TO:	**Bay of Plenty Regional Council**
DATE:	**30 September 2023**
COMMENTS ON:	**Freshwater policy review – draft FMU stories**
FROM:	**New Zealand Kiwifruit Growers Incorporated (NZKGI)** **Kathy Mason** **Senior Policy Advisor** **kathy.mason@nzkgi.org.nz** **Phone: 021 056 4778**

1. Introduction

Thank you for the opportunity to provide feedback on the draft Bay of Plenty Freshwater Management Unit ("FMU") stories. These comments have been prepared by New Zealand Kiwifruit Growers Inc (NZKGI).

NZKGI is a grower advocacy body for New Zealand Kiwifruit Growers. The kiwifruit industry is the biggest sector in New Zealand's horticulture industry, with 2,843 kiwifruit growers producing approximately 184 million trays for export from 13,610 productive hectares. In 2021/22 this was worth $2.911 billion in gross sales. Sales are expected to grow to $4.5 billion by 2025, and by 2030 Māori grower revenue is expected to grow from $271 million to $638 million per year.

Our feedback is structured as follows:

- Section 1 is this introduction,
- Section 2 describes the economic and employment benefits to the nation and the Bay of Plenty Region,
- Section 3 provides an overview of the approach to these comments,
- Section 4 is an overview of kiwifruit growers' interests in freshwater,
- Section 5 provides general grower comments,
- Section 6 provides responses to some of the FMU questions that are more general in nature and apply across all of the FMUs, and,
- Section 7 provides responses to the FMU specific questions.

2. Economic and Employment Benefits

NZKGI recently engaged Business and Economic Research Ltd ("BERL")[1] to assess the economic impact of New Zealand kiwifruit growing. The paragraphs that follow summarise their findings.

2.1 National Benefits

BERL states that businesses throughout New Zealand benefit from the annual $2.0 billion on average of direct expenditure by the kiwifruit growing industry. Expenditure flows down through supply chains and on to employees of the suppliers, leading to indirect and induced impacts. The average total national expenditure generated from kiwifruit growing is $4.30 billion per year.

In addition, kiwifruit growing generates significant employment in New Zealand. Kiwifruit growing directly supported the employment of 25,341 full-time equivalent employees (FTEs), consisting of 9,250 permanent employees and 64,365 seasonal workers[2]. When the employment impacts of the indirect expenditure (17,010 FTEs) and induced expenditure (6,148 FTEs) are included, the total national employment supported by kiwifruit growing was 48,500 FTEs.

It is important to note that because kiwifruit growing is a seasonal activity, the total number of people employed is much higher than the calculated number of FTEs as they are not employed for a full year (four workers working three months of the year is equivalent to one FTE).

2.2 Regional Impacts

The Bay of Plenty has long been the centre of New Zealand's kiwifruit growing industry, and the average expenditure in the region accounted for 79% of national grower expenditure. The average annual $1.59 billion of direct expenditure by growers in the Bay of Plenty over the past three seasons resulted in a $2.96 billion total average annual expenditure impact within the region.

As Table 1 shows, this expenditure directly contributed $692 million to the Bay of Plenty's GDP and supported 20,805 FTEs. Direct employment in the Bay of Plenty was 82 percent of total national employment generated by kiwifruit growing. When indirect and induced impacts are included the total impact of kiwifruit growing in the Bay of Plenty region contributed $1.65 billion to GDP and supports 37,323 FTEs.

[1] BERL (2023) Economic impact of the New Zealand kiwifruit growing (CURRENTLY IN DRAFT)
[2] BERL's figures are annual averages across three years, being the 2020/21, 2021/2022 and 2022/23 seasons.

Table 1: Bay of Plenty kiwifruit growers' average annual regional impact 2020/21 to 2022/23

	Direct	Indirect	Induced	Total
Expenditure ($m)	1,588.9	801.2	569.3	2,959.3
GDP ($m)	692.3	587.1	365.9	1,645.3
Employment (FTEs)	20,805	11,174	5,344	37,323

Source: BERL analysis

Direct – referring to the direct economic activity generated by industry, such as money spent on capital costs and operations.

Indirect – referring to economic activity generated by industries associated downstream and upstream to the industry, for example transport haulage, packing, and accommodation.

Induced – referring to economic activity generated by industries not associated with the industry in the value chain, but still affected by the additional economic activity. This includes, for example, the spending by employees of the growers, packhouses and their suppliers.

When the indirect and induced impacts are included the impact of kiwifruit growing is 7.7% of BOP regional GDP, and 25% of FTE employment.

3. Overview of Approach

Like other regional councils throughout New Zealand, BOPRC is preparing to make changes to its freshwater policy to bring it into line with the National Policy Statement for Freshwater Management 2020[3] ("NPS-FM"). The new rules are expected to address the decline in water quality that has occurred in some catchments, and to ensure that the amount of water taken from rivers and groundwater leaves sufficient water to support ecosystem health and other important values within those water bodies.

As part of that workstream, BOPRC has divided the region into 13 different draft Freshwater Management Units (FMUs) and produced individual FMU stories. Comments on the FMU stories are being sought by the end of September 2023.

HortNZ, supported by NZKGI and NZ Avocados, provided industry statements on the FMU stories to BOPRC on 28th August 2023. HortNZ will be providing separate comments on the proposal to set minimum flows based on fish habitat retention when the draft regional plan has been released for comment. For that reason, NZKGI refrains from making comments on that matter at this time, except to emphasise the importance of getting the minimum flows right.

We note that BOPRC is continuing to work on the science that underpins the proposed freshwater policy. This includes a review of the groundwater allocation. We appreciate BOPRC's efforts to engage and to provide updates as further information has come to hand since the FMU stories were released.

[3] The NPS-FM came into effect on 3 September 2020 and was amended on 7 September 2017, 8 December 2022 and 23 February 2023.

At this point in time, and as you will appreciate, while growers know that limits will be set and action plans will be required, the detail is currently unknown, and for this reason, growers are yet to find out what the proposed policy will mean for them personally from a practical perspective.

We describe below the interests that kiwifruit growers have in freshwater and the concerns that we are hearing from them regarding the freshwater policy changes, noting the comment above that growers are yet to see the detail and these comments are general in nature.

4. Kiwifruit Growers' Interests in Freshwater

Kiwifruit growers have different interests in freshwater depending on their individual circumstances:

- Growers have their own personal and professional circumstances to consider, and this will affect their strategies for applying water and nutrients,
- Growers' water needs will differ depending on whether they grow green, gold and/or red kiwifruit, where they are located and what their soil type is,
- There is considerable variation in the size of the orchards[4] and therefore how much water and nutrients need to be applied (on a total volume per orchard basis),
- Some have young vines while others have established orchards which can result in some differences with respect to water and nutrient application,
- While most growers have conventional orchards, some have organic orchards[5], and there are differences in the types of nutrients that are applied,
- Some established growers would like to increase the size of their orchards, and will require more water to do so,
- Some may have stressed vines due to previous frost and/or high rainfall and flooding events and they will be giving some thought to how best to look after their vines going forward including how best to apply water and nutrients,
- Some may have experienced the devastating effects of last year's cyclones and are looking to rebuild what they have lost, and,
- As the industry expands, new growers will seek to enter the industry and will be looking for the right combination of highly productive land, optimal climatic conditions, the ability to source and house labour, the ability to apply nutrients to sustain production and a readily available water supply.

In summary all kiwifruit growers have an interest in freshwater to varying extents, and these interests can vary between growers and change over time, depending on each grower's personal and professional circumstances.

In relation to the freshwater policy, kiwifruit growers' interests in freshwater can be broadly described under the headings of "water quantity" and "water quality" as described below.

[4] Green orchards are on average 3.3 ha in size and gold orchards are on average 3.9 ha.
[5] Approximately 5% of the kiwifruit producing hectares in New Zealand are organically grown.

4.1 Water Quantity

Growers will variously need water for the purposes of irrigation, frost protection, spraying, and domestic use (being largely drinking water, handwashing and/or orchard toilets). Some have multi-enterprise properties and may require stock drinking water or water for other purposes.

The following summarises the various individual circumstances that may apply to kiwifruit growers in relation to water availability:

- Some hold existing resource consents to take and use groundwater, geothermal water and/or surface water,
- Some take water from the municipal supply,
- Some take water as a permitted activity[6],
- Some may collect and store roof runoff,
- Some growers have water storage available in the form of tanks, ponds, and/or dams,
- Some currently have no ability to store water and will be wondering how much water they will need to store in the future, the area of land required, what the cost of that will be, and when they will have to pay for it,
- Some growers have well established orchards that may be more resilient to drought than younger vines (and vice versa),
- Some who currently do not irrigate may be concerned about climate change[7] and may wish to secure water at some future time,
- Some may be looking to apply for resource consent to take and use water some time in the future when they can afford to do so,
- Some growers' orchards are in areas that experience frost and will be needing water and/or frost fans for frost protection[8],
- Some existing growers would like to plant more vines and will need more water to do so,
- Māori kiwifruit growers would like to be able to access water for future development, and,
- Potential new growers who wish to enter the market will be considering the foreseeable supply of freshwater in their investment decisions.

NZKGI has regular contact with growers, and it is fair to say that kiwifruit growers in the region have concerns regarding the emerging freshwater policy and what it might mean in terms of their ability to access a reliable water supply:

- Some growers are concerned that while they are currently authorised to take surface water or groundwater, they now find themselves in a position where their surface water or groundwater aquifer is overallocated and they are concerned about the potential for clawback, restrictions or both,

[6] Rule 38 of the BOPRC RNRP permits the abstraction of groundwater provided the temperature of the water does not exceed 30 degrees Celsius, or the daily volume does not exceed 35 cubic metres per day. Rule 41 of the BOPRC RNRP permits the take and use of surface water provided the temperature of the water does not exceed 30 degrees Celsius, or the daily volume does not exceed 15 cubic metres per day.

[7] Noting that a lack of water in spring/summer would likely affect fruit size and therefore grower returns, and with the climate change the rainfall pattern is likely to change with less rainfall in the spring/summer

[8] Ōpōtiki, Edgecumbe, Tauranga, Te Puke and Katikati experienced severe frost damage on 6 October 2022

- Some growers are concerned that with the minimum flows proposed, water may be unavailable to them during dry periods when they most need it for irrigation and/or frost protection. This will be particularly the case where they do not currently have storage.
- Some growers with existing resource consents to take groundwater in the Katikati area have commented that they have watched with concern as many more resource consents have been granted in their area since their consent was granted, and that the aquifers that they draw from are now considered to be overallocated,
- Some growers with existing surface water take consents are concerned that as more consents to take surface water are granted, reliability issues will be exacerbated and they want to protect their existing rights to take reasonable volumes of water and to use it efficiently,
- Some growers who currently take water from the municipal supply for their orchards are concerned that they will no longer be able to,
- Some growers are concerned that the water that they currently take as a permitted activity will become unavailable or otherwise constrained,
- Some are concerned that they will lose the ability to take water from their roof runoff,
- Some have concerns regarding their storage dams/ponds[9],
- Some are concerned that their drinking water and stock water takes that are currently permitted activities will no longer be so in the future,
- Some are concerned that the policy is unclear in terms of what applies to them, and they are seeking certainty and wishing to avoid the unintended consequences that may arise if their individual situation isn't appropriately recognised and provided for,
- Some are struggling financially, trying to get back on their feet following two very difficult years, and will find it difficult to fund increased capital work (e.g. water storage, and/or wetlands and/or any other currently unspecified improvements) that the freshwater policy may require,
- New industry entrants will likely be watching the freshwater policy process with interest and will factor water availability into their investment decisions.

All growers know that changes to the freshwater policy are coming but they don't know what the limits, action plans and rules look like yet, and this is creating uncertainty.

NZKGI urges BOPRC to consider the freshwater policy changes through the lens of these concerns as the policy continues to be drafted.

We request that BOPRC introduces a permitted activity rule for water storage ponds with workable conditions.

[9] The requirement for resource consents for on-stream dams is creating some concern together with the prospect that some of the storage ponds and dams may meet the definition of "natural inland wetlands".

4.2 Water Quality

From the policy that has been released so far, we note that regional councils tend to be focussed on reducing nitrogen, phosphorus, *E. coli* and suspended solids in the waterways, with the degree of reduction dependent upon location[10]. In that respect:

- While kiwifruit orchards do not contribute to E. coli concentrations in freshwater, its presence can indicate the presence of pathogens from animal or human faeces and for kiwifruit is of concern for food safety reasons,
- Within the Bay of Plenty region, phosphorus is naturally elevated due to the geology and may not be an issue for kiwifruit growers, (to be confirmed once more detail is released) and,
- Established kiwifruit orchards are generally flat and well vegetated[11] and suspended solids in the stormwater runoff from kiwifruit is likely to be less of an issue than other land uses (to be confirmed once more detail is released).

In summary, while the details are yet to unfold, nitrogen is expected to be the main contaminant of concern for kiwifruit growers.

Growers need to be able to apply nutrients to ensure that their vines remain healthy and productive. The following summarises the various individual circumstances that are likely to apply in relation to nutrient application on orchard:

- Some have organic orchards and will be relying on mulch and organic supplements, as opposed to synthetic fertilisers,
- Most have conventional orchards, and many will be applying some form of synthetic fertiliser,
- Interest is growing regarding regenerative farming, and this may change the way that some growers manage their orchards in the future, and,
- Depending on individual circumstances, nutrients may be applied in the form of synthetic fertiliser, foliar fertiliser, fertigation, compost and/or organic supplements.

In addition, new growers looking to enter the industry may need to recontour the land which has the potential to generate suspended solids in the stormwater runoff until the land is regrassed and planted. We assume that the consent conditions that apply to recontouring activities sufficiently protect surface water from suspended solids, but this is unclear in the FMU stories.

[10] We note that some councils are also focussing on copper and zinc particularly in urban catchments where elevated levels may be adversely affecting aquatic life but this is not currently the case for the Bay of Plenty region.

[11] Noting that in some cases, recontouring is necessary to develop the land for kiwifruit.

A key matter for the industry is how the nutrient limits will affect industry growth. NZKGI is of the view that the conversion of land from other uses to kiwifruit that will result in a decrease in the key contaminants of interest should be encouraged, noting also that kiwifruit production is a low emissions industry.

Some growers are very concerned that the new policy will require them to reduce their nitrogen application in response to the limit setting, especially in those FMUs where estuary values and outcomes will drive the need for substantial change. Growers with soils that are more prone to nutrient leaching, and located in catchments where substantial changes are signalled as being required (in the order of 70% in the Kaituna and Wāihi Estuary FMUs) are particularly concerned.

A better understanding of whether the bulk of the contamination is arising from stormwater runoff or leaching would help to prioritise control methods.

Growers would also like to know how much of the contamination in the waterways is naturally occurring.

Understanding the source of the contaminants will be important in terms of identifying priorities for improvement. In some cases, the relative areas occupied by kiwifruit orchards are so small across an FMU, that nitrogen reductions on orchard might not be measurable.

Regardless of the freshwater policy changes, some growers are considering establishing an artificial wetland for water treatment purposes and would appreciate some advice from BOPRC on what is required and how to get started.

Others are concerned that wetland treatment may become mandatory at least for some orchards, that there will be insufficient room for water storage and wetlands on some orchards and some have concerns around what the regulatory requirements and financial implications of consenting, building and maintaining their wetlands are likely to be.

As previously discussed, a permitted activity rule for the construction and maintenance of artificial wetlands with workable conditions combined with some advice to growers would help to encourage their uptake and use.

5. General Grower Comments in Relation to the FMU Stories

The following sections highlight a number of general grower concerns that are common to all of the FMU stories. Some of the issues raised below are likely to be relevant in other regions throughout the country as well.

5.1 Tension Between Sustaining the Economy and Employment and Achieving the Draft Visions within the Proposed Timeframes

As previously discussed, the growing of kiwifruit is extremely important for the economy of the Bay of Plenty Region. To repeat the main points:

The average annual $1.59 billion of direct expenditure by growers in the Bay of Plenty over the past three seasons resulted in a $2.96 billion total average annual expenditure impact within the region, and:

When indirect and induced impacts are included the total impact of kiwifruit growing in the Bay of Plenty region contributed $1.65 billion to GDP and supports 37,323 FTEs, and:

When the indirect and induced impacts are included the impact of kiwifruit growing is 7.7 percent of BOP regional GDP, and 25% of FTE employment.

Growers are proud of the economic contribution that they make to the region and their ability to provide decent employment for so many people. The average picking wage across the industry for 2023 was $28.45, which is well above the minimum wage of $22.70.

The draft visions in the FMUs are accompanied by suggested timeframes to achieve those visions. As an industry we know that growers will be affected by the new limits and the action plans, but as yet there is no detail as to how individual growers and the industry as a whole will be affected.

For that reason, there is no indication yet as to how the new policy will affect local communities in terms of economic benefits and employment. Our view is that industry, tangata whenua and communities need the full story to be able to meaningfully consider how these changes may affect them in relation to the suggested timeframes to achieve the visions.

We reiterate that growers have different capacities to absorb change while maintaining economically viable orchards. In addition, we note that many water take consents will expire in 2026 and this will substantially increase the workload of hydrogeologists and irrigation specialists who are already very busy.

In our view, the timeframes to achieve the visions need to consider the reasonable time and headroom that growers will require to adapt.

If growers are required to have resource consents for their storage ponds and/or wetlands, this will contribute to the problem and result in further delays.

Permitted activity rules with appropriate and workable conditions will assist growers to provide additional storage in a timelier manner.

The NPS-FM provides that long-term visions can be set at FMU, part FMU, or catchment level along with goals and timeframes to achieve them that are ambitious but reasonable. Once more detail becomes available, NZKGI would like to work with BOPRC on a phased approach which will identify those catchments where longer timeframes may be required for growers to make changes to achieve the visions while keeping their businesses viable.

5.2 Te Mana o te Wai

There is a hierarchy of obligations in Te Mana o te Wai that prioritises:

(a) first, the health and well-being of water bodies and freshwater ecosystems

(b) second, the health needs of people (such as drinking water)

(c) third, the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future.

The taking of drinking water, and the domestic use of water (e.g. for orchard toilets and handwashing) clearly fits within the second priority.

In our view there needs to be some consideration of a management flow that would sit above the minimum flow in surface waters to ensure that in most foreseeable

circumstances during drought conditions, there remains sufficient water to protect human health and to sustain the life of commercially important plants and animals.

For kiwifruit this would mean making provision for the quantity of water that is necessary in drought conditions to keep the rootstock alive, so that a reasonable/marketable yield can be achieved the following year. In addition, sufficient water needs to be available for frost protection to those growers who need it, given the potentially devastating impacts of frost.

For animals, the management level would ensure that stock drinking water continues to be available. NZKGI has received feedback from growers with multi-enterprise properties that they cannot watch their stock die of thirst while they irrigate their orchards.

Over time, and as growers and other resource users adapt to the freshwater policy changes the management level could be adjusted, and ultimately phased out as growers increase their reliance on storage and/or take from groundwater instead of surface water.

A permitted activity rule for water storage with workable conditions will assist that process.

5.3 Existing Growers Versus New Water Takes

As previously discussed, some growers who have existing resource consents to take surface water or groundwater, have been watching with concern as more and more water take consents have been granted. Some are upset to now find that the surface water or groundwater that they have been taking from is overallocated and that they may have to give up some of their allocated water.

Some are also concerned that as more water is allocated, the reliability of their surface water take will more likely be compromised.

NZKGI requests that BOPRC considers a policy framework going forward that would require new surface water take applicants to implement water storage that would see them through dry periods to avoid cumulative effects on reliability.

We would like clarification as to whether BOPRC intends to make changes to the permitted activity rules for surface water and groundwater takes.

At present growers can take up to 35 m^3/day of groundwater and 15 m^3/day of surface water as a permitted activity, subject to conditions. Some growers are doing this at present and storing the volumes of water that they need. Presumably the setting of minimum flows will mean that growers will not be able to take 15 m^3/day when river levels are low, but they will be able to when the flow is higher.

Growers are currently able to apply for resource consent to take the equivalent of 35 m^3 of groundwater per day (being 12,775 m^3 per year) over a smaller timeframe for the purposes of irrigation and frost control. Presumably they will still be able to do this even in overallocated catchments because their permitted activity take is provided for in the allocation volume of the aquifer?

5.4 Climate Change Adaptation

We note that every regional council must have regard to the foreseeable effects of climate change when they set their limits for resource use.

The BOPRC FMU stories have different wording regarding climate change. Generally speaking, and depending on location:

- Maximum temperatures will increase as will the number of days with prolonged high temperature (>35^{o}C),
- Annual rainfall totals are not expected to change significantly in the period to 2040, although the pattern will likely change with less in the spring/summer months,
- Reduced summer rainfall and increased evaporation and transpiration may increase water demand while reducing stream flow,
- In spring fed catchment changes to low flow are likely to be subdued, but increases in evaporation and transpiration may increase demand,
- More frequent extreme rainfall events may result in higher flood flows in summer and winter, and sediment loss from erosion may get a lot worse,
- Land on the lowland plains nearest the coast may become increasingly affected by salinity and wetness, and be gradually inundated by the sea, or by higher river levels, making land use less viable or unviable in the medium to long term,
- Some land use may become less viable or unviable by mid-late century.

The industry recognises that chronic rising temperatures will impact the kiwifruit industry over the medium to long term (30 to 80 years). A rise in winter temperature is believed to already be impacting on consistent bud-break and king flower production in some areas of New Zealand. Over the past five years, 10 out of 11 sites across the Bay of Plenty and Gisborne regions showed a reduction in winter chilling hours between May and June.

Rising average summer temperatures will increase vine water demand and may impede fruit development in water deprived areas. An increase in the number of hot days could cause thermal stress and have negative impacts on production.

Warmer temperatures are expected to lengthen growing seasons. Plants will start maturing earlier potentially exposing them to frosts. Although the number of frosts is generally expected to decline, when they do occur their impact could be much larger than previously experienced. Frost protection will become increasingly important.

In addition, the kiwifruit industry has experienced severe weather events in recent years, and these seem set to continue. The social cost of these events is significant for growers and their wider communities, with the wider impacts felt long after the initial damage is repaired.

NZKGI requests that the freshwater policy is cognisant of the fact that some orchardists will likely be affected by significant weather events in the future, and this will likely mean that some will be unable to implement some of the necessary changes within the stipulated timeframes.

While the impacts of climate change will vary depending on location, the overall assumption is that:

- growers who currently do not irrigate may need to in the future particularly if climate change results in reduced spring/summer rainfall, given that this is an important time for increasing fruit size,

- frost will continue to be an issue for some growers in the Bay of Plenty region, and water for frost protection may be less available when it is needed in some locations[12],
- future challenges will include severe weather events, flooding, inundation and saltwater intrusion.

Over time, we also note that the current distribution of orchards across the region may change as growers seek to establish in new areas where water is more readily available, there is more winter chill and orchards are less susceptible to inundation and the effects of saltwater intrusion. Post harvest facilities may follow as orchards move into new areas.

In our view, the freshwater policy needs to have a future focus that considers how the kiwifruit industry may respond and adapt to climate change. We note that some of the FMU stories do not currently provide for commercial and industrial use, and this is based on the activities that exist in those FMUs at present. However, if in the future kiwifruit growers want to establish their orchards further inland, and as postharvest facilities follow, water for commercial and industrial use will be required. Water for industrial use will be required to service the drilling rigs that will be required to access groundwater and commercial water will be required to service post harvest facilities.

In summary, the freshwater policy needs to acknowledge the potential for severe weather events in the future and the effects that these events will have on growers. It also needs to consider and provide for changing land use that might be expected as a result of climate change.

In addition, we note that the FMU stories do not have a freshwater value or draft environmental outcome regarding frost protection, as it does for irrigation, cultivation, and production of food and beverages:

Freshwater Value	**Draft Environmental Outcome**
Irrigation, cultivation, and production of food and beverages	Reasonable and efficient irrigation and food processing freshwater needs are provided for with an adequate level of reliability, to the extent possible and subject to providing for the outcomes shaded above.

We request that the reasonable need for water for the purposes of frost protection is provided for.

5.5 Adaptive Management Approach to Incorporate Research Results

In 2019, NZKGI, Māori Kiwifruit Growers, Zespri, HortNZ and industry partners and growers launched the kiwifruit industry's water strategy. The aim of the strategy is to provide strong leadership and a clear vision and governance to the kiwifruit industry. The vision is *as follows:*

"To collectively protect and enhance our water resources for our people, our environment, and our communities while enabling kiwifruit industry growth."

[12] Frost fans may be an option, but the district council noise rules can limit their practical.

As an industry, it was agreed that there were three outcomes to be achieved for growers by 2025:

1. Demonstrate alignment of nutrient inputs and losses to good practice limits.
2. Use monitoring technology to actively manage and demonstrate efficient use of water.
3. Access tools and knowledge to protect and foster healthy, fertile soils.

While considerable research on kiwifruit water and nutrient use has already been carried out, the 2025 timeline referred to above does not align with the notification date for the regional policy statements and regional plans, being the end of 2024. For this reason, the research programme is not complete. In addition, some of the research that is currently underway needs to be carried out over multiple seasons to assess trends and to provide results that have a high degree of certainty, given all of the many contributing factors that influence crop yield and quality.

This ongoing research, combined with investment in innovation and a commitment to continuous improvement, is expected to continue and will help growers to understand and implement best practice in terms of protecting the freshwater environment.

We request that BOPRC gives some thought to how the results of future research and innovation can be incorporated within the planning framework to allow its efficient uptake. An adaptive management approach that allows the industry to easily implement change that is mutually beneficial to the industry and the freshwater environment without going through a full plan change process is requested by NZKGI.

5.6 Municipal Takes

We note that in some areas municipal takes use up the bulk of the allocation. For example, at the presentation in Katikati on 20th September 2023, BOPRC staff advised that that the municipal supply uses up 82% of the groundwater in Waihī-Waiau, 78% in Uretara-Te Rereatukahia and 77% in Waipapa.

We are currently reviewing the Smartgrowth Strategy 2023-2073 and question whether the allocation of water to the municipal takes across the entire region provides for future foreseeable growth.

<u>If so</u>, we question whether there is overallocation on paper as opposed to real overallocation and whether growers can utilise part of the allocation for municipal supply in the interim while it is not being used for municipal purposes. This would provide more time for growers to implement storage.

We ask this on the basis that the Smartgrowth maps show planned growth areas as well as potential long-term growth areas (the latter presumably not required municipal water for some time).

<u>If not</u>, our concern is that growers will find themselves in the position at some point in the future where the need for additional municipal supply again results in over-allocation.

Growers require certainty for their investment, and we would appreciate some feedback on this.

We also question whether any proposed sharing of allocation reductions would apply to municipal users. In our view, there could be significant benefits with some simple water conservation measures, noting that municipal users take up a large proportion of some catchment allocations.

6. Industry General Response to FMU Questions

Some of the questions in the FMU stories are general in nature and have already been responded to in HortNZ's submission. Some require a response from growers. We respond to those questions below.

6.1 Surface Water Questions

Question

If you had to choose between a reliable water supply but very little water available and more water available but unreliably, which would you prefer and why?

Answer

Growers will have different responses to these questions depending on their individual circumstances.

Growers who already have a resource consent to take surface water and who do not have storage would most likely prefer a reliable water supply but with very little water available to other users, because they will be concerned that if more water is taken by multiple users then it will be less reliable for everyone.

Growers who already have resource consents to take water and who also have storage might be happy for more water to be made available for other users, however they would likely want to consider their individual situation and how they might be affected by the minimum flow limits. Until they have that information, they will find it difficult to comment.

New potential water take applicants would most likely prefer more water to be available so that they have some prospect of accessing water. They may be happy to take water from the secondary allocation block (i.e while river levels are comparatively high) and to store water and to accept a resource consent condition that would mean that they do not affect the reliability for existing users (noting that spring fed streams may be less problematic). Our view is that BOPRC should allocate more water from the secondary allocation block to allow storage and therefore avoid effects on reliability.

In summary, our view is that there need not be only one either/or answer to the question as framed. A secondary allocation block in combination with storage would provide an opportunity to make more water available to new potential water take applicants while protecting the reliability for existing efficient users with the right mix of rules and policy direction. Rather than have a "one size fits all" across the region we request that BOPRC explores the possibility of different solutions for different catchments.

Question

Sometimes our surface water challenges are because people take water at the same time. How willing would you be to work with others in your area to ensure water is taken from your stream(s) at different times?

Answer

Our understanding is that while some people only take water for part of a day, BOPRC allocates it for the whole of the day because they do not know when the water is being taken. While individual growers are likely to have their own views, in general kiwifruit growers are open to exploring any options that would help to overcome issues of allocation and reliability and would be willing to work with others in their area to ensure that water is taken from their stream(s) at different times. Growers already apply water at night in the height of summer to minimise water loss from evapotranspiration.

Question

A small number of catchments in the Tauranga Moana, Kaituna, Rangitāiki and East Coast FMUs are currently overallocated. We may need to claw back or reduce the overall water allocation in some catchments. How do you think we should approach this i.e. prioritise particular uses, timeframes for transition?

Answer

Prior to considering clawback, we suggest that the following actions be undertaken in the order listed first:

- Ask consent holders whether they are still using their resource consents and if not, whether the consents can be surrendered,
- Check water use records through a fair and consistent pro rata system for all, and if considerably less water is being used than the authorised take allows then the consent could be reviewed to free up allocation, and,
- Consider other options such as the potential for rostering surface water takes.

With respect to the second bullet point, the expiry of a large number of water take consents in 2026 will provide an ideal opportunity to assess allocated volumes against water use records.

Our view is that where there is overallocation, there needs to be a conversation with the people who are most affected to determine how the overallocation can best be phased out. Based on our knowledge of the kiwifruit industry, everyone's circumstances are different. Some people will likely be in a better position than others to harvest and store surface water from a secondary allocation block. Those people who are affected by overallocation need to be part of the solution for phasing it out.

A simple option for groundwater overallocation might be to take a small amount of water off everyone, but this has the potential to reward inefficient users and should only be considered if the volumes are small.

Regarding prioritising uses, from a kiwifruit industry perspective only, we make the point that kiwifruit growing is a low emissions and sustainable industry that contributes significantly to the Bay of Plenty region in terms of economic impact and employment. As an absolute minimum, kiwifruit orchards need water for domestic use, rootstock protection and frost protection. To be economically viable, orchards need to have sufficient water to promote good fruit size and quality.

6.2 Groundwater Questions

Question

Groundwater is managed primarily to protect and maintain surface waters, and to meet current and future beneficial uses. What other things should it be managed for?

Answer

The first priority is to understand and acknowledge that all groundwater is different e.g. depth, volume, source entry and exit, pressure and recharge. It can take many years to fully understand groundwater aquifers.

Our view is that groundwater should be managed so that new groundwater takes do not:

- adversely affect existing authorised groundwater takes,
- cause saltwater intrusion,
- dewater culturally important springs, and,
- drain rivers and wetlands.

Geothermal and warm water is an important resource for some kiwifruit growers, particularly in the Tauranga Moana FMU.

While other resource users may rely on geothermal water for the heat that it provides, kiwifruit growers rely on warm water and geothermal water as a water source for irrigation and frost protection.

The FMU stories have the following wording in relation to geothermal warm water however the draft environmental outcome does not appear to make provision for geothermal warm water that is used for irrigation and frost control:

Freshwater Values	**DRAFT Environmental Outcomes**
Geothermal warm water	Significant geothermal warm water resources are protected from the cooling effects of activities and made available for efficient uses that require heat and/or heated water, while preserving, enhancing and protecting the mauri of the geothermal resource.

We request that the draft regional plan makes specific provision for the use of the warm water and geothermal resource for irrigation and frost protection.

Question

Our understanding of groundwater availability is incomplete. We can set groundwater allocation limits that are lower i.e. more conservative or higher i.e. greater risk of overallocation. Where on the spectrum of risk are you?

Answer

Our understanding is that it can take many years to develop a good understanding of the groundwater resource and that BOPRC has recently been carrying out additional work and this has resulted in a better understanding of the allocation status of some of the aquifers.

Our view is that it would be preferable to set higher allocation limits but to accompany them with an adaptive management approach. This could include a monitoring programme with trigger limits that when exceeded would indicate the need to halt allocation and to carry out a review; the purpose of which would be to avoid adverse effects that might otherwise continue and result in overallocation.

25 Miro Street, PO Box 4246
Mt Maunganui South 3149
New Zealand

TOLL FREE: 0800 232 505
P. 07 574 7139 E. info@nzkgi.org.nz
www.nzkgi.org.nz

7. FMU Specific Questions

This section provides answers to the FMU specific questions. There are 13 draft FMUs in the Bay of Plenty region are shown in Figure 1 below.

Figure 1: Draft FMUs

Two of the FMUs (being Motiti and Rotorua Te Arawa lakes) do not have kiwifruit growing in them, so no comments have been provided on those FMUs.

We note that at the time that the FMU stories were written, BOPRC was using kiwifruit orchard area data for 2017. This data is now out of date. Zespri has since provided the updated data to BOPRC.

Table 2 summarises the number of kiwifruit orchards located within each FMU in the Bay of Plenty region.

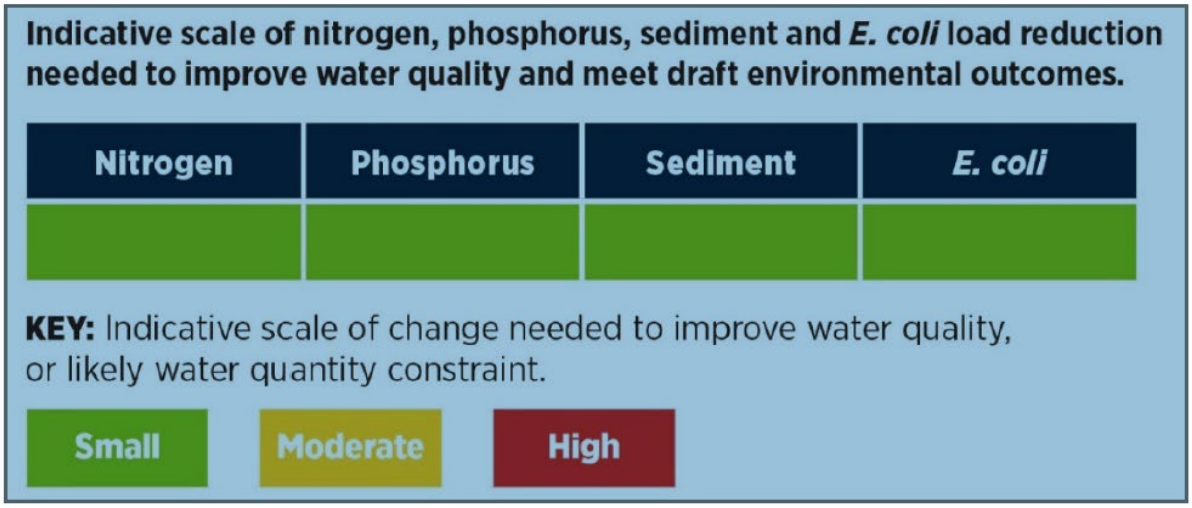
FMU	Number of KPINs
East Coast	66
Kaituna	853
Motiti	0
Ōhiwa	6
Rangitāiki	100
Rotorua Te Arawa Lakes	0
Tarawera	40
Tauranga Moana	1052
Waihī Estuary	302
Waioeka-Ōtara	140
Waiōtahe	33
Waitahanui	21
Whakatāne	36

Table 2: Kiwifruit Orchard Number Per FMU

The pages to follow answer a number of questions for each of the FMU stories.

Each page starts with the chart from the FMU story that summarises the indicative scale of change for nitrogen, phosphorus, sediment and E. coli that is needed to improve water quality and achieve environmental outcomes.

East Coast FMU



Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes. Growers have stressed the importance of considering both the freshwater policy and the economic issues affecting people in this area together.

Question

Does this brief summary about water quality in this FMU seem about right to you?

Answer

We question the statement "The sedimentary geology in this FMU easily erodes under heavy rainfall and this increases sediment and dissolved phosphorus runoff". Presumably if the phosphorus is attached to the sediment then it is not dissolved reactive phosphorus but total phosphorus. A clear understanding of whether the phosphorus is associated with the solid fraction or dissolved in the water is required to best consider the problem and the actions necessary.

What is missing from all of the FMU stories is a clear understanding of where the various nutrients, E. coli and suspended sediments are coming from, what the priorities are in terms of controlling these contaminants, where efforts can be best focussed, and what that means for kiwifruit growers. We presume that more information will be provided through the draft plan change.

While we note that the indicative scale of change to improve water quality is small as shown in the chart above, it would be helpful to see a map that overlays land use with the locations of the water quality monitoring sites and the monitored/estimated states to get a better understanding of cause and effect.

25 Miro Street, PO Box 4246
Mt Maunganui South 3149
New Zealand

TOLL FREE: 0800 232 505
P. 07 574 7139 E. info@nzkgi.org.nz
www.nzkgi.org.nz

It appears that the bulk of the suspended fine sediment is from the hill country. There is no indication as to whether this is exacerbated by feral animals as there is in other FMU stories. It appears that the suspended fine solids are mainly derived from hill country under native and/or exotic forest and given the small land area used for kiwifruit and farming, they are likely minor contributors. The kiwifruit orchards are all located in close proximity to the coast and some are located in areas where the river and stream water quality is in the A band for suspended solids and is not deteriorating.

Question

Does this brief summary about water quantity in this FMU seem about right to you?

Answer

Generally yes. It is noted that storage is probably needed to sustain further development. We support applying a secondary block to address what appears in the records to be over allocation.

For all of the FMUs there is no discussion as to the number of households that are on tank water derived from roof runoff.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes. We note that while substantial groundwater may be available to allocate, in practice it may be difficult to access and extract this water. From a practical perspective surface water with storage appears to be the most practical option for kiwifruit growers.

Kaituna FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about water quality in this FMU seem about right to you?

Answer

The Kaituna FMU includes Te Puke which is an important area for kiwifruit production.

The scale of change required in this FMU is clearly driven by the degraded state of the Maketū Estuary. It is noted that sediment, phosphorus and nitrogen loads from the catchment are the key causes of poor ecosystem health, as well as historical changes in river flows through the estuary from the Kaituna River diversion.

What is missing from all of the FMU stories is a clear understanding of where the various nutrients, E. coli and suspended sediments are coming from, what the priorities are in terms of controlling these contaminants, where efforts can be best focussed and what that means for kiwifruit growers. We presume that more information will be provided through the draft plan change.

It would helpful to see a map that overlays land use with the locations of the water quality monitoring sites and the monitored/estimated states to get a better understanding of cause and effect.

It would also be helpful to gain a better understanding of whether runoff or losses to groundwater are the biggest contributors to poor water quality.

The map showing the three water quality monitoring sites (or is it four – note the mismatch between the text and the water quality maps) suggests that contributions from a large part of the catchment may be unknown but have been estimated. Given the scale of change proposed, more information on the basis and validation of the estimates is required for growers to have confidence that the water quality summary is about right.

Question

Does this brief summary about water quantity in this FMU seem about right to you?

Answer

Yes. It is noted that storage is probably needed to sustain further development. We support applying a secondary block to address what appears in the records to be over allocation. We note that many users are allocated much more water than they have used, even in peak weeks of dry years, and this can block other users from accessing water.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

We understand that further work has been carried out since the FMU story was prepared and that more groundwater may now be available for allocation. We will be watching this with interest.

Ōhiwa FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about water quality in this FMU seem about right to you?

Answer

What is missing from all of the FMU stories is a clear understanding of where the various nutrients, E. coli and suspended fine sediments are coming from, what the priorities are in terms of controlling these contaminants, where efforts can be best focussed and what that means for kiwifruit growers. We presume that more information will be provided through the draft plan change.

It would helpful to see a map that overlays land use with the locations of the water quality monitoring sites and the monitored/estimated states to get a better understanding of cause and effect.

Having said that, there are only six kiwifruit orchards located in this FMU and the indicative scale of change for nitrogen is small.

Question

Does this brief summary about water quantity in this FMU seem about right to you?

Answer

Yes. It is noted that storage is probably needed to sustain further development. We support applying a secondary allocation block to address what appears in the records to be

over allocation. We note that many users are allocated much more water than they have used, even in peak weeks of dry years, and this can block other users from accessing water.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes

Rangitāiki FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

Nitrogen	Phosphorus	Sediment	*E. coli*

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small | Moderate | High

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about water quality in this FMU seem about right to you?

Answer

This FMU story clearly states where the contaminants are coming from and kiwifruit orchards do not appear to be the cause. What is missing is what the priorities are in terms of controlling these contaminants, where efforts can be best focussed and what that means for kiwifruit growers. We presume that more information will be provided through the draft plan change.

It would be helpful to see a map that overlays land use with the locations of the water quality monitoring sites and the monitored/estimated states to get a better understanding of cause and effect.

The coloured chart above seems at odds with the narrative in the FMU story, which states that nitrate concentrations at three monitored river and stream sites in the catchment are elevated – B band and are some of the highest in the region, and that measured fine sediment in the Whirinaki at Galatea is in the D band and does not meet bottom lines. Presumably there are discrete areas within the FMU that need attention but overall the indicative scale of change is small?

25 Miro Street, PO Box 4246
Mt Maunganui South 3149
New Zealand

TOLL FREE: 0800 232 505
P. 07 574 7139 E. info@nzkgi.org.nz
www.nzkgi.org.nz

We note that there are no kiwifruit orchards located in Galatea or inland and that they are located within 20km of Whakatāne, i.e. downstream within the FMU.

High sediment loads in the surface water can create issues for kiwifruit growers for their water takes.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

Yes. It is noted that storage is probably needed to sustain further development. We support applying a secondary block to address what appears in the records to be over allocation. We note that many users are allocated much more water than they have used, even in peak weeks of dry years, and this can block other users from accessing water.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes

Tarawera FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

In general yes, noting the comments to follow. Measured dissolved reactive phosphorus concentrations are high (in the D band) at both sites in the Tarawera River, do not meet bottom lines and are showing worsening trends. The high phosphorus is likely from the volcanic influence in the area, although human activity, including wastewater discharges from the Tasman Mill, are adding to this. Understanding the source of the high phosphorus will be important in terms of understanding where efforts need to prioritised.

It is noted that the poor water clarity below Kawerau is linked to the colour of the Tasman Mill wastewater discharge and complicated by geothermal (both natural and industrial) and wetland inputs as well as actual sediment runoff from pasture in the lower catchment.

The FMU story does not describe the base load of contaminants from Lake Tarawera and this is important given the volcanic soils, large catchment and hills that feed into the Lake Tarawera. It is unclear how much nitrogen and phosphorus is natural in the river. In our

25 Miro Street, PO Box 4246
Mt Maunganui South 3149
New Zealand

TOLL FREE: 0800 232 505
P. 07 574 7139 E. info@nzkgi.org.nz
www.nzkgi.org.nz

view the Tasman Mill discharge is the main issue for the freshwater quality of the Tarawera River.

The farms are located between Kawerau and the coast. Very few kiwifruit orchards bound the river. Most drains head to the Rangitāiki.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

Yes. We note that there is no identified overallocation in the catchment. The allocation of a secondary block of water that can only be taken during periods of high flow is supported, noting that storage would be necessary to provide reliable access during dry periods.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Generally yes, and all of the policy options are generally supported, noting that the Groundwater Management Zones are yet to be developed. NZKGI would like to have the opportunity to provide feedback on how these zones are developed. Most takes for kiwifruit orchards are groundwater takes.

One grower commented that the Awaiti aquifer is said to come from the Rangitāiki headwaters on Napier-Taupo Road and that it is why it is 300 to 450m deep.

Tauranga Moana FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small Moderate High

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

Generally yes. We note that contaminant load reduction will be driven by the health of the Tauranga Harbour, and in order to do that, nitrogen loads from all rivers and streams need to be reduced, with a particular focus on the southern harbour catchments. In order to meet the top of B band for mud content, sediment loads from all catchments need to reduce, with broad estimates for each sub-estuary ranging from 3% to 18%. It is acknowledged that work is underway to determine whether DRP at Kopurererua at SH29 and Omanawa at SH29, which is worse than national bottom lines, is naturally occurring.

The FMU story states that nitrogen, phosphorus, sediment and *E. coli* are primarily sourced from all rural land uses including forestry. Urban areas will be the source of heavy metals (e.g. from industrial, port and urban stormwater), and a significant source of contaminants associated with stormwater discharges, including *E. coli*.

Some stormwater runoff from properties (including some kiwifruit orchards) does not end up in the rivers and streams but discharges directly to the coast. The FMU stories in general do not discuss this, and we question whether some of these properties should have different controls around contaminant discharges.

The main issue appears to be *E. coli* which is not sourced from kiwifruit orchards.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

Yes. We note that there is identified overallocation in the FMU. The allocation of a secondary block of water that can only be taken during periods of high flow is supported, noting that storage would be necessary to provide reliable access during dry periods.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes, however we note that BOPRC has done more work on the groundwater management zones since the FMU stories were written, and at a recent (20 September 2023) public presentation in Katikati BOPRC staff advised that groundwater in Waihī-Waiau, Uretara-Te Rereatukahia, Waipapa and Maungatawa are overallocated. Areas of between 50% and 90% allocation include Ongare-Tanners Point and Te Puna-Oturu. In addition, the proposal is to manage the groundwater system as a single layer.

Given the importance of groundwater in this FMU to growers, we are considering engaging a peer reviewer to review the methodology used to determine the allocation status in these aquifers.

We note from the presentation on 20th September that the municipal supply uses up 82% of the groundwater in Waihī-Waiau, 78% in Uretara-Te Rereatukahia and 77% in Waipapa. We are currently reviewing the Smartgrowth Strategy 2023-2073 and question whether the allocation of water to the municipal take provides for foreseeable future growth. If so, we question whether there is overallocation on paper as opposed to real overallocation and whether growers can utilise part of the allocation for municipal supply in the interim, until they can implement storage. If not, our concern is that growers will find themselves in the position at some point in the future where the need for additional municipal supply again results in over-allocation. Growers require certainty for their investment and we would appreciate some feedback on this.

Waihī Estuary FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small | Moderate | High

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

Yes, although we note that there are only three water quality monitoring sites covering one half of the FMU only. Our view is that more data is required to fully understand what is going on in this FMU and where efforts need to be concentrated.

We note that the need for contaminant load reduction is being driven by the health of the Wāihi Estuary, and that substantial reduction of nitrogen, phosphorus, sediment and E. coli are proposed.

NZKGI would like to work with BOPRC and other sectors that operate within this FMU to better understand the sources of the contaminants and the priorities in terms of addressing them. *E. coli* is not an issue for kiwifruit growers and sediment will be generated from surrounding land. It would be interesting to know whether the bulk of the nitrogen in particular that is finding its way into the estuary is derived from surface water runoff or nitrogen leaching into groundwater that is connected with surface water. If the primary source is surface water runoff then that would help us all to focus our research and efforts in that area, and to identify the best and most practical ways to reduce N

losses that would otherwise find their way to the estuary, while considering economic impacts.

Presumably if the action plan focuses on land use changes that would result in *E. coli* reduction, then that will result in associated reductions in nitrogen, phosphorus and/or sediment.

We note that as of January 2022 there were 28 surface water takes in the FMU. Presumably surface water that is taken and irrigated back onto land reduces the contaminant load that would otherwise find its way to the estuary during dry periods. It will be important to consider this in relation to the setting of minimum flows and timing of improvement actions to prevent perverse outcomes.

Hydrological modification and land drainage have also had an impact in the catchment and actions within the estuary itself may be needed to address the legacy effect of sediment and nutrients already accumulated. NZKGI is particularly interested to comment on the action plan for this FMU.

We agree that a reasonable timeframe will be needed to make the transition necessary to achieve A or B band states in the estuary. While 40 years is suggested as the timeframe needed to fully achieve the targets with 10 yearly targets to measure progress along the way, it is difficult to comment on the timeframe until an action plan is drafted, and the economic implications of the proposed reductions are available for us to consider.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

We note that there is only one scientific study and limited gauging information to inform the setting of minimum flows and allocation limits. Presumably more data will be available by the time that the regional plan is notified to provide confidence that the minimum flows and allocation limits are robust and not overly conservative, especially given that the FMU story is identifying significant overallocation. NZKGI supports a secondary allocation block noting that storage dams would be required to provide reliable access to water during dry periods. We support ensuring that what is allocated through resource consents more closely matches what is used.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes, however we note that new Groundwater Management Development Zones are being developed and we will be watching this with interest in the hope that more groundwater will be available for allocation.

Waioeka-Ōtara Estuary FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small Moderate High

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

We note the comment in the third paragraph of page 16 that dairy, drystock, and horticulture are the main sources of nitrogen and phosphorus loads in this FMU. This appears to contradict the last paragraph of page 16 that states that while a large proportion of nitrogen may be coming from native forest areas, dairy and drystock contribute disproportionately greater nitrogen compared to land area (i.e. horticulture is not mentioned). NZKGI is interested to know more about the contribution of nitrogen and phosphorus from the various land uses, noting that the indicative scale of change needed for nitrogen is small. The section "Land and land use" does not say what percentage of the land is used for kiwifruit orchards.

The sediment load from the small area of drystock farming is estimated to be disproportionately high, almost as much as from native forest which covers a much greater area. Gully erosion is the dominant erosion process and native forest contributes most of the *E. coli* load (due to it covering 85% of the FMU) but the proportion coming from forest is low compared to its proportion of total land area, whereas dairy and drystock contribute substantially more relative to their land area.

It appears that most river issues come from upstream and are derived from forestry and farm runoff. Grower feedback is that all kiwifruit is estimated to be between 10 and 15 km of the coast. It would also appear that feral and pest animals in the forest are making *E. coli* losses worse and that some parts of the FMU (in native forest and drystock) have steep, erodible land that is more susceptible to erosion. A focus on the control of feral and pest animals in the forest appears to be necessary to achieve the desired results. It would be interesting to know how much phosphorus is naturally occurring.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

It is unclear how many gauging sites there are in this FMU. This is an important FMU for growing kiwifruit and it is important that the minimum flows and allocation limits are based on data that growers can have confidence in.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes, however we note that depending on how the FMU is subdivided into groundwater management zones, some areas may have the potential to be nearing their allocation limits. NZKGI will be watching developments in this space.

Waiōtahe FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small Moderate High

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

Yes. It is noted that surficial erosion is the dominant erosion process in the catchment, and the majority of sediment loss is likely to be from native forest (estimated at 76%), because it is the largest single use in the catchment (55%) and most of this is in areas with steep land and high rainfall.

Dairy is estimated to be the largest contributor to nutrient loads. Native forest is estimated to contribute most of the *E. coli* load in the upper catchment and in the lower catchment additional estimates of *E. coli* suggest that dairy farmland is the most significant contributor.

It would appear that the contribution of contaminants from kiwifruit orchards is small in this FMU compared to other source.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

Yes. With no resource consents to take surface water in this FMU (Waiōtahe River) there are no particular issues relating to surface water quantity. Allocation currently exists for future water takes.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes. There appears to be future groundwater allocation in this area and NZKGI will be watching for the Groundwater Management Zones once they are developed. The FMU story states that as of January 2022, there were just four water take consents in the Waiōtahe FMU, all from groundwater. All consents are for horticultural irrigation, with a couple of them also authorising take for frost protection and other minor purposes. There are 33 KPINs in this FMU and growers note that only a small number of kiwifruit orchards in this FMU have irrigation.

Growers note that saltwater intrusion and bore water quality and quantity are key concerns here.

Waitahanui FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small | Moderate | High

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

Yes, noting that there is only one monitoring site to the east of the FMU. The streams have mobile pumice beds and generally well-shaded headwaters so nutrients like nitrogen and phosphorus that can promote plant, weed and algal growth are not expected to be an issue. The main issue appears to be *E. coli* which is not relevant for kiwifruit. It is agreed that the shift of some dairy farming land use to kiwifruit may reduce *E. coli* losses in the FMU.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

It is unclear why August has more low flow days than all of the other months of the year, except for January and February. It is noted that the Waitahanui Stream is very strongly spring fed and the very stable flows in this FMU leave little room for higher allocations for frost protection or secondary uses. Given that wording, it is unclear why page 23 of the

FMU story discusses the potential for allocating a secondary block that can only be taken during periods of high flow with storage dams likely necessary.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes. It is noted that new Groundwater Management Zones within which allocation limits are set are not envisaged to substantially change the current allocation status.

Whakatāne FMU

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Question

Does this brief summary about the people, land and water in this FMU seem about right to you?

Answer

Yes

Question

Does this brief summary about surface water quality in this FMU seem about right to you?

Answer

Yes. We note that there is a high proportion of native and exotic forest and some dairying in the headwaters and that most of the kiwifruit is located in the lower areas. Dairy is estimated to contribute a disproportionately high amount of the total nitrogen and total phosphorus for its land area. While native forest land use is estimated to contribute a significant portion of the total nitrogen load, this is only because of the very large proportion of land area to native forest.

Question

Does this brief summary about surface water quantity in this FMU seem about right to you?

Answer

We note that the Whakatāne FMU has gravel bed rivers and streams, and that while the Whakatāne River as a whole is not overallocated, the management of takes and minimum flows is important. The allocation of a secondary block that can only be taken during periods of high flow is supported, noting that storage will be required.

Growers note that there is saltwater intrusion way up river.

Question

Does this brief summary about groundwater quantity in this FMU seem about right to you?

Answer

Yes. It is noted that new Groundwater Management Zones within which allocation limits are set are not envisaged to substantially change the current allocation status.

Growers note that shallow bores are high in iron and/or salt.