



HOROWHENUA LAKE DOMAIN BOARD

NOTICE OF MEETING

A meeting of the Horowhenua Lake Domain Board will be held in the
Horowhenua District Council Chambers
126-148 Oxford Street, Levin
on Monday, 6 May 2019, commencing at 10.00 am

AGENDA

Public Forum

1. **Welcome and Karakia**
2. **Apologies**
3. **Confirmation of Minutes** – 4 February 2019
4. **Matters Arising**
5. **Monitoring Report** (copy **attached**)
6. **Finance**

Mr Paulin will give a finance update
7. **General**
 - (i) Domain Gate – Overnight Closure / Options for the Installation of Bollards
Ben Wood, Council Parks & Property Officer, will provide some information on the possible installation of bollards as a deterrent to damage at the Domain.
 - (ii) Muaūpoko Māori Tribe Domain Board Members
The Chair will provide an update.
 - (iii) Regular Clean-Ups at Muaūpoko Park/Providing a Walkway Through the Shrubbery
Cr Kaye-Simmons will report on the clean-up undertaken on 6 April.
The provision of a walkway through the shrubbery to be discussed.
 - (iv) Lake Horowhenua Update from Horizons Regional Council
A written update from Horizons Regional Council is provided (**attached**).
8. **Next Meeting:** 5 August 2019

*Note: Public Forum
Five (5) minutes allocated to each speaker*

MINUTES OF A MEETING OF THE HOROWHENUA LAKE DOMAIN BOARD HELD IN THE HOROWHENUA DISTRICT COUNCIL CHAMBERS, 126-148 OXFORD STREET, LEVIN, ON MONDAY, 4 FEBRUARY 2019, COMMENCING AT 10.10 AM

PRESENT

Mr R Kemper	(Chair, Department of Conservation)
Mr R Warrington	(Board Member, Iwi Representative)
Mayor M Feyen	(Board Member, Horowhenua District Council)
Cr V Kaye-Simmons	(Board Member, Horowhenua District Council)
Cr P Tukapua	(Board Member, Horowhenua District Council)
Mr M Wiremu-Matakatea	(Board Member, Iwi Representative) (from 10.40 am)

IN ATTENDANCE

Ms C Visser	(Department of Conservation)
Mr J Paulin	(HDC, Financial Accountant)
Mrs K J Corkill	(Meeting Secretary)

PUBLIC IN ATTENDANCE

There were seventeen members of the public in attendance at the commencement of the meeting.

1. WELCOME AND KARAKIA

The meeting commenced with a karakia (Cr Tukapua).

2. APOLOGIES

There were no apologies.

PUBLIC FORUM

Anne Hunt covered a variety of topics in her comments including a contribution from her being received by the UN; Monitoring Report items; provision of keys for access to the Domain; the Domain Board not having the authority to grant building leases; matters in the Māori Appellate Court with regard to the Lake Trust and possible ramifications following Judge Doogan recusing himself; the Domain Board not being legally constituted under the ROLD Act with regard to its iwi membership,

With a number of her comments being in relation to legal matters, Mr Kemper queried if Mrs Hunt was a lawyer. Mrs Hunt responded in the negative, but did explain her experience with the law saying that she was a very astute author on legal issues.

Mrs Hunt then read a declaration from Philip Taueki in which he noted that he was a direct descendent of Taueki who had signed the Treaty of Waitangi in 1840 and that Lake Horowhenua was privately-owned and its environs were ancestral ground which had been owned in fee simple since 1898. Mr Taueki then challenged the legality of the constitution of the Domain Board and covered other issues with regard to the Lake and activities there.

With Mr Taueki having asserted that there would be no geese cull as the owners had already agreed that the Lake was a bird sanctuary, Cr Kaye-Simmons queried if Mrs Hunt could provide any documentation to support that comment.

Tania Naika introduced herself to the meeting. Advising that she a friend of the Taueki family Ms Naika outlined her dream of setting up a Māori arts and weaving centre at the Lake, though

it need not specifically be for Māori but could include other cultures as well. The Lake also had the resources such as harakeke. She was currently residing in the Rowing Club building and cleaning it up so it could be used for art classes.

Vivienne Taueki confirmed that Ms Naika had been invited to use the building, which had been sitting empty, and noted there was a lot of women interested in weaving.

Charles Rudd addressed a number of items in his comments, including:

- with the previous Minutes referencing the Board's constitution, he queried what the objective of the constitution was and where did the ROLD Act fit in;
- with regard to Muaūpoko Park sign design resolution which mentioned recreational use, recreational fishing rights belonged to Muaūpoko;
- in terms of matters before the Courts, these did have an effect on the Domain Board whether the Board realised it or not;
- Judge Harvey had ruled that the boat club buildings belonged to the owners and access and use should not be left to the Board;
- the overnight closure of the gate and Philip Taueki's occupation;
- with regard to the Board's iwi membership, he tabled a letter from the Office of the Minister of Lands dating back to October 1980 approving the appointment of Mr Warren as a Māori member of the Domain Board, which stated that the iwi representatives' tenure was three years. He and Mayor Feyen had intended to go and see the Minister but that had not yet occurred;
- his offer of a 'tiki tour' with the Chair had also not yet been taken up.

In terms of visiting the Minister, Mayor Feyen said he had not been able to get an appointment. Mr Kemper said he would speak to his diary manager about scheduling the offered tiki tour.

Vivienne Taueki said she supported previous speakers in terms of the gate and key access, and the appointment of new iwi members had been going on far too long. She said her main focus, however, was the decision of the Environment Court in 2017 with regard to Horizons Regional Council (HRC) and resource consents issued which were unlawful and in contravention of the Act. HRC was ignoring certain matters under Rule 14 of the One Plan which meant consents were not being processed properly. That had a lot to do with meeting targets for the Lake and as the Regional Council was an Accord Partner, as was the Board, the Board should be taking more interest in consents administration.

Mr Wiremu-Matakatea joined the meeting (11.40 am).

Ms Taueki tabled a copy of the resource consent saying that there was not real will at the Regional Council to improve water quality here; however it did have a responsibility to comply with the One Plan. The matter had also been raised with Horowhenua District Council and she said one of the statutory groups needed to stand up and do something about it as the Regional Council was issuing consents illegally.

Saying that while some of the issues raised were directly out of the scope of the Board, with his DOC hat on he would check on whether DOC had been advised of the resource consent matter.

3. CONFIRMATION OF MINUTES – 10 SEPTEMBER 2018

Moved: Feyen Seconded: Wiremu-Matakatea

"THAT the Minutes of the Horowhenua Lake Domain Board meeting held on 10 September 2018 be confirmed as a true and correct record."

CARRIED

4. MATTERS ARISING

Noting the number of items that the Chair had said he was going to follow up, the Mayor sought an assurance there would be a report back on these. He also queried what the Chair meant when he had described the various issues facing the Board as a labyrinth and said he would like some documentation confirming the advice that Mr Kemper had received that the Board was operating legally.

With regard to legal advice received, Mr Kemper said he would check if this could be released.

Referencing the mention of the United Nations Declaration on the Rights on Indigenous Peoples, Mr Warrington suggested that the Board should try to determine the role of that decision with regard to the Domain Board.

In relation to the closure of the Domain gate, Mayor Feyen requested that it be noted that when he originally had had a discussion with the CE about this, Mr Clapperton had agreed that a key would be provided to Philip Taueki.

It was pointed out that this was not either the CE's or Mayor's decision to make; it was a decision for the Domain Board.

With Cr Kaye-Simmons having advised that she had been singled out for objectionable emails following the Domain Board's decision re the gate key, Mayor Feyen requested that she provide a copy of those emails to the Chair, which she agreed to do.

Responding to a query from the Mayor about a proposed meeting with Lake Trustees and his desire to be involved in that, the Chair advised that this had not yet occurred because of the current situation with the Trust.

In relation to (vii) Urban Stormwater, Cr Tukapua requested that the words "and its recreational use of surface waters" be added.

Cr Kaye-Simmons advised that she had made an error with regard to the time when requesting approval for the Waitangi Day Celebrations at Muaūpoko Park: it would be 10.00 am to 4.00 pm (not 3.00 pm).

Mayor Feyen queried if there would be a report on progressing the iwi members' appointment, with the Chair responding that there had been some progress but not in relation to the third party funding.

Mayor Feyen also sought assurance that his suggestion that a hui be held for all parties with an interest in Lake Horowhenua would be actioned as he wanted a forum where personalities were taken out of the equation.

Mayor Feyen also requested that livestreaming of Domain Board meetings be explored.

5. MONITORING REPORT

Item 35 Resignation of Board Member and Appointment of a Replacement

Mr Kemper said he had followed up to see if there was a way that seeking nominations could be simplified and also the definition in the Act of "Muaūpoko Māori Tribe". He had spoken to the Office of Treaty Settlements (OTS) as to if and how it could assist. Whilst the OTS could have a role to play, it had a busy portfolio and this was not on the top of its list. It was therefore unlikely the appointment of iwi members could be simplified.

It was estimated that the cost of running an election would be in the vicinity of \$30,000.00. Agreement had also been reached at the last meeting that third party funding would be sought. The communication with the OTS had clarified that that

avenue had been closed off. The matter was now on the table for the Board to decide what action should come next.

Getting a letter from the OTS as to its position was suggested, with Mr Kemper saying he personally did not think a letter was required. The OTS was currently focussed on national issues, not the Horowhenua, and was working on a set of established priorities.

Item 47 Draft Pest Management Plan

While it appeared that those residing at the Lake did not want a geese or chicken cull, Mayor Feyen spoke particularly in support of a geese cull.

Mr Kemper noted that there was as yet no update of a proposed timeframe for a cull.

Item 42 Lake Trust Update

When the results of the recent election for the Lake Trust were available, Mr Kemper said he would be in contact to arrange for regular updates from the Trust to occur.

Item 49 For follow up by Chair from Public Forum – checking role of the Board in relation to resource consent process

Cr Tukapua noted that in terms of the resource consent process, the decision on who was an affected party rested with the Regional Council, with consideration being given on a case by case basis. The Domain Board could seek to be an affected party but the Regional Council would make the decision.

Item 50 Lake Signage

Cr Tukapua said the art work had been updated to reflect what had been decided and was ready to be installed, but she queried if there had been a follow up with the Regional Council as to who had the responsibility for signage and where the costs might lie.

Mr Kemper said he had spoken to Jon Roygard who had indicated that there could be funding available from the Regional Council. He would follow this up.

Mr Warrington requested that a further item (Item 53) be added to the Monitoring Report to follow up on the United Nations Declaration on the Rights of Indigenous Peoples.

The meeting adjourned briefly (11.20-11.25 am).

6. APPROVAL GRANTED

Community Group Clean Up – Muaūpoko

Moved: Tukapua Seconded: Procter

“THAT the approval granted for the clean-up at Muaūpoko Park on 19 January 2019 be confirmed.

CARRIED

7. FINANCE

Mr Paulin tabled the Statement of Financial Performance for the year ended 30 June 2018 and a letter from Audit New Zealand dated 31 January 2019 confirming the information as provided.

Moved: Tukapua Seconded: Kaye-Simmons

“THAT the Statement of Financial Performance for the year ended 30 June 2018 and the letter from Audit New Zealand be received.

CARRIED

7. GENERAL

(i) Horowhenua Obedience Dog Training Club

Moved: Kaye-Simmons Seconded: Wiremu-Matakatea

“THAT the Horowhenua Lake Domain Board approves the Horowhenua Obedience Dog Training Club Term Dates and Calendar Events for 2019:

Term Dates for 2019

Enrolment

January 16

March 20

May 22

July 31

October 2

Break Up: December 4

Start

January 23

March 27

May 29

August 7

October 9

Graduation

March 13

May 15

July 17

September 25

November 27

Tuesdays – Agility

Thursday – Young Handlers class

Sunday am – Introductory class

Event Dates

January 19, 20, 21

February 23, 24

March 10

March 30, 31

April 6, 7

July 27

August 18

September 7, 8

CARRIED

(ii) Scheduling Regular Clean Ups at Muaūpoko Park/Providing a Walkway through the Shrubbery

Cr Kaye-Simmons gave a report on the clean-up done by ten members of a community group at Muaūpoko Park on 19 January. 115 kgs of rubbish had been collected in less than three hours. There was a lot of plastic, broken glass and cans (mostly alcohol) in the rubbish collected, as well as other out of the ordinary items. This had led to an expressed desire to have more regular clean-ups at the Domain to support the local contractor in terms of rubbish collection. Of the community group doing the clean-up, only two or three were not iwi members. The desire was expressed to spread the word and create an event page to have regular clean ups – and also to get younger ones involved. If permission was granted, the next clean-up day would be 23 March.

With regard to providing a walkway through the trees, Cr Kaye-Simmons said it was extremely congested particularly in the centre, and making it easier to access had been discussed. It was appreciated that as this was a DOC Reserve permission would be needed to create a track and also perhaps raising the trees to deter people from dumping rubbish in there.

Mr Kemper confirmed that there would be a process involved and Cr Kaye-Simmons said she would follow that up with Ms Visser.

Moved: Kaye-Simmons Seconded: Procter

THAT the Horowhenua Lake Domain Board grants permission for 4-6 weekly clean-ups at Muaūpoko Park, commencing 23 March 2019, for interested members of the public and iwi members.

CARRIED

(iii) Domain Gate – Overnight Closure

With it agreed that this matter would be reviewed, the Chair sought views from around the table.

Mayor Feyen reiterated his view that although he supported the gate being closed at night to preclude inappropriate activity, he thought that a key should be made available to the person who lived there and he would move a motion to that effect, with the Chair noting that technically nobody should be living at the Domain.

With the gate still being locked, the Chair queried if Members wanted that reviewed.

The Mayor proposed a motion that “The gates to Muaūpoko Park remain open at night, with this to be reviewed at the next Lake Domain Board meeting”. The motion lapsed for want of a seconder.

Dr Procter said he was happy for the status quo to remain until the Lake Trustees were in place and it could be discussed with them.

Saying that she thought there were cameras at Foxton Beach that monitored comings and goings and assumed these had been placed there by the Regional Council, Cr Tukapua suggested installing cameras would be a way of assisting with security, amongst other things, at the Lake Domain. This could be something that could be considered and pursued through the Horizons’ Annual Plan process, particularly as after hearing from Ms Naika it was not just a matter of providing one extra key.

Mr Kemper noted that DOC did use that technology in reserves. However, at present the status quo would prevail with regard to the Domain gate with the possibility of cameras being installed to be explored in relation to security.

(iv) Sailing and Rowing Club Buildings – Current and Future Use

Mr Kemper said the advice he had received was that as the buildings were on Lake Trust land and while the Domain Board did have an administrative role, as the owners it was appropriate for the Trust to be the decision-makers with regard to building use. He suggested it would not be possible to make progress until the Lake Trust was settled.

(v) Chair’s Report

Mr Kemper said the primary objective for the last meeting was for him as the new Chair to get an understanding of the Board’s role and the issues faced. Most of the matters he had looked into had been raised during today’s meeting; however, in terms of the interdependency between the Board, the Council and the Lake Trust, some of the boundaries were still not clear. He reiterated that he did not think much progress would be made with OTS but the matter of the election did need to be pursued. He had spoken with Di Rump from MTA in terms of the Muaūpoko Māori Tribe and would catch up with her in the near future.

Mayor Feyen stressed the importance of the new Lake Trustees in terms of moving forward and said he thought it would be a positive step for the Domain Board to meet with them as soon as possible.

Whilst agreeing in principle, Mr Kemper said nothing could be done in that regard until the new Trustees were confirmed. He said he did think that one of the challenges the Board faced was focusing on what it wanted to achieve rather than what had happened in the past. Also people in the public forum had brought a range of issues to the Board in which it did not have a statutory role. He reiterated that he had followed up on the items he had agreed to, his understanding was going up significantly and he was committed to moving forward including engaging with other parties when and where possible.

Mayor Feyen reiterated his suggestion of having Domain Board meeting live-streamed and Cr Tukapua expressed her dissatisfaction, with the last meeting having been in September last year, at the slow progress being made.

Reminding those present of the Waitangi Day Celebration at Muaūpoko Park on 6 February, Cr Kaye-Simmons said it was the seventh year the event had been run and it would be one of the biggest yet. All were encouraged to attend.

8. MEETING CLOSURE

The meeting closed at 11.56 pm.

CONFIRMED this day of 2019

Chairperson

HOROWHENUA LAKE DOMAIN BOARD - MONITORING REPORT

following the 2 February 2019 meeting

Item	Item Description	Meeting Date	Resolution/Action	Responsible person	Status	Comment
35	Resignation of Board Member and Appointment of a Replacement	2 November 2015 1 February 2016 2 May 2016 1 August 2016 13 February 2017 15 May 2017 2 October 2017 12 February 2018 7 May 2018 10 September 2018 4 February 2019	<p>Chair to confirm status of current iwi members</p> <p><i>THAT the Horowhenua Lake Domain Board agrees in principle to seeking third party funding to support an election process to replace the Board's iwi members AND FURTHER THAT the Board agrees in principle to providing funding to support the process if required, with any proposal to be brought to the Board for final approval.</i></p>	Chair	On-going	<p>This has been an on-going issue since 2015 and much discussed.</p> <p>The Board Chair reported on her discussions with the Minister of Conservation, Eugenie Sage, on 1 May 2018. Still to be progressed.</p> <p>The Chair will provide an update at the May Board meeting</p>
42.	Lake Trust Update	2 May 2016	Update from the Lake Trust to be regular Agenda item		On-going	
47.	Draft Pest Management Plan	1 August 2016		Ben Wood		\$5,000 received from DOC towards a Pest Management Plan.

[illegible]

Item	Item Description	Meeting Date	Resolution/Action	Responsible person	Status	Comment
						To follow up with HRC with regard to funding for signs
51.	Domain Gate – Overnight closure	10 September 2018 4 February 2019	The Chair to investigate the installation of bollards to prevent boy racers causing damage The use of security cameras to be explored.	Chair		Status quo to remain until Lake Trustees in place. An item on the May 2019 Agenda.
52.	Urban Stormwater	10 September 2018	<i>THAT Horowhenua District Council be requested to report to the Horowhenua Lake Domain Board on the findings of the feasibility study into urban stormwater.</i>	R Green	Completed	A monitoring programme is in place and will be refined further over the coming months to be able to fully understand the quality of the discharges and effects on the Lake. A resource consent application has been lodged with Regional Council. The application seeks a 5 year term to enable the discharges to be authorised while Council works with the community and stakeholders to identify long term options. This is consistent with the LTP funding allowance for improvements in Years 4-7 of the plan.
53.	United Nations Declaration on the Rights of Indigenous Peoples	4 February 2019	This to be followed up.			Resolution adopted by the UN General Assembly and NZ Human Rights

Item	Item Description	Meeting Date	Resolution/Action	Responsible person	Status	Comment
						Commission précis provided with May Agenda
54.	Scheduling of Regular Clean Ups at Muaūpoko Park/Providing a Walkway through the Shrubbery	4 February 2019	<i>THAT the Horowhenua Lake Domain Board grants permission for 4-6 weekly clean-ups at Muaūpoko Park, commencing 23 March 2019, for interested members of the public and iwi members.</i> Follow up with DOC for permission to put track through the trees	Cr Kaye-Simmons		Cr Kaye-Simmons will report on the clean-up undertaken on 6 April and provision of walkway to be discussed under General Business.
55.	Sailing and Rowing Club Buildings – Current and Future Use	4 February 2019	Chair to meet with the Lake Trustees and other interested parties in this regard	Chair		



General Assembly

Distr.: General
2 October 2007

Sixty-first session
Agenda item 68

Resolution adopted by the General Assembly on 13 September 2007

[without reference to a Main Committee (A/61/L.67 and Add.1)]

61/295. United Nations Declaration on the Rights of Indigenous Peoples

The General Assembly,

Taking note of the recommendation of the Human Rights Council contained in its resolution 1/2 of 29 June 2006,¹ by which the Council adopted the text of the United Nations Declaration on the Rights of Indigenous Peoples,

Recalling its resolution 61/178 of 20 December 2006, by which it decided to defer consideration of and action on the Declaration to allow time for further consultations thereon, and also decided to conclude its consideration before the end of the sixty-first session of the General Assembly,

Adopts the United Nations Declaration on the Rights of Indigenous Peoples as contained in the annex to the present resolution.

*107th plenary meeting
13 September 2007*

Annex

United Nations Declaration on the Rights of Indigenous Peoples

The General Assembly,

Guided by the purposes and principles of the Charter of the United Nations, and good faith in the fulfilment of the obligations assumed by States in accordance with the Charter,

Affirming that indigenous peoples are equal to all other peoples, while recognizing the right of all peoples to be different, to consider themselves different, and to be respected as such,

Affirming also that all peoples contribute to the diversity and richness of civilizations and cultures, which constitute the common heritage of humankind,

¹ See *Official Records of the General Assembly, Sixty-first Session, Supplement No. 53 (A/61/53)*, part one, chap. II, sect. A.

Affirming further that all doctrines, policies and practices based on or advocating superiority of peoples or individuals on the basis of national origin or racial, religious, ethnic or cultural differences are racist, scientifically false, legally invalid, morally condemnable and socially unjust,

Reaffirming that indigenous peoples, in the exercise of their rights, should be free from discrimination of any kind,

Concerned that indigenous peoples have suffered from historic injustices as a result of, inter alia, their colonization and dispossession of their lands, territories and resources, thus preventing them from exercising, in particular, their right to development in accordance with their own needs and interests,

Recognizing the urgent need to respect and promote the inherent rights of indigenous peoples which derive from their political, economic and social structures and from their cultures, spiritual traditions, histories and philosophies, especially their rights to their lands, territories and resources,

Recognizing also the urgent need to respect and promote the rights of indigenous peoples affirmed in treaties, agreements and other constructive arrangements with States,

Welcoming the fact that indigenous peoples are organizing themselves for political, economic, social and cultural enhancement and in order to bring to an end all forms of discrimination and oppression wherever they occur,

Convinced that control by indigenous peoples over developments affecting them and their lands, territories and resources will enable them to maintain and strengthen their institutions, cultures and traditions, and to promote their development in accordance with their aspirations and needs,

Recognizing that respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable development and proper management of the environment,

Emphasizing the contribution of the demilitarization of the lands and territories of indigenous peoples to peace, economic and social progress and development, understanding and friendly relations among nations and peoples of the world,

Recognizing in particular the right of indigenous families and communities to retain shared responsibility for the upbringing, training, education and well-being of their children, consistent with the rights of the child,

Considering that the rights affirmed in treaties, agreements and other constructive arrangements between States and indigenous peoples are, in some situations, matters of international concern, interest, responsibility and character,

Considering also that treaties, agreements and other constructive arrangements, and the relationship they represent, are the basis for a strengthened partnership between indigenous peoples and States,

Acknowledging that the Charter of the United Nations, the International Covenant on Economic, Social and Cultural Rights² and the International Covenant on Civil and Political Rights,² as well as the Vienna Declaration and Programme of

² See resolution 2200 A (XXI), annex.

Action,³ affirm the fundamental importance of the right to self-determination of all peoples, by virtue of which they freely determine their political status and freely pursue their economic, social and cultural development,

Bearing in mind that nothing in this Declaration may be used to deny any peoples their right to self-determination, exercised in conformity with international law,

Convinced that the recognition of the rights of indigenous peoples in this Declaration will enhance harmonious and cooperative relations between the State and indigenous peoples, based on principles of justice, democracy, respect for human rights, non-discrimination and good faith,

Encouraging States to comply with and effectively implement all their obligations as they apply to indigenous peoples under international instruments, in particular those related to human rights, in consultation and cooperation with the peoples concerned,

Emphasizing that the United Nations has an important and continuing role to play in promoting and protecting the rights of indigenous peoples,

Believing that this Declaration is a further important step forward for the recognition, promotion and protection of the rights and freedoms of indigenous peoples and in the development of relevant activities of the United Nations system in this field,

Recognizing and reaffirming that indigenous individuals are entitled without discrimination to all human rights recognized in international law, and that indigenous peoples possess collective rights which are indispensable for their existence, well-being and integral development as peoples,

Recognizing that the situation of indigenous peoples varies from region to region and from country to country and that the significance of national and regional particularities and various historical and cultural backgrounds should be taken into consideration,

Solemnly proclaims the following United Nations Declaration on the Rights of Indigenous Peoples as a standard of achievement to be pursued in a spirit of partnership and mutual respect:

Article 1

Indigenous peoples have the right to the full enjoyment, as a collective or as individuals, of all human rights and fundamental freedoms as recognized in the Charter of the United Nations, the Universal Declaration of Human Rights⁴ and international human rights law.

Article 2

Indigenous peoples and individuals are free and equal to all other peoples and individuals and have the right to be free from any kind of discrimination, in the exercise of their rights, in particular that based on their indigenous origin or identity.

³ A/CONF.157/24 (Part I), chap. III.

⁴ Resolution 217 A (III).

Article 3

Indigenous peoples have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development.

Article 4

Indigenous peoples, in exercising their right to self-determination, have the right to autonomy or self-government in matters relating to their internal and local affairs, as well as ways and means for financing their autonomous functions.

Article 5

Indigenous peoples have the right to maintain and strengthen their distinct political, legal, economic, social and cultural institutions, while retaining their right to participate fully, if they so choose, in the political, economic, social and cultural life of the State.

Article 6

Every indigenous individual has the right to a nationality.

Article 7

1. Indigenous individuals have the rights to life, physical and mental integrity, liberty and security of person.
2. Indigenous peoples have the collective right to live in freedom, peace and security as distinct peoples and shall not be subjected to any act of genocide or any other act of violence, including forcibly removing children of the group to another group.

Article 8

1. Indigenous peoples and individuals have the right not to be subjected to forced assimilation or destruction of their culture.
2. States shall provide effective mechanisms for prevention of, and redress for:
 - (a) Any action which has the aim or effect of depriving them of their integrity as distinct peoples, or of their cultural values or ethnic identities;
 - (b) Any action which has the aim or effect of dispossessing them of their lands, territories or resources;
 - (c) Any form of forced population transfer which has the aim or effect of violating or undermining any of their rights;
 - (d) Any form of forced assimilation or integration;
 - (e) Any form of propaganda designed to promote or incite racial or ethnic discrimination directed against them.

Article 9

Indigenous peoples and individuals have the right to belong to an indigenous community or nation, in accordance with the traditions and customs of the

community or nation concerned. No discrimination of any kind may arise from the exercise of such a right.

Article 10

Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation and, where possible, with the option of return.

Article 11

1. Indigenous peoples have the right to practise and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature.

2. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with indigenous peoples, with respect to their cultural, intellectual, religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs.

Article 12

1. Indigenous peoples have the right to manifest, practise, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains.

2. States shall seek to enable the access and/or repatriation of ceremonial objects and human remains in their possession through fair, transparent and effective mechanisms developed in conjunction with indigenous peoples concerned.

Article 13

1. Indigenous peoples have the right to revitalize, use, develop and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places and persons.

2. States shall take effective measures to ensure that this right is protected and also to ensure that indigenous peoples can understand and be understood in political, legal and administrative proceedings, where necessary through the provision of interpretation or by other appropriate means.

Article 14

1. Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning.

2. Indigenous individuals, particularly children, have the right to all levels and forms of education of the State without discrimination.

3. States shall, in conjunction with indigenous peoples, take effective measures, in order for indigenous individuals, particularly children, including those living outside their communities, to have access, when possible, to an education in their own culture and provided in their own language.

Article 15

1. Indigenous peoples have the right to the dignity and diversity of their cultures, traditions, histories and aspirations which shall be appropriately reflected in education and public information.

2. States shall take effective measures, in consultation and cooperation with the indigenous peoples concerned, to combat prejudice and eliminate discrimination and to promote tolerance, understanding and good relations among indigenous peoples and all other segments of society.

Article 16

1. Indigenous peoples have the right to establish their own media in their own languages and to have access to all forms of non-indigenous media without discrimination.

2. States shall take effective measures to ensure that State-owned media duly reflect indigenous cultural diversity. States, without prejudice to ensuring full freedom of expression, should encourage privately owned media to adequately reflect indigenous cultural diversity.

Article 17

1. Indigenous individuals and peoples have the right to enjoy fully all rights established under applicable international and domestic labour law.

2. States shall in consultation and cooperation with indigenous peoples take specific measures to protect indigenous children from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development, taking into account their special vulnerability and the importance of education for their empowerment.

3. Indigenous individuals have the right not to be subjected to any discriminatory conditions of labour and, inter alia, employment or salary.

Article 18

Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.

Article 19

States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Article 20

1. Indigenous peoples have the right to maintain and develop their political, economic and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities.

2. Indigenous peoples deprived of their means of subsistence and development are entitled to just and fair redress.

Article 21

1. Indigenous peoples have the right, without discrimination, to the improvement of their economic and social conditions, including, inter alia, in the areas of education, employment, vocational training and retraining, housing, sanitation, health and social security.

2. States shall take effective measures and, where appropriate, special measures to ensure continuing improvement of their economic and social conditions. Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities.

Article 22

1. Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities in the implementation of this Declaration.

2. States shall take measures, in conjunction with indigenous peoples, to ensure that indigenous women and children enjoy the full protection and guarantees against all forms of violence and discrimination.

Article 23

Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions.

Article 24

1. Indigenous peoples have the right to their traditional medicines and to maintain their health practices, including the conservation of their vital medicinal plants, animals and minerals. Indigenous individuals also have the right to access, without any discrimination, to all social and health services.

2. Indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health. States shall take the necessary steps with a view to achieving progressively the full realization of this right.

Article 25

Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Article 26

1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.

2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.

3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned.

Article 27

States shall establish and implement, in conjunction with indigenous peoples concerned, a fair, independent, impartial, open and transparent process, giving due recognition to indigenous peoples' laws, traditions, customs and land tenure systems, to recognize and adjudicate the rights of indigenous peoples pertaining to their lands, territories and resources, including those which were traditionally owned or otherwise occupied or used. Indigenous peoples shall have the right to participate in this process.

Article 28

1. Indigenous peoples have the right to redress, by means that can include restitution or, when this is not possible, just, fair and equitable compensation, for the lands, territories and resources which they have traditionally owned or otherwise occupied or used, and which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent.

2. Unless otherwise freely agreed upon by the peoples concerned, compensation shall take the form of lands, territories and resources equal in quality, size and legal status or of monetary compensation or other appropriate redress.

Article 29

1. Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.

2. States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent.

3. States shall also take effective measures to ensure, as needed, that programmes for monitoring, maintaining and restoring the health of indigenous peoples, as developed and implemented by the peoples affected by such materials, are duly implemented.

Article 30

1. Military activities shall not take place in the lands or territories of indigenous peoples, unless justified by a relevant public interest or otherwise freely agreed with or requested by the indigenous peoples concerned.

2. States shall undertake effective consultations with the indigenous peoples concerned, through appropriate procedures and in particular through their representative institutions, prior to using their lands or territories for military activities.

Article 31

1. Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.

2. In conjunction with indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.

Article 32

1. Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.

2. States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.

3. States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.

Article 33

1. Indigenous peoples have the right to determine their own identity or membership in accordance with their customs and traditions. This does not impair the right of indigenous individuals to obtain citizenship of the States in which they live.

2. Indigenous peoples have the right to determine the structures and to select the membership of their institutions in accordance with their own procedures.

Article 34

Indigenous peoples have the right to promote, develop and maintain their institutional structures and their distinctive customs, spirituality, traditions, procedures, practices and, in the cases where they exist, juridical systems or customs, in accordance with international human rights standards.

Article 35

Indigenous peoples have the right to determine the responsibilities of individuals to their communities.

Article 36

1. Indigenous peoples, in particular those divided by international borders, have the right to maintain and develop contacts, relations and cooperation, including activities for spiritual, cultural, political, economic and social purposes, with their own members as well as other peoples across borders.

2. States, in consultation and cooperation with indigenous peoples, shall take effective measures to facilitate the exercise and ensure the implementation of this right.

Article 37

1. Indigenous peoples have the right to the recognition, observance and enforcement of treaties, agreements and other constructive arrangements concluded with States or their successors and to have States honour and respect such treaties, agreements and other constructive arrangements.

2. Nothing in this Declaration may be interpreted as diminishing or eliminating the rights of indigenous peoples contained in treaties, agreements and other constructive arrangements.

Article 38

States in consultation and cooperation with indigenous peoples, shall take the appropriate measures, including legislative measures, to achieve the ends of this Declaration.

Article 39

Indigenous peoples have the right to have access to financial and technical assistance from States and through international cooperation, for the enjoyment of the rights contained in this Declaration.

Article 40

Indigenous peoples have the right to access to and prompt decision through just and fair procedures for the resolution of conflicts and disputes with States or other parties, as well as to effective remedies for all infringements of their individual and collective rights. Such a decision shall give due consideration to the customs, traditions, rules and legal systems of the indigenous peoples concerned and international human rights.

Article 41

The organs and specialized agencies of the United Nations system and other intergovernmental organizations shall contribute to the full realization of the provisions of this Declaration through the mobilization, inter alia, of financial cooperation and technical assistance. Ways and means of ensuring participation of indigenous peoples on issues affecting them shall be established.

Article 42

The United Nations, its bodies, including the Permanent Forum on Indigenous Issues, and specialized agencies, including at the country level, and States shall promote respect for and full application of the provisions of this Declaration and follow up the effectiveness of this Declaration.

Article 43

The rights recognized herein constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world.

Article 44

All the rights and freedoms recognized herein are equally guaranteed to male and female indigenous individuals.

Article 45

Nothing in this Declaration may be construed as diminishing or extinguishing the rights indigenous peoples have now or may acquire in the future.

Article 46

1. Nothing in this Declaration may be interpreted as implying for any State, people, group or person any right to engage in any activity or to perform any act contrary to the Charter of the United Nations or construed as authorizing or encouraging any action which would dismember or impair, totally or in part, the territorial integrity or political unity of sovereign and independent States.

2. In the exercise of the rights enunciated in the present Declaration, human rights and fundamental freedoms of all shall be respected. The exercise of the rights set forth in this Declaration shall be subject only to such limitations as are determined by law and in accordance with international human rights obligations. Any such limitations shall be non-discriminatory and strictly necessary solely for the purpose of securing due recognition and respect for the rights and freedoms of others and for meeting the just and most compelling requirements of a democratic society.

3. The provisions set forth in this Declaration shall be interpreted in accordance with the principles of justice, democracy, respect for human rights, equality, non-discrimination, good governance and good faith.



**The Rights of
Indigenous Peoples:**
What you need to know.



**NZ
Human
Rights.**

UNDRIP?



UNDRIP (United Nations Declaration on the Rights of Indigenous Peoples) is a comprehensive international human rights document on the rights of indigenous peoples. It sets out the minimum standards for the survival, dignity, wellbeing, and rights of the world's indigenous peoples.

Indigenous peoples, including Māori, were involved in drafting it. The Declaration reflects existing international human rights standards and explains how these apply in the specific circumstances of indigenous peoples. The New Zealand government announced its support for the Declaration in April 2010 at the United Nations.

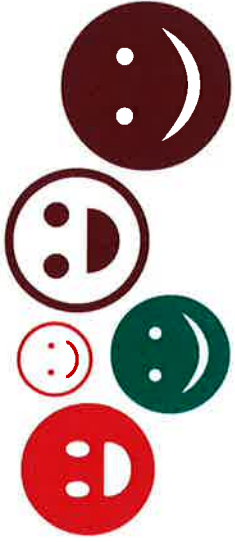
Its 46 articles cover all areas of human rights as they apply to indigenous peoples. Key themes are:

- self-determination
- equality and non-discrimination
- participation, underpinned by free, prior, informed consent
- culture
- land, territories, and resources.

What are the UNDRIP's aims?

The Declaration aims to "enhance harmonious and cooperative relations between the State and indigenous peoples, based on principles of justice, democracy, respect for human rights, non-discrimination and good faith".





Who are indigenous peoples?

Around the world, indigenous peoples may be known by names such as: tangata whenua, aboriginal, first nations, 'native' or 'tribal' peoples. Māori are the indigenous people of Aotearoa New Zealand.

It is up to indigenous peoples themselves to decide whether they consider themselves to be indigenous (self-identification).

Some of the features and experiences common to indigenous peoples around the world are:

- self-definition as indigenous and distinctly different from other groups within a state
- special attachment to and use of their traditional land
- experience of subjugation, marginalisation, dispossession, exclusion or discrimination as a result of colonialism.

The Treaty of Waitangi (Te Tiriti o Waitangi).

The Treaty of Waitangi is New Zealand's own, unique statement of human rights, and can be understood as our first human rights treaty. It has become the central focus for the Government's efforts to resolve indigenous rights issues here:

The articles of the Treaty reflect fundamental human rights principles:

Article One

Reflects the right to self-determination for incoming settlers, democratic and citizenship rights

Article Two

Reflects the right to self-determination for tangata whenua, indigenous rights and property rights

Article Three

Reflects the right to equality and non-discrimination

Article Four

Reflects the right to freedom of religion and beliefs.

These fundamental human rights are affirmed in international human rights documents, including the UNDRIP.



What is the relationship between UNDRIP and the Treaty of Waitangi?

The Treaty and Declaration are

strongly aligned and mutually consistent. The Declaration assists with the interpretation and application of the Treaty principles.

Partnership:

Which entails good faith cooperation and shared decision making.

Protection:

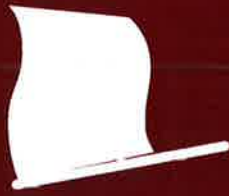
Protection of rangatiratanga (self-determination) and taonga such as reo (language), tikanga (customs), mātauranga (knowledge), land and resources.

Participation:

Participation in society on an equal basis to others, and freedom from discrimination.

UNDRIP affirms the status of

treaties between indigenous people and States. It helps explain how international rights standards apply and how treaty promises can be achieved.



“In keeping with our strong commitment to human rights, and indigenous rights in particular, New Zealand now adds its support to the Declaration both as an affirmation of fundamental rights and in its expression of new and widely supported aspirations.”

Minister of Justice, Parliament, 2010

What does UNDRIP mean for Aotearoa New Zealand?

The Declaration holds considerable moral authority and contains principles that are consistent with those in the Treaty, New Zealand's founding constitutional document.

This means that government decisions and policy should take the principles of UNDRIP into consideration alongside the Treaty.

To view the full declaration visit: www.hrc.co.nz



What do the UNDRIP articles say?



Indigenous peoples have the right to:

1. All human rights, including collective rights
2. Equality and non-discrimination
3. Self-determination
4. Autonomy or self-government
5. Their own institutions
6. A nationality
7. Life, liberty and security
8. Protection from cultural destruction or assimilation
9. Belong to indigenous communities or nations
10. Freedom from forced removal from their lands
11. Their culture and cultural property
12. Their spiritual and religious customs

13. Their languages, stories and names
14. Education, including in their own language
15. The dignity and diversity of their culture
16. Their own media and equal access to all other media
17. Protection in employment
18. Participation in decisions that affect them
19. Good faith consultation on laws and policies that affect them
20. Their own political, social and economic institutions and activities
21. Improvement of their economic and social conditions
22. Particular attention to the needs of elders, women, youth, children and disabled people
23. Development
24. Health, and to their traditional medicinal resources and health practices
25. Their spiritual relationship with their lands and resources
26. Recognition and protection of their lands and resources
27. Fair processes for dealing with their rights to lands and resources
28. Redress for lands and resources taken or damaged without consent
29. Environmental protection
30. Consultation before their lands are used for military activities

- 31.** Their cultural and intellectual property
- 32.** Use and develop their lands and resources, and consultation on projects that would affect these
- 33.** Determine their own identity and membership
- 34.** Their own institutions, laws and customs
- 35.** Determine the responsibilities of individuals to their communities
- 36.** Maintain and develop contacts across borders
- 37.** Observance of their treaties with States



How is the Declaration applied?

The final articles of the Declaration provide guidance on how it is to be interpreted and applied. The Declaration is applied:

- 38.** By States, in consultation and cooperation with indigenous peoples, through appropriate measures, including legislation
- 39.** Through financial and other assistance to indigenous people
- 40.** By ensuring indigenous peoples have access to fair procedures for resolving disputes with States, and to remedies for breaches of their rights

41. With financial and other assistance from the United Nations and other international organisations, and by establishing ways to ensure indigenous peoples' participation in matters that affect them

42. Through promotion and follow up by the United Nations and States



The rights set out in the Declaration:

- 43.** Are minimum standards
- 44.** Apply equally to males and females
- 45.** Do not diminish any other rights that indigenous peoples have
- 46.** Do not allow actions that are contrary to the Charter of the United Nations, or that diminish the territorial integrity of States

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Human Rights Commission

HOROWHENUA LAKE DOMAIN BOARD – 6 MAY 2019

7. General

- (iv) Lake Horowhenua Update from Horizons Regional Council (**attached**)

If you wish to view the attachments on Horizons Website, links to the reports are provided below.

- Paper to Council in September 2018 providing an update on work at Lake Horowhenua
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Lake%20Horowhenua%20Update.pdf>

The annexes to the paper

- Annex A - Lake Report Card
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20A%20Report%20Card.pdf>
- Annex B - Rationale for Lake Weed Harvesting:
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20B%20Rationale%20for%20weed%20harvesting.pdf>
- Annex C - Sediment Legacy results
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20C%20Sediment%20legacy%20project%20results.pdf>
- Annex D - Kakahi monitoring project results
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20D%20Kakahi%20monitoring%20project%20results.pdf>
- Annex E – Pest fish survey results
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20E%20Pest%20fish%20survey%20results.pdf>
- Annex F – Water quality state and trends
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20F%20Water%20quality%20state%20and%20trends.pdf>
- Annex G – Health and Safety considerations
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Regional-Council-Meeting-2018-25-09/18157%20Annex%20G%20Health%20and%20safety%20considerations.pdf>
- Paper to Councils Strategy and Policy Committee in November 2018 about and integrated sediment and drainage management plan for the Arawhata.
<http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Strategy-Policy-Committee-2018-13-11/18198%20Integrated%20Sediment%20%20Drainage%20Management%20Plan%20for%20the%20Arawhata.pdf>
- Paper to Councils Environment Committee in March 2019 that includes an update on the work to restore Lake Horowhenua. <http://www.horizons.govt.nz/HRC/media/Media/Agenda-Reports/Environment-Committee-2019-13-03/1925%20Annex%20A%20Freshwater%20Activity.pdf>

Report No.	18-157
Decision Required	

LAKE HOROWHENUA UPDATE

1. PURPOSE

- 1.1. This item is to update Council on progress with the restoration of Lake Horowhenua through the **Lake Horowhenua Accord (Lake Accord)** and seeks Councils endorsement around the next steps for **Horizons Regional Council (Horizons)** in this work.

2. EXECUTIVE SUMMARY

- 2.1. The fifth anniversary of the signing of the Lake Accord was celebrated on the 4th of August 2018. Through the Lake Accord, considerable progress has been made in the restoration of Lake Horowhenua.
- 2.2. The Lake Accord is a collaboration led by the Lake Trust (that are elected to represent the Beneficial Owners of lake). Other partners include the **Horowhenua Lake Domain Board (Domain Board)**, the Regional and District Councils and the Department of Conservation.
- 2.3. The Lake Accord was formed following the completion of lake restoration option reports commissioned by Horizons and completed by **National Institute of Water and Atmospheric Research (NIWA)**. Horowhenua District Council led the formation of the Lake Accord.
- 2.4. The collaboration has delivered the Lake Accord, an Action Plan and significant works to implement these. The collaboration has been extended to involve Central Government, horticulture growers and the dairy industry across three large work programmes comprising of the Lake Horowhenua Freshwater Clean-up Fund, Te Mana o Te Wai and **Freshwater Improvement Fund (FIF)** projects. Horizons, the Accord Partners, Universities, NIWA and others have collaborated to undertake science and monitoring to inform restoration options and to measure progress. This work is ongoing and in recent months new reports on pest fish populations and the sediment in the lake have been advanced.
- 2.5. Some Beneficial Owners of the lake and community members have actively challenged the work to restore the lake and this has considerably slowed progress on the restoration of Lake Horowhenua. Regulatory processes in various courts have included cases around the Lake Horowhenua Trust, its elections and its management, the regulatory consents for undertaking restoration programmes and the legality of Horizons being able to access the lake. Beyond the legal processes, work on the ground has been hampered by physical intervention, aggressive behaviour and threats toward the Lake Accord partners, usually Horizons staff and Lake Trustees, undertaking work or participating in activities relating to the lake. The paper provides and updates on a number of legal proceedings.
- 2.6. The individuals challenging the work to restore the lake have actively advocated for less work being done to restore the lake. This has included court processes seeking to block the completion of restoration works including the installation of a fish pass to enhance native fish populations (Photo 1) and the construction of a sediment trap to reduce sediment and phosphorus inputs into the lake. Without the actions of these individuals, restoration of the lake would have been much further advanced. In particular, the weed harvesting activities to reduce the seasonal algal blooms and toxic conditions that close the lake for recreation and impact on fish and other aquatic life in the lake. Further, the opposition to the restoration of the lake has significantly increased costs and diverted funds from action to restore the lake, either on the ground or in the lake.

- 2.7. Recent aggressive behaviour to staff during monitoring, verbal and physical threats to Horizons staff, and a confrontational presentation to Council that included giving Councillors and one staff member a "trespass notice", have resulted in Horizons ceasing a some activity in and around Lake Horowhenua. Some activity away from the lake has been able to continue. Monitoring has largely ceased, although limited monitoring is being done by accessing the lake though the use of helicopters with permission from the Domain Board and Lake Trust. Science work has continued using information gathered through the significant amount of field work completed earlier this year and prior to that.
- 2.8. This item overviews the various projects and activities of the lake restoration programme including providing updates on a number of legal proceedings and seeks Council's endorsement around the next steps for a range of activities/projects in and around the lake.



Photo 1. Lake Trust representatives and Horizons Councillors and Staff at the newly installed fish pass at the weir on the Hōkio stream.

3. RECOMMENDATION

It is recommended that Council:

- a. receives the information contained in Report No. 18-157 and Annexes.
- b. endorse the continuation of Horizons work programmes as a part of the Lake Trust led Lake Horowhenua Accord in collaboration with the Lake Trust and other Lake Accord partners.
- c. endorse the continuation of the following works that occur outside of the Lake Domain and Lake Trust land area.
 1. Water quality and flow monitoring of the tributaries that enter the lake. Noting that one monitoring site that was in the Lake Domain will need to be moved to a location outside of the Lake Domain;
 2. Installation of two continuous flow sites on tributaries that flow into Lake Horowhenua to contribute to Horizons requirements to the Freshwater Improvement Fund (FIF) project;
 3. Continuation of the groundwater monitoring within the catchment, including an increase in the groundwater monitoring as part of Horizons contribution to the FIF project around groundwater;
 4. Continuation of animal and plant pest control in the catchment (including possum and some purple loosestrife control);
 5. Continuation of Horizons presence on Governance Groups as both Governance and advisor roles;
 6. Continuation of work with the horticulture growers, including the Sustainable Farming Fund project;
 7. Completion of the processes with HeritageNZ to provide for the completion of the access road, boat ramp and associated dredging;
 8. Participation in the Maori Appellate Court process, specifically around the Maori Land Court injunction decision that was appealed by Ms. Taueki;
 9. Monitoring and maintenance of the sediment trap including actions required by consent conditions and additional efficiency monitoring; and
- d. endorses the continuation of the following works that occur within the area of Lake Domain and Lake Trust Land area (including the lake).
 1. Continuing monitoring of the lake both through the collection of water quality samples and servicing of the water quality monitoring buoy using helicopters. Noting the preference is to do this work by boat and the use of helicopters is ideally an interim measure until the boat ramp location near the sediment trap (or another location other than in the Lake Domain) is operational;
 2. Returning to monitoring of the lake outlet and Hōkio Stream both through the collection of water quality samples and servicing of the lake water level and Hōkio Stream water level and flow site. Noting the continuous monitoring at these locations has not been ceased over recent months, however the servicing of these sites has;
 3. Undertaking ongoing science and monitoring to inform the lake restoration programme and other programmes where it is assessed as safe to do so;
 4. Assessing options for purple loosestrife management within the Lake Domain and Lake Trust land areas and where assessed as feasible, including budgetary considerations, undertaking purple loosestrife control;
 5. Completion of the construction of the access road to the boat ramp for the weed harvester on Horizons and Lake Trust land under the current contract for this work, which includes establishment of a docking bay and some limited dredging of the lake. Noting this includes working through the HeritageNZ and Maori Appellate Court processes, with the latter involving a challenge to installation of the access road and boat ramp;

6. Finalising design and completing construction of the boat ramp for the weed harvester at the alternate location near the sediment trap;
7. Undertaking monitoring as required by consent conditions to enable the harvesting of weed in Spring 2019 and completing work on other lake weed harvesting related consent conditions;
8. Enabling lake weed harvesting in 2019. Noting this requires some preparatory work on the harvester including obtaining spare parts and equipment for monitoring the activity on the lake. Further it requires procurement for a contractor to undertake the works; and
9. Reestablishing the ability to launch boats and undertake monitoring etc from the Lake Domain if the assessment of risk changes.

4. FINANCIAL IMPACT

- 4.1. This item does have financial impact. The recommendations relate to budget items previously approved by Council noting the removal of funding from year 1 (2018-19, this year) of the **Long Term Plan (LTP)** for lake weed harvesting has reduced the ability to complete some preparatory work in advance of the LTP signalled weed harvesting activity in 2019-2020.
- 4.2. If Council decide to not proceed with finishing the access road, docking bay and dredging associated with the boat ramp for the lake weed harvesting project, there will be additional costs as a result of breaking the contract. If works proceed as currently contracted (noting, as above, that these works are presently the subject of litigation) then works will be completed as per the approved budget (and procurement process that has already been completed). Additional costs associated with responding to the regulatory permissions will also be incurred.
- 4.3. Proceeding with some activities in a modified way may result in additional costs for some activities. For example, the use of helicopter sampling of the lake compared to sampling by boat. Additional involvement of Tangita Tiaki from the Lake Trust in the monitoring will also likely increase the costs of the monitoring. Modifying the way of working to implement some projects with additional health and safety measures in place may also increase costs, for example additional security costs.

5. COMMUNITY ENGAGEMENT

- 5.1. The Lake Horowhenua Accord has been subject to considerable community engagement. The activities have been reported by various means including via media, public reporting to Council through the Environment Committee Agenda, through publicly notified resource consent hearings, the Lake Horowhenua Domain Board meetings and through various other reporting by the Lake Accord partners.

6. SIGNIFICANT BUSINESS RISK IMPACT

- 6.1. Possible risk impacts include potential further community concern around the increasing cost of this activity and uncertainty around it progressing. Further, there are risks in progressing this activity in the field. These risks include the risk of the project not progressing due to weather type delays or delays caused via protest type action, including potential harm to staff or contractors. The health and safety implications of completing this work have led to the reduction in work currently being carried out. If Horizons is to resume these functions health and safety obligations exist for Horizons, both for staff and governance. This is discussed further within the item and its annexes.
- 6.2. The significant risk impacts of not proceeding with the activity include reputational damage with Lake Accord Partners, the community, funding partners (e.g. the Ministry for the Environment) and others due to the inability to progress what is viewed as key interventions identified by NIWA, that Horizons have actively pursued and invested in.

There is also risk that not progressing this work will result in the Lake Accord partnerships no longer functioning.

7. BACKGROUND

- 7.1. Lake Horowhenua has had a long complicated history of management. This has been traversed and is still a matter of discussion as a part of ongoing treaty settlement processes. This paper focuses on the more recent management in the lead up to the Lake Horowhenua Accord signing and beyond. The management is complicated by multiple agencies and organisations having statutory roles. These responsibilities are discussed in the Lake Accord Action Plan and are not repeated here for the sake of brevity. The Lake Accord Action Plan can be located at <http://www.horizons.govt.nz/HRC/media/Media/Reserves%20and%20Projects/Action-Plan-for-Lake-Horowhenua.pdf?ext=.pdf>
- 7.2. There is also a level of challenge within iwi around who should manage the lake and how this should be done. The Lake Horowhenua Trust is the body who administers the lake on behalf of the Beneficial Owners of the lake. Trustees are appointed by way of election. The Trust has been challenged legally a number of times over recent years and there are still some matters before the court. A recent Maori Appellate Court decision (12 September 2018) concluded:
- "...that Judge Doogan should have recused himself from sitting on 19 May 2016. It follows that his decision to appoint trustees at 354 Aotea MB 54-88 (354 AOT 54-88), should be quashed."; and
 - "We direct a rehearing before the Māori Land Court pursuant to s 56(1)(e). The purpose of the rehearing is to (1) consider the results of the 9 April 2016 election; (2) enquire into any objections to trustee candidates; and (3) appoint trustees. The Lake Horowhenua Trust will be without trustees in the meantime, so the re-hearing should occur soon."
- 7.3. This decision was released recently and there has not been sufficient time to assess what, if any, implications this may have for Horizons activity at the Lake. Staff will endeavour to have a further update for Council around this at the time of presentation of this item.
- 7.4. A range of other iwi/hapu organisations and individuals have been involved and expressed views in the lake restoration programme through a range of processes such as the consent process and through the Long Term Plan and Annual Plan processes. These individuals and groups have included some who have supported the Lake Accord work and some who have opposed it.

8. POLICY CONTEXT

- 8.1. Lake Horowhenua was previously managed under the Lake Horowhenua and Hōkio Stream Catchment Management Strategy (1997). The policy process of the One Plan (notified in 2007), identified Lake Horowhenua as a priority for regulatory effort including being a target catchment for the nutrient management rules for intensive farming. Further Lake Horowhenua was identified in the One Plan for non-regulatory effort around monitoring and restoration.
- 8.2. Horizons in collaboration with the Lake Trust commissioned work around restoration options that was completed by NIWA scientists in 2011 & 2012 (Gibbs 2011, Gibbs and Quinn 2012). These reports compiled the available monitoring and science information for the lake and identified a suite of options to restore the lake. The monitoring information clearly showed the lake had poor water quality and also showed water quality had declined for a key measure of lake health, the Trophic Lake Index (TLI). The restoration options information determined that restoration of the lake was possible. These and a range of other factors led to the Horowhenua District Council taking the lead to form the Lake

Accord. The Lake Accord has enabled the reestablishment of monitoring at the lake, the subsequent Action Plan and associated projects including the Freshwater Clean-up Fund project, Te Mana o te Wai project and the new Freshwater Improvement Fund project.

- 8.3. The work of the Lake Accord is consistent with the statutory requirements of Horizons to maintain and improve water quality through the Resource Management Act and requirements through the **National Policy Statement for Freshwater Management (NPS-FM)** to improve water bodies that are below national bottom lines. The monitoring and research has clearly shown Lake Horowhenua has poor water quality that is below national bottom lines for a range of water quality indicators (Annex A). The Lake Horowhenua report card (Annex A) overviews the likely improvements from the key lake intervention projects (including lake weed harvesting) as predicted by Dr Gibbs of NIWA. These improvements include moving four out of five key water quality indicators out of the category of being below national bottom lines. The predicted improvements are for parameters that include toxicity measures of ammonia and cyanobacteria that can impact on aquatic life, and in the case of cyanobacteria also close the lake for recreational use.
- 8.4. The proposed non-regulatory lake restoration projects are intended to advance the restoration of the water quality in Lake Horowhenua. The projects are considered interim steps toward a broader longer term programme to restore Lake Horowhenua. These actions alone will not fully restore the lake. This has been made clear through a range of court processes and Council papers. As an example the lake weed harvesting activity seeks to reduce the toxicity issues of cyanobacteria and ammonia in the lake, however will not likely address the production of green algae in the lake. The key difference being the weed harvesting will reduce the frequency the green algae is in a toxic form (cyanobacteria). A further example is the sediment trap on the Arawhata, which is one method to reduce sediment and phosphorus entering the lake. Other sediment reduction methods including addressing the sediment at source, drainage improvements and sediment traps on other streams would be complementary and build on the improvements provided by the sediment trap on the Arawhata.

9. LEVEL OF INVESTMENT

- 9.1. Lake Horowhenua is the largest of over 220 lakes in the Manawatū-Whanganui Region that are greater than a hectare in size. Through the Lake Accord, Lake Horowhenua has received significantly more restoration investment than any other lake in the Region over recent years.
- 9.2. Overall, the three core projects with Central Government and local investment total when announced of around \$4.117 million, with approximately \$2.354 million (57%) from Central Government. Other funding partners include Horizons, Horowhenua District Council, the Lake Trust, DairyNZ, and the Tararua Growers Association. Over and above these projects Horizons has contributed more than \$580,000 in regulatory costs to obtain resource consents for lake weed harvesting, a sediment trap and a fish pass. Horizons has also invested significantly in monitoring and science for the lake. This cost is broadly estimated to be over \$600,000 over the life of the Accord, with some further funding obtained from external sources i.e. not from rates.
- 9.3. Other costs for Horizons ratepayers have included purchase of a monitoring boat specifically for Lake Horowhenua, costs for other court processes, staff costs, additional costs for the weed harvesting project including equipment costs and establishing the access track etc. Overall, the non-regulatory work of the Accord is estimated to be in excess of \$4 million over the past five years across a range of funding organisations.
- 9.4. Horizons Long Term Plan commits approximately \$2.156 million of further funding to restoration of the lake over ten years (2018-28) via the Lake Horowhenua Restoration Rate and further funding for staff time, monitoring, science etc in the order of \$1 million in total over 10 years. This comprises approximately \$100,000 per year for monitoring of the lake

health using the monitoring buoy, lake sampling, lake level, monthly monitoring of inflow/outflow flows and water quality, as well as measurements of water level and flow on the Arawhata inflow and the Hōkio Stream outflow. A **Sustainable Farming Fund (SFF)** project with the horticulture growers and industry is budgeted to spend approximately \$400,000 over 3 years including \$120,000 from Horizons. Horizons has budgeted \$700,000 over the next 10 years (\$70,000 per annum) for work with the horticulture growers, including the support of the SFF project. The projected spend for the next five years including the total FIF project budget is estimated to be greater than \$3 million.

- 9.5. Broadly the investment in the lake is estimated to total over \$7 million over the first decade of the Lake Accord to restore the lake. This excludes some of the costs from other agencies, landowners and the regulatory processes around policy development and consents for nutrient management, water takes etc. Included within this investment has been a significant amount from the Regions ratepayers. The regional rate contribution has been a mixture of general rate for monitoring/research and some implementation work as well as the targeted rate of the Lake Horowhenua Restoration that is funded 80% from Horowhenua District Ratepayers and 20% from general rates (i.e. across the Region, including the Horowhenua District).
- 9.6. This level of investment in water quality improvement is not isolated, with many large water quality restoration programmes underway through the country and Region. Iconic lakes such as Lake Taupō and the Rotorua lakes have investments in the order of hundreds of millions of dollars over recent decades. Other lakes like Te Waihora (Lake Ellesmere) near Christchurch, and Lake Wairarapa have had more modest budgets, with Te Waihora estimated to have received more than the budgets going into Lake Horowhenua (with approximately \$9 million secured from the Freshwater Clean-up Fund). Lake Wairarapa is estimated to have received lower investment than Lake Horowhenua, having received some funding through the Freshwater Clean-up Fund. The only other lake in the Horizons Region with significant planned investment is Lake Waipu. The Lake Waipu Freshwater Improvement Fund (FIF) project, has approximately \$1.9 million programmed to be spent over 5 years with funding from central government, Horizons and Rangitikei District Council. Other lakes have received some investment, with riparian planting and fencing typically dominating the work to restore lakes. Horizons has recently upgraded the lakes monitoring programme and the results show a large proportion of the monitored lakes are below national bottom lines for several measures of water quality in the National Policy Statement for Freshwater Management. Restoration options for these lakes has been assessed through Horizons science programme and two reports on this are nearly complete (one for deep lakes and the other for shallow lakes).
- 9.7. Other water quality restoration measures in the Region have spent large budgets including \$72 million for the Sustainable Land Use Initiative over about 10 years, the Manawātū River Leaders' Accord spending \$46 million over approximately four years through the Freshwater Clean-up Fund. The Horowhenua District Council has undertaken significant recent investments in water quality including in the order of \$8 million for Shannon wastewater to be land applied (with support from the Freshwater Clean-up Fund) and a current project to land apply Tokomaru wastewater to land (with support from the FIF).

10. ACHIEVEMENTS

- 10.1. While progress has been slow in some aspects of the restoration, a range of work has been completed or advanced. Some of the first achievements of the Accord include the Accord itself, the Action Plan and re-establishing a monitoring and science programme.
- 10.2. The sections below provide updates on the achievements and current progress on the three key projects that have involved Central Government and local investment i.e. the Freshwater Clean-up Fund, Te Mana o te Wai project and the Freshwater Improvement Fund projects.

11. THE FRESHWATER CLEAN-UP FUND

11.1. The Freshwater Clean-up Fund project for Lake Horowhenua was led by Horizons Regional Council, with Horowhenua District Council managing the boat wash project. The overall programme completed the following:

1. Purchase of a lake weed harvester for lake weed harvesting to address toxic conditions in the lake (Annex B overviews the rationale for lake weed harvesting);
2. Establishment of a boat wash facility near the lake to assist with biosecurity management in the lake;
3. 4,397 kilometres of stream fencing and 7,100 riparian plants established in the catchment and a fish pass on the Patiki Stream;
4. Establishment of a sediment trap on the Arawahata Stream that Dr Max Gibbs of NIWA estimated would reduce the annual load of sediment input to Lake Horowhenua from the Arawahata Stream by more than 50%, equivalent to reducing the yearly sediment inputs from all of the inflowing streams by approximately 25% and the annual load of phosphorus from these by 30%. The sediment trap is a part of a wider programme to reduce sediment entry into the lake with the design of this trap focussed on coarse sediment removal during large storm events. This design focus means the sediment trap does not always operate during rainfall events and may not visually change the colour of the water between entering the sediment trap and exiting the sediment trap, which can be more of a reflection of the fine sediment content. The measure of success over time will be the amount of sediment accumulated in the trap, and subsequently removed from the sediment trap, rather than deposited into the lake;
5. Drainage and Erosion Management Plans (DEMPs) have been completed for eight horticultural growers within the Lake Horowhenua Catchment. Twenty (DEMPs) were produced covering 82% or 368 ha of the total area assessed (446 ha). In the Arawahata area, 15 plans covered 81% of the estimated 404 hectares cropped in the sub-catchment. The blocks without specific DEMPs were very similar to nearby properties operated by the same grower. Planning for a phased upgrade of the drainage infrastructure in the catchment was completed to complement this work. The phased upgrade was funded separately via Horizons last Long Term Plan over three years and there is already more work that could be done to improve the management of water in the Arawahata Catchment during storm events.
6. Sustainable Milk Plans were prepared for all 10 dairy farms in the Lake Horowhenua Catchment. The plans cover a total of 1,765 ha of land used for dairy farming and associated runoff blocks; and
7. A fish pass on the weir in the Hōkio Stream, a restoration measure recommended via the fish population monitoring in 2013 to enable fish to have improved access to the lake. Observations indicate the fish pass is working, with schools of inanga viewed on multiple occasions in the Arawahata Stream in 2018. In the 2013 fish survey over several days, only a few inanga were detected.

12. TE MANA O TE WAI

12.1. The Te Mana o Te Wai work programme “Te Kakapa Manawa o Muaūpoko” contains thirteen projects and is led by the Lake Horowhenua Trust. Horizons assisted with the application for this funding. The Lake Trust has appointed a Governance Group that includes Councillor Sheldon, a Horizons staff member is also listed as a non-voting advisor to the group. The project has been underway for about 2 years and is ongoing and on track to be completed by December. Horizons has a role in assisting with the delivery of some projects that are managed via a contract between the Lake Trust and Horizons. The status of the component projects is outlined below.

12.2. **Community engagement** – The work of the Accord including Te Mana o te Wai project have been on display at Te Takere (the Levin Library/community hub). Several community

planting days have been held, including a recent one to celebrate the 5th anniversary of the Accord. Horizons have assisted with the community planting days.

- 12.3. **Manawhenua engagement** – Two versions of a magazine have been produced, one for the beneficial owners and one for a wider public audience. These have been circulated through various mechanisms. The second and third magazines are being produced in an online video type format. Six wananga have been programmed with some of these now complete.
- 12.4. **Lake report card, website and lake signage.** A lake report card has been developed (Annex A). A website has also been developed. The signage work has included establishing a pou (Figure 1) that is located on Horizons land (at the sediment trap location). Horizons assisted with the production of the lake report card and an update is currently being progressed.



Figure 1: Image of the pou established and unveiled on the 4th August 2018 during the Lake Horowhenua Accord anniversary celebrations.

- 12.5. **Sediment legacy study and options report** – This project sought to answers questions around the rate at which the lake is infilling (sediment accumulation rate) and also the source of that sediment from within the catchment. This involved work by NIWA, Massey University, the Lake Trust, and Horizons and involved the collection of sediment cores from the lake and analysis of these. Key points from the study include that sediment rates have increased over recent decades and that predominate sources of sediment to the lake have changed over time (Annex C). The results show that over the last 5 years the Arawhata Stream Catchment has been contributing between 48% and 75% of the sediment, and the Mangaroa Stream catchment, has been contributing between 20% and 45% over the same period. This result reinforces the importance of the work to address sediment in the Arawhata sub-catchment.
- 12.6. **Cultural monitoring programme** – The cultural monitoring programme has been completed in several stages with a computer mapping (GIS) tool to map cultural information and scientific data, and a cultural monitoring programme being developed and presented to the Lake Trust. Kakahi monitoring was a component of this programme (Annex D). This was a joint project by the Lake Trust, Niwa and Horizons. The monitoring concluded that although adult kakahi are producing larvae in Lake Horowhenua recruitment failure is probably occurring with poor or no survival of either larvae and/or

juveniles. A likely cause of recruitment failure is poor water quality, specifically elevated pH and ammonia concentrations during the summer larval release period. Other factors may be contributing including reduced populations of host fish and/or sedimentation in juvenile habitat. In addition, the presence of many dead adult mussels *in situ* in the sediment suggests that adult survival is also decreasing in recent years. The adult mussels may simply be aging and reaching the end of their life span or they may be affected by multiple stressors in Lake Horowhenua, particularly degraded water quality and sedimentation. The results indicate that without in-lake interventions such as the lake weed harvesting, the kakahi populations in Lake Horowhenua will eventually become extinct.

- 12.7. **Nursery** – The Lake Horowhenua Trust have established a new nursery to provide plants for the restoration of the lake and elsewhere. Approximately 36,000 plants are in production.
- 12.8. **In-lake planting** – This trial sought to implement one of the recommendations made in the Gibbs (2012) report for the restoration of Lake Horowhenua. The trial involved the planting of approximately 2,500 plants on the lake edge extending into the lake up to a depth of 60 cm's. Although exact numbers aren't known, after numerous visits to the site following the planting it is estimated that the plant survival rate was around 5%. Factors influencing the survival rate were birds, pest plants, and wave action. During the planting it was noted that vegetation was beginning to naturally extend out from the lake edge into the lake and this appeared far more stable than the plants that were planted as part of the trial. On-site observation was that as the plants grow out from the lakes edge they provide a mat and stability which prevents the wave action from eroding the plants. Although this natural succession may be slow it is likely to be more successful.
- 12.9. **Removal of rubbish from the lake** – This project is targeting the locating and removing rubbish such as steel standards and wire from the lake and also mapping the location of significant structures in the lake. Procurement for this work has been completed and the work is underway.
- 12.10. **Lake weed cordon** – This project to enhance biosecurity protection aimed to establish a weed cordon at the launching location in the Domain. Weed cordons are established in some Rotorua lakes and provide a mechanism to reduce the potential for weeds coming into the lake from boats, waka etc. The project was ceased and the funding redirected within the Te Mana o Te Wai project.
- 12.11. **Stormwater upgrades** – Originally this project targeted stormwater upgrades to be led by Horowhenua District Council at Makomako Road, Patiki Stream and Mangaroa Stream). Late in the project this changed to works on the Queen Street drain. Horizons governance and officers were not a part of the decision to change the location of the works or any decisions in relation to completion of the works.
- 12.12. **Stream fencing and riparian planting** – There have been issues with establishing fencing and planting on some leased land particularly in the Patiki Catchment. Some blocks with multiple owners have been difficult to source permissions for work to proceed. In some cases, while the people leasing the land have signaled interest, Horizons have not been able to secure permissions to undertake the work. This leaves further gaps in the level of stock exclusion on some streams. By the end of the project approximately 5.7 km's of stream fencing and 15,000 riparian plants planted.
- 12.13. **Pest Fish Survey** – As a requirement of the consent conditions for the fish pass on the Hōkio Stream, Horizons was required to monitor pest fish in the lake before and after the installation of the fish pass. Monitoring indicated that populations of the main pest fish species recorded in Lake Horowhenua (perch, goldfish and koi carp) had not increased since the installation of the fish pass (Annex E). Although koi carp are a difficult species to capture and all fishing methods will underestimate their abundance, the continued difficulty in capturing koi carp within Lake Horowhenua since 2013 suggests this species remains at densities below those known to cause adverse ecological impacts.

- 12.14. **Glass eels** – The glass eels project involved capturing glass eels, growing them in a establish facility to increase survival rates and releasing them into Lake Horowhenua. Approximately 1,000 eels were released as a part of the 5th anniversary celebrations on the 4th August 2018.

13. FRESHWATER IMPROVEMENT FUND

- 13.1. A further achievement of the Lake Accord is the establishment of the Freshwater Improvement Fund project for Lake Horowhenua, led by the Lake Trust. The project has been underway from 1 July 2018 and is programming delivery over a three year period. The Lake Trust has appointed a governance group that includes Councillor Sheldon. A Horizons staff member is also listed as a non-voting advisor to the group. Horizons is involved as a co-funding partner and will lead the groundwater research component of the project. The component projects and some of their linkages with Horizons work programmes are outlined below.
- 13.2. **Stormwater upgrades** – This project is led by the Horowhenua District Council and includes a range of stormwater upgrades. This links to Horizons regulatory programmes where Horowhenua District Council are completing monitoring and compiling a resource consent application for the discharge of stormwater to Lake Horowhenua.
- 13.3. **Cultural monitoring** – This programme is being led by the Lake Trust and builds on work in the Te Mana o Te Wai project. The programme has linkages with Horizons monitoring of the lake and the reporting of lake health through the lake report card, state of environment report, LAWA etc.
- 13.4. **Groundwater research** – This project is being led by Horizons and seeks to refine the knowledge of groundwater inputs to Lake Horowhenua. The lakes water balance has been studied and reported on several times over the last decade or so and this work seeks to reduce the uncertainty around the groundwater inputs. The new study will have the benefit of new information from the lake level monitoring and inflow/out flow monitoring completed recently as a part of the monitoring programme (see below). Groundwater and hydrology information is important to inform lake restoration efforts and resource consent processes around water allocation in the catchment. In the past resource consents to take water have been declined based on potential effects on the lake e.g. Levin Meats and some applications by horticulture growers. Further, some horticulture growers have water take consents that have short terms and this work will likely inform the decisions around any new applications to take beyond the expiry of the existing consents.

14. MONITORING AND SCIENCE

- 14.1. The monitoring and science programme has evolved over the last decade or so. Horizons was actively doing work in the catchment in 2008, however ceased activity due to health and safety concerns for staff. Monitoring restarted in 2013 following the signing of an intent to form an Accord. The monitoring and science programme are briefly outlined below including updating on work that has recently ceased due to health and safety concerns.
- 14.2. A summary of the state and trends of water quality in the Lake Horowhenua Catchment is provided in Annex F. This is based on a recent analysis of the regions water quality information for state and trends that is programmed to be presented to Council as a part of the next Environment Committee meeting. The report shows that the ability to calculate trend information has been impacted by the disruptions to water quality information collection that have resulted in sampling not being undertaken consistently due to health and safety concerns. Only trend information for the macroinvertebrate community index is able to be presented. This does not show any definitive trends that there is strong statistical confidence in, however the information indicates a general degradation over the ten year period 2007 to 2017. The state information compared to the One Plan targets show E. coli targets are met in the lake and outflow stream, but not in the inflowing

tributaries where monitored, nutrient targets are almost uniformly not met in the lake and tributaries and the lake does not meet chlorophyll a targets. Compared to the National Policy Statement categories of water quality state as outlined in the National Objectives Framework (NOF), the lake is below national bottom lines (band D for phytoplankton and nutrient measures, nitrogen and phosphorus). Inflowing tributaries are band E for E. coli, with the outflow stream being band B). Nitrate as assessed for toxicity to aquatic life as a part of the NOF is band B or C in most tributaries, however band D (below the national bottom line) in the Arawhata stream.

14.3. The monitoring and science at the lake is done as a part of the Lake Accord and the Lake Trust provide Tangata Tiaki to assist with some of the monitoring as a standard practice. Permissions are obtained for the work from the Lake Trust and the Lake Domain Board. Various components of the monitoring programme are overviewed below.

14.4. **Lake monitoring buoy to monitor changes in a range of parameters over time.**

- This has provided critical information to inform the restoration programme including data on the pH changes in the lake and frequency and duration of deoxygenation of the base of the lake (that leads to phosphorus release).
- Recently Horizons moved to servicing this via helicopter following ongoing access issues for boats at the lake over many years. Launching and retrieving boats from the lake now includes notifying police as a standard practice and arrests have been made during this type of activity on multiple occasions. The opposition to Horizons (or its contractors) using boats is often cited around biosecurity concerns. Horizons have put in place measures to manage the biosecurity risk including use of a dedicated monitoring boat that is only used in Lake Horowhenua.
- The potential longer term solution for this is Horizons accessing the lake, from the alternative boat ramp near the sediment trap that has been proposed to enable lake weed harvesting.
- This is the only lake monitoring buoy Horizons currently has deployed permanently in the Region.
- Previously completed by the dedicated monitoring boat, this work is now delivered via the helicopter sampling. When the monitoring was completed by boat Tangata Tiaki were assisting with this monitoring when they were available. However, with the change to helicopter sampling they are no longer assisting with this work.

14.5. **Monthly Lake Monitoring to measure lake health.**

- This monitoring involves collection of samples and measurement from the lake in multiple locations.
- This monitoring provides for calculation of compliance with One Plan targets, National Policy Statement requirements and links to a target of the Lake Accord to improve the Trophic Lake Index (TLI). The TLI is the measure that was determined to be statistically declining by the Niwa report and is the measure that is used to compare lakes on a national level through the LAWA website. In 2010, Lake Horowhenua was ranked as the 7th worst lake out of 112 monitored for TLI nationally.
- This information also allows calculation of trend information over time to assess the effectiveness of interventions including regulatory and non-regulatory measures.
- The sampling also measures a range of other parameters that enables comparison to measures specified in One Plan Targets and the National Policy Statement for Freshwater Management.
- The lakes monitored for water quality in the region are mostly monitored via helicopter on a quarterly basis. Lake Horowhenua is the only lake monitored monthly by Horizons.
- Previously completed by the dedicated monitoring boat, this work is now delivered via the helicopter sampling. When the monitoring was completed by boat Tangata Tiaki

were assisting with this monitoring when they were available. However, with the change to helicopter sampling they are no longer assisting with this work.

14.6. Continuous flow and lake level monitoring

- This currently consists of monitoring of the Arawhata Stream level and flow, the Hōkio Stream level and the lake level.
- These recording sites provide critical information about groundwater and hydrology of the streams and lake.
- The Arawhata site also informs the management of the sediment trap.
- The servicing of these monitoring sites ceased in June due to health and safety concerns.
- Two further similar sites are proposed and budgeted for this year as a part of the Freshwater Improvement Fund. These have been on-hold and are now proposed to be installed.
- The Hōkio Stream recorder and the lake level recorder are located on Lake Trust land.

14.7. Monthly inflow and outflow monitoring

- This comprises of measuring flow and collecting water quality on the inflows and outflow of the lake once a month.
- The measurement of flows, via flow gaugings is a technical exercise involving specialist training and equipment.
- This has provided key information on enabling the calculation of the relative contributions to nutrient and sediment loads in the lake from various catchments to help inform lake restoration options.
- The data also allows calculation trend information over time to assess the effectiveness of interventions including regulatory and non-regulatory measures. This monitoring programme is relatively new and the records are nearing the length of time where trend information can be generated. Water quality trend analysis such as those used in national state of environment reporting or the LAWA website typically use 10 years of record to generate trend information. It is noted that gaps in the record can influence the ability to complete trend analysis. This is currently an issue for trend analysis of information from the Lake Horowhenua monitoring programme.
- This monitoring ceased in June 2018 and has been sporadic at times prior to this due to health and safety concerns.
- The majority of this monitoring is not on Lake Trust land, however the outflow monitoring of the Hōkio Stream is.
- Tangata Tiaki have not regularly been involved in this monitoring, however the Lake Trust has recently requested that Tangata Tiaki become involved in this work on a regular basis.

14.8. Other targeted investigations

- These have included fish surveys, lake weed mapping, and other monitoring work linked to the restoration programme and/or national research work.
- Outputs from this include improved understanding of the fish populations and lake weed in the lake. This includes the development of a lake weed harvesting strategy that was submitted as a part of the consenting process.
- At the present time there is no programmed monitoring in this space in 2018. Mapping of lake weed over this spring/summer would be helpful, however at this stage is not progressing due to funding requirements and the health and safety issues of having to launch a boat on the lake.

15. MANAGEMENT OF PURPLE LOOSESTRIFE

- 15.1. Purple loosestrife is a highly invasive weed of wetland areas, stream and lake margins, and drains. It is present across much of the Region in relatively low and reducing populations, except the Lake Horowhenua infestation. Horizons has been managing the infestation at Lake Horowhenua over many years. This has met resistance in the field by some individuals and has at times required Police involvement to provide safe access to areas around the lake for control work. Over recent years, Horizons staff have not been able to complete the full level of weed control due to health and safety issues. This year staff undertook some control work, however were unable to complete the work following a directive from management that no further work in and around the lake take place.
- 15.2. The interruption to the programme over several years, has meant a considerable loss of the gains previously made against this weed. It is noted that this year, no budget has been allocated to purple loosestrife control at the lake. Without ongoing control this weed is approaching, if not at, a point where current management methods are insufficient to regain control of the weed in this area.

16. CURRENT WORK PROGRAMME

- 16.1. Horizons has involvement in a range projects within the Lake Horowhenua catchment, some of these are currently on hold or only being completed in part. This section overviews the current status and work remaining on a range of the non-regulatory projects underway in the catchment. The monitoring and science programmes covered above are not repeated in this section but do form part of the current work programme.

Lake weed harvesting

- 16.2. The lake weed harvesting project is viewed as a key intervention for the health of the aquatic life in the lake and for improving the suitability of the lake for recreation. This in-lake activity seeks to address the in-lake processes that lead to toxic conditions in the lake including elevated pH, ammonia toxicity and the cyanobacteria blooms that occur in the lake.
- 16.3. The project has been delayed by regulatory processes and including a publicly notified consent hearing, Environment Court and the High Court. The project was delayed by a further year through the Long Term Plan process following delays in establishing the infrastructure for the 2018 harvesting season. Council included the target of lake weed harvesting in 2019 and beyond in the Long Term Plan.
- 16.4. The delays were in part due to an injunction in the Maori Land Court about the establishment of the access track and boat ramp on Lake Trust land to enable weed harvesting. This application was dismissed by the Maori Land Court, however has recently been appealed to the Maori Appellate Court. The outcome of this process will be a factor in determining if and how the lake weed harvesting programme is to proceed in 2019.
- 16.5. Prior to the injunction, the construction of the access track was underway on Horizons land. This work located some middens that triggered a requirement to cease work and to work with HeritageNZ regarding this and the process to undertake further work. Horizons has previously worked with HeritageNZ to obtain archaeological authorities for a range of lake restoration activities including the sediment trap on the same site. HeritageNZ had previously advised that an authority was not required for the work on the access road and boat ramp, however locating the middens triggered some further process requirements. These processes require completion if the work on the access road and boat ramp is to proceed.
- 16.6. The completion of the access road, a docking bay and some limited dredging of the lake is currently contracted to be completed. This contract is on hold. There is the ability to restart the contract. If the contract is ceased there will be some further costs.

- 16.7. There is some boat ramp design work to be completed and a contract for the construction of boat ramp itself to be established. There is the ability to complete this work in close alignment with the timing of the completion of the current contract for the access road etc.
- 16.8. A further task related to the lake weed harvesting (and the sediment trap and fish pass) is the cost recovery for the resource consent process from both the Environment and High Courts. This equates to approximately \$135,000 needing to be recovered through processes in both the District and High Courts. This recovery process is underway.

Sediment trap

- 16.9. The sediment trap is operational. Further work on the sediment trap includes completing some consent condition requirements that relate to monitoring for potential fish entrapment. Ongoing maintenance of the sediment trap is budgeted via the Drainage Scheme and is a further task.
- 16.10. There is further optional work around measuring the efficacy of the sediment trap and potentially modifying it, as is permitted by the resource consent conditions, to make it more effective. This work has not been prioritised for completion this year.

Work with the horticulture growers

- 16.11. The Long Term Plan provides funding for work with the horticulture growers to implement the Drainage and Erosion Management Plans and to complete the new Sustainable Farming Fund project "future proofing vegetable production". There is an associated PhD project being formulated to support this project with funding from Massey University and Horizons. A further project related to this is the management of and continual improvement of the drainage network in the Arawhata Catchment by the River Management Team.

Te Mana o Te Wai Fund

- 16.12. Horizons remaining work on the Te Mana o Te Wai fund includes:
- Ongoing governance of the project (Councillor Sheldon) and staff support of the governance project.
 - Coordinating the finalisation of the legacy sediment and pest fish reports with NIWA and the Lake Trust.
 - Finalising the stream fencing and planting work.
 - Provision of information for an update to the Lake Report Card.
 - Final invoicing and reporting on the project.

Freshwater Improvement Fund

- 16.13. Horizons remaining work on the Freshwater Improvement Fund includes:
- Ongoing governance of the project (Councillor Sheldon) and staff support of the governance project.
 - Finalising the scope and activity for the groundwater component of the project.
 - Commissioning the science work and undertaking the field work required for the groundwater project, including installing two additional flow sites on tributary streams that flow into the lake. This work has been budgeted for.
 - Administration including invoicing and reporting on the project.

17. NEXT STEPS

- 17.1. There are range of potential options for Horizons ongoing work programme around Lake Horowhenua, all of which have an element of complexity to them.
- 17.2. As outlined above there are significant challenges for continuing work on the ground in the catchment following staff experiencing aggressive and confrontational behaviour when

undertaking some work, threats to staff, a “trespass notice” being given to Councillors (and one staff member) and further legal and regulatory work to complete (associated with the Maori Appellate Court proceedings and with HeritageNZ).

- 17.3. In relation to the confrontational behaviour, charges have recently being laid against Phillip Taueki regarding alleged intimidation of a Horizons staff member. This has placed some limitations on Mr Taueki's interactions with the staff member, some Lake Trustees and other witnesses (including another Horizons staff member) until the court process is completed.
- 17.4. There are legislative requirements around health and safety to manage given the significant history of threats and aggressive behaviour experienced during some types of work. In simple terms, the advice Horizons has received indicates that if Horizons is initiating projects and contributing funding to projects, then Health and Safety requirements remain if Horizons:
 - Undertakes the work itself via its own staff or with its own staff, including when delivered in collaboration with the Lake Trust (noting Tangata Tiaki receive remuneration from Horizons for their involvement);
 - Engages contractors to complete the work (including if someone else manages the contracts for Horizons).
 - Provides a grant to enable some other agency to undertake the work (themselves or via contractors).
- 17.5. It is noted that if Horizons initiating and setting out the work, as well as funding the work, provides the ability to 'influence and control the work'. This places requirements on Horizons to be a part of managing the risk of the work. More information on Health and Safety requirements is provided in Annex G.
- 17.6. For the purposes of forming options for the next steps, Horizons work programme is considered in two parts. This has been done to separate the area where the most frequent increased health and safety risk has been experienced to date. The two areas being:
 1. Works that occur within the Lake Domain and within the Lake Trust land (including on the lake); and
 2. Works that occur outside this area within the catchment and in various public places, courts, meetings etc.
- 17.7. The areas of Lake Domain and Lake Trust land have additional complexities related to the legislative roles and rights of organisations, including the Lake Domain Board, the Lake Trust and beneficial owners of the lake, within these locations. These areas are where staff have primarily encountered the aggressive behaviour and threats, noting other threats, confrontational and aggressive behaviour have been encountered in and around various regulatory processes and other meetings. Some of the more typical threats to staff refer to what will happen when staff are next located in the areas around the lake. That said, physical threats and aggressive behaviour have also occurred in relation to lake restoration in areas outside of the Domain and Lake Trust Land e.g. in and around court proceedings.
- 17.8. The Lake Domain area and the Lake Trust land are considered the highest risk locations and working in these areas has been temporarily ceased based on health and safety considerations.
- 17.9. To date, restoration work on the ground completed within the catchment but outside of the Lake Horowhenua Trust land and the Domain area has not encountered the strong opposition that has occurred within the Domain and Lake Trust Land area. Please note this refers to on-the ground type works, fencing, planting, community planting days etc and excludes the activities around court processes and other meetings about lake restoration.

- 17.10. The work to be done outside of the Lake Trust land and the Domain area for the non-regulatory lake restoration programme includes programmes outlined below, which is referred to as List 1. It noted that some modifications to the way these are to be delivered are included in the list to lessen the health and safety risk. These programmes are:
1. Water quality and flow monitoring of the tributaries that enter the lake. Noting that one monitoring site that was in the Lake Domain will need to be moved to a location outside of the Lake Domain;
 2. Installation of two continuous flow sites on tributaries that flow into Lake Horowhenua to contribute to Horizons requirements to the Freshwater Improvement Fund (FIF) project;
 3. Continuation of the groundwater monitoring within the catchment, including an increase in the groundwater monitoring as part of Horizons contribution to the FIF project around groundwater;
 4. Continuation of animal and plant pest control in the catchment (including possum and some purple loosestrife control);
 5. Continuation of Horizons presence on Governance Groups in both Governance and advisor roles;
 6. Continuation of work with the horticulture growers, including the Sustainable Farming Fund project;
 7. Completion of the processes with HeritageNZ to provide for the completion of the access road, boat ramp and associated dredging;
 8. Participation in the Maori Appellate Court process, specifically around the Maori Land Court injunction decision that was appealed by Ms. Tauaki; and
 9. Monitoring and maintenance of the sediment trap as required by consent conditions for fish entrapment and additional efficiency monitoring;
- 17.11. There are also a number of work streams to be done that involve needing access to the lake and its margin and therefore to be present on the Lake Trust land and/or the Domain area (referred to as List 2). These work programmes are:
1. Continuing monitoring of the lake both through the collection of water quality samples and servicing of the water quality monitoring buoy using helicopters. Noting the preference is to do this work by boat and the use of helicopters is ideally an interim measure until the boat ramp location near the sediment trap (or another location other than in the Lake Domain) is operational;
 2. Returning to monitoring of the lake outlet and Hōkio Stream both through the collection of water quality samples and servicing of the lake water level and Hōkio Stream water level and flow site. Noting the continuous monitoring at these locations has not been ceased over recent months, however the servicing of these sites has;
 3. Undertaking ongoing science and monitoring to inform the lake restoration programme and other programmes where it is assessed as safe to do so;
 4. Assessing options for purple loosestrife management within the Lake Domain and Lake Trust land areas and where assessed as feasible, including budgetary considerations, undertaking purple loosestrife control;
 5. Completion of the construction of the access road to the boat ramp for the weed harvester on Horizons and Lake Trust land under the current contract for this work, which includes establishment of a docking bay and some limited dredging of the lake. Noting this includes working through the HeritageNZ and Maori Appellate Court processes, with the latter involving a challenge to installation of the access road and boat ramp;
 6. Finalising design and completing construction of the boat ramp for the weed harvester at the alternate location near the sediment trap;
 7. Undertaking monitoring as required by consent conditions to enable the harvesting of weed in Spring 2019 and completing work on other lake weed harvesting related consent conditions;

8. Enabling lake weed harvesting in 2019. Noting this requires some preparatory work on the harvester, including obtaining spare parts and equipment for monitoring the activity on the lake. Further, it requires procurement for a contractor to undertake the works; and
9. Reestablishing the ability to launch boats and undertake monitoring etc from the Lake Domain if the assessment of risk changes.

18. OPTIONS

- 18.1. There are a range of options that could potentially be considered as a part of this item. One option that is not presented is to continue as Horizons had previously operated through accessing the lake for monitoring and other activity via the Domain. This has been ruled out in the interim based on the health and safety risk. The options could be presented in terms of individual decisions on various projects but have been considered as three packages for the non-regulatory lake restoration programme being:
 1. Proceeding with all of the work, with some modifications to how this is delivered i.e. complete the projects on both List 1 and List 2.
 2. Proceeding with all of the work outside of the Lake Domain and Lake Trust land area (List 1), and cease all work inside the Lake Domain and Lake Trust area (List 2).
 3. Ceasing all of the work in the catchment i.e. cease all of the work in Lists 1 and 2.
- 18.2. As a further consideration in the options is to retain an ability to return to using the Lake Domain should the assessment of risk change.

19. ASSESSMENT OF OPTIONS

- 19.1. Option 1 is to proceed with all works via a modified programme. Advantages of this include progressing the work with modifications to the way the programme is delivered in consideration of the current assessment of the health and safety risk. This option enables Horizons to continue to seek to implement works to achieve regulatory requirements around maintaining and improving water quality and raising water quality parameters to be above national bottom lines. A disadvantage is the additional workload associated with this option due to increased activity around regulatory permissions etc, and potential further exposure of staff and Councillors to the types of confrontational behaviour that has been experienced during some work around Lake Horowhenua. Fiscally, Option 1 involves further expenditure than the other options including in relation to enhancing security/health and safety management, regulatory processes and increased level of physical works.
- 19.2. Option 2 includes cessation of work in the Lake Domain area and Lake Trust land (including the lake). Advantages of this option include removing the need for staff to operate in these areas reducing health and safety risk and exposure of staff to the types of confrontational behaviour that can occur when working around Lake Horowhenua. Option 2 also has lower expenditure than Option 1. A disadvantage is that some of the work to restore the lake will not occur and the forecast improvement of the lake will not likely occur. With this option the lake would be forecast to continue to stay below national bottom lines for water quality with there being ongoing impacts to the aquatic life (fish, kakahi etc). A range of monitoring work would also cease removing the ability to track changes in water quality and aquatic health.
- 19.3. Option 3 is cessation of all non-regulatory lake restoration work (including some monitoring) in the Lake Horowhenua Catchment. An advantage of this is lower costs. Disadvantages include having to cease involvement in a range of collaborative programmes such as the Freshwater Improvement Fund with Accord Partners and Sustainable Farming Fund work with the horticulture growers and industry. A range of work that would inform regulatory processes (including monitoring of water quality outcomes)

would also be ceased. The same disadvantages as outlined in Option 2 would also apply to Option 3.

- 19.4. The paper is presented with resolutions based on option 1, which seeks to reduce the health and safety risk through a modified work programme and enable Horizons to continue to undertake lake restoration activity.

20. SIGNIFICANCE

- 20.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Logan Brown

FRESHWATER AND PARTNERSHIPS MANAGER

Jon Roygard

GROUP MANAGER NATURAL RESOURCES AND PARTNERSHIPS

ANNEXES

- A Lake Horowhenua report card
- B Rationale for weed harvesting
- C Sediment legacy project results
- D Kakahi monitoring project results
- E Pest fish survey results
- F Water quality state and trends
- G Health and safety considerations

ECOSYSTEM HEALTH

The National Policy Statement for Freshwater Management 2014 (Freshwater NPS) sets out the objectives and policies for freshwater management under the Resource Management Act 1991. The National Objectives Framework of the Freshwater NPS contains a list of attributes that must be managed. These attributes are graded into four different categories of which Band D falls below the national bottom line. Unless certain criteria are met an Authority must develop plans to move systems out of Band D.

The monitoring data to date shows the attribute state that Lake Horowhenua falls into Band D for several measures

PRESIDENT BAND	TP	TN	TAN	CHL _a	CYANOBACTERIA
	Annual median (mg/m3)	Annual median (mg/m3)	Annual maximum (mg/m3)	Annual maximum (mg/m3)	80th percentile (mm3/L)
A	< 10	< 300	< 0.05	< 10	< 0.5
B	> 10 AND < 20	> 300 AND < 500	> 0.05 AND < 0.4	> 10 AND < 25	N/A
C	> 20 AND < 50	500 AND < 800	0.4 AND < 2.20	> 25 AND < 60	> 0.5 AND < 10
D	> 50 (250)	> 800 (1910)	> 2.20	> 60	> 10

As part of the integrated approach that is being undertaken for the restoration of Lake Horowhenua predictions have been made by Dr Max Gibbs (NIWA) that a range of parameters will move from Band D (or below national bottom lines) to

* less than | > greater than

PREDICTED FUTURE BAND	TOTAL PHOSPHORUS	TOTAL NITROGEN	AMMONIA	Chlorophyll _a	CYANOBACTERIA
	Annual median (mg/m3)	Annual median (mg/m3)	Annual maximum (mg/m3)	Annual maximum (mg/m3)	80th percentile (mm3/L)
A	< 10	< 300	< 0.05	< 10	< 0.5
B	> 10 AND < 20	> 300 AND < 500	0.05 AND < 0.4	> 10 AND < 25	N/A
C	> 20 AND < 50	500 AND < 800	0.4 AND < 2.20	> 25 AND < 60	> 0.5 AND < 10
D	> 50 (250)	> 800	> 2.20	> 60	> 10

These predictions show that the restoration work, including the sediment trap and weed harvesting activities, will provide immediate and positive effects on water quality through the reduction of cyanobacterial blooms

< less than | > greater than

WHAT IS THE TLI?

Lake Horowhenua has very poor water quality and is classified as supereutrophic on the trophic level index (TLI). The TLI measures four parameters: water clarity, chlorophyll content, total phosphorus and total nitrogen, and is used to give an overall picture of the health of New Zealand lakes. Each lake is assigned a number, typically between 1 and 7, the lower the number, the better the water quality in the lake.

TLI HISTORY FOR LAKE HOROWHENUA DATA TABLE						
Year	2006	2007	2008	2009	2014	2016
TLI Score	6.5	6.1	6.7	7.1	6.1	6.7

*2010-2013 Lake not monitored

HUMAN HEALTH

Currently swimming is actively discouraged at Lake Horowhenua. Other recreational activities, such as boating, rowing and sailing, are discouraged during the summer months when toxic algal blooms may be present. A key goal of the lake weed harvesting activity, planned for 2016-19, is to reduce the frequency of toxic cyanobacterial blooms. Over the 2016-17 summer period (November to April) Lake Horowhenua's water quality was sampled 22 times for *E. coli*.

CATEGORY	RANGE	% SAMPLES IN EACH CATEGORY
Avoid swimming	> 550 <i>E. coli</i> MPN/100ml	55%
Could be a health risk	250-550 <i>E. coli</i> MPN/100ml	14%
Should be safe to swim	< 250 <i>E. coli</i> MPN/100ml	32%

* All samples were taken from the Lake edge rather than the centre of the Lake, and represent the risk to human health from contact with the Lake at the Domain

E. coli monitoring in the middle of the lake shows that between July 2013 and June 2017 it was always safe to swim from an *E. coli* infection risk perspective. This is likely due to the UV radiation killing the *E. coli* that will be entering the lake from various sources

He Hokioi Rerenga Tahī
Te Kawenata o te Roto o Horowhenua

LAKE HOROWHENUA CATCHMENT REPORT CARD

HE MIHI

Ko tēnei te moemoeā
O te iwi nei, arā ko Ngāi Tara te Muaūpoko o te Ika
Kia rongoā te taiao nei, te whenua me ngā wai tapū o te rohe nei
E kōrero ana tātou ki ngā iwi katoa, kei a tātou kotahi te rongoa
Tī hea Mauria Ora!

This is the wish of our iwi Ngāi Tara te Muaūpoko o te Ika
To restore nature, our sacred lands and waters to their former glory
We are speaking to all people, as we are all part of the solution
The breath of life!

LAKE HOROWHENUA CATCHMENT

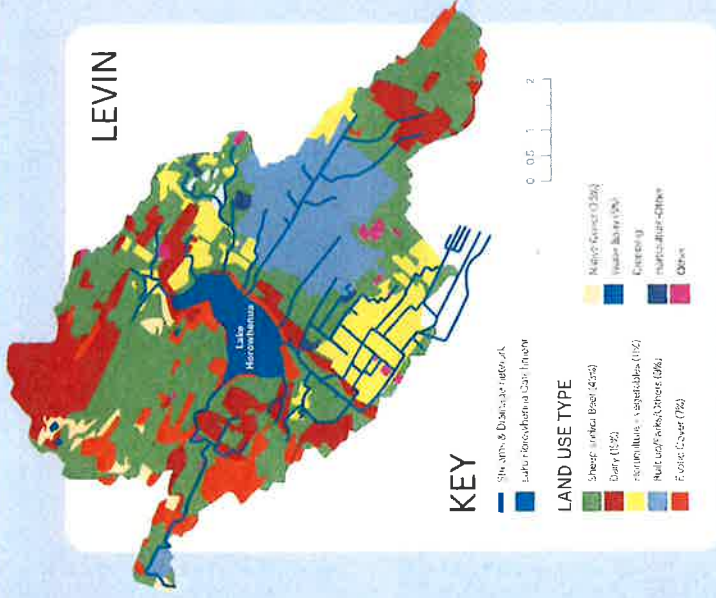
LAKE HOROWHENUA RESTORATION

BACKGROUND

In pre-European times, Lake Horowhenua was a cleanwater supply and valued fishery for the Māuipoko iwi who lived in the coastal forest that surrounded the Lake.

Clearance of coastal forest, draining of swamps, intensification of land use, urban expansion, and the disposal of treated effluent in the Lake between 1962 and 1987 has led to significant degradation of Lake Horowhenua. After the input of treated sewage stopped in 1987, water quality within the Lake started to improve. However, a decade later water quality began to decline again and in 2010 Lake Horowhenua was ranked as the 7th worst out of 112 monitored lakes in New Zealand.

Lake Horowhenua is regularly closed for recreation in summer due to the presence of toxic cyanobacteria. This is related to the large amounts of nutrients and sediment entering the Lake combined with large amounts of sediment and nutrients already present in the Lake.



LAKE HOROWHENUA ACCORD

In 2013, five parties representing Māuipoko owners, community interests and statutory bodies agreed to work together to provide leadership, halt degradation and put in place remedial measures on Lake Horowhenua and Hoko Stream that will ensure these taonga (treasures) hold pride of place in the Horowhenua community. The five parties that form the Lake Horowhenua Accord are: Lake Horowhenua Trust, Lake Horowhenua Domain Board, Horowhenua District Council, Horizons Regional Council, and the Department of Conservation.

FUNDING

Lake restoration initiatives have been greatly enhanced with funding and in-kind resource from all Lake Horowhenua Accord parties. The \$1.28 million Fresh Start for Freshwater Clean-up Fund project received \$730,500 from Horizons Regional Council, Horowhenua District Council and industry, as well as \$540,000 from the Ministry for the Environment.

The Clean-up Fund project included the installation of a fish pass over the weir to enable fish to travel between the sea and the lake, the construction of a sediment trap which is predicted to reduce sediment phosphorus loads from streams into the lake by more than 25%, and lake weed harvesting to reduce cyanobacteria blooms. Less blooms will increase the lake's frequency of suitability for swimming over summer and the weed harvesting will also enhance the fishery by reducing the toxicity effects of the lake weed in spring.

Sub-projects through the Clean-Up Fund project included the completion of environmental management plans for all 10 dairy farms in the catchment, sediment and erosion control plans for growers covering 80 per cent of the horticultural land in the catchment, and the building of a boat wash facility to reduce the risk of further lake weed species being introduced to and contaminating the Lake.

MfE have also contributed a further \$980,000 as part of the Te Mana o Te Wai Fund (Te Kakapa Marawa o Māuipoko) towards a \$1.2 million project that will involve a scientific assessment of the lakebed sedimentation and native fish populations, community planting days, an education programme, development of a plant nursery, completion of storm water treatment upgrades and the repairing of fish barriers.



Most recently a \$1.6 million Freshwater Improvement Fund project has been awarded to the Accord Partners. This project, led by the Horowhenua Lake Trust, has co-funding from Horizons, Horowhenua District Council and the Lake Trust, as well as \$842,750 from MfE. The work programme will include assessment and flushing of the stormwater system, establishment of a silt interceptor, shallow groundwater monitoring and implementation of two cultural monitoring programme activities.

Monitoring in 2015 and 2016 found five species of macrophytes within the lake of which two species are exotic. There are currently 12 species of native fish and three introduced species of fish which have been sighted in the Lake Horowhenua catchment. Koura and freshwater mussels are also present.



Annex B: Overview of the rationale for the weed harvesting activity.

Lake weed harvesting was one of the many recommendations of the Horizons & NIWA reports on restoration options for Lake Horowhenua that were incorporated into the Lake Horowhenua Accord, the Lake Accord Action Plan and the Fresh Start for Freshwater Clean-up Fund project for Lake Horowhenua.

Lake Horowhenua is a hypertrophic lake that had a mean trophic level index (TLI) of 6.4 for the 2013-14 year. The lake develops high ammonia concentrations in spring/summer and cyanobacteria blooms in summer.

The lake has two main species of aquatic macrophytes (weeds) – *Potamogeton crispus* (curly-leaf pondweed) and *Elodea canadensis* (Canadian pond weed). Although both weeds are exotic invasive species, they have very different life/growth cycles. *Elodea* is a perennial plant with a clumping growth form. It develops a dense weed bed that eventually reaches the surface. Although the plants flower they do set seed and propagation is entirely from small fragments broken off the surface reaching stems. In contrast, *Potamogeton* is an annual plant that grows from propagules (turions) shed by the mature plants before they die in summer. The propagules germinate in autumn (April –May) and overwinter as low growing plants. In spring these plantlets grow rapidly to reach the water surface. In summer, they flower and produce turions which fall to the lake bed to produce the next year's plants. In mid-summer the mature plants die and collapse onto the lake bed where their decomposition causes anoxia and the release of phosphorus (P) from the sediment beneath the decomposing plant matter.

The weed harvesting operation is viewed as the key project within the overall restoration programme for Lake Horowhenua. Weed harvesting is to be undertaken in the lake to directly break a cycle that is occurring where the introduced lake weed is altering the chemistry of the lake by increasing the pH of the water, lowering the nitrogen concentration and enabling the chemistry to become favourable for phosphorus release from the sediment into the lake. Increased phosphorus and low nitrogen conditions favour the growth of the cyanobacteria in the lake. Cyanobacteria in the lake can be toxic to humans and animals restricting the use of the lake for recreation. Cyanobacteria also impacts on aquatic life. The die off of some of the lake weed in summer also leads to low oxygen levels at the bed of the lake which makes conditions suitable for further release of phosphorus contributing to the cyanobacteria blooms.

The lake weeds influence on pH can also drive a further change in the chemistry of the lake leading to toxic levels of ammonia that can and do kill fish. In 2013/14, ammonia toxicity persisted for a period of several months in summer; however, ammonia toxicity was not observed in the 2014/15 season (according to monthly monitoring data up to January 2015). Figure 1 shows a schematic of the *Potamogeton* growth cycle including the impacts on the lake and how the weed harvesting programme aims to reduce these.

Harvesting the weed aims to reduce the weeds ability to change the pH of the lake as much as it currently does (i.e., less weed equals less photosynthesis) thereby creating conditions in the lake that are more favourable for fish and other aquatic life, including the native lake weeds. Harvesting the weed and managing the removal of the cut weed will reduce or eliminate the development of the high pH that can lead to phosphorus release from the sediment and ammonia toxicity. It will also reduce or eliminate the development of cyanobacteria blooms. Further it will remove part of the nutrient load from the lake. An overview of the weed extent in Lake Horowhenua at various times of the year is shown in Figure 2.

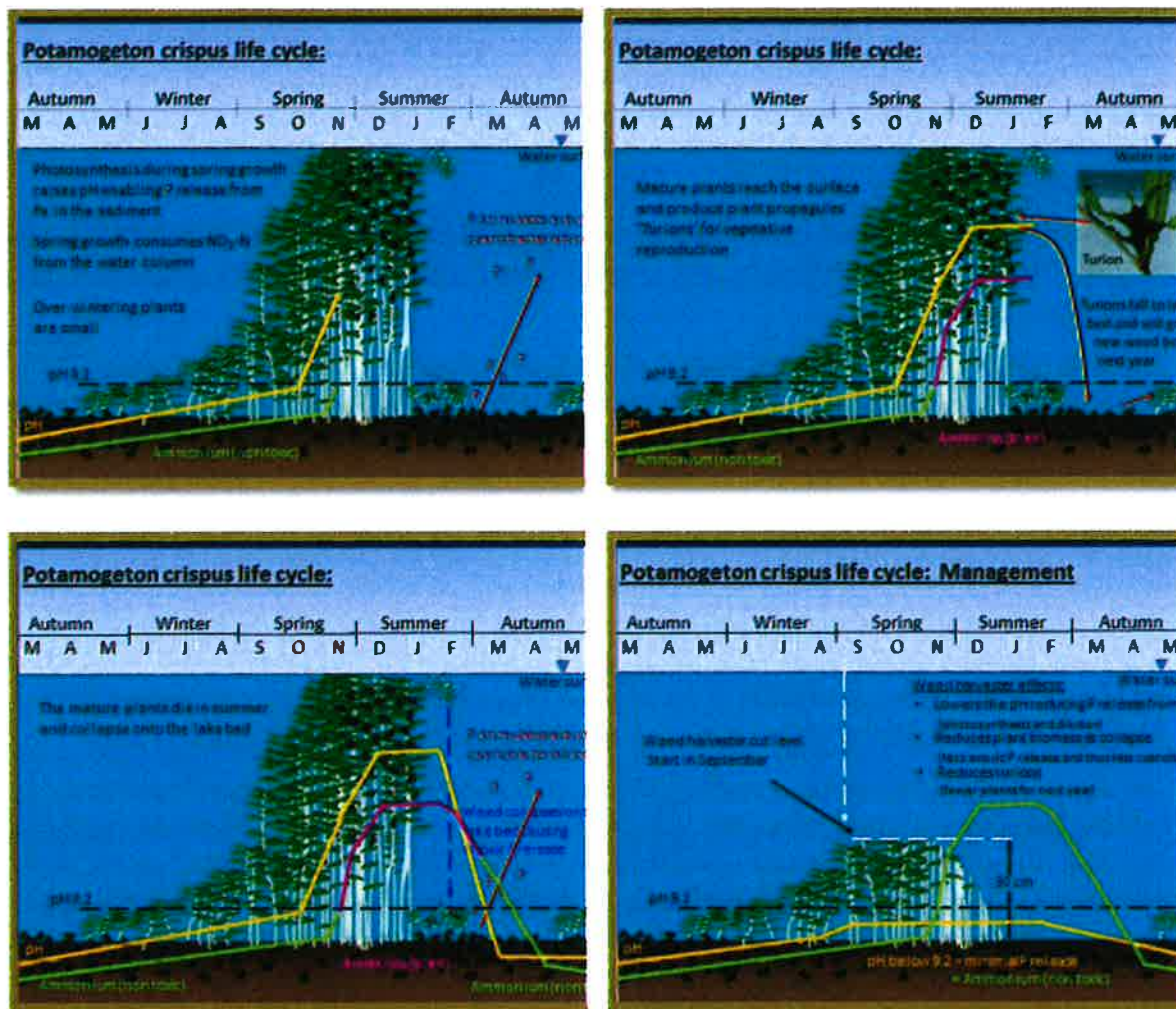


Figure 1: Schematic diagram showing the key parts of the *Potamogeton* life cycle (A) to (C) and the effect of mowing the tops off the weed beds (D).

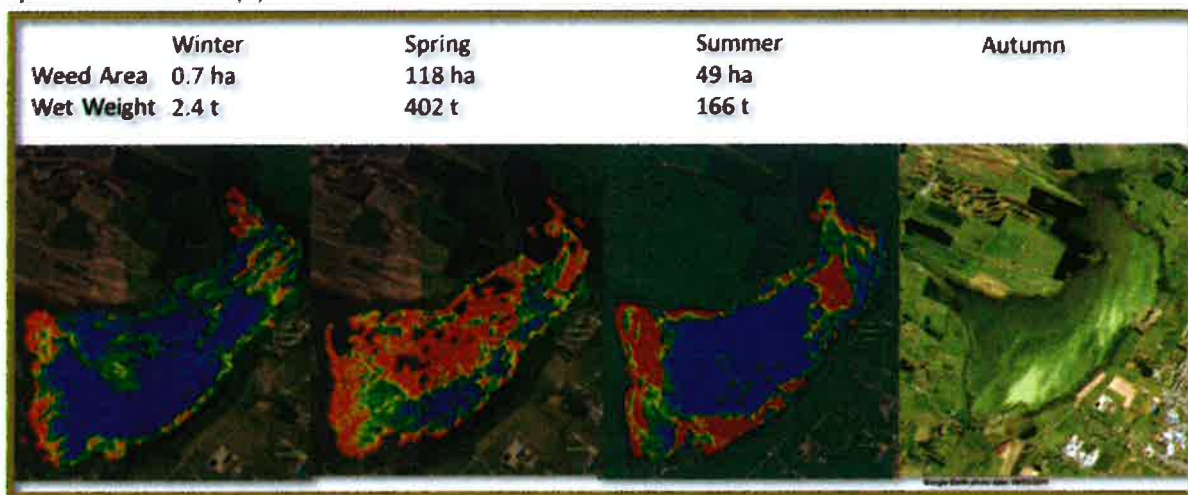


Figure 2: Compilation of three weed mapping surveys arranged to indicate the natural sequence of expansion and decline of the weed beds each year. Surveys are not in chronological order. Red represents 100 % weed cover per unit area and blue represents 0 %. Intermediate colours on a rainbow colour scale represent different percentage cover at those locations.

Annex C: Key results of the sediment legacy project

The Te Mana o te Wai work programme included a project to complete a sediment legacy project to inform the restoration programme. The project was a collaboration between the Lake Trust, Horizons, Massey University and NIWA. The report was completed by NIWA. The sediment legacy project reported that:

- In 1922 the sediment came from the southern inflows (Arawhata Stream and Sand Road drain) and the Queen Street drain;
- In 1942 the sediment originated from the Arawhata Stream and Patiki Stream Catchments;
- In 1962 the sediment originated from the Arawhata Stream and Mangaroa Stream Catchments.
- During the period that sewage effluent was being discharged into the lake, this may have been the source of some of the additional sediment, but it is unlikely to have been the major source. The CSSI isotopic proportions indicate that, in 1972, the sediment originated from the Mangaroa Stream at the northern end of the lake and the Sand Road drain at the southern end of the lake.
- In 1980 the sediment was coming from the Queen Street Drain which is consistent with observations by Gibbs and White (1991; 1994) of very high flows of turbid water in the Queen Street drain and the Arawhata Stream. At that time, the Queen Street drain flow was augmented with water from the Ohau River and also received water from hydroponics (M. Gibbs, NIWA, personal observations).
- Over the last 5 years the sediment results show the Arawhata Stream catchment has been contributing between 48% and 75% of the sediment, and the Mangaroa Stream catchment has been contributing between 20% and 45% over the same period (Figure A). In addition the sediment accumulation rates have increased in recent times as shown in the table below (Table A).

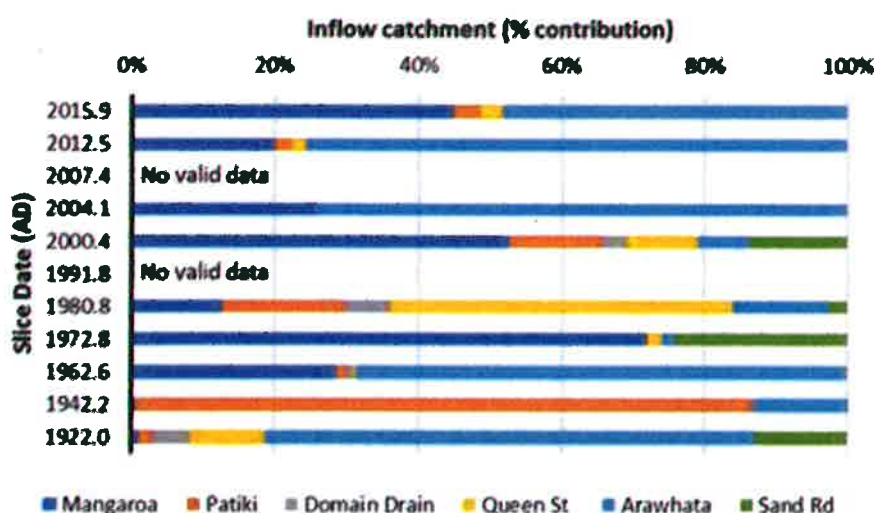


Figure 1 Bar graph of soil proportions showing the relative proportion changes in soil sources contributing to the sediment at site 1. Data from 2007 and 1991 have been omitted as they were not interpretable.

Table 1 Sediment accumulation rates in Lake Horowhenua as determined by the sediment legacy study.

Sediment accumulation rates (SAR) for selected depth / date ranges in the sediment core from Site 1.

Depth range (cm)	Time range (year)	SAR (mm y ⁻¹)
0-1.5	2015-2018	6.2
1.5-3.5	2012-2015	5.9
3.5-10	2000-2012	5.8
10-15	1991-2000	5.2
15-30	1962-1991	5.0
30-40	1942-1962	4.9

Annex D: Key findings of the Kakahi monitoring project.

Kakahi Monitoring in Lake Horowhenua was undertaken as a part of the Te Mana o te Wai Cultural monitoring project.

Kakahi (freshwater mussel) monitoring was completed as a part of the cultural monitoring project of the Te Mana o Te Wai Project. The monitoring was undertaken by NIWA in November 2017 as a joint project between the Lake Trust, NIWA, and Horizons. This monitoring involved divers scuba diving within the lake along transect lines and recovering live kakahi (Photo 1) that they encountered. These were then counted, measured, visually inspected and then replaced in the Lake.

Preliminary evaluation of brood pouch status indicated that 43% were females brooding ripe larvae (glochidia). It was concluded that although adult kakahi are producing larvae in Lake Horowhenua recruitment failure is probably occurring with poor or no survival of either larvae and/or juveniles. A likely cause of recruitment failure is poor water quality, specifically elevated pH and ammonia concentrations during the summer larval release period. Other factors may be contributing including reduced populations of host fish and/or sedimentation in juvenile habitat.

In addition, the presence of many dead adult mussels *in situ* in the sediment suggests that adult survival is also decreasing in recent years. The adult mussels may simply be aging and reaching the end of their life span or they may be affected by multiple stressors in Lake Horowhenua, particularly degraded water quality and sedimentation. The results indicate that without in-lake interventions such as lake weed harvesting, the kakahi populations in Lake Horowhenua will eventually become extinct.

The Lake Accords interventions have targeted these potential causes of low recruitment including:

- The lake weed harvesting aiming to address the elevated pH and ammonia concentrations;
- Work to improve fish populations and diversity in the lake including the fish pass work and lake weed harvesting to address toxicity impacts on fish populations; and
- Work to target sediment reduction including installation of the sediment trap, work with Horticulture growers and the recent sediment study to inform sediment management.



Photo 1: Kakahi encountered from Lake Horowhenua during November 2017. Kakahi were returned to the water after measurement.

Annex E: Pest Fish Survey results

The pest fish survey was undertaken as a requirement of the consent conditions for the fish pass on the Hōkio Weir (Photo 1). Horizons was required to identify changes in the abundance, composition and size structure of pest fish species present in Lake Horowhenua as a result of the fish pass installation. This project also formed part of the work programme for the Te Mana o Te Wai project and was a collaboration between the Lake Trust, Horizons Regional Council and Niwa.

Gill net surveys were carried out in April 2017, prior to the installation of the fish pass, and during April and May 2018, a year post-completion of the fish pass.

Across 2017 and 2018, the main fish species captured in the gill nets were perch (2,420) and goldfish (266), with lower numbers of mullet (30) and rainbow trout (2) recorded. The perch were predominately large adult fish ranging between 350 and 500 mm and the goldfish population were predominately between 150 and 200 mm.

Monitoring indicated that populations of the main pest fish species recorded in Lake Horowhenua (perch, goldfish and koi carp) are all below the threshold density of 50 kg per hectare specified by consent conditions. Based on the current population structure and biomass of perch and goldfish there is no evidence to suggest that the abundance of these species within Lake Horowhenua has increased since 2017 as a direct result of the fish pass installed at Hokio weir.

Although koi carp are a difficult species to capture and all fishing methods will underestimate their abundance, the continued difficulty in capturing koi carp within Lake Horowhenua since 2013 suggests this species remains at densities below those known to cause adverse ecological impacts. It should also be noted that once resident in a lake, perch, goldfish and koi carp will readily breed and form self-sustaining populations. In this regard, changes in abundance and size structure can naturally occur independent of immigration into the system via the fish pass at Hokio weir.

Annex F: State and Trends of Water Quality in the Lake Horowhenua Catchment

Prepared by Maree Patterson,
Senior Scientist – Water Quality
Horizons Regional Council

September 2018

Introduction

The state and trends of water quality for the Lake Horowhenua Catchment has recently been assessed by Land, Water, People Ltd. as part of the Regional State and Trends of Water Quality Report. This Annex presents the current State and Trends of water quality in the catchment utilising Horizons state of the environment water quality data to 30 June 2017 for the Lake, the inflowing tributaries and the Hōkio Stream at the outlet of the Lake.

Trends

Gaps in the data as a result of health and safety issues and sampling access hinder the ability to assess trends in water quality for the Lake and tributaries. As such only trends in MCI are able to be reported. Over the 10 year period 2007 – 2017 All sites monitored for Macroinvertebrates (Lake Outlet, Patiki and Arawhata Streams) have too much noise in the data to determine a trend with confidence. However, both the Hōkio at Lake Outlet and Patiki Stream are indicating a general degradation in the Macroinvertebrate Community Index (MCI) over the period.

State

The state of water quality for the 5 year period (1 July 2012 – 30 June 2017) has been assessed against both the water quality targets identified in the One Plan (as a pass/fail) and against the attribute state bands in the National Objectives Framework (NOF) (NPS-FM, 2017).

The assessment against the One Plan targets are presented in Table 1 and Table 2.

- Ammoniacal nitrogen targets are met in both the Lake and the tributary streams.
- *E. coli* targets are met in the Lake but not in the tributaries with the exception of the Hōkio Stream at Lake Outlet during the bathing season.
- Nutrient targets are almost uniformly not met in the Lake and tributaries
- Where monitored the tributary stream fail to meet MCI targets.
- Clarity is uniformly not met in the tributaries.
- The Lake does not meet targets for chlorophyll *a*.

The assessment against the NoF is presented in Table 3 and Table 4.

- The Lake is below the national bottom line for all trophic status (nutrient and algae) attributes assessed.
- The tributaries are band E for *E. coli* with the exception of the Hōkio at Lake Horowhenua which is band B.
- Nitrate in the tributaries is band B or C with the exception of the Arawhata which is band D.
- Ammoniacal Nitrogen in the tributaries is spread across bands A-C.
- MCI compared to the Stark bands is poor (<80) at the Arawhata Stream and Hōkio at Lake Horowhenua sites and fair (<81 – 100) at the Patiki Stream site.

Table 1: Assessment of the water quality data for Lake Horowhenua against the One Plan Targets. Green means the site meets the specific target and red means the target is not met at the site.

Site Name	Chlorophyll <i>a</i> (average)	Chlorophyll <i>a</i> (maximum)	Total Nitrogen	Total Phosphorus	Ammoniacal Nitrogen	<i>E. coli</i> bathing	<i>E. coli</i> Year round
Lake Horowhenua	Fail	Fail	Fail	Fail	Pass	Pass	Pass

Table 2: Assessment of the water quality data for the Lake Horowhenua tributaries against the One Plan Targets. Green means the site meets the specific target and red means the target is not met at the site.

Site Name	Clarity	SIN	DRP	MCI	Ammoniacal-N (Max)	Ammoniacal-N (Mean)	<i>E. coli</i> (Bathing)	<i>E. coli</i> (year round)	Dissolved Oxygen Saturation
L Horowhenua Inflow at Lindsay Road	Fail	Fail	Fail	Not assessed	Pass	Pass	Fail	Fail	Fail
Patiki Stream at Kawi Road	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Fail	Fail
L Horowhenua Inflow at culv d/s Queen St	Not assessed	Fail	Pass	Not assessed	Pass	Pass	Fail	Fail	Fail
Queen Street Drain at L Horowhenua	Fail	Fail	Fail	Not assessed	Pass	Pass	Fail	Fail	Fail
Makomako Road Drain at L Horowhenua	Fail	Fail	Fail	Not assessed	Pass	Pass	Fail	Fail	Pass
Arawhata Drain at Hōkio Beach Road	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Fail	Fail
L Horowhenua Inflow at Hōkio Sand Rd	Fail	Fail	Fail		Pass	Pass	Fail	Fail	Fail
Hōkio at Lake Horowhenua	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Fail	Fail

Table 3: Assessment of the water quality data for Lake Horowhenua against the NoF Targets. Green = Band A, Yellow = Band B, Orange = Band C, Red = Band D (below national bottom line) and Dark Red = Band E (for *E. coli* only).

Site Name	NOF: Lake Phytoplankton (Median)	NOF: Lake Phytoplankton (Max)	NOF: Lake Total Nitrogen	NOF: Lake Total Phosphorus	NOF: Ammoniacal Nitrogen
Lake Horowhenua	D	D	D	D	Not assessed

Table 4: Assessment of the water quality data for the Lake Horowhenua tributaries against the NoF Targets. Green = Band A, Yellow = Band B, Orange = Band C, Red = Band D (below national bottom line) and Dark Red = Band E (for *E. coli* only).

Site Name	<i>E. coli</i> combined	Nitrate combined	Ammoniacal- N combined
L Horowhenua Inflow at Lindsay Road	E	B	C
Patiki Stream at Kawi Road	E	C	A
L Horowhenua Inflow at culv d/s Queen St	E	C	B
Queen Street Drain at L Horowhenua	E	C	A
Makomako Road Drain at L Horowhenua	E	C	A
Arawhata Drain at Hōkio Beach Road	E	D	B
L Horowhenua Inflow at Hōkio Sand Rd	E	B	B
Hōkio at Lake Horowhenua	B	B	C

Annex G: Health and Safety Risk Management Considerations for the Lake Horowhenua Accord Work.

Prepared by Dave Griffith, HR Development.

August 2018

Introduction

This document relates to the health and safety implications for the ongoing work done as part of the Lake Horowhenua Accord and Action Plan. This advice is from the viewpoint of Horizons Regional Council and its health and safety obligations towards its workers, other stakeholders' workers and the public.

Work carried out under the Accord includes – fish pass construction; sediment traps; weed harvesting on the lake; agricultural impact reduction initiatives; water quality monitoring, lake bed analysis and plant nurseries.

Operational Challenges

Since the implementation of the Action Plan there has been increasing opposition to the work from some members of the community. Horizons workers have been subjected to actual physical violence, threats and intimidation. The work being carried for the improvement of the lake and its surrounds is a statutory obligation, reducing the ability to simply cease to do the work. While some the initiatives have been halted in the interests of the health and safety of workers, this has been considered a temporary measure. For the full work programme to commence again there would need to be additional risk management solutions put in place to protect workers and others from further violence and intimidation.

Governance – Health and Safety Perspective

Horizons Regional Council is a Person Conducting a Business or Undertaking (PCBU) under the *Health and Safety at Work Act 2015* (HSWA). As a PCBU, Horizons Regional Council has a primary duty of care to 'ensure so far as reasonably practicable, the health and safety of workers who work for the PCBU' and also 'that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking'. Under the HSWA, workers are identified as employees, contractors, sub-contractors and some volunteers (where a volunteer is an integral part of the organisation).

The HSWA appoints Officers of the PCBU to take on the responsibility for achieving the primary duty of care. For Horizons, the Officers of the PCBU are the elected members and the Chief Executive. The Officers of the PCBU are given six due diligence obligations that demonstrate that they are meeting the requirements of the HSWA. In relation to the Lake Horowhenua Accord work, the most relevant due diligence obligation is 'to ensure that the PCBU has available for use, and uses, appropriate resources and processes to eliminate or minimise risks to health and safety from work carried out as part of the conduct of the business or undertaking'.

It is important to note that under the HSWA 'Health means physical and mental health'. Physical and mental health has equal standing when it comes to meeting our health and safety obligations and managing risk.

Operational Risk Management

The HSWA requires that 'a PCBU who manages or controls a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace, and

anything arising from the workplace are without risks to the health and safety of any person'. From an operational perspective, given the level of potential mental and physical harm that Horizons workers have been subjected to, there needs to be additional consideration given to the controls in place for minimising risk when the work is carried out. The current controls, although extensive have failed to mitigate the potential for mental and physical harm to occur. If work is to be recommenced in some of the areas where it has been temporarily halted, then management must be confident that 'all reasonably practicable steps' have been put in place to prevent further harm.

Working with other PCBU's

Horizons has other options at its disposal for the delivery of the required services as part of the Lake Horowhenua Accord Work. They could directly engage contractors to carry out the work, or take a further step back and provide grant funding for other stakeholders to facilitate the work. In both cases Horizons cannot extract itself completely from its obligations under the HSWA. PCBU's working together on a piece of work or a work programme need to 'so far as is reasonably practicable, consult, co-operate with, and co-ordinate activities with all other PCBUs who have a duty in relation to the same matter'. This means all the PCBU's involved have a stake in meeting the primary duty of care for the health and safety of workers and other persons.

If Horizons is engaging others to complete the work on their behalf in place of Horizons employees, there will still be a requirement for them to consult, cooperate and coordinate with the PCBU's they are partnering with. This includes sharing information on the risks involved in the work and the agreeing the control measures that will prevent harm. Regardless of who carries out the work, Horizons will not be able to remove itself completely from its duty of care under the HSWA.

Report No.

18-198

Decision Required

INTEGRATED SEDIMENT AND DRAINAGE MANAGEMENT PLAN FOR THE ARAWHATA

1. PURPOSE

- 1.1. This item seeks council approval to scope and price the development of an integrated sediment and drainage management plan for the Arawhata Catchment that flows into Lake Horowhenua.

2. EXECUTIVE SUMMARY

- 2.1. The Arawhata sub-catchment is the most significant source of sediment to Lake Horowhenua. The sub-catchment is within a target catchment for the One Plan nutrient management rules and has some of the highest nitrate concentrations of the monitored sites within Horizons monitoring network. The issues of sediment and nutrient management in the catchment are inextricably linked with the movement of water in the catchment over land and through the various drainage networks.
- 2.2. The Hōkio Drainage Scheme was traditionally a very small scheme of approximately 350 ha that focussed on a few major tributaries flowing to Lake Horowhenua and a small part of the Hōkio stream that is the single outflow from the lake to the sea. A review by Horizons in 2008 lead to the expansion of the scheme in 2009 to include the whole catchment, approximately 4,527 ha, including remnants of the Ohau water race that are in the Arawhata sub-catchment and the Hōkio stream to the sea.
- 2.3. The Arawhata Catchment is small and the flow within it is increased due to the linkage with the water race that previously conveyed water from the Ōhau River to the area providing stock water and additional flow into Lake Horowhenua. During the 1980's, the Horowhenua District Council ceased to manage this and handed management back to the landowners. Part of the recommendation for expanding the Hōkio Drainage Scheme was the ongoing issues around parts of the old water race being infilled. Incorporating this area into the Hōkio Drainage Scheme has provided the opportunity to return to a more coordinated management approach.
- 2.4. There has been a coordinated cross organisational approach to the management of the drainage and water quality issues within the scheme, with early work focussing on the Hōkio Stream clearing willows, fencing the waterway and planting native plants in the riparian margins. Other activities have included the completion of farm plans for all of the dairy farms in the catchment, prior to the consenting of the dairy farms as a part of the implementing the nutrient management rules of the One Plan. In relation to the sedimentation and drainage issues of the Arawhata sub catchment, the work programme to date has:
- made significant progress on understanding the issue through a full survey of the drainage scheme, development of drainage and erosion management plans for the majority of the horticultural land in the sub-catchment, work with the horticultural growers to understand the drainage issues, monitoring of water quality and flow in the catchment and an audit of compliance of the Horticulture growers in relation to the cultivation rules of the One Plan.
 - progressed on the ground implementation including work on horticultural and dairy farms, the drainage scheme and constructing a large scale sediment trap at a downstream point in the Arawhata sub-catchment.

- attracted nationally funded science projects to work in the catchment including:
 - Landcare Research work to understand the efficacy of different mitigation options for horticulture farms to reduce sediment loss;
 - the newly established Sustainable Farming Fund project, Future Proofing Vegetable Production, that is focussing on reducing nitrogen loss from farms; and
 - an associated PhD study, funded by Massey University and Horizons that is set to start soon, working alongside the Sustainable Farming Fund project.
- 2.5. Overall there has been progress made, however there is still work to be done. There are limitations of the current network in providing land drainage and in minimising sediment discharge to the Lake. In some cases, the farms are struggling to manage water coming onto the property from roads or other properties due to a lack of drainage capacity, or complete lack of drainage. There are also issues of the drains overflowing onto cultivated land and eroding soil into the drainage network and issues of flooding on roads during and following storm events.
- 2.6. Scope exists for a more coordinated approach to drainage and the work on farm including an upgrade of the current drainage system, which is in the majority the remnants of the old water race, into a designed drainage system that integrates with the drainage on farms. A revised design could plan placement of mitigations to reduce sediment input into the drains and further sediment traps and other features within the network to capture sediment. This item seeks Councils approval to scope and price a work programme to do this, with a view to providing the option to Council to do this work, seeking funding from rates reserves or via an upcoming annual plan process.

3. RECOMMENDATION

That the Committee recommends that Council:

- a. receives the information contained in Report No. 18-198 and Annex.
- b. endorses the scoping and pricing of a work programme to develop an integrated management plan for drainage and sediment management in the Arawhata catchment.

4. FINANCIAL IMPACT

- 4.1. There is a limited financial impact of this item due to the staff time component of scoping a work programme and working through an external procurement process to identify potential providers and the likely costs of the work. Some financial provision for this work, albeit of a lesser scope than this item envisages, exists in Year 3 of the Long Term Plan.

5. COMMUNITY ENGAGEMENT

- 5.1. The issue of sediment management in the Arawhata has been a topic of a range of work programmes including, the Hōkio Drainage Scheme meetings and work related to the Lake Horowhenua Accord and associated Clean-up Fund and Te Mana o te Wai programmes. The issue has also been subject to some media comment. This item is a public item and provides for further communication around this issue.

6. SIGNIFICANT BUSINESS RISK IMPACT

- 6.1. This item is not considered to have a significant business risk impact. The item seeks to provide a further step to addressing an issue that impacts production with the catchment

and also impacts on water quality management and outcomes in the Arawhata, Lake Horowhenua and the Hōkio stream. Accordingly the impacts are considered to be positive.

- 6.2. The work is outside of the area that is administered by the Lake Trust on behalf of the Beneficial Owners of the lake. This project is largely based on roadsides and private land and may therefore be subject to a lower level of opposition than some of other lake restoration activity has experienced in recent years.

7. BACKGROUND

- 7.1. Sediment and drainage management in the Arawhata is a key issue for both horticultural production and water quality outcomes for the lake.

Sediment is a key issue for the catchment

- 7.2. The Arawhata Stream is the major contributor of sediment to Lake Horowhenua. This hasn't always been the case and during the time the water race was operating (e.g. in the 1980's), it has been reported that the Queen Street drain was the largest contributor.
- 7.3. Horizons monitoring of the water quality and flow of the major tributaries of the lake on a monthly basis clearly shows that the Arawhata Stream is the largest contributor of sediment and phosphorus to the lake. Further, the data shows the significance of large storm events as a major contributor of sediment and phosphorus load to the lake compared to the smaller events that occur more frequently (Annex A).
- 7.4. A more recent study has confirmed the Arawhata is currently the major contributor of sediment to the lake. The study was completed as a part of the Te Mana o Te Wai project for Lake Horowhenua led by the Lake Trust was completed in collaboration with Massey University and NIWA, with Horizons managing the contract with NIWA for the delivery of the final science report. The report analysed sediment cores from the lake and found that over the last 5 years, the Arawhata Stream catchment has been contributing between 48% and 75% of the sediment, and the Mangaroa Stream catchment has been contributing between 20% and 45% over the same period (Annex A). In addition the sediment accumulation rates have increased in recent times as shown in the table in Annex A.
- 7.5. The sediment on its own is an issue for the lake, however the phosphorus that accompanies it is also a key issue for the lake. The regular combination of low nitrogen and increased phosphorus in the lake in summer provides suitable conditions for cyanobacteria growth that leads to the closure of the lake for recreational purposes and impacts on aquatic life in the lake. The monitoring data in Figure 1 of Annex A shows that almost all of the phosphorus that enters the lake from streams, comes in during large events. The total phosphorus entering the lake is not immediately plant available, but can be converted to plant available form when the pH in the lake is at certain levels and when the weed dies down creating low dissolved oxygen conditions that enable the release of the phosphorus from the sediments.

Drainage is a key issue for the catchment

- 7.6. The Arawhata Catchment has mixed land use that includes lifestyle blocks, dairy farming and approximately 400 ha of horticultural land use (Figure 1).
- 7.7. The catchment drainage is largely based on the old water race system that transferred water from the Ōhau River to the land within the catchment and also discharged water to Lake Horowhenua. The water race also provided a drainage network, however this was not its primary purpose. The water race was disestablished by Horowhenua District Council in the 1980's and landowners were then allowed to fill in sections of the water race on their properties.
- 7.8. A review of the scheme undertaken in 2008 identified ongoing issues caused by the closure of the water races and the lack of maintenance on the Hōkio Stream. The review recommended the scheme be expanded to include the whole catchment (approximately

13 November 2018

4,527 ha). This was adopted by Council and the new scheme established as part of the 2009-19 Long Term Plan. Between 2009 and 2014 scheme work focused on improvements in and around the Hokio Stream, in collaboration with the Freshwater Team.

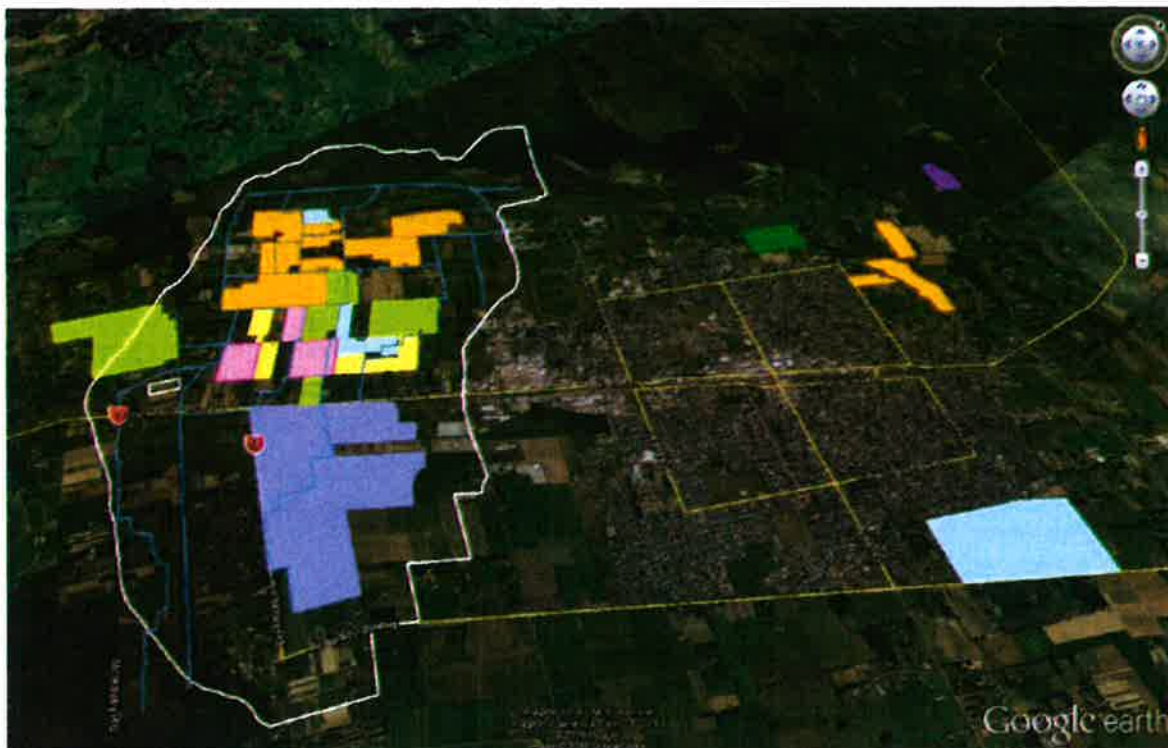


Figure 1: Location of the areas of horticultural land that have been assessed as a part of the Lake Horowhenua Clean-Up Fund project. The catchment area shown in white is the boundary for the Arawhata sub-catchment. Lake Horowhenua is the near the centre top of the image. Source Bloomer 2015.

Some progress on the issue has been made

- 7.9. As a part of the Lake Horowhenua Clean-up Fund project, a cross-organisational team worked on integrating the management of land and the drainage scheme to reduce sediment loads into the lake. This involved surveying the entire network of drains, developing drainage and erosion management plans on horticulture farms and design and construction of a sediment trap at the lower end of Arawhata Stream. This integrated drainage project was done in collaboration with the Tararua Growers Association (horticultural growers), the Ministry for the Environment and the Horowhenua District Council.
- 7.10. The survey work identified the extent of the issue including:
- where drains simply ended in locations where some land owners had filled them in;
 - the small size of the majority of the drainage network; and
 - the ad hoc development of drainage on farm to link to the drainage network
- 7.11. The survey work and conversations with the local growers led to the Hōkio Drainage Scheme investing \$315,000 in an initial phase of better adapting the water race into a drainage network. This involved increasing the size of drains and a number of culverts in the catchment and some minor drainage improvements with the focus on reducing the risk of overland flows caused by capacity constrictions. The investment was significant compared to the annual operational spend of the scheme which is in the order of \$30,000 per year.
- 7.12. Alongside this work, Horizons has completed or collaborated on other work to further understand the issue including:

- Installing a new flow recorder in the catchment (near the sediment trap) to monitor water level, flow and water quality through monthly measurement including sediment measures.
 - A detailed sedimentation study of Lake Horowhenua in partnership with the Lake Trust, Massey University and NIWA (Annex A).
 - Landcare Research completing some research work into the effectiveness of several edge of field mitigations for sediment loss on horticulture farms in the catchment.
- 7.13. Drainage and Erosion Management Plans (DEMPs) have been completed for eight horticultural growers within the Lake Horowhenua Catchment. Twenty DEMPs were produced covering 82% or 368 ha of the total area assessed (446 ha). In the Arawhata area, 15 plans covered 81% of the estimated 404 hectares cropped in the sub-catchment (Figure 1). The blocks without specific DEMPs were very similar to nearby properties operated by the same grower. There has been some rapid implementation of aspects of these plans, however the overall level of implementation has not been assessed. There are indications that the limited functionality of parts of the drainage network is impeding further progress as there is not anywhere to direct water flowing from paddocks, and in some cases the limitations of the drainage network is resulting large scale overland flow.
- 7.14. Horizons has constructed a sediment trap near the outlet of the Arawhata Stream to the lake. Modelling indicates that this sediment trap will remove more than 50 percent of the sediment from the Arawhata Stream, with the design focussing on coarse sediment. Overall the modelling indicates that this will lead to a 25% decrease in sediment load to the lake from all streams that flow to the lake and a 30% reduction to the phosphorus load to the lake from streams. Further work to enhance the sediment traps efficacy and to measure this is underway in 2018-19.

8. DISCUSSION

- 8.1. The issue of drainage and sediment management in the Arawhata Catchment are closely linked. While progress has been made in understanding the issue and taking initial steps to address the issue, there is still considerable work to do. The old water race system is unable to fully cope with large storm events due to a size that was designed for delivery of stock water. The issue is further exacerbated by parts of the water race being blocked in places. In some parts of the catchment there is little in terms of drainage infrastructure, particularly alongside some roads. The interchange of water from roads, roadside margins and paddocks can lead to areas of land or roads being flooded and the loss of soil from cultivated land into the drainage network.
- 8.2. This paper proposes the development of an integrated drainage and sediment management plan for the catchment to provide for improvements to both the drainage in the area and also the management of sediment. This work would seek to better optimise the drainage network, recommend on farm works and mitigations, and also provide options for sediment management on farms and in the drainage network including vegetation or other edge of paddock sediment mitigation measures and sediment traps.
- 8.3. The project would seek to engage with local landowners and key agencies/organisations to develop a detailed plan. It is envisaged that this spatial planning approach would seek to reach a level of relatively fine detail around network functionality. The development of the plan may require gathering of some further data within the catchment, however the aim would be to primarily use existing information from the existing survey work of the drainage system, the available Lidar data, the drainage and erosion management plans, water quality data and hydrological information (such as rainfall, water levels and flow). Further, the plan would scope prioritise and cost an implementation plan.

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9. TIMELINE / NEXT STEPS

- 9.1. If Council approve proceeding with this work, further scoping of the work will be completed and a procurement process will be undertaken. Once the scope and costings have been further developed, staff will bring an item to council to consider if the work should proceed and how it would be funded.

10. SIGNIFICANCE

- 10.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Jon Roygard

GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

Ramon Strong

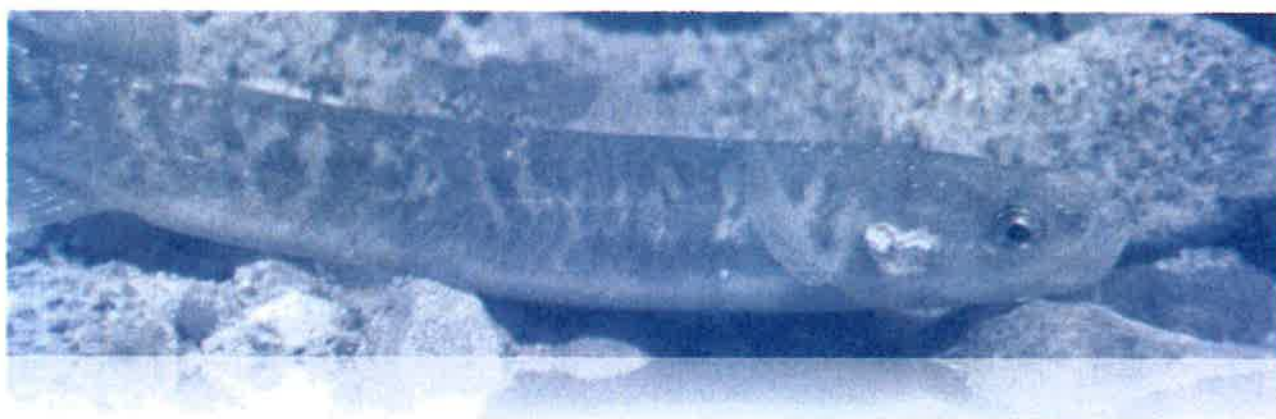
GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

Nic Peet

GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

ANNEXES

- A Sediment and Phosphorus Inputs to Lake Horowhenua



FRESHWATER ACTIVITY

1 Waterway Enhancement & Protection

1.1 Activity Overview

Horizons' Freshwater Team is a small group that works closely with other Horizons teams and people external to the organisation, to implement water quality improvement works. The team draw on the scientific monitoring work carried out by Horizons and other agencies to prioritise and focus implementation efforts. The team works with landowners and a number of external agencies, including iwi/hapū, district and city councils, central government, industry and community groups to undertake collaborative projects. The team also actively seeks funding from other sources, allowing the acceleration of works.

The team's main activities include riparian fencing and planting for water quality improvement and fish habitat enhancement, including the identification and enhancement of whitebait spawning habitat and fish passage improvement (Table 1 and Figure 1). Other activities include a wide range of works on projects such as the Manawatū River Leaders' Accord, Lake Horowhenua Accord, and **Freshwater Improvement Fund** (FIF) projects; these works include sewage treatment plant upgrades and lake weed harvesting.

Table 1 Summary of riparian fencing and planting in 2018-19 financial year.

	Riparian Fencing				Riparian Planting			
	Target	Allocated	Completed	Percentage complete to target	Target	Allocated	Completed	Percentage complete to target
		Km	Km	%		Plants	Plants	%
Regional	12	22.656	10.918	91	20,000	40,842	14,761	74
Manawatū	50	59.3	21.8	42	40,000	51,328	21,108	52
Whangaehu	17	20.796	0.895	5.3	3,333	7,925	225	7
Total	69	102.75	33.613	48%	63,333	100,095	36,094	57%

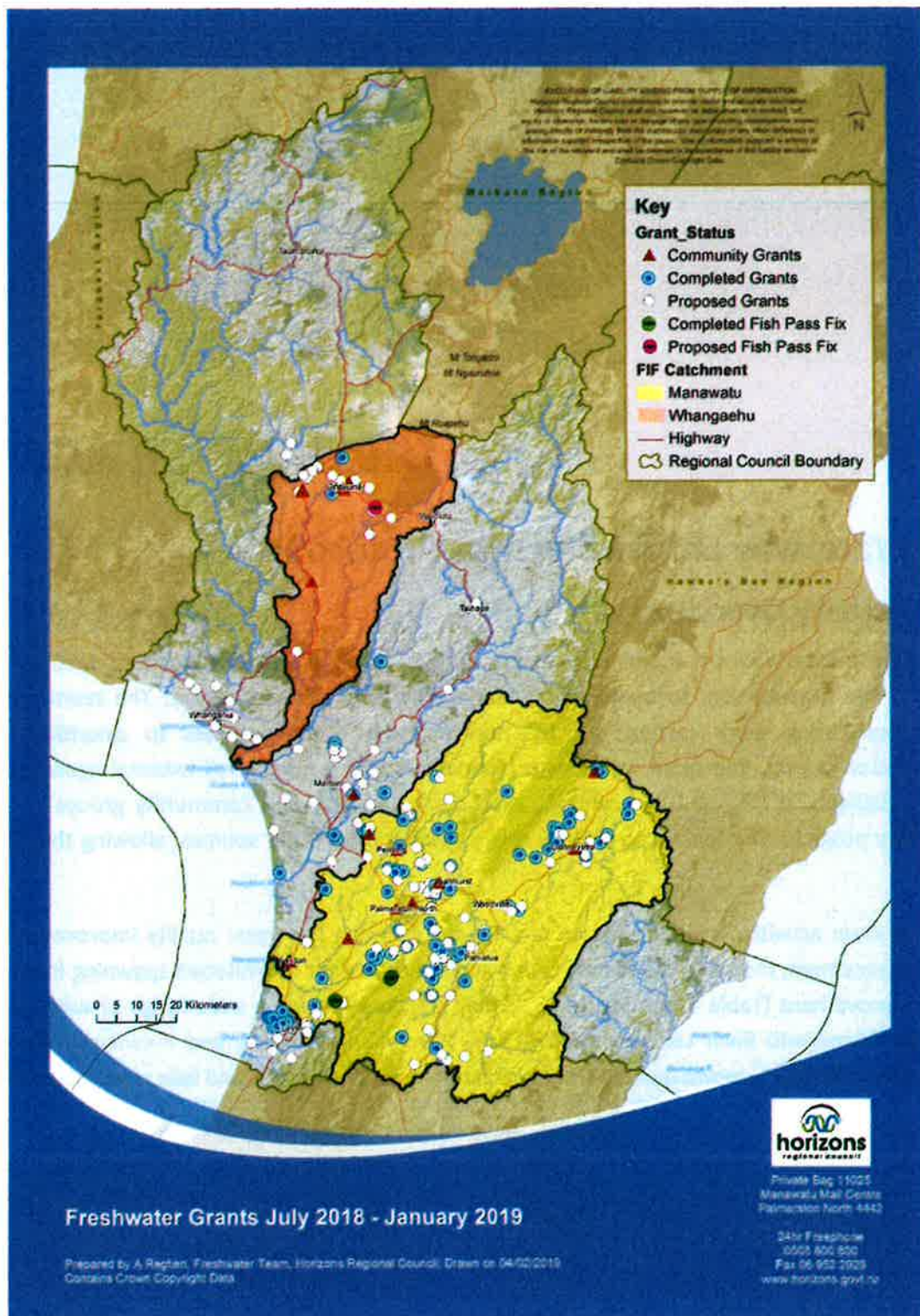


Figure 1 Location of the completed Freshwater Grants works for 2018-19, including the Regional, Manawatu and Whangaehu programmes. Each point on the map represents one fencing, planting, fish pass or community project.

2 Manawatū River Accord/Freshwater Improvement Fund

2.1 Activity Overview

- 2.1.1 The Manawatū River Leaders' Accord Action Plan includes an array of activities related to improving water quality, to achieve the goals of the Accord. This activity funds works to improve water quality in the Manawatū Catchment as part of the Accord, including excluding stock from streams, riparian planting, improving fish passages and supporting community projects. During this financial year and the following four years the targeted rate is to be used as Horizons' contribution to the Freshwater Improvement Fund project.

2.2 Targets

Table 2 Annual Plan performance measures and assessment against the year-end for 2018-19 for the Manawatū FIF project.

Measure	Year to date	Target	% Complete	% Allocated
Stream fencing (km)	21.8	50	43.6%	118% (59.3 km)
Riparian plants	21,108	40,000	53%	128% (51,328)
Fish barrier remediation	5	4	125%	125%
Community project funded	0	9	0	100%

2.3 Activity Highlights

Manawatū River Leaders' Accord and Action Plan

- 2.3.1 The Manawatū River Leaders' Accord Forum was held on 16 November 2018, just prior to the launch of the new Manawatū River website and release of the progress report. The next forum will be held in May 2019.
- 2.3.2 The inaugural Manawatū River Festival was held at Hardies Street reserve on the banks of the Manawatū River on the 24 November 2018 and was well attended. Photos from the day are on the website www.manawaturiver.co.nz. The progress report was officially released at the River festival.
- 2.3.3 The second quarterly report for the Manawatū River Freshwater Improvement Fund has been completed and was submitted to the **Ministry for the Environment** (MfE) at the end of January 2019.
- 2.3.4 Fridge magnets advertising the riparian fencing and planting programme were delivered to 8,096 rural mail boxes in December. This resulted in a small number of enquiries just prior to the Christmas break and we hoped to receive more enquiries after the holiday period.
- 2.3.5 Five barriers to fish passage have been fixed during this reporting period (Photo 1 to Photo 7). This includes three culvert replacements in the upper Kahuterawa Catchment where culvert size

was increased and all were lowered below the stream bed level. The other two fixes were in the Mangaone Catchment where a fish pass was installed on a weir which was increased in height to back flood a culvert thus eliminating the perch.

2.3.6 All nine of the community projects approved during October 2018 were sent contracts that have been returned and each project has been assigned a Freshwater Team member to be the Horizons contact. Regular contact will be made to see how projects are progressing. Draft reporting templates for community projects have been prepared and are undergoing reviews prior to being circulated to parties to enable them to fill in as projects are completed. The preparation of a reporting template is to make reporting consistent across projects and also to simplify the requirements for community groups.

2.3.7 The successful applicants and projects are:

- B & P Drysdale and Te Kauru – continuation of riparian fencing and planting of the source of the Manawatū River (near Norsewood);
- New Zealand Landcare Trust – riparian fencing and planting in the Stoney Creek catchment;
- Mangaone West Landcare Group – riparian fencing and planting in the Mangaone West catchment;
- Dannevirke Host Lions Club – growing rata to be planted in riparian zones;
- Save Our River Trust – feasibility study for the construction of a wetland to treat water discharged from Kings Canal prior to entering the Foxton Loop;
- Oroua River Catchment Care Group – riparian enhancement and weed control in Timona Park;
- Te Rangimarie Marae – feasibility study into creating an access way to the Oroua Awa from the Marae;
- Manawatū Source to Sea – education and removal of plastic from water; and
- Ngā Kaitiaki ō te Rerenga Rauropi – restoration of Pioneer Highway Stream.



Photo 1 A perched culvert before and after replacement.



Photo 2 Weir on the Otatau Stream and perched culvert on a side stream 5m upstream of the weir.



Photo 3: Installation of a slightly higher weir to flood the perch on the culvert and installation of rock work prior to concreting the rocks in place.



Photo 4 Final placement of rock for the correct gradient and start of concreting after water diversions are in place.

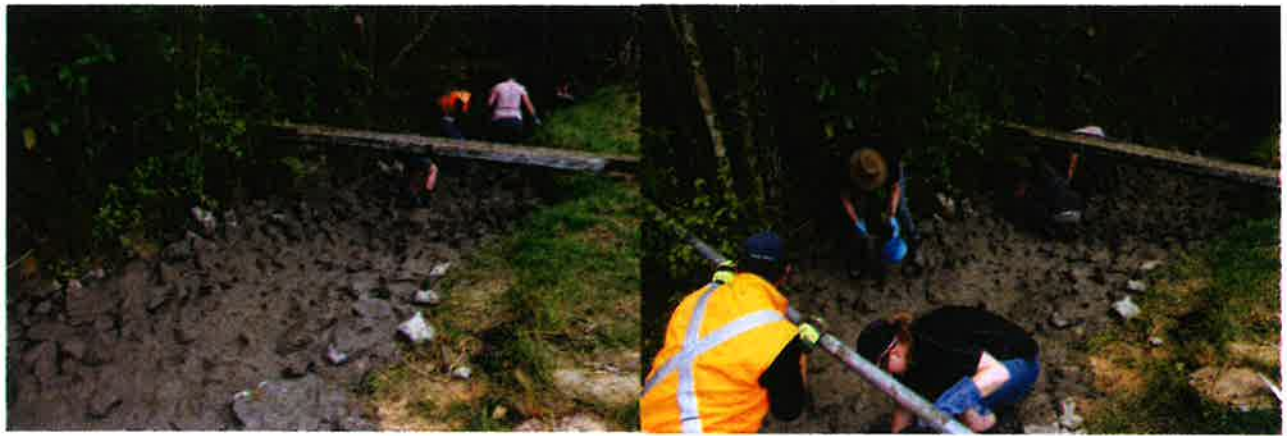


Photo 5 After concreting.



Photo 6 Left, weir after the concrete has dried and the water allowed to flow down the pass; right, raised water level flooding the culvert drop which will allow fish free access to upstream.



Photo 7 Looking through the culvert showing the pooling water, slowing the water velocity to allow fish to migrate through the culvert.

3 Regional Freshwater Programme

3.1 Activity Overview

This programme focuses on the protection and enhancement of waterways across the Region, excluding the Manawatū and Whangaehu FIF projects. The main component of the Regional Freshwater Programme is supporting stock exclusion from waterways via Freshwater Grants, advice and education, riparian enhancement and planting where desirable, aquatic habitat enhancement, and supporting industry and community-led initiatives. A summary of progress against the Annual Plan targets for the 2018-19 year is in Table 3.

3.2 Targets

Table 3 Annual Plan performance measures and assessment against year-end 2018-19 for the Regional Freshwater Programme, excluding the Manawatū and Whangaehu FIF projects.

Measure	Year to date	Target	% Complete	% Allocated
Stream fencing (km)	10.918	12	91%	189% (22.656)
Riparian plants	14,761	20,000	74%	204% (40,842)
Fish barrier remediation	0	1	0	100%
Community project supported	1	1	100%	100%

3.3 Activity Highlights

Work with individuals, community groups and iwi to improve waterways

- 3.3.1 During the reporting period the focus for the programme has involved working through all enquiries to confirm fencing and planting projects going ahead this financial year, and establish working areas for the new team.

Swim Spots

- 3.3.2 Following high readings for *E. coli* at the Ototoka swim spot, further monitoring along the main stem of the catchment to just north of SH3 is being planned to identify the source of the high readings. The Compliance Team visited all consented dairy farms within the catchment in December and excluded these as a source of the high readings. The Freshwater and Science teams are working with Ngaa Rauru Kiihi to provide an opportunity for cultural observers to attend the monitoring.

Te Mana o te Wai, Nga Puna Rau o Rangitikei

- 3.3.3 In 2018 a Restoration Options Report was completed for Lake Oporoa. One recommendation was to reduce the input of organic matter to the lake from poplars in the catchment.
- 3.3.4 In January 2019 poplar poisoning occurred at Lake Oporoa to be followed up with manuka and lakeside native plantings in winter. Replanting is to ensure that the hillside remains stable and works towards aspirations that the iwi and landowners have for the Lake.
- 3.3.5 Further fencing work is occurring in the Pourewa Catchment with the final aim of undertaking riparian planting along the Pourewa Stream at Rata Marae near Hunterville. Planning is also underway for riparian fencing and planting for two projects on private land along the Stream near Taihape.
- 3.3.6 A number of projects within the Ngā Puna Rau o Rangitikei project are to have signage established to highlight the project and also the joint approach to completing the works. An example of one of the signs to be installed in the next two months is below.

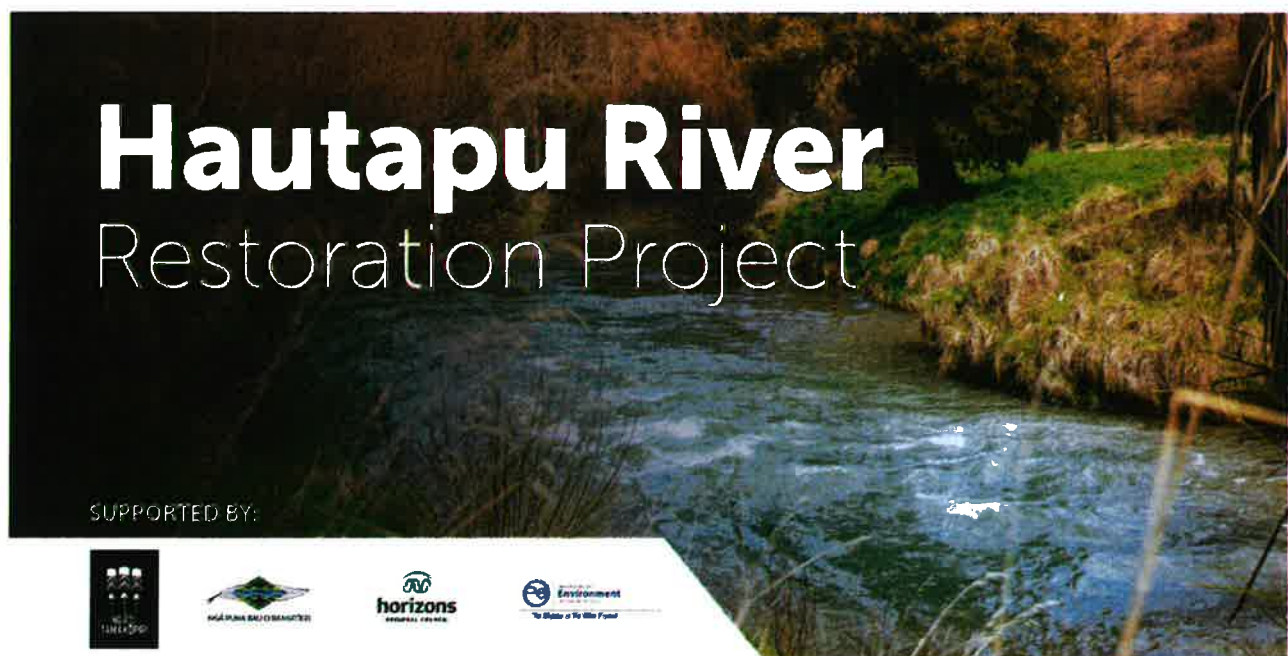


Figure 2 Image of the project sign for the Hautapu River Restoration project.

- 3.3.7 The Ngā Puna Rau project will be presented to the Strategy & Policy Committee meeting in March.

4 Whangaehu Freshwater Improvement Fund

4.1 Activity Overview

This programme focuses on the delivery of the Ngā Wai Ora o Te Whangaehu Freshwater Improvement Fund project, which focuses on the protection and enhancement of waterways within the Whangaehu Catchment. The main components of the programme are supporting stock exclusion from waterways, riparian enhancement and planting where desirable, aquatic habitat enhancement and supporting industry and community-led initiatives.

4.2 Targets

Table 4. Annual Plan performance measures and assessment against year-end 2018-19 for the Whangaehu FIF project.

Measure	Year to date	Target	% Complete	% Allocated
Stream fencing (km)	0.895	17	5.3%	122% (20.796)
Riparian plants	225	3,333	7%	237% (7,925)
Fish barrier remediation	0	2	0%	100 (2)%
Community project funded	0	4	0%	150%(6)

- 4.2.1 A Governance Group meeting was held for the Whangaehu Freshwater Improvement Fund (FIF) project on 17 January 2019 to approve the quarter two report to be submitted to MfE. The report was submitted at the end of January 2019. The next Governance Group meeting is to be held on 17 April 2019.
- 4.2.2 All community projects that were approved during November 2018 have returned contracts and each project has been assigned a Freshwater Team member to be the Horizons contact. Regular contact will be made to see how projects are progressing. Draft reporting templates for community projects have been prepared and are undergoing reviews prior to being circulated to parties to enable them to fill in as projects are completed. The preparation of a reporting template is to make reporting consistent across projects and to also simplify the requirements for community groups.
- 4.2.3 While the project is over-allocated at 20.796 km for a 17 km target, work continues to find further stream fencing to ensure the target is met.
- 4.2.4 Fridge magnets advertising the riparian fencing and planting programme were delivered to 1,141 rural mail boxes in December. This resulted in a small number of enquiries just prior to the Christmas break and we hoped to receive more enquiries after the holiday period.



Figure 3 Fridge magnets delivered to rural delivery addresses in the Manawatū and Whangaehu catchments as part of the Freshwater Improvement Fund projects.

5 Lake Waipu Freshwater Improvement Fund

5.1 Activity Overview

The Lake Waipu Freshwater Improvement Fund project specifically seeks to remove the discharge into the lake from the Rātana Wastewater Treatment Plant. This is to be led by Rangitikei District Council (RDC) as the consent holder and Horizons' project relates to monitoring the effect of the removal of discharge from the lake and to understand the lake's internal processes. The aim is to develop a restoration plan that deals with the legacy issue resulting from the current discharge.

Table 5. Annual Plan performance measures and assessment against year-end 2018-19 for the Lake Horowhenua Accord, including the Freshwater Improvement Fund project.

Measure	Year to date	Target	% Complete
Annual report to Council on the Waipu Catchment Freshwater Improvement Fund project.	0	1	0

- 5.1.1 A working party meeting scheduled for 22 February 2019 involved a visit to the Feilding WWTP land discharge area. This is to allow working party members to gain an understanding of land application of the discharge and how this might work in the Rātana situation.
- 5.1.2 Work continues with the Ministry for the Environment in terms of signing off the Deed of Funding for this project. An important note here is that Horizons will be contracted to the MfE for delivery of the project. However, contracting of Horizons should not be seen by parties as removing the need for a normal resource consent process to allow any proposal to be assessed as required by the One Plan and the Resource Management Act 1991.

6 Lake Horowhenua Accord and Lake Horowhenua Freshwater Clean-Up Fund

6.1 Activity Overview

The Accord is a partnership between the Lake Horowhenua Trust, Horowhenua Lake Domain Board, Horowhenua District Council, Horizons Regional Council and the Department of Conservation to address water quality issues in Lake Horowhenua. Several Clean-Up Fund projects have an ongoing work component. Horizons also had a role in delivering some of the Te Mana o Te Wai projects which were to be completed by October 2018, and a component of the Freshwater Improvement Fund project which started on 1 July 2018.

6.2 Targets

Table 6 Annual Plan performance measures and assessment against year-end 2018-19 for the Lake Horowhenua Accord, including the Freshwater Improvement Fund project.

Measure	Year to date	Target	% Complete
Annual report to Council on lake restoration activity including the Freshwater Improvement Fund project for Lake Horowhenua.	1	1	100%

6.3 Activity Highlights

The Lake Horowhenua Accord, Te Mana o Te Wai and FIF project

- 6.3.1 A comprehensive update on lake restoration activity was provided to Council in September 2018 (Regional Council meeting). This provides the annual report identified in the LTP target. Weed control for purple loosestrife and willows has been undertaken within the sediment trap land.
- 6.3.2 A hearing was held in December 2018 in the Levin District Court for the recovery of costs of approximately \$130,000 associated with the Environment Court hearing and the costs awarded to Horizons. A second hearing is to be held in April to work towards a payment plan, with the following information to be provided prior to the hearing:
- The trustees are to obtain a market appraisal of the rental charged for land and of the existing trees on Hōkio A land;
 - The Trustees are to provide evidence of the expenditure of income earned from the felling of trees on their land; and
 - The Trustees undertake on a best endeavours basis to review the rental agreements with the occupiers of the Hōkio houses.
- 6.3.3 Work on the Heritage NZ and Māori Appellate Court process has been on hold while processes related to the election of the Lake Trust have been subject to court processes. The planned Māori Appellate Court hearing for November has been deferred with a tentative date set for May 2019 which may be further delayed. The Lake Trust election was scheduled for February 2019 and would require a decision by the Court. The requirement for elections has delayed the Lake Trust's input into Heritage NZ and Māori Appellate Court processes. These delays will further delay lake weed harvesting activity for another year with the aim now being for a spring 2020 start to activity. The weed harvesting activity aims to address the generation of cyanobacteria which can close the lake for recreational purposes and also has ecological impacts.
- 6.3.4 Monitoring of the lake by helicopter recommenced in February 2019 after permissions from the interim Lake Trust were granted. The lake was observed to be in a state of cyanobacterial bloom (Photo 8 and Photo 9), the cyanobacteria bloom was potentially avoidable had the weed harvesting activity been able to proceed last year.

- 6.3.5** The lake restoration activity by Horizons is focusing on work with the horticultural sector and drainage and sediment management in the Arawhata Subcatchment. A procurement process is underway to assist with the development of a plan to identify works or actions that will maintain or improve the drainage network effectiveness and water quality outcomes in the catchment.

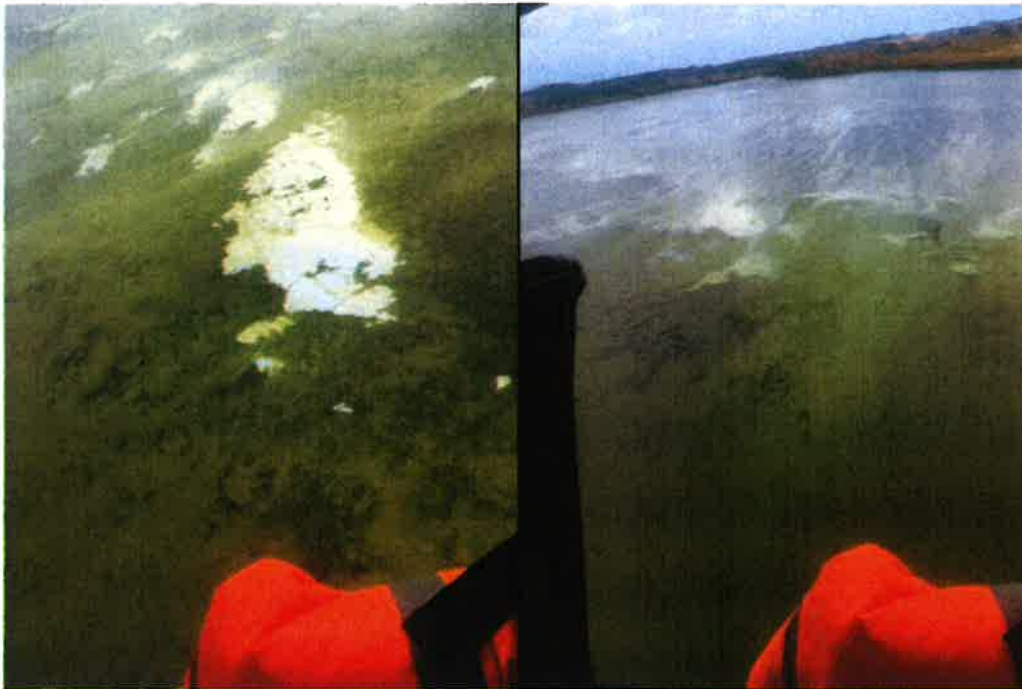


Photo 8 Lake Horowhenua on 18 February 2019 taken from the helicopter; the large white area is clumping of cyanobacteria cells which are breaking down (decomposing) and losing their pigments. This is likely to generate considerable odour.



Photo 9 Algae cells clumping in April 2018, showing what the large floating mat in the above photos comprises.

7 Freshwater Improvement Work with the Horticultural Sector

7.1 Activity Overview

Building on previous work with the Tararua Growers Association as a part of the Freshwater Clean-Up Fund project, Horizons established new funding of \$70,000 per year for work with the horticulture sector to reduce nutrient and sediment loss from horticulture farms. This funding will be used in part to contribute to a **Sustainable Farming Fund (SFF)** project future-proofing vegetable production.

The balance of the funding will be prioritised to implementation of work to reduce nutrient and sediment losses from horticultural farms, including establishment of sediment traps etc, similar to the way freshwater grants are paid for fencing and planting of waterways. This funding may be utilised to design the proposed interventions.

7.2 Targets

Table 7 Annual Plan performance measures and assessment against year-end 2018-19 for Freshwater Improvement Work with the horticultural sector.

Measure	Year to date	Target	% Complete
Annual report on work with the horticulture sector through the freshwater and partnerships programme to improve water quality.	0	1	0%

7.3 Activity Highlights

Future-proofing vegetable production

7.3.1 The Future Proofing Vegetable Production Sustainable Farming Fund (SFF) project has continued. A recent update from the project includes:

- Milestone two report was submitted to the Ministry for Primary Industry at the end of January 2019. Work completed in this report included:
 - Completion of fertiliser calibration assessments to assess the accuracy of equipment used for fertilising plants. Work is to continue with the development of tools for growers to calibrate their own equipment and planning a workshop to demonstrate how this is undertaken;
 - Irrigator assessments have commenced in some areas to ensure that excessive irrigation isn't occurring as this can cause nitrate leaching, or too little irrigation causing yield loss due to moisture stress;
 - Work continues on Overseer and its applicability to intensive vegetation production.

7.3.2 The implementation component of the budget is seeking to complete on-farm works to reduce sediment and nutrient input to waterways. Several jobs have been investigated during the year and some proposed works have not eventuated. Works on one farm are still programmed to occur and some of this funding has been directed to monitoring inside the Arawhata Catchment to assist with targeting of freshwater improvement works. In this initial year of the budget this approach is considered sensible in order to prioritise the expenditure.

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