hours of ground hunting	4,500	4,500	4,500
1,2	HA-1	Ecological weed control	Entire KNE	GWRC Biodiversity & Parks departments	Distribute ecological weed biosecurity guidelines to all permit holders through the existing permit systems, and to tramping groups when opportunities arise.	Biosecurity guidelines distributed to all permit holders, and to other users when possible	Nil	Nil	Nil

Key Native Ecosystem Plan

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2016/17	2017/18	2018/19
1,2	HA-2	Human activities	Entire KNE	GWRC Parks, Biodiversity, Biosecurity & Environmental Science departments	Ensure pest plant biosecurity guidelines are adhered to while carrying out all management activities.	Guidelines available and adhered to in all cases	Nil	Nil	Nil
1,2,3	HA-3	Human activities	Entire KNE	GWRC Parks department	Continue to communicate policy of no open fires being allowed in the KNE site through the park brochure and signage.	No human induced wild fires occur	Nil	Nil	Nil
						Total	**$33,400**	**$33,400**	**$148,400**

*RTC = Residual Trap Catch. †BMI = Bite Mark Index.

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10. Funding contributions

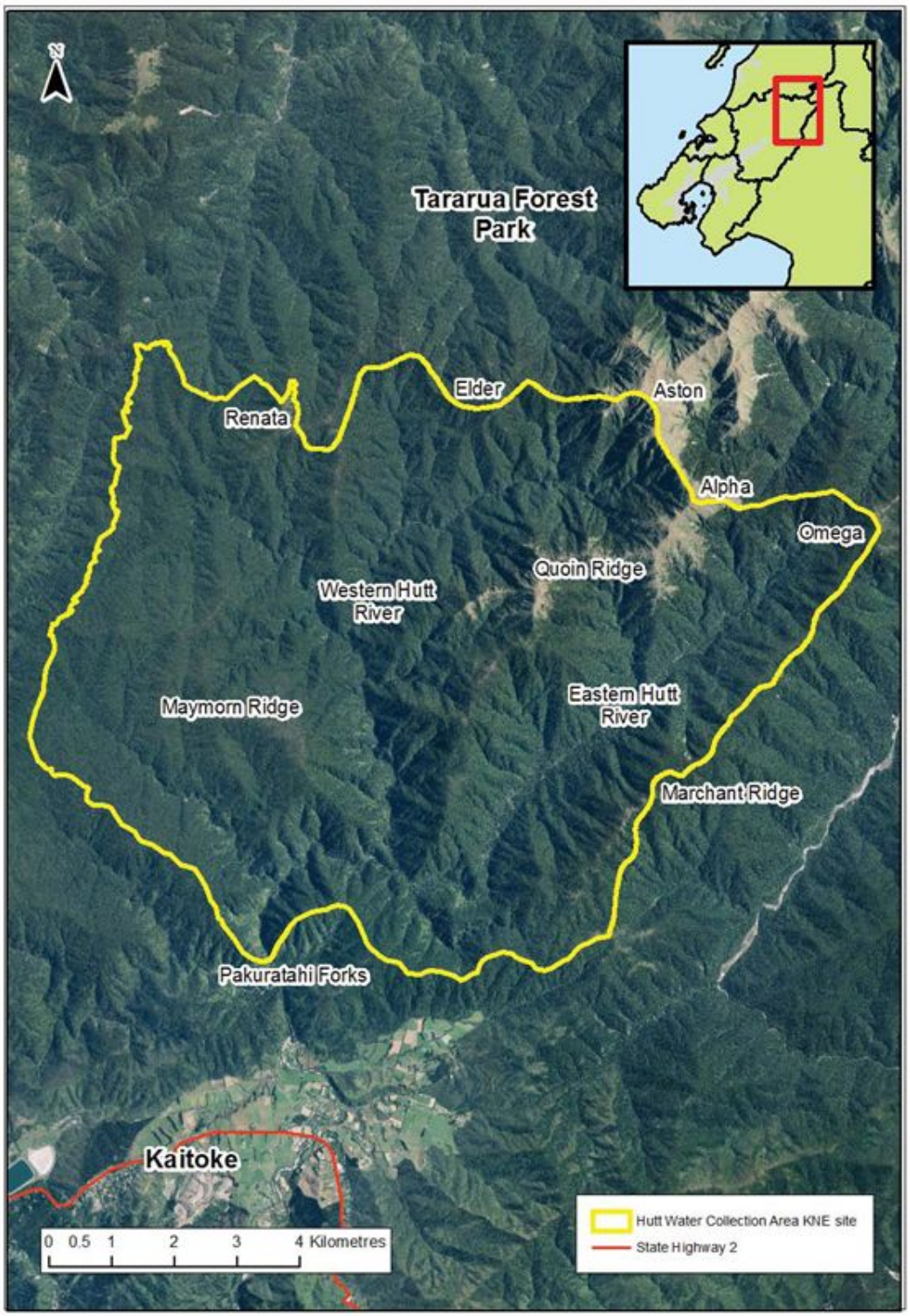
10.1. Budget allocated by Wellington Water Limited

The budget for the 2016/17 and 2017/18 years are indicative only and subject to change.

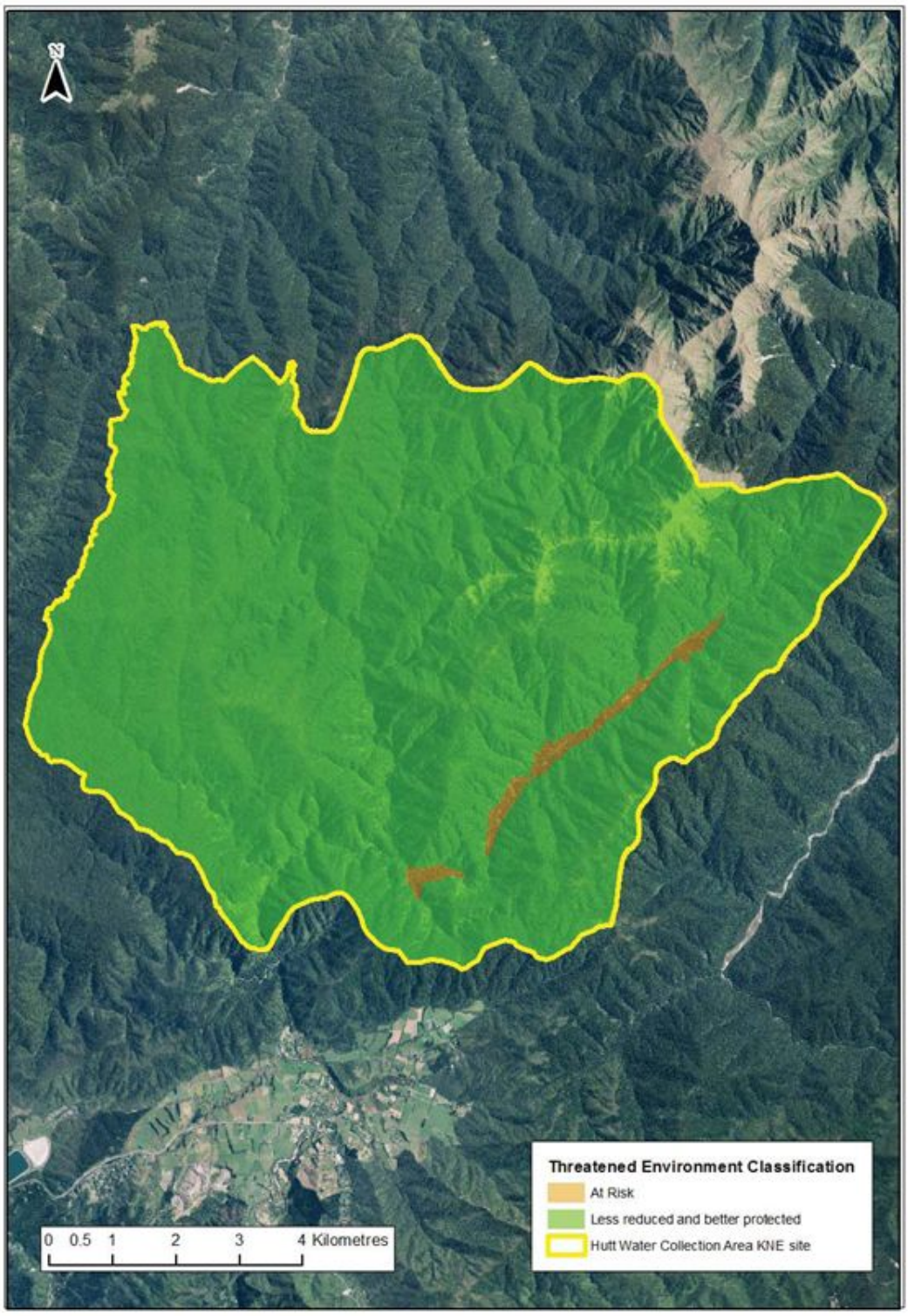
Table 5: Budget allocated to the Hutt Water Collection Area KNE site by Wellington Water Limited

Management activity	Timetable and resourcing		
	2016/17	2017/18	2018/19
Ecological weed control	$2,900	$2,900	$2,900
Pest animal control	$30,500	$30,500	$145,500
Total	**$33,400**	**$33,400**	**$148,400**

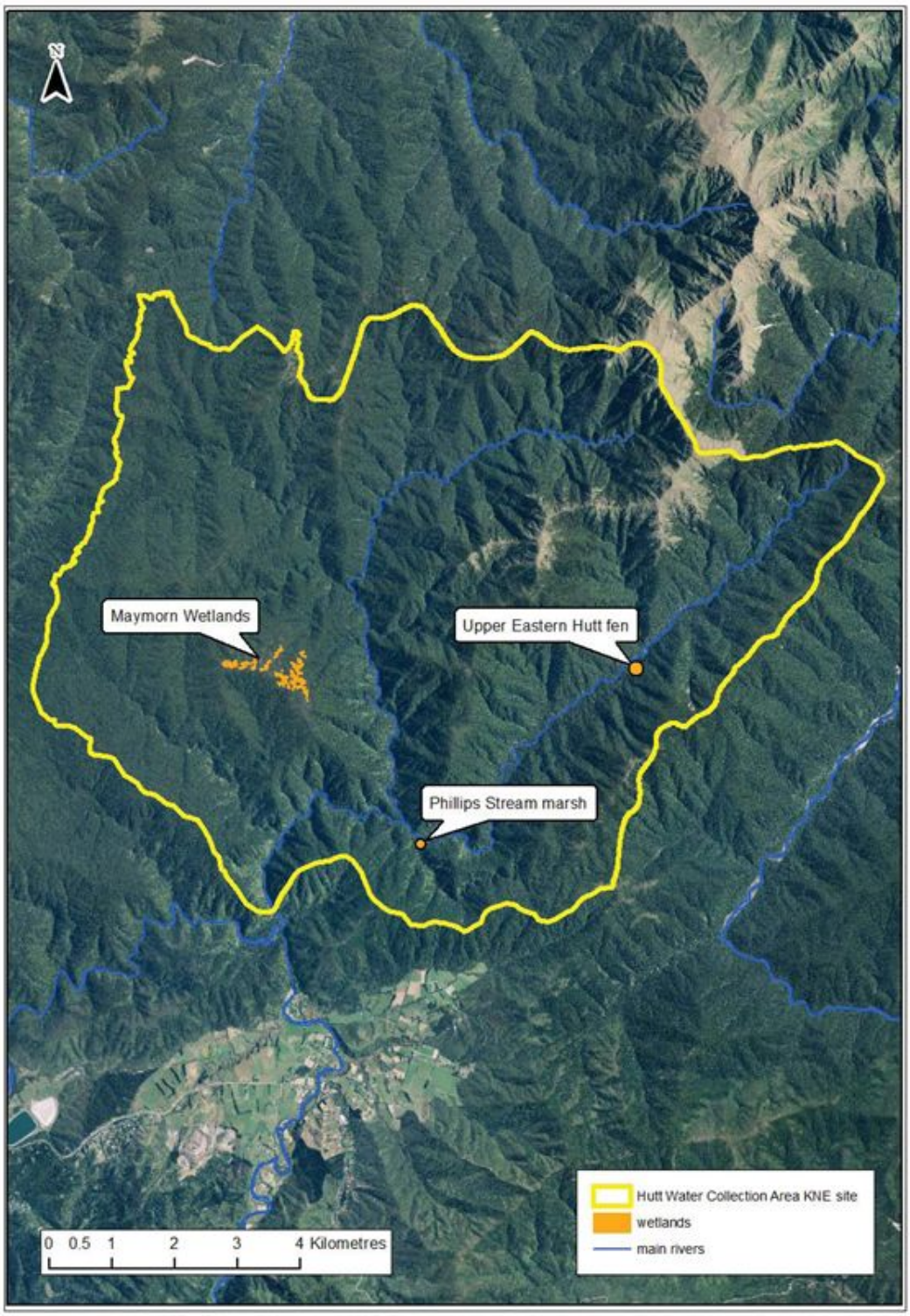
Appendix 1: Site maps



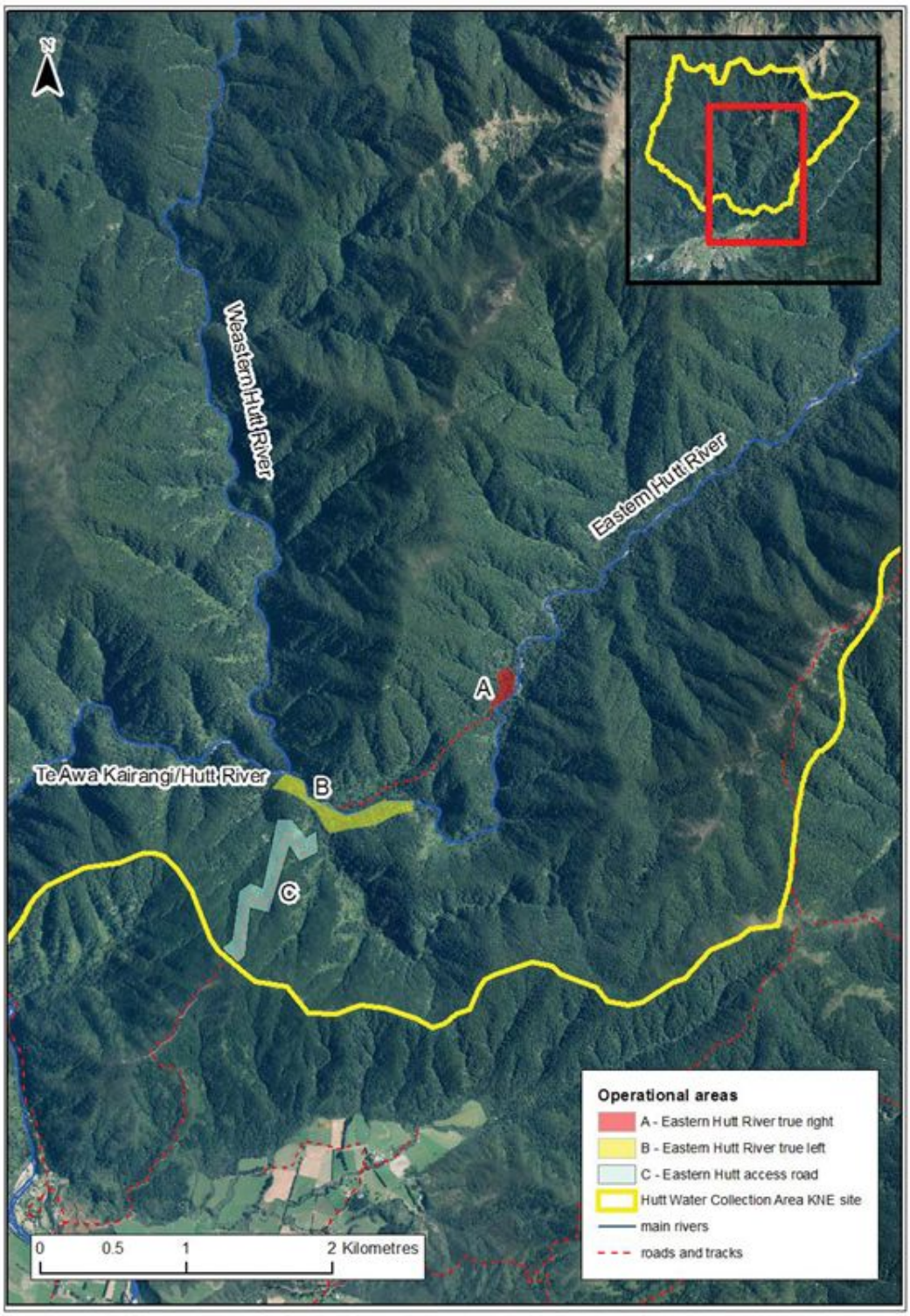
Map 1: The Hutt Water Collection Area KNE site boundary and major geographical features



Map 2: Land Environment New Zealand threat classifications for the Hutt Water Collection Area KNE site



Map 3: Wetlands in the Hutt Water Collection Area KNE site. Maymorn Wetlands are scheduled as an outstanding wetland in the proposed Natural Resources Plan



Map 4: Operational areas in the Hutt Water Collection Area KNE site

Appendix 2: Nationally threatened species list

The New Zealand Threat Classification System lists species according to their threat of extinction. The status of each species group (plants, reptiles, etc) is assessed over a three-year cycle[50], with the exception of birds which are assessed on a five-year cycle[51]. Species are regarded as Threatened if they are classified as Nationally Critical, Nationally Endangered or Nationally Vulnerable. They are regarded as At Risk if they are classified as Declining, Recovering, Relict or Naturally Uncommon. The following table lists Threatened and At Risk species that are resident in, or regular visitors to, the KNE site.

Table 6: Threatened and At Risk species at the Hutt Water Collection Area KNE site

Scientific name	Common name	Threat status	Observation
Plants(vascular)[52]			
Brachyglottis kirkii var. *kirkii*	Kirk's daisy	At Risk - Declining	GWRC 2008[53]
Plumatochilus tasmanica	Greenhood orchid	Threatened - Nationally Vulnerable	GWRC 2008
Birds[54]			
Acanthisitta chloris	Rifleman	At Risk - Declining	http://ebird.org/content/new zealand/ (accessed 22/01/2014)
Cyanoramphus novaezelandiae	Red-crowned parakeet	At Risk - Relict	http://ebird.org/content/new zealand/ (accessed 22/01/2014)
Eudynamys taitensis	Long-tailed cuckoo	At Risk - Naturally Uncommon	http://ebird.org/content/new zealand/ (accessed 22/01/2014)
Falco novaeseelandiae	New Zealand falcon	Threatened - Nationally Vulnerable	http://ebird.org/content/new zealand/ (accessed 22/01/2014)
Nestor meridionalis	Kākā	Threatened - Nationally Vulnerable	http://ebird.org/content/new zealand/ (accessed 22/01/2014)
Phalacrocorax carbo	Black shag	At Risk - Naturally Uncommon	http://ebird.org/content/new zealand/ (accessed 22/01/2014)
Reptiles[55]			
Mokopirirakau "southern North Island"	Ngahere gecko	At Risk - Declining	GWRC Reptile distribution database (accessed 2016)
Freshwater fish[56]			
Anguilla dieffenbachii	Longfin eel	At Risk - Declining	GWRC 2008[57]
Galaxias brevipinnis	Kōaro	At Risk - Declining	GWRC 2008

Scientific name	Common name	Threat status	Observation
Galaxias divergens	Dwarf galaxias	At Risk - Declining	GWRC 2008
Gobiomorphus hubbsi	Bluegill bully	At Risk - Declining	GWRC 2008
Gobiomorphus huttoni	Redfin bully	At Risk - Declining	GWRC 2008
Invertebrates [58]			
Paranephrops planifrons	Northern kōura	At Risk - Declining	GWRC 2008

Appendix 3: Regionally threatened plant species list

The following table lists regionally threatened species that have been recorded in the KNE site. Native plant species have been identified in the Plant Conservation Strategy, Wellington Conservancy 2004-2010[59].

Table 7: Regionally threatened plant species recorded in the Hutt Water Collection Area KNE site

Scientific name	Common name	Threat status	Observation
Plants[60]			
Brachyglottis kirkii var. *kirkii*	Kirk's daisy	Regionally critical	GWRC 2008[61]
Cyathea cunninghamii	Gully tree fern	Sparse	GWRC 2008
Ileostylus micranthus	Green mistletoe	Gradual decline	GWRC 2008
Korthalsella lindsayi	Leafless mistletoe	Sparse	GWRC 2008
Peraxilla colensoi	Scarlet mistletoe	Regionally critical	GWRC 2008
Peraxilla tetrapetala	Red mistletoe	Regionally critical	GWRC 2008
Pimelea gnidia	Pimelea	Data deficient	GWRC 2008
Pittosporum cornifolium	Tawhirikaro	Sparse	GWRC 2008
Plumatochilus tasmanica	Greenhood orchid	Regionally critical	GWRC 2008
Raukaua edgerleyi	Raukawa	Sparse	GWRC 2008

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The Greater Wellington Regional Council's purpose is to enrich life in the Wellington Region by building resilient, connected and prosperous communities, protecting and enhancing our natural assets, and inspiring pride in what makes us unique

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January 2017
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Report	**2017.424**
Date	20 October 2017
File	CCAB-10-387
Committee	**Environment**
Author	**Fiona Colquhoun, Parks Planner**

Parks Network Plan Review 2017-18

1. Purpose

To seek approval for the proposed programme for the review of the Parks Network Plan.

1.1 Background

The Parks Network Plan (PNP), which was approved by Council in 2011, encompasses eight parks and forests:

- Akatarawa Forest Park
- Battle Hill Farm Forest Park
- Belmont Regional Park
- East Harbour Regional Park
- Kaitoke Regional Park
- Pakuratahi Forest
- Wainuiomata Recreation Area

The Reserves Act (1977) requires that GWRC, as the administering body of any reserves in the regional parks, keep management plans under continuous review (section 41), adapting to changing circumstances and increased knowledge.

There have been three amendments to the current Parks Network Plan (in 2012, 2014 and 2016) and it remains relatively current. However, new policy documents such as the proposed Natural Resources Plan, and changes to national policy documents should be reflected in the PNP and officers consider that it is now appropriate to review the overall plan.

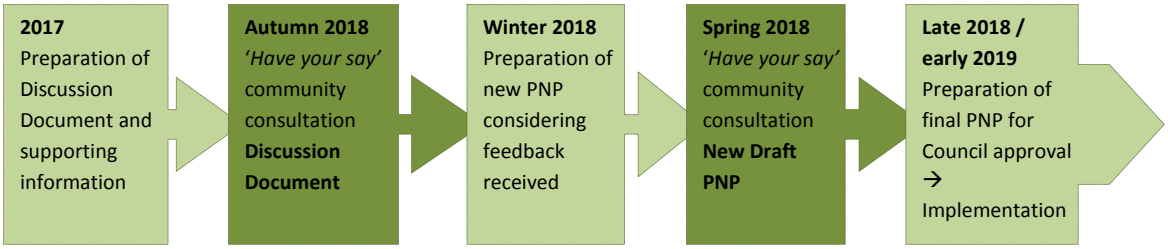
1.2 Proposed Parks Network Plan review process

The proposed review process encompasses two periods of public consultation (for two months each) and ongoing partner and stakeholder discussions throughout the review period.

The first period of consultation will seek feedback on a range of issues and opportunities identified in a discussion document and a number of supporting documents. Based on feedback received a new draft plan will then be prepared and public, partner and stakeholder feedback sought. Hearings will be then be convened before a final plan is prepared and presented for Council approval.

Environment Committee input will be sought and updates provided throughout the review period.

The proposed Parks Network Plan review timeline is summarised as:



Once completed and approved by Council, the new PNP will guide management of the regional parks network for the following ten years, with future amendments undertaken as the need arises.

1.3 Preparation of a discussion document and supporting information

Preparation of a discussion document has commenced and with input sought from Councillors.

The discussion document will highlight key achievements over the life of the current plan, discuss a range of issues facing parks, and present a number of proposals for new services or facilities in order to seek public feedback on them.

More detailed supporting information will be provided about topical operational issues in parks such as weed management and spraying protocols, and farming and grazing in parks. A broader 'environmental scan' encompassing a summary of visitor research and feedback will also be provided.

1.4 Consultation proposed

A communications plan is being prepared. The first round of public consultation is timed to largely run in parallel with Long Term Plan consultation, the end of the summer events programme and the autumn 'Our Region' promotion for parks. Further information will be provided about the detail of proposed consultation and engagement at a later date.

Information about the proposed Parks Network Plan review process will be provided on updated parks management pages of the GWRC website.

2. Consideration of Climate Change

The proposed discussion document will encompass climate change as it relates to parks, park assets and resilience of facilities and services. This includes

GWRC's interests in the Emissions Trading Scheme and the Permanent Forest Sink Initiative.

3. The decision-making process and significance

Officers have considered the significance of the matter, taking into account the Council's significance and engagement policy, and decision-making guidelines. Due to the procedural nature of this decision officers recommend that the matter be considered to have low significance.

A formal record outlining consideration of the decision-making process is not required in this instance.

The notification process for the new draft Parks Network Plan is outlined in the Reserves Act and applies to the new proposed draft Plan.

3.1 Engagement

Engagement on this matter is unnecessary. A communications and engagement plan is being prepared. A range of engagement activities will take place during consultation periods ranging from website information and social media to park based face to face engagement opportunities.

4. Recommendations

That the Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the contents of the report.*

3. ***Approves*** *the proposed programme for the Park Network Plan review as set out in this report.*

Report prepared by:	Report approved by:	Report approved by:
Fiona Colquhoun Parks Planner, Corporate and Strategic Planning	**Nicola Shorten** Manager, Corporate and Strategic Planning	**Luke Troy** General Manager, Strategy

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Report **2017.405**
Date 16 October 2017
File CCAB-10-380

Committee **Environment**
Author **Kat Banyard, Project Advisor and Shelley Elliott, Project Advisor**

Whaitua Programme Update - November 2017

1. Purpose

To provide information to the Environment Committee on the status of the three active whaitua projects and any key upcoming work.

2. Background

The whaitua process is a community-led, collaborative planning process to address a number of land and water management issues and carry out our obligations under the National Policy Statement for Freshwater Management (NPS-FM). The programme aims to improve the integration of activities and achieve better resource management practices that reflect local aspirations.

The Region has been divided into five whaitua or catchments. Whaitua committees, consisting of community members, iwi representatives, partner representatives, and GWRC representatives will make recommendations to the Council through a Whaitua Implementation Programme (WIP) report. A WIP will contain strategies and actions that will form a programme of work for the management of land and water in that catchment.

There are currently two established committees, the Ruamāhanga Whaitua Committee and Te Awarua-o-Porirua Whaitua Committee. Planning is underway to set up the Wellington Harbour and Hutt Valley Whaitua.

A Collaborative Modelling Project supports each Whaitua Committee by feeding knowledge into their decision-making process. Experts in the various topic areas (for example ecologists, economists, social scientists) work collaboratively to ensure information and data is up to date and to provide expert advice to the Whaitua Committee when required. The project involves partnering with mana whenua as well as having significant iwi and community input, as well as input from relevant stakeholders.

3. Ruamāhanga Whaitua

3.1 Policy direction

A joint workshop with Te Upoko Taiao Natural Resources Plan Committee and the Environment Committee to discuss the policy direction in more detail is being organised for November 2017. The current high level policy direction for managing contaminants, river management and water allocation is set out below. This will continue to develop in the coming months as the Committee works towards its WIP.

3.1.1 Managing contaminants

There are a number of places in the whaitua where the national bottom lines for water quality are not being met. In particular there are excessive levels of periphyton (algae) growth in rivers and streams in the Eastern Hills and the Parkvale Stream. The Parkvale Stream does not meet the bottom line for nitrate toxicity. Several rivers do not meet the revised swimming standard. Lake Wairarapa and Lake Onoke also have very poor water quality in general.

The Ruamāhanga Whaitua Committee (the Committee) will set limits (as regulatory rules) to achieve objectives at the sub-catchment scale as required by the NPS-FM. Limits will be set for nitrogen, phosphorus, pathogens and sediment.

The Committee supports a non-regulatory pathway to achieve these limits. Individual point source discharges will continue to be regulated as they are now. The Committee supports enabling sub-catchment groups who will have a practical implementation focus to achieve the limits. The Committee also supports a holistic approach to farm scale planning that seeks continuous improvement in environmental performance.

3.1.2 River management

The rivers, lakes and wetlands of the Ruamāhanga whaitua are highly modified and degraded which has led to a loss of natural character and habitat. The Committee is considering where opportunities exist to achieve a more natural river geomorphology and a holistic approach to river management. They want to improve the extent and quality of riparian margins.

Another option being considered is to put the Ruamāhanga River back into Lake Wairarapa to improve the water quality and restore the mana of the lake. This will be a longer term option that may tie into the establishment of the Statutory Board.

3.1.3 Water allocation

Climate change is going to have ongoing effects in the catchment, with significant low flow reductions predicted by the end of the century. This will further restrict water user reliability even if there is no change in policy direction.

The Committee has reviewed minimum flows and allocation limits for the eight major rivers in the whaitua. Most suggested changes are small, however significant changes are being considered to the minimum flows in the Upper

Ruamāhanga and the Waipoua rivers. These changes will provide better protection for fish habitat and from the pressures of climate change. Any changes will need to be implemented over a period of time to mitigate economic impacts.

The Committee is considering how best to manage groundwater takes that are directly connected with surface water. These may be restricted further.

3.2 Key work in the coming months

In the coming months the Ruamāhanga Whaitua Committee will develop and finalise their freshwater objectives – what they want to achieve in terms of environmental state improvement. Under the NPS-FM the Committee will need to maintain or improve water quality, and improve in places where national bottom lines aren't being met. They will also need to meet the 90% swimmable target by 2040. These discussions will be informed by a range of information and knowledge, including results from the collaborative modelling project and the perspectives of mana whenua and the community.

The Committee is just beginning to engage on their preferred policy approach to water allocation with the community and stakeholders. Peter Gawith, Chair of the Committee is speaking at the Wairarapa Water Users Group AGM on 26 October. A letter and face to face meetings are also being set up for users who would be directly affected by the Committee's preferred changes to minimum flows and Category A groundwater restrictions at minimum flows. Some of the preferred changes have the potential to have significant impacts on water users and the Committee is working to clearly communicate the rationale and timeframe over which any changes would occur.

Regular engagement with partners and stakeholders will continue. Updates to District Councils, the Wairarapa Committee and the Farming Reference Group are already confirmed in the coming months.

The Committee is still expecting to make all their major decisions by the end of 2017. The Committee supports further engagement with stakeholders and the community on the 'whole package' in February and March 2018 with a view to a final WIP being presented to Council in April/May.

4. Te Awarua-o-Porirua Whaitua

4.1 Progress since last update

The Committee has continued to explore policy management options with a view to identifying draft policy preferences and places to maintain or improve water quality. The Committee has made significant progress in consideration of water takes and allocation limits, and has honed their consensus decision making skills in the process.

The Collaborative Modelling Project (CMP) team has progressed modelling the scenarios developed by the Committee. It is expected that the bulk of the modelling outputs will be finalised by December 2017.

The Committee recognises the importance of engaging with partners and stakeholders and having them included in the policy development process. Ngāti Toa, Territorial Authorities, Wellington Water Ltd, rural stakeholders and developers will all have significant roles to play in the implementation of WIP recommendations.

Members of the Committee and Project Team have engaged with the rural community. Keeping communication open between the whaitua committee and the rural community helps to spread the message that "change is coming" and provides the rural community with a channel for ongoing dialogue.

The Project Team continue to strengthen their relationship with Porirua City Council (PCC). PCC are moving into an early engagement stage in their District Plan review process and have been talking with the Project Team about opportunities to work together with communities with interests in both the plan review and WIP development. For example, PCC are starting engagement with both rural stakeholders and developers through their 'deep dive' process as part of the district plan review and there are clear benefits for PCC & GWRC to work together and share information in this space.

4.2 Key work in the coming months

The next phase of work for the Committee is to sign off on their draft policy preferences and begin to explore objectives and limits for each freshwater management unit in their catchment.

As the modelling results come through in December, the Project Team will be working hard to translate that data in a way that aids the Committee's decision-making to the point of finalising objectives, limits and policy approaches, and writing the WIP by mid-2018.

The Committee will continue to engage with partners and key stakeholders to raise awareness of the whaitua and also provide these groups with ways to input into the process.

5. Wellington Harbour and Hutt Valley Whaitua

Officers have been working with a consortium to revise the design of the Wellington Harbour and Hutt Valley whaitua process. They have been holding targeted interviews with representatives from GWRC and partner organisations. They're looking to gather lessons learned from the two current processes and create a revised design that builds on these learnings. A potential new design for the Wellington Harbour and Hutt Valley whaitua process will be available by December 2017.

Recent changes to the Resource Management Act (RMA) have amended Schedule 1 and provided an alternative collaborative pathway for preparing a review or a change to a plan. The new pathway looks to support community participation earlier in the process to produce plans that better reflect community values and reduce litigation costs. The new approach curtails appeals rights at the end of the process. The decision to go down the alternative pathway is optional and a decision will need to be made by Council prior to the start of the process.

6. Consideration of Climate Change

No decision is being sought in this report.

The matters addressed in this report have been considered by officers in accordance with the process set out in the GWRC Climate Change Consideration Guide.

6.1 Mitigation assessment

Mitigation assessments are concerned with the effect of the matter on the climate (i.e. the greenhouse gas emissions generated or removed from the atmosphere as a consequence of the matter) and the actions taken to reduce, neutralise or enhance that effect.

Officers have considered the effect of the matter on the climate.

Officers note that the matter currently does not affect the Council's interests in the Emissions Trading Scheme (ETS) or the Permanent Forest Sink Initiative (PFSI). However, recommendations made by the Whaitua Committees could provide a co-benefit of mitigating climate change. For example, the retirement and planting of erosion-prone land could give effect to sequestering carbon, however this will not be able to be further analysed until the Committee make their recommendations. Officers involved in this work will ensure this is considered in the final WIP report.

6.2 Adaptation assessment

Adaptation assessments relate to the impacts of climate change (e.g. sea level rise or an increase in extreme weather events), and the actions taken to address or avoid those impacts.

Consideration of climate change adaption has been built into the collaborative modelling projects which support each whaitua project.

Climate change impacts on rainfall and catchment hydrology are being modelled and will be applied to the scenarios developed by the Committees. This information will allow for analysis of changes in contaminant generation, water allocation and flow, and the effectiveness of mitigations (such as stormwater treatment, erosion and sediment control) on a catchment-by-catchment basis.

7. The decision-making process and significance

No decision is being sought in this report. This report is for Environment Committee members to receive an update on the progress of the three whaitua projects.

7.1 Engagement

Engagement on this matter is unnecessary.

8. Recommendations

That the Environment Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report.*

Report prepared by:	Report approved by:	Report approved by:
Kat Banyard Project Advisor	**Alastair Smaill** Team Leader - Whaitua	**Nigel Corry** General Manager, Environment Management Group

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Te Pane Matua Taiao

Report	**2017.426**
Date	24 October 2017
File	CCAB-10-389
Committee	**Environment Committee**
Author	**Cr Kedgley, Chairperson, Environment Committee**
	Cr Blakeley, Councillor

Report on the Climate Change and Business Conference organised by the Environmental Defence Society

1. Purpose

To report on the Climate Change and Business Conference attended by Crs Blakeley and Kedgley.

2. Background

The Climate Change and Business Conference took place in Auckland on 10 and 11 October 2017.

3. Key Themes

As severe climate events and changes in typical weather patterns become the new normal, climate change will be the largest economic disruptor of our lifetimes.

We are in the midst of a major transition to a low carbon economy, and there will be an economic advantage for those companies and countries that move towards a low emission economy quickly.

Climate change debate is over and it's time now for accelerated climate change action.

New Zealand should be a leader in climate change action, but in fact our emissions have been increasing, not decreasing. Our emissions increased by 24% since 1990, and we now have the fifth highest climate emissions, per person, in the OECD.

Mandatory climate change targets kick in on 2030, and the longer New Zealand waits to achieve these targets, the more difficult it will be.

Our carbon price is so low that it isn't changing behaviour or giving the right incentives for change. But if the government were to send a clear market signal through a carbon price and other measures, businesses would respond very quickly.

Action on climate change brings huge environmental, social and health benefits. And the cost of decarbonising is not as high as the cost of not decarbonising.

There was general consensus that New Zealand needs to set up an independent Climate Commission, comprised of a group of experts who advise the government on Climate Change (modelled on the UK Climate Commission – its chair Lord Deben spoke by video to the conference) and embed statutory climate change targets in new Climate Change legislation. This is now certain to happen with the change in government.

Generation Zero, the advocacy group of young people, is campaigning for a target of net zero carbon emissions by 2050 within legislation.

3.1 Impact of climate change on the business sector

Within five years most major economies will require climate change risks to be embedded into the financial reporting of companies. Boards will be required to make an annual disclosure or Climate Change Investment Statement about how they are preparing for a low carbon world; how they will manage climate change risks to their business, and how it will affect their business model, and how they will integrate climate change risks into their long term strategic thinking. Businesses also need to understand and disclose their carbon footprint/emissions and identify actions they will take to reduce their footprint.

No business will be unaffected by climate change. If a business is not thinking about climate change it is not thinking about its future.

Organisations that prepare for climate change and change their business model will outperform other companies in the long term.

Investments may sour as consumers turn away from fossil fuel industries, and investors demand climate change transparency and reporting. Millions of dollars of divestment of climate changing assets are taking place around the world.

Vector has begun reporting on how climate change will fundamentally change its business model.

Mercury, Westpac and Air NZ have committed to converting 1/3 of their vehicles to electric. They have issued a challenge for 30 companies in NZ to join them.

Air NZ has committed to being carbon neutral in growth of its activities from 2020 and to reduce its emissions by 50% by 2050.

3.2 Impact of transport on climate change

Transport is a massive carbon emitter/polluter, and a huge contributor to air pollution.

Overall 17% of New Zealand's emissions are from transport and transport is the fastest growing sector for emissions.

40% of greenhouse gas emissions in Auckland are from transport, 39% in the Wellington Region.

99% of transport in New Zealand is fuelled by fossil fuels ("We need to stop burning stuff", Chris Thurston; EECA).

We need to electrify public transport and vehicles/trucks.

Trust Power says we have enough planned renewable electricity in New Zealand to deliver the electricity needed for a major switch to electric vehicles.

There is no mention of emissions in the government's National Policy Statement on Transport, which is heavily focused on roads and not on electrified public transport.

We also need to shift people's mind-sets away from car dependency. "We are backward looking in our thinking and lacking in innovation in the transport sector," Lester Levy; Chair of Auckland Transport).

3.3 Impact of climate change on farming

New Zealand has the highest percentage of emissions from methane from farming in the world.

Half of our greenhouse gas emissions come from animals and agriculture.

We can't meet our climate change targets with existing land use patterns.

Intensive farming systems have reached their economic, social and environmental limits. Farmers are pouring fertiliser, water and chemicals onto the land and much of it is lost. High rates of nitrogen are leaching into soils and our agricultural sector will be under increasing pressure to provide a detailed account of its environmental impact to overseas markets.

The government is subsidising intensive agriculture by not charging for any externalities on farms eg water pollution, antibiotic resistance.

Irrigation not only provides a subsidy to farmers but also drives fertiliser and land use intensification.

There is a major threat to current farming practices from animal free protein production, and synthetic food, and from consumers switching towards plant-based diets. Analysts predict massive growth in this sector that will cause disruption to traditional animal based farming.

We need to change the way we farm and switch to quite different farming systems and techniques that will regenerate the environment.

Regenerative agriculture builds the soil and minimises our ecological footprint.

We could cut our agricultural emissions by half if we encouraged innovative farming agricultural techniques such as precision farming, precision irrigation and precision fertiliser use. Other strategies include:

- Encouraging forestry and native forest planting to regenerate on hilly land.
- Reducing stock on farms; reducing intensification and monoculture.
- Using low carbon feeds for animals.
- Converting from animal to plant protein.

3.4 Climate change litigation risks

Climate change litigation is growing around the world, based on the premise that governments have an obligation to act but most have failed to do so.

If an industry/government understands the risks of climate change but ignores them or fails to act there are litigation opportunities.

Successful litigation has been taken against the Dutch and Pakistan governments, and many other cases are proceeding.

For example, Greenpeace is suing the government of Norway for acting in favour of fossil fuel companies and taking insufficient action to reduce emissions.

San Francisco and Oakland, are suing five major carbon producing companies and are seeking compensation.

Graduate law student Sarah Thomson has taken a judicial review of the way the New Zealand government set its climate change targets. The hearings were in June and the judgement will be released shortly.

Scientific uncertainty cannot be used as an excuse for not acting.

We need to put in place a legal policy framework that supports difficult decisions—eg staged retreat in the face of sea level rise and coastal erosion, and uninsurable buildings on flood plains.

3.5 Impact of climate change on the insurance industry

The number of weather related natural hazard events has tripled since the 1990’s and this is posing a real challenge to the business model of the insurance industry, and reducing their appetite for insuring high risk assets.

As risks change, the approach to insurance will change, and premiums will increase in high-risk areas and elements of insurance cover may be removed.

There will also be an increase in liability risks as parties suffering losses from climate change seek to recover their losses from others they believe may have been responsible.

Restricting property insurance in high-risk areas will inevitably impact on property values.

Some locations will become uninsurable. But this will occur in a targeted, gradual way.

At present IAG Insurance provide insurance cover for three flood events. After the third flood event they will no longer insure.

See Bank of England report on the impact of climate change on the insurance industry, September 2015.

3.6 Impact of climate change on flood protection

After significant flooding events, cities such as Melbourne and Copenhagen have developed major strategies to reduce the impact of flooding due to heavy rains that are expected to increase in intensity as a result of climate change; and to prepare their cities to be able to cope with extreme rainfall events.

The aim of their strategies is to spend money on preventing flooding impacts rather than just mopping up afterwards.

Copenhagen has a Climate Change Adaptation Plan and an innovative Cloudburst Management Plan that is designed to reduce the city's flooding risk.

Instead of relying on traditional drainage and sewerage solutions, Copenhagen has identified 300 'surface solutions' that will increase permeability throughout the city and keep as much water as possible out of the sewerage system.

Strategies include increasing permeability throughout the city by green gardens, roof gardens; green walls, increasing permeable paving and park areas; reopening streams; developing parks that could turn into lakes during flood events; green; water absorbing roads that turn into rivers during flood events; water retention pools on playing fields; diversions that drain water to areas where there would be minimal impact; diverting water into the harbour through large pipes; installing underground tanks to prevent flooding; separating rainwater from waste water.

Copenhagen is doing all of its flood protection work within a framework of 'improving city green spaces,' which will help create new urban spaces and opportunities for urban development.

The flood protection initiatives will be rolled out at the rate of 15 a year.

Melbourne is also focussed on reducing flooding impacts by greening its city and making it more permeable. It has an Urban Forest Fund which enables it to match dollar for dollar the construction of green malls, green roofs; green laneways. Every tree in Melbourne is identified on a website.

3.7 Government Action on Climate Change

The Ministry for the Environment says the drive to low emissions is increasingly guiding the government across the board.

The Paris agreement comes into force fully in 2021 and the government has established a climate change transition unit which is looking at how we can meet our mandatory 2030 target; what else the government can focus on to reduce our emissions; how it can use the levers of government to affect change, and how we can diversify the economy and move to a high value economy.

The government has set up three Climate Change working groups:

- A forestry reference group.
- An agricultural reference group.
- A climate change adaptation working group that is looking at how to build resilience to climate change into our economy.

The government is presently spending $1 billion a year in purchasing carbon offsets overseas, whereas it would cost $2 billion to meet our target at home.

The New Zealand Productivity Commission has been commissioned by government to investigate New Zealand's transformation to a low-emissions economy. It will release its draft report in February and its final report in June/July.

3.8 Local Government Response to Climate Change

Local government has a duty to avoid harm to their communities from climate change, and to avoid or mitigate natural hazards.

Local government is also required to have regard to climate change, but it's difficult for local government to drive the climate change agenda because they don't have the political mandate to do so.

Government departments and local government are operating separately and not integrating their climate change responses.

Councils are at risk if they know and have identified a climate change risk but do nothing about it.

Councils need to move from defensive/reactive action on climate change to proactive action.

Decisions are being made on an ad hoc basis, without a supportive legal and policy framework and clear objectives.

4. Consideration of Climate Change

The matters addressed in this report are of a procedural nature, and there is no need to conduct a climate change assessment.

5. The decision-making process and significance

The matter requiring decision in this report has been considered against the requirements of Part 6 of the Local Government Act 2002.

No decision is being sought in this report.

5.1 Engagement

Engagement on this matter is unnecessary.

6. Recommendations

That the Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report.*

Report prepared by:	Report prepared by:
Cr Kedgley	**Cr Blakeley**
Chairperson, Environment Committee	Councillor

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Report	**17.384**
Date	24 October 2017
File	CCAB-10-378
Committee	**Environment Committee**
Author	**Nigel Corry, General Manager, Environment Management** **Wayne O'Donnell, General Manager, Catchment Management** **Luke Troy, General Manager, Strategy**

General Managers' report to the Environment Committee meeting 1 November 2017

1. Purpose

To inform the Environment Committee of Greater Wellington Regional Council (GWRC) activities relating to the Committee's areas of responsibilities.

2. Catchment Management

2.1 Biosecurity

2.1.1 Regional Pest Management Plan (RPMP) Review

Drafting of the Plan continues alongside undertaking cost-benefit analysis (CBA) to determine the appropriate control programmes for species.

Wildland Consultants have been contracted to undertake analysis on species that require a higher level of analysis, as determined by a set of criteria under the National Policy Direction for Pest Management (2015). These species include the Canada goose, possums, feral cat, Bathurst bur and Boneseed.

For pest plant species, delimiting surveys have been completed and the data will be used in the CBA to determine which species should be selected for inclusion in the reviewed RPMP.

2.1.2 Feral Goats

Feral goat control was undertaken for NZTA on the Paekakariki Escarpment (SH1) where goats were becoming a traffic hazard. Sixty feral goats were removed, in what was a high risk operation that required careful planning and execution by skilled staff. The goats were required to be mustered over the top of this escarpment so control could take place away from the road and out of sight of Paekakariki, no mean feat when you are dealing with this terrain and that many goats.

Figure 1 Area in Paekakariki where goats had to be removed

2.1.3 Predator Free Wellington

Glen Falconer, Biosecurity, has been working with Predator Free Wellington to produce and finalise a rat and mustelid eradication plan for Miramar Peninsula. Staff have also been involved with purchasing and delivering rat traps and boxes to the predator free groups set up in Miramar.

2.1.4 Regional Possum Predator Control Programme (RPPCP)

Work has commenced on the 2017/18 programme which covers 90,000ha. The Bioworks team has completed control over 28,000ha to date. Approximately 15,500ha will be treated in the Wellington - Kapiti area and the remainder will be undertaken within the Masterton and Carterton districts.

2.1.5 Mycoplasma bovis

To assist with the Mycoplasma bovis response coordinated by MPI, Senior Biosecurity officer Wayne Cowan was deployed as part of the national response team, to carry out and enforce ‘restricted place notices’ on the seven infected farms in Oamaru. His presence will make the management of farm de-

population easier on landowners and staff delivering this gruesome task. To date, Wayne has spent three weeks on the response team.

2.1.6 National Interest Pest Response - Manchurian wild rice

Our team submitted to the Ministry for Primary Industries a 10 year strategic plan for eradicating Manchurian wild rice (MWR) from Te Harakeke wetland in Waikanae (the only known site within the Wellington Region).

2.2 Land Management

2.2.1 NZARM Conference - Southland

The annual New Zealand Association of Resource Management (NZARM) conference was recently held in Invercargill. This is traditionally the main conference for land managers across the country. Attendees included regional councils, territorial authorities, industry representatives (fertiliser companies, Beef and Lamb, Fonterra, DairyNZ), research providers, farmers, land and water consultants, and forestry representatives.

Titled "managing soil and water interaction through people and science" the programme had a strong focus on innovative science happening in Southland. Due to the unique 'Physiographics of Southland' the region has been grouped into different zones according to factors such as water origin, soil type, geology and topography. Now being used in the planning and extension areas of Council, recommendations for good on-farm management practices are tailored to zones as each zone is different in the way contaminants build up and move through the soil and aquifers, and into streams and rivers.

While still in the early stages of the freshwater engagement process, Southland's catchment groups are setting themselves up and taking a practical approach to promoting and adopting good management practices.

2.2.2 Stoney Creek Harvesting Plan

It is anticipated that harvesting of the forest at Stoney Creek will commence in early 2018. Stoney Creek forest was included in the cutting rights sale to RMS. PF Olsen act as forest managers on behalf of RMS.

In preparation for the commencement of harvesting, a community meeting was held to explain to the residents and stakeholders that a ten year harvesting operation was about to start and allow the community to raise any concerns. The meeting was held on 17 October at the Tutumururi School and was well represented by GWRC, South Wairarapa District Council and PF Olsen staff. The community was also well represented and had a good cross section of residents and farmers.

The main areas of concern to the community were traffic movement and traffic safety issues. This is particularly relevant to Range Road, where significant work to upgrade the road was required before it would be fit for purpose. This was currently being worked through with staff from South Wairarapa District Council and PF Olsen. All parties present would be satisfied that traffic movements and traffic safety would be occurring with the safety of all road users in mind. Overall it was a successful meeting and those present would

have left the meeting satisfied that they have had the opportunity to raise concerns and now have avenues to raise future issues.

2.2.3 Akura Nursery

Akura Nursery is now officially closed as of 30 September 2017. The 2017 winter planting programme was fairly intense with cold, wet weather and challenging environments. Considerably more native plants were purchased from Akura Nursery than the previous few years. Plant numbers were as follows:

	SOLD
Eco-sourced manuka plugs	**22,325**
Eco-sourced natives	**52,681**
non eco-sourced natives	**28,864**
Open Grown flax	**2,710**
Eucalypts	**8,334**
Other	**14,936**
Pines	**101,200**
Total	**208,725**

A number of old poplar and willow stool beds have been completely removed and the land re-cultivated and replanted with new material. This work is part of the ten year stool replacement programme which will increase the pole production to full capacity by 2020/21. At present the pole nursery has not reached its full potential and this year produced the following:

	SOLD
3mA Poles	**24,140**
3mB Poles	**630**
2.5m poles	**1,894**
3.2m Poles	**1,131**
2m River Poles	**5,250**
Total	**33,045**

2.2.4 Riparian programme

The Riparian programme supports landowners to achieve water quality and biodiversity outcomes through the management of stock access to

waterways. Part of this programme is to work with landowners to identify waterways and sites that meet the definitions for Category 1 (sites of significance under the proposed Natural Resources Plan (pNRP)).

Members of the project team, landowners and local iwi spent a day at Pararaki River Mouth, a site identified as Category 1 for its cultural values, to learn from former DOC archaeologist, Kevin Jones, on how conventional methods of excluding stock (fencing) could compromise the cultural values present. The day provided a great opportunity to apply what was learnt at other similar Category 1 sites and how the effects of grazing can be managed to protect the values identified in the plan.

During this quarter, the Riparian project has focused on shifting the landowners forward along the behaviour change spectrum through to implementation of their stock exclusion plans.

2.2.5 WRECI programme

Following a wetter than average winter season, the Wellington Regional Erosion Control Initiative (WRECI) planting programme has been completed with 14,822 poplar and willow 3m A grade poles and 84,901 seedlings contract planted in July and August this year.

Applications for WRECI afforestation and reversion grants for 2017/18 and 2018/19 were mailed out in September with applications needing to be returned in late October. Already a strong response from landowners has been received which should see the fund fully subscribed.

2.2.7 Farm Environment Plans (FEP)

The FEP programme has received strong interest from landowners to enter into the programme possibly buoyed by an increase in conversations around stock

exclusion. Although interest from landowners wanting an FEP developed around Lake Wairarapa remains high, Land Management advisors will begin to actively engage with farmers in the Parkvale catchment as it has been identified in the pNRP and the FEP programme strategy as a priority catchment.

Applications for the contestable fund have also been strong with close to $300,000 of on-farm work to improve water quality and biodiverstiy under consideration for approval.

2.2.8 Enabling Catchment Communities (ECC)

A cross department team from Land Management and Environment Policy has been set up to look at how GWRC can best position itself to engage with catchment community groups that are beginning to form in the region. These eight groups, all Wairarapa based catchment communities have formed for a number of reasons; one of the main drivers being an awareness of increased expectations on rural communities to improve land use and water quality and the need for collaborative responses to achieve and maintain change.

The ECC team are meeting with industry, iwi and local community organisations to look at a Wairarapa owned approach (Wairarapa Catchment Communities) that can integrate and manage supply and demand delivery of knowledge and resources to catchment communities. The group are also beginning to meet with internal departments to discuss and gather feedback on this new approach.

2.3 Flood Protection Implementation

2.3.1 Te Awa Kairangi/Hutt River, RiverLink

The RiverLink project has completed 2 of 3 planned workshops to discuss project scope, costs and cost sharing between the project partners based on the preliminary design. The project is on track to recommend to the Hutt Valley Flood Management Subcommittee a preliminary design, with which to proceed to the next stage of statutory approvals, in March 2018.

Sixteen properties have been acquired, and a further 50 are in various stages of negotiation. 118 is the total current property requirement to deliver the flood protection outcomes for the RiverLink project. Hutt City Council has separately sought to acquire additional properties to assist delivery of its making places project. NZTA will identify their property requirements at a future date once they have completed their detailed business case process.

2.3.2 Te Awa Kairangi/Hutt River Small Projects

Several smaller projects are underway along Te Awa Kairangi/Hutt River. These include; repairs and planting of the Belmont ‘Dog Club’ Rock Protection; erosion repairs Belmont Right Bank adjacent to State Highway 2 opposite Waimarie Croquet Club site; Port Road north and south of the Waiwhetu mouth;

2.3.3 Te Awa Kairangi/Hutt River Environmental Strategy

Officers will seek endorsement from the Hutt Valley Flood Management Subcommittee to proceed to consultation with the draft Hutt River

Environmental Strategy Action Plan in November 2017. A copy of the draft has been provided to the subcommittee during its last meeting to enable sufficient time for Subcommittee members to familiarise themselves with the document prior to November's decision point.

The Environmental Strategy and Action plan sets out a vision for amenity and environmental outcomes on the river, and includes an action plan to assist with prioritisation and delivery of these outcomes.

2.3.4 Pinehaven Stream

The Pinehaven Stream Floodplain Management plan recommends a package of stream capacity improvements to provide 1-in-25 year channel capacity and protection of habitable floor levels to a 1-in-100 year level including effects of climate change.

Wellington Water is project manager for delivery of the Pinehaven Stream Flood Capacity improvements. Preliminary design and modelling has been completed and an engagement plan is being developed to re-engage with properties adjacent to the areas of work, and to inform and update the wider Pinehaven and Silverstream communities.

Plan Change 42 includes controls for the management of the Mangaroa River and Pinehaven Stream Catchment. It looks to ensure development is compatible with flood risk, implement stormwater neutrality for new development and control development in flood hazard areas. The further submission period for Plan Change 42 – Mangaroa and Pinehaven Flood Hazard Extents closed on 8 June 2017. Hearings were held in September 2017 and the outcome of this hearing process is anticipated prior to December 2017. The Plan Change is an essential component of the Floodplain Management Plan outcomes, and is required before the stream flood capacity improvements can commence.

2.3.5 Waikanae River, Jim Cook Park

The Jim Cook Park stopbank upgrade project earthworks have completed and a grass strike has been achieved. Due to wet weather conditions during the project and the finishing works the expected quality standard has not been met, this will be improved once weather improvements permit. The mitigation and enhancement planting plan is being finalised, this planting plan ties into and supports the 5 year planting plan being developed with the Friends of the Waikanae River.

Boundary alignment corrections and encroachments along the boundary of Jim Cook Park are being addressed, and fencing will be built once boundary alignment concerns have been resolved.

Forty dangerous trees adjacent to the site will be removed once ground conditions have improved. This will tie in with walking track improvements along the boundary of the Kapiti Equestrian and Vaulting Centre site.

2.3.6 Otaki River

GWRC will be assisting the Peka Peka to Ōtaki Expressway (PP2O) project team with an upgrade to the Chrystalls Extended Stopbank. This upgrade is being proposed to mitigate the effects of the new SH1 bridge that is part of the Pekapeka to Otaki project. It will benefit Otaki residents by improving the stopbank levels and adding an allowance for climate change effects.

2.3.7 Waitohu Stream

Work has recommenced to secure entry agreements needed to complete the South Waitohu Stopbank channel improvements and the Convent Road stopbank parts of the proposed Waitohu Flood Protection works. To date six of the 15 agreements required have been secured. The focus of recent agreement discussions has been with the Otaki and Porirua Trust Board which is one of the largest landowner parcels of land where the works will be carried out.

2.3.8 Lower Wairarapa Development Scheme Improvement works

Whakawhiriwhiri Stream drainage improvement works are delayed with ongoing landowner entry negotiations and Soil Conservation and River Control Act 1941 (SCRA) compulsory entry process. It is unclear if works will proceed this financial year. Condition 12(a) of the consent order requires that works shall be completed by 19 December 2018.

2.4 Operations, Delivery and Planning

2.4.1 Western Operations

Western River Schemes

Work programmes in the western river schemes are progressing to budget and programme.

A very successful “Friends of the Otaki River” walkover took place on 22 September 2017. Approximately 160 people participated and enjoyed hearing about the Council’s activities to manage the river, gravel extraction operations and the works associated with the PP2O expressway project.

Community members enjoy their Otaki River visit on 22 September

2.4.2 Wairarapa Operations

Significant buffer erosion occurred in the Ruamahanga River during a minor flood at the end of September. Approximately 20 metres of berm was lost and the stopbank endangered adjacent to the Rathkeale School. Staff have responded quickly to make interim repairs and realigned the river.

Ruamahanga River, Rathkeale stopbank damages and repairs

2.4.3 Asset Management and Operations Planning

A successful asset management workshop involving ten Regional Councils and two Unitary Authorities was held on 14 September 2017. The purpose of the workshop was to establish a national user group for the implementation of a flood protection asset performance code of practise to drive best practise within the sector.

2.4.4 River management resource consents

The submission period for the four western consents closed on the 1 May 2017 and 55 submissions were received. We have gone back to most submitters for a second round of meetings. Good progress is being made in understanding the issues and how these can be resolved. In September a decision was made to

continue working with submitters to resolve their concerns. We remain committed to resolving as many of these as we can.

The key areas of focus for the project continue to be developing operational plans and work programming, cultural health monitoring, gravel extraction, code of practice and ongoing environmental monitoring.

Progress continues to be made on the project to renew resource consents for the operation of the Geoffrey Blundell Barrage Gates. Background information to support the application has been collated, consent strategies developed and consultation undertaken with key stakeholders.

Resource consent applications are also being prepared for the Porirua Stream to renew the consent for gravel extraction in the lower reaches and to enable erosion repairs caused by flood damage.

2.5 Investigations, Strategy and Planning

2.5.1 Floodplain Management Plan (FMP) Development

Waiohine FMP

The first Steering Group meeting for the Waiohine FMP was held on 6 October. The Project Team was confirmed and guidance was given on its Terms of Reference. The Steering Group will meet monthly.

The first Project Team meeting is scheduled for 19 October and these meetings will be held weekly. The Project Team is responsible for reviewing information, obtaining community and expert input, and making recommendations to the Steering Group on a preferred combination of options.

Te Kāuru Upper Ruamāhanga River FMP

Both work streams of FMP development - rural and Masterton urban – are continuing. The project team will present a revised Volume 1 and Volume 2 of the draft FMP to the Subcommittee in the next quarter for feedback and look for endorsement to proceed to public consultation.

Work continues on modelling the agreed Waipoua hydrology to feed into options development for Masterton. We are currently calibrating this new hydraulic model with the revised hydrology.

2.5.2 Investigations and Strategy

Porirua District Plan Review

We are working with Porirua City Council on having updated flood maps for the Porirua Stream, in combination with stormwater flood hazard information from Wellington Water, in its proposed District Plan. The District Plan should be ready for consultation in February 2018.

(a) Flood Warning review

The Implementation Plan has been completed. The current Flood Warning Manual, as well as other internal documentation regarding flood warning from Environmental Science and WREMO now needs to be updated. This process

will be started in the later part of 2017 through a project looking to rationalise the internal documentation. This rationalisation will then feed into the development of an interagency masterplan in the next two years.

(b) Climate change policy

GWRC has a policy on the allowances that should be made for climate change in mapping and design for large floods. NIWA has confirmed that the climate change report recently released for GWRC does not provide new information to change any allowances we currently have. It is, however, timely to consider if the policy needs to be updated with any other new information. We will report back to Councillors with a more detailed explanation, including recommendations for any changes to the policy.

3. Biodiversity

3.1 Biodiversity Management

3.1.1 Key Native Ecosystem (KNE) programme

The Biodiversity department has arranged a series of collaborative planning meetings with internal and external partners to discuss and agree the approach to managing KNE sites in Regional Parks, in the Kapiti Coast district, and in the Wairarapa. These meetings will inform the next round of three-year KNE management plans.

The KNE ungulate control programme has begun in Akatarawa, Wainuiomata/Orongorongo (including the Wainuiomata Mainland Island), Kaitoke and East Harbour Northern Forest KNE sites. In total 34 goats, 39 pigs and 7 deer have been killed. High numbers of pigs were reported in the Wainuiomata Mainland Island.

3.1.2 QEII National Trust Programme

A presentation to the QEII National Trust (QEII) outlined how the Wetland and Riparian programmes support landowners to meet the new pNRP rules. We will subsequently provide information to QEII so they can to send information to QEII covenant holders in the region outlining how the new rules may affect them.

3.1.3 Wetland programme

Biodiversity staff have conducted initial site visits to significant natural wetlands in the Wellington Region. These sites are; Whakatiki River Mouth (estuarine marsh) near Castlepoint, D Cook wetland (Olearia virgata swamp) and Matahiwi Bush II wetland (swamp forest) near Masterton and the Blue Mountain Bush Swamp Forest in Whitemans Valley.

Landowners of two significant natural wetlands signed up to the Wetland Programme; Te Hopai Lagoon in South Wairarapa and Woodside Bush Fragments wetland near Greytown. Restoration Management Plans are currently being developed for these two sites.

3.2 Biodiversity Advice and Advocacy

3.2.1 Biodiversity Advice

GWRC and Auckland Council are leading the development of national guidance for biodiversity offsetting on behalf of all regional councils and unitary authorities. A final draft has been received and will be converted into a public guidance document over the next few months.

A project to determine how to better protect lizards through resource consent conditions is underway. A contractor is being engaged to deliver this project over the next year, with the aim of developing region wide guidance on the issue.

3.2.2 Collaborative Restoration: Te Awarua-o-Porirua Harbour and Catchment Project

Applications for the Te Awarua-o-Porirua Harbour Catchment Community Restoration Fund have closed. The applications received are currently being assessed.

GWRC is supporting Ngati Toa to organise a multi-species shellfish survey in the Onepoto arm of Te Awarua-o-Porirua Harbour for late November. It is envisaged this will become a regular citizen science event. In addition to providing scientific advice and coordinating volunteers, GWRC is also funding the Mountains to Sea Wellington Trust to work with Ngati Toa to organise this first event.

3.2.3 Biodiversity Advocacy

A free 'In Safe Hands' Restoration Day workshop, planned by Biodiversity department staff, was delivered in Wellington City to the volunteer restoration community by Conservation Volunteer New Zealand. The topic was 'HOW to be safe on a community conservation activity and WHAT you can do in very practical ways to manage safety'. The workshop was jointly funded by GWRC and WCC.

WCC, DOC and GWRC have collaboratively delivered two Pest Feast events at the Harbourside Market in Wellington as part of DOC's National Conservation Week. Pest Feast attracts hundreds of members of the public to come and ask questions about pest management. They can also try pest related menu items such as Pine Resin Sourdough and Wallaby in a Blanket.

Event planning for Restoration Day 2018 has begun. The inter-agency planning committee meet in October to decide on the theme of next year's event (hosted by GWRC). Restoration Day is a day-long conference that celebrates the work of restoration volunteers in the region.

4. Enabling Catchment Communities

A cross department team from Land Management and Environment Policy has been set up to look at how GWRC can best position itself to engage with catchment community groups that are beginning to form in the region. These eight groups, all Wairarapa based catchment communities have formed for a number of reasons; one of the main drivers being an awareness of increased

expectations on rural communities to improve land use and water quality and the need for collaborative responses to achieve and maintain change.

The ECC team has been meeting with a working group of iwi partners, community, Federated Farmers, primary industry and DOC to set up the coordination and integration of services supporting Wairarapa Catchment Communities.

This is likely to take the form of a Wairarapa-owned organisation that provides strategic oversight to catchment communities enabling them to plan for catchment wellbeing and access specific services in a way that best meets their needs. Service providers who deliver a great number of programmes and resources to catchment communities will also benefit through coordinated provision that enables broader outcomes to be achieved as well as more direct benefits from being able to work off each other's service delivery platforms.

There is strong support indicated for development of a Wairarapa catchment community service from central government and primary industry.

Internally ECC are beginning a programme of workshops discussing "becoming an enabling organisation?". Workshops and presentations are being planned with senior leadership, departments and teams for the remainder of the year.

5. Environment Management

5.1 Harbours

The Harbourmaster attended six season opening days or safety briefing events at local clubs and was the guest speaker at two of them. This is useful in terms of profile and also maintaining communication with recreational harbour users.

The Deputy Harbourmaster attended numerous Civil Defence/Emergency Management meetings, many of these are focused on resilience and recovery around after natural disaster. There is increased planning around the role of the harbour for transport supply and refining our part in that work.

In September, the navigation equipment at Beacon Hill was reviewed by ENL Ltd, who now have a staff member specialising is these systems. We are talking to them around possible upgrades and improvements to our system. This is assisting to ensure we maintain the best equipment for our requirements.

Sunday 17 September the "ANL Elinga" became the first container ship to use Centreport's container cranes since the November 16 earthquake. This was a milestone for Centreport, however, it is still only a first step towards returning to normal operations.

On 28 September Fairfax media (Dompost and Stuff) spent three hours at Beacon Hill interviewing one of the Communications Officers. They took video that became a "Curious City" article in the Dompost and on Stuff.co.nz. A very good (and patient) performance by Emmanuel Makarios. In this process we both raised the profile of the signal station and passed on safety messages to harbour users.

On 2 October Centreport's new pilot vessel "Te Haa" entered service after crew training and familiarisation.

In October the Harbourmaster met with local rowing representatives and an open water swimmer who had an incident with a rowing skiff four years ago that resulted in an on-going injury. We were able to inform the swimmer about the follow up and steps taken as a result of her incident and reassure her of the importance placed on water safety by ourselves and the clubs.

Safer boating week (October 13-20) marked the start of our summer education and enforcement campaign with a leap off Queens Wharf. This year we received funding from Maritime NZ and working alongside them we will be promoting the use of Lifejackets and Communications. As part of this we have been funded by Maritime NZ for five "no excuses" days. On these days breaches of bylaws around speed and lifejackets will result in some form of enforcement action. While the actual dates of these days will be flexible and dependent on the weather the intention behind them will be communicated in advance.

On the 18 October the Harbourmaster attended the South Island Harbourmaster meeting in Nelson. It has been pointed out that Wellington is in the North Island however the Cook Strait ferries and movement of local recreational craft gives us more in common with the top of the south that the rest of the North Island. This is useful to be able to discuss issues, share resources and see what approach other regions are taking.

5.2 Environmental Regulation

5.2.1 Water supply - Havelock North Inquiry response

We are in the early phases of a bore assessment exercise in (aquifer) water supply protection areas on the Kapiti Coast and the Wairarapa. This is to determine whether the bores or land use related activities present an unacceptable health risk to the water users from these supply schemes.

While this is a natural extension of our findings and process development from our Hutt Valley Waiwhetu work, it is more centrally linked to the Havelock North Inquiry Phase One recommendations. We have also commenced work with Wellington Water Limited and Regional Public Health to form a Regional Forum on water supply challenges that have come to light from the Phase One findings. We anticipate the first forum may be held before the end of the year.

The Phase Two Havelock North report is due out in mid December – and we expect that this will outline more changes to water supply system regulation as a whole. To this end our current focus ought to help us get ahead of some possible recommendations around our collective need to ensure that water supply risk is being actively managed.

And finally, next steps in our the Waiwhetu Aquifer response work. This will provide some direction as to whether or not we should focus effort on more detailed bore investigations in the Hutt Valley.

5.2.2 Kapiti Coast District Council (KCDC) – stream maintenance consents

KCDC have needed to apply for a suite of consents to carry out stream channel maintenance, largely in response to the proposed Natural Resources Plan now clarifying stream maintenance and vegetation clearance rules, and providing more clearly for both ecological and mana whenua values. The Kapiti urban waterways play an important, multifaceted role – in flood and stormwater conveyance; ecological function; processing and retaining contaminants; and mahinga kai and Māori customary use functions. This has added complexity to consent processing, with the need to balance a wider range of functions and values.

We have granted KCDC consents for the maintenance of two sections (Stage 1 and 2) of the Mazengarb Stream, and are processing the final downstream reach (Stage 3) which ends at the Waikanae Estuary. We are also part way through processing consents for the Wharemauku Stream and its tributaries. To date applications have been processed with shorter durations given the limited baseline information available to guide how effects can be appropriately managed.

We will now explore with KCDC opportunities for a global consenting package that would integrate stream maintenance activities across Kapiti watercourses. Such an approach may provide opportunities to develop a single

set of consistent stream works methods and also to provide for longer consent durations, providing efficiencies and potential consent process cost-saving benefits for KCDC.

5.2.3 Wairarapa Wastewater re-consenting

Application assessments are continuing for both Featherston and Carterton wastewater discharge consents. We are awaiting further information in relation to Featherston before proceeding with formal public notification of the proposal. With regards Carterton, discussions between CDC and GWRC around conditions are currently being held which, if resolved, will result in Carterton proceeding without the need for a hearing (as all the submitters on the proposal have now withdrawn their right, or do not wish, to be heard).

5.2.4 T and T Landfill

Councillors Ponter and McKinnon visited the T&T site at the beginning of October to observe the progress of stormwater diversion channels works, which is expected to lead to improvement in the water quality of Owhiro Stream. The sharing of knowledge around the sight construction programme, and the sheer scale of the works, meant that all had a greater appreciation of the work has happened on this site in the last 6 months to improve.

We are planning another site visit with Councillors and another community engagement opportunity before the end of the calendar year.

The works remain ahead of schedule at this point, with completion still planned for December 2017.

Councillors Ponter and McKinnon on site with GWRC staff and the T&T Landfill team

Stormwater diversion channel from September site visit

5.2.5 Roads of National Significance (RoNS) Projects

(a) Transmission Gully and PCC Link Roads

Works on the Transmission Gully site continue and are expected to increase in scale and tempo as the summer earthworks season approaches. The site is being inspected on a weekly basis by GWRC. In the Transmission Gully approvals space, we continue to process Site Specific Environmental Monitoring Plans (SSEMPs) (including the first mitigation planting SSEMP) and critical consents providing for the earthworks required, including additional mitigation requirements associated with those works. The application for redesign of Bridge 19 is also being processed, along with updating of consent conditions for the JV's risk-based approach to earthworks. The consenting load on Transmission Gully is expected to reduce somewhat in the next month. The Streams Mitigation Working Group has reconvened to work through stream mitigation package and diversion design matters and informal agreements have reached with NZTA regarding legal protection of mitigation occurring on GWRC Parks land.

Access track construction, vegetation clearance, and culvert installation associated with the PCC link roads continues. Consent applications for redesign of Bridge 29, an additional fill site and temporary culverts are being processed. All of the Stage 1 SSEMPs for the link roads have been certified (focused on enabling works).

(b) Peka Peka to Ōtaki

All overarching management plans within GWRC jurisdiction have been certified with provisos. One enabling works SSEMP has been certified and two others are being processed. In General Accordance requests associated with mitigation planting and earthworks borrow sites are also processed. Enabling

works involving vegetation clearance, structure removals, proof bores, compound setup have commenced with permanent construction works to commence November.

5.2.6 Porirua Pilot Project

The Porirua Wastewater collaboration project (known as the Porirua Pilot Project) between GWRC and WWL continues to develop a shared understanding of the complex wastewater issues in Te-Awarua-o-Porirua Whaitua. This quarter saw our first meeting with Ngāti Toa and Regional Public Health to share some of our knowledge and ask questions of each other, who will now form part of the wider working group collective. A wastewater 'options' workshop will follow in late October, enabling the wider working group to work through a full range of plant and network options together.

5.2.7 Resource Legislation Amendment Act 2017

Significant changes have been made to the Resource Management Act (RMA) with the passing of the Resource Legislation Amendment Act in April. The majority of regulatory changes, particularly to the resource consent process, took effect on 18 October 2017. Key changes affecting our regulatory functions are:

- We can now exempt activities from needing a resource consent for 'marginal or temporary' rule breaches.
- Updated processes on whether to notify resource consent applications or not, including strengthened non-notification provisions for residential activities (including activities associated with the construction of dwelling houses) on land that is 'zoned' for such use in a district plan.
- Updated powers for striking out submissions on notified resource consents.
- We can now have regard to measures proposed or agreed by applicants to ensure positive effects on the environment that offset or compensate for any adverse effects on the environment.
- The scope of resource consent conditions has been limited.

As a consequence of these changes we have updated our procedures and templates to ensure resource consent decision making is consistent with the RMA amendments. However the changes also usefully codify aspects of practice already established at GWRC (including approaches to drafting consent conditions and considering beneficial effects of environmental off-setting).

5.3 Environmental Science

5.3.1 Climate

The *Climate change and variability – Wellington region* report (commissioned from NIWA) which sets out climate change projections for the Wellington region to the end of the century was released on 7 August.

Environmental Science officers facilitated the development of the report and contributed to the communications associated with it. Officers provided an overview of the implications of the report's findings at the formal launch to Mayors and Councillors from Councils across the region on 7 August and have contributed to a series of subsequent presentations associated with the report's release, detailed below at section 6.

5.3.2 Land

Latest bird monitoring undertaken for WCC shows a significant increase in native forest bird numbers between 2011 and 2016. The presence of Zealandia, along with increasing levels of predator control being conducted in parks, reserves and suburban areas, are creating improved opportunities for encountering a wider range of native bird species in the heart of the capital.

Senior Monitoring Officer, Owen Spearpoint, was interviewed on Radio New Zealand on our involvement in *Bringing Kirk's tree daisy back to Wellington*. Kirk's tree daisy (kohurangi) is very susceptible to deer and goat browse and threatened at both a national and regional level. Owen assisted Otari Reserve staff to collect some of these plants from the Wainuiomata Water Collection Area, so that the nursery at Otari can increase the numbers of these plants through 'ex-situ' conservation methods.

http://www.radionz.co.nz/national/programmes/ourchangingworld/audio/201856985/bringing-kirk-s-tree-daisy-back-to-wellington

Based on information gathered through our river bird monitoring in the Wairarapa, we are working with the Flood Protection department on enhancing river nesting habitat for black-billed gulls (a critically threatened species).

5.3.3 Water

The flood warning network for the Korokoro catchment is now live. This will enable NZTA to manage the flood risk at SH2 in Petone, but has also been picked up by other users including Parks who are using it to manage their work in the catchment. Initial feedback from NZTA has been very positive.

At the request of Parks a water level monitoring station has been installed at the Historic Birchville dam. This will enable them to actively manage the risk, with potentially very severe consequences; of the dam breaking due to adverse weather conditions/raising water levels.

Work continues with Environmental Regulation and Wellington Water on the proposed global consent for 'de-watering' for excavations. This has been a great example of working collaboratively with consent applicants and coming up with better solutions for all. The outcome of this work may provide a template for other applicants in the future.

Development of scientific investigations into the causes of the Waiwhetu Aquifer contamination is ongoing. Looking forward, we will be working with Wellington Water and Regional Public Health on an education campaign about managing water supply from bores.

A coastal water quality buoy was deployed in Wellington Harbour on 10 July. This is a joint programme between GWRC and NIWA and the result of several years of discussions and planning. WRIBO (Wellington Region Integrated Buoy Observations) will help us understand the effects of the biggest freshwater inflow to the harbour – Te Awa Kairangi/Hutt River.

http://www.gw.govt.nz/wellington-harbour-buoy

In September we held our annual meeting with our partners (TA's, Regional Public Health and Wellington Water) in the Recreational water quality programme. The purpose of the meeting is to discuss results of the previous season and plan for the impending summer period, including any specialised/targeted communications activities to advise communities about when and where it is safe to swim. The Community Engagement team also attended to ensure alignment with the current Our Region campaign about water. The meeting was a great success, with excellent buy-in and financial contributions from our partners to a specialised "Is it safe to swim?" communications campaign for the summer.

5.3.4 Working with communities

Planning for the Wellington Harbour/Hutt Valley Whaitua, due to start in 2018, is underway. We have engaged a consortium of experts to help explore learnings from our current experiences with the Ruamāhanga and Te Awarua-o-Porirua whaitua, as well as other New Zealand experiences. A number of interviews with key people (internal and external) involved in the current two whaitua have been undertaken, and have identified some factors that will help improve and streamline the whaitua process. A workshop will be held in November to present the learnings and a proposed new process design.

Further development and support of citizen science potential including a freshwater quality catchment group monitoring project in Kourarau (being undertaken by the landowners in the Kourarau Stream catchment), and a project to quantify the ecological benefits of community-led stream restoration works in Waiwhetu Stream (to be undertaken by Friends of Waiwhetu Stream). In parallel we are also progressing conversations with the National Advisory Group for Freshwater Citizen Science to develop a nationally consistent approach to, and tools for, citizen science.

5.4 Environmental Policy

5.4.1 National Planning Standards introduction

The purpose of the National Planning Standards is to improve consistency in plan and policy statement structure, format and content so they are easier to prepare, understand, compare and comply with. The Standards also support implementation of national policy statements and help councils observe the procedural principles of the Resource Management Act 1991 (RMA).

The Standards have been introduced as part of the 2017 amendments to the Resource Management Act 1991. The development of the National Planning Standards is enabled by sections 58B–58J of the RMA. They are issued by the Minister for the Environment.

GWRC is a pilot council testing proposals from the Ministry for the Environment. We are currently considering two potential standards that will affect us: regional policy statement / regional plan structure and tangata whenua provisions. We also understand that there are infrastructure provisions being development which may insert objectives, policies and rules into statements and plans.

There is a very real cost of both the engagement process and when we must comply with the standards. It is likely that both the regional policy statement and regional plan will need to be updated to be compliant with the standards. Mandatory standards should be implemented by 2019 for operative plans. Given the timing of our notified regional plan, we will have five years after it is made operative to comply.

5.4.2 Proposed Natural Resources Plan update

Officers were asked questions by the Hearing Panel on their Right of Reply statements for Hearings 1 and 2 on 4 September in Masterton. Hearing 3 (Water allocation and Natural form and function) then commenced on the following day on 5 September in Masterton. Hearing 3 is being reconvened in November following expert conferencing on water allocation. The Officers Right of Reply statement for Natural form and function was due for pre-circulation on 13 October, with questioning when the hearing is reconvened.

Officers continue to progress s42A reports for Hearing 4, 5 and 6, aiming to have Hearing 4 reports complete by 22 December (ahead of the 12 January deadline). All hearing information, including audio recordings is available on a portal accessed through the Council website http://pnrp.gw.govt.nz/.

Hearing 4 (water quality and stormwater) will now commence on 12 February 2018, Hearing 5 commencing 26 March and Hearing 6 on 7 May. The hearing panel's decisions on submissions are now due by 30 November 2018.

5.4.3 Summer swimming engagement

The 2017 amendments to the National Policy Statement (NPS) for Freshwater Management require us to schedule specific sites for primary contact recreation where there is immersion in water. This is part of the new swimming requirements of the NPS.

During the summer period we will be running an engagement process to understand where our community swim and where they would like to swim in the future. This will form the basis of father consultation prior to this information being notified at the first available plan change.

5.4.4 District planning hearings

The Policy team has represented GWRC in two city council hearings - flood hazard provisions in UHCC and transport provisions in HCC. Both are key areas for our Council operations and policy direction. The UHCC plan change has been long awaited and still needed strong support at the hearing. At the HCC hearing we were asking for further encouragement of active modes of transport as in the strategic direction of the Regional Land Transport Plan.

HCC are also promoting a plan change to improve the city's ability to implement the NPS on Urban Development Capacity (the 'medium density' proposal which saw significant media coverage). As the draft plan change took account of constraints such as hazards and opportunities such as intensification around transport hubs, we provided an initial letter of support to the Council meeting. The plan change was approved for notification early November and we will be responding with a detailed submission.

5.5 Parks

5.5.1 Queen Elizabeth Park

The winter restoration planting programme across the parks has been completed, with continued wet weather affecting site access.

Approximately 25,000 trees were planted in Queen Elizabeth Park (QEP), the largest ever planting in one year to date, achieved with volunteers, corporate groups, local schools and contractors. This year the work included 2.5ha of new planting using smaller plant stock at a lower cost. This is the first year of implementing "Quick" or "Q" planting methods, the result of 4 years of trialling various planting techniques to achieve larger areas at a reduced cost.

The QEP restoration group is now growing on plants for the 2018 season, and plans are being finalised for 2019.

In addition to this, we are working closely with a private family trust to fund and restore around 25ha in the northeast corner of the park. This is a highly visible site and the largest single area identified for restoration in the Sustainable Land Use Plan. A substantial grant means that we can retire it from the farm licence, deal with the extensive gorse problem and plant it using our low cost techniques. We will also create a new track to further improve recreational access from Raumati South to the northern end of the park.

Low cost planting beside Te Ara o Whareroa near Raumati South. The relatively large spot spray areas mulch the surrounds of the small seedlings, keeping weeds down and some moisture in the soil.

This recent development has meant that this area will be added to others already identified for aerial spraying in November, to make a total of around 55ha of gorse, lupins and blackberry across the park to be controlled. Given the scale of works, and expected public concerns we have worked with our

Customer Engagement teams to develop a range of materials to outline the programme, why this is being done and how we manage risk to minimise impacts on people and the environment.

The new buildings at the Mackays Crossing entrance are nearing completion with finishing works well underway ready for opening on 2 December. Our mana whenua partners have gifted us two names for the area – Ramaroa for the entire complex and Kotare for the meeting room. “Ramaroa” can be interpreted as “eternal flame” or “guiding light”, while the name “Kotare” recognises the kingfisher bird which can often be seen in the area.

Works continue outside the building on hard landscaping and road improvements, which includes small roundabout and a new park exit way. The design work for carpark has been completed and some of the works themselves are underway.

A new electronic gate is being built at Queen Elizabeth Park (Wellington Road); the design of which is in keeping with the historic archway at the park’s entrance.

Southern end of Kotare meeting room in foreground; Park Ranger office at rear

5.5.2 Battle Hill Farm Forest Park

The public consultation process for Riding for the Disabled’s permanent arena at Battle Hill was concluded. 18 submissions were received, 15 in favour and 3 opposed. The lease for the long term occupation is currently being developed to allow the project to get underway. This will be staged with tree removal and earthworks to get underway over the next month ahead of the arena construction itself, which RDA is hoping to have completed ahead of the 2018 winter. Once the new arena is commissioned the temporary arena behind the homestead will be returned to a grassed paddock.

Fencing at Battle Hill continues to meet the requirements of the Natural Resources plan in relation to Category 1 wetlands.

Gradient and surface improvement work is underway on the Summit Loop track, one of the most popular walks at the park.

5.5.3 Whitireia Park

A new automated gate has been installed at Whitireia Park and will be commissioned after Labour weekend.

5.5.4 Belmont Regional Park

Fencing works have been completed at the Hill Road entrance tidying up several old fences that were in a state of disrepair. Together with some road maintenance the works have created a far more appealing entrance to this increasingly popular area of the park.

We were the recipient of several tonnes of millings from SH2 road works, delivered to Dry Creek at no charge. These have been laid onto the gravel road leading to the summer camping area, upgrading the surface and minimising dust for the expected influx of summer budget campers. Landscaping works have also been completed at the entrance to Dry Creek and around the new toilet block.

With the two farm licences at Belmont Regional Park now well established, we have been assessing the future of two former shepherd's houses that are no longer required. We have obtained valuations and cost estimates associated with the disposal of these properties, and expect to bring a recommendation to the next meeting of the Environment Committee.

5.5.5 East Harbour Regional Park

Parks have been working with Naylor Love to finalise pricing and contractors for the Lighthouse Complex works. The Naylor Love team will be on site from 24 October 2017 to commence work on the garage and generator house reroofing and exterior works.

5.5.6 Kaitoke Regional Park

The Eastern Sector Park Rangers recently carried out a team "working bee" to upgrade the Stuart MacAskill Lookout track at Te Marua Lakes, remetalling the track surface and lookout area.

The mountain bike trail builders NtrailZ are well underway reinstating the Flow-K mountain bike track in Kaitoke Hill plantation forest post harvesting. GWRC assisted with organising a digger contractor to help clear a track line for the volunteers. The NtrailZ members also hosted BNZ staff in a Closed for Good day.

From left: BNZ volunteers in the Kaitoke Forest; Park Rangers on the rake and compactor at Te Marua Lakes.

5.5.7 Akatarawa and Pakuratahi Forests

Road maintenance and cleaning up of multiple slips both in Akatarawa Forest and on the Rail Trail in Pakuratahi Forest has kept parks staff and contractors busy over the last month. With machinery on site we have also been able to prepare sites for future culvert replacements and repairs.

Work is also underway in the Pakuratahi Forest to change the gate locks over to the electronic Salto lock system that has been so successful in the Akatarawa Forest for monitoring access and increasing our ability to maintain forest security.

5.5.8 Parks Planning

Review of the Parks Network Plan has commenced with development of project and communication plans and discussions with iwi and key internal and external stakeholders. Two periods of public consultation are proposed, the first with a discussion document outlining key issues and opportunities. Details of the proposed management plan review programme are outlined in a separate report for the committee.

6. Climate Change

6.1 Dissemination of NIWA Climate change and variability – Wellington region report:

GWRC officers and Councillors have participated in a number of public forums through which the GWRC-commissioned NIWA report *Climate change and variability – Wellington region* has been promoted since it was released on 7 August.

These include:

- 3 August: Confidential pre-release to the Water Wairarapa Governance Group (Cr Laidlaw, Cr Staples and Officers)
- Science Scones (internal GWRC presentation to all staff) (Officers)
- 10 August: Victoria University Geography, Environment and Earth Sciences Seminar (Officers)
- 10 August: Water Wairarapa Stakeholder Advisory Group (Officers)
- 21 August: Farming Reference Group (Officers)
- 18 September: Wairarapa District Health Board (Cr Staples and Officers in collaboration with Ora Taiao - NZ Climate and Health Council)
- 14 September: Sustainable Wairarapa/Forest and Bird Wairarapa (Cr Blakely in collaboration with NIWA)
- 29 September: Wairarapa Combined Councils Meeting (Cr Laidlaw and Officers)
- 13 October: Wairarapa River Scheme (Officers)
- 18 October: Wairarapa Chamber of Commerce (Officers)

7. Responses to public participation

20 September 2017

There was no public participation at this meeting.

8. The decision-making process and significance

No decision is being sought in this report.

8.1 Engagement

Engagement on this matter is not necessary.

9. Recommendations

That the Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report.*

Report approved by:	Report approved by:	Report approved by:
Nigel Corry General Manager, Environment Management	**Wayne O'Donnell** General Manager, Catchment Management	**Luke Troy** General Manager, Strategy