

SUBMISSION ON

National direction for vegetables

25 July 2025

To: Ministry for the Environment

Name of Submitter: Horticulture New Zealand

Supported by: Hawke's Bay Vegetable Growers Association,
Onions NZ, Process Vegetables NZ, Pukekohe Vegetable
Growers Association, Vegetables NZ

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Our submission

Horticulture New Zealand (HortNZ) thanks the Ministry for the Environment for the opportunity to submit on freshwater national direction and welcomes any opportunity to continue to work with the Ministry for the Environment and to discuss our submission. The details of HortNZ's submission and decisions we are seeking are set out in our submission below.

HortNZ's Role

Background to HortNZ

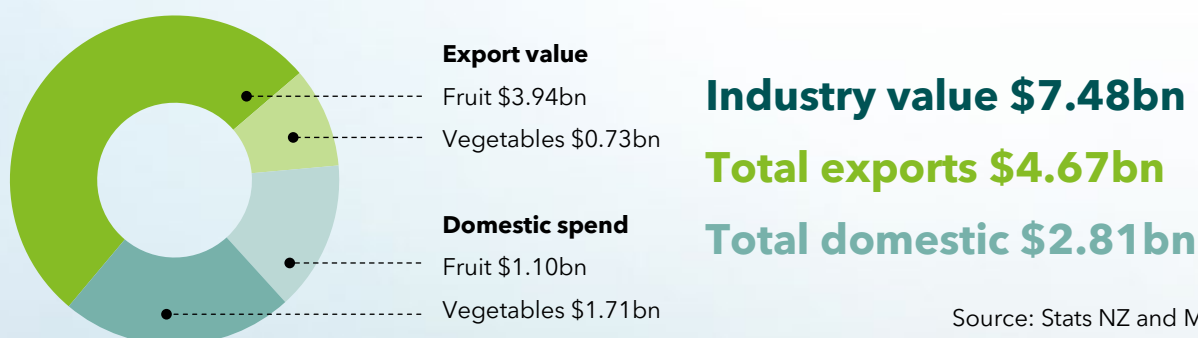
HortNZ represents the interests of approximately 4,500 commercial fruit and vegetable growers in New Zealand who grow around 100 different fruits and vegetables. The horticultural sector provides over 40,000 jobs.

There are approximately 80,000 hectares of land in New Zealand producing fruit and vegetables for domestic consumers and supplying our global trading partners with high quality food.

It is not just the direct economic benefits associated with horticultural production that are important. Horticulture production provides a platform for long term prosperity for communities, supports the growth of knowledge-intensive agri-tech and suppliers along the supply chain, and plays a key role in helping to achieve New Zealand's climate change objectives.

The horticulture sector plays an important role in food security for New Zealanders. Over 80% of vegetables grown are for the domestic market and many varieties of fruits are grown to serve the domestic market.

HortNZ's purpose is to create an enduring environment where growers prosper. This is done through enabling, promoting and advocating for growers in New Zealand.



HortNZ's Resource Management Act 1991 Involvement

On behalf of its grower members HortNZ takes a detailed involvement in resource management planning processes around New Zealand. HortNZ works to raise growers' awareness of the Resource Management Act 1991 (RMA) to ensure effective grower involvement under the Act.



Executive Summary

National direction for vegetables is needed

HortNZ supports the Government's proposals for national direction for vegetables. Unworkable freshwater rules have threatened the continued supply of vegetables at reasonable prices, so national direction is needed to help councils support this matter of national importance while managing the local effects of vegetable growing in an equitable way.

Due to the national importance of vegetable growing for our domestic food supply, HortNZ is seeking that vegetables are designated a permitted activity **within environmental limits**.

HortNZ seeks immediate introduction of:

- a new NPSFM objective,
- supporting policies in the NPSFM, and
- a National Environmental Standard (NES) for Vegetables.

The timing is urgent, so that regional councils have clear direction about how to provide for vegetable growing in the context of Plan Changes 1 and 2 which are in Environment Court. Timing is essential because vegetable growers need confidence that they can continue to operate without waiting for the RMA replacement bills to be passed into law and implemented.

That said, HortNZ sees these changes transitioning well to the new resource management system. The Expert Advisory Group (EAG) report on the incoming replacement to the RMA suggests a wider role for national permitted activity standards.¹ HortNZ sees national direction for vegetables fitting neatly into that approach, even providing a first case study to show how implementation can work.

The EAG report notes that Central Government may have an interest in regional spatial planning and could participate where there is an agreement with local authorities. Matters of national significance may be covered in the spatial plans, particularly infrastructure with national rather than regional benefits.² HortNZ sees vegetable growing for domestic food supply in the same vein - a nationally important activity with national, rather than regional, benefits due to the centralised nature of the supermarket supply chain. Planning for vegetable growing within environmental limits under the Natural Environment Act can be enabled through related national policy direction that directs this consideration in spatial planning.

¹ Report from the Expert Advisory Group on Resource Management Reform. [Blueprint for resource management reform: A better planning and resource management system](#). 2025. (para 99e)

² Report from the Expert Advisory Group on Resource Management Reform. [Blueprint for resource management reform: A better planning and resource management system](#). 2025. (para 283e)

Table 1: HortNZ's proposed approach to national direction for vegetables

HortNZ Policy Outcomes Sought	Proposed Content
NPSFM objective to enable vegetable growing	Recognise the national significance of commercial vegetable production by enabling new and existing commercial vegetable production, such that New Zealand has a resilient supply of vegetables for current and future generations.
NPSFM policy to enable vegetable growing	<ol style="list-style-type: none"> 1. Commercial vegetable growing is enabled as a standalone activity and as part of diversified farming operations. 2. Standalone commercial vegetable growing and associated crop rotation is authorised as a permitted activity with a farm plan³ that demonstrates that the diffuse discharge risk is managed. 3. Commercial vegetable growing as a standalone activity, and crop rotation are enabled and provided for when outcomes and limits are set. An action plan approach is used in catchments that support commercial vegetable production in addition to limits.
NPSFM value to enable vegetable growing	The target attribute states provide sufficient assimilative capacity to provide the resource use limit needed to support commercial vegetable growing.
NES for Commercial Vegetable Growing	<ol style="list-style-type: none"> 1. Makes commercial vegetable growing a permitted activity nationally 2. Applies to existing vegetable growing and expansion of vegetable growing 3. Enables crop rotation 4. Includes minimum practice standards for all commercial vegetable growers 5. Relies on audited and certified risk-based farm plans 6. Prevails over more stringent and more lenient regional rules, including freshwater farm plans, or other farm planning requirements, but not over existing consents. 7. To support crop rotation, vegetable growing can be authorised on a property that is consented or permitted for another farming activity, but the rules for vegetable growing would apply to the part of the farm where commercial vegetable growing was occurring. 8. Specifies that vegetable growing can also be authorised as part of mixed farming activities by Regional Plans.

³ This could be a certified freshwater farm plan or an industry assurance plan developed under the NES Vegetables.

Table 2: HortNZ Proposed Drafting for the NES Vegetables

- 1) A commercial vegetable growing operation over 5 ha must be undertaken in accordance with an independently audited and certified farm plan developed within one year of the commencement date. The farm plan must include the following minimum criteria:
 - a. The freshwater farm plan and associated action plan must include a risk assessment that considers:
 - i. The biophysical characteristics of the farm including soil, rainfall and slope,
 - ii. The risk factors and practices associated with the activity, and
 - iii. Demonstrate the use of suitable tools to support decision making on appropriate risk mitigation.
- 2) The farm plan must:
 - a. Demonstrate that the grower is adopting a risk-based approach to managing risks over time through implementation of the action plan.
 - b. In determining the appropriate actions to manage risk, the grower must apply industry Codes of Practice or guidelines for managing nutrients (nitrogen and phosphorus) and sediment.
 - c. The grower must demonstrate they have adopted the following minimum standards in their first audit:
 - i. Nutrients
 1. Nutrient crop budgets that:
 - a. Account for plant uptake, and
 - b. Are informed by a minimum of one soil mineral nitrogen test per crop per annum.
 2. Fertiliser application practices that:
 - a. Minimise drift for ground application, and
 - b. Ensure application equipment is calibrated annually.
 - ii. Sediment and Erosion control
 1. 5m uncultivated setbacks from rivers, or a 4m vegetated buffer strip setback from rivers, or contouring such that water flows to a sediment treatment device rather than flowing into the river via overland flow.
 2. The slope of any land cultivated for commercial vegetable production must be 10 degrees or less, calculated as a block average.
 - iii. Irrigation
 1. A farm scale irrigation plan accounts for rainfall, evapotranspiration, and fertiliser inputs and sets out the methods undertaken to ensure the efficient operation of

the irrigation system in a way that minimises impacts to freshwater.

iv. Stock

1. Stock farmed as part of crop rotations must meet the permitted activity standards of the relevant Regional Plan, or be consented as part of a farming activity.
- d. The farm plan must be updated annually to reflect crop rotation or expansion onto new land not previously included within the farm plan in the following manner:
- i. As properties change due to crop rotation or expansion, the freshwater farm plan risk assessment and action plan must be updated.
- e. The farm plan must document the location of all properties that are being used for commercial vegetable production, including fallow, cover crop and pasture phases, and the actions relevant to each property.

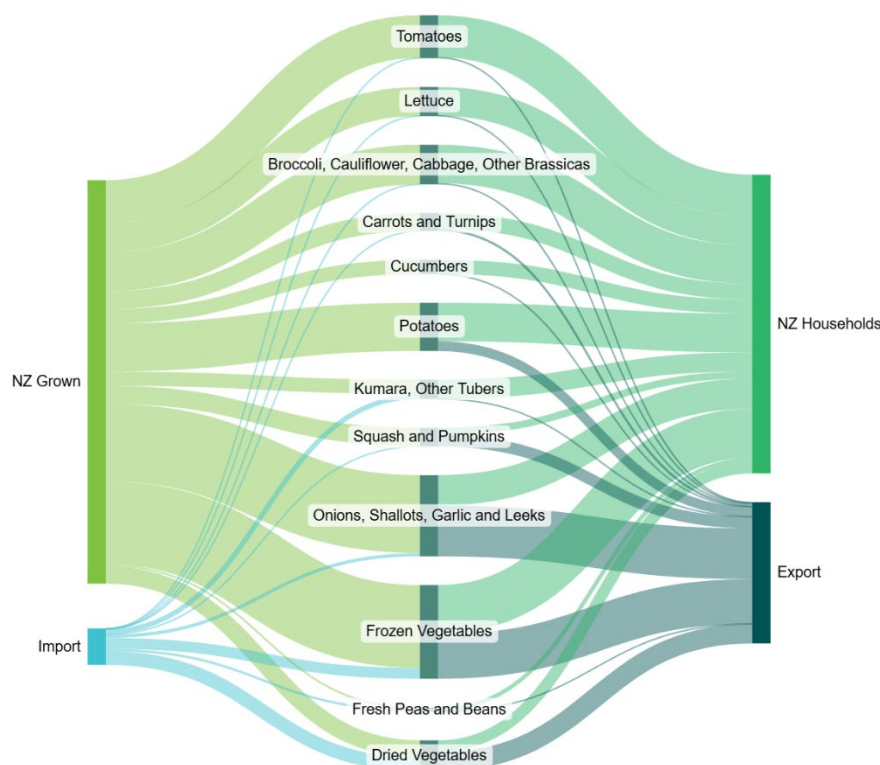
Submission

1. Commercial vegetable growing in New Zealand

Vegetable growing produces healthy food for New Zealanders. More than 80% of the vegetables grown domestically are sold in New Zealand, and those that are exported (primarily processed vegetables, onions and potatoes) add economic and environmental sustainability to crop rotations. The sector generates \$2.44 billion of value between the domestic and export markets.⁴ In total, over 70 different types of vegetables are grown in New Zealand.⁵

It is not possible to import fresh vegetables at the scale necessary to meet our population's nutritional needs or at a reasonable price due to our country's geographic isolation and the perishable nature of vegetables.⁶ We, as a country, are reliant on our vegetable growers' hard work to feed ourselves, and our families, nutritious food.

Figure 1: Source and end destination of vegetables by value (Year ended June 2023)⁷



⁴ HortNZ. [Annual Report to March 2024](#). Accessed online 23/12/24.

⁵ New Zealand Legislation. [Commodity Levies \(Vegetables and Fruit\) Order 2024 \(SL 2024/259\) 3 Interpretation](#)

⁶ Agchain. July 2023. [Sensitivity of Domestic Food Supply To Loss In Vegetable Growing Production In Specified Vegetable Growing Areas](#). Accessed online 22/07/25.

⁷ Stats NZ. [New Zealand Trade Dashboard](#). Year ended June 2023; Stats NZ. [Household Economic Survey](#). Year ended June 2023; Buttercup Squash Council Inc via United Fresh, Plant & Food Research. [Fresh Facts 2024](#)

1.1. Vegetable growing area is linked to domestic demand

The area of land in vegetable growing has contracted significantly in recent decades. A quarter of vegetable growing land from 2007 is no longer in production, declining to 37,420 hectares in 2022.

Improved efficiency has driven part of the contraction; for example, most tomatoes are now grown in glasshouses rather than outdoors. New Zealanders' changing diets have also contributed to the decline in growing area. New Zealanders are eating far below recommended servings of vegetables for health and nutrition, as shown in Figures 2 and 3. Vegetables are an essential part of New Zealand's food supply, and public health guidelines recommend that New Zealanders eat at least three servings of vegetables per day.⁸

Figure 2: Only one in eleven Kiwi adults meet the recommended intake of fresh vegetables⁹

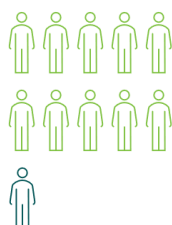
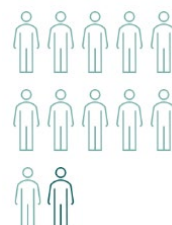


Figure 3: Only one in twelve Kiwi children meet the recommended intake of fresh vegetables¹⁰



Currently, unworkable regional regulation is threatening to further constrain the supply of vegetables. The price of vegetables is directly related to available supply. As the price of vegetables increases, people consume even fewer vegetables,¹¹ which has negative consequences for public health. Vegetable growers are already squeezed with shrinking margins due to a lack of supermarket competition, threatening their economic viability even as consumers face higher prices.

New Zealand's population is expected to grow from 5.3 million to 6 million people by 2040.¹² Assuming that per capita demand for vegetables remains the same, an expansion of vegetable producing area at the same rate as population growth would see growing area reach 42,362 hectares in 2040, still below 2017 levels, as shown in Figure 4. That number does not account for any technological or practice improvements that allow for higher yields on less land.

⁸ Ministry of Health. 2020. [Eating and Activity Guidelines for New Zealand Adults: Updated 2020](#). (p. 23)

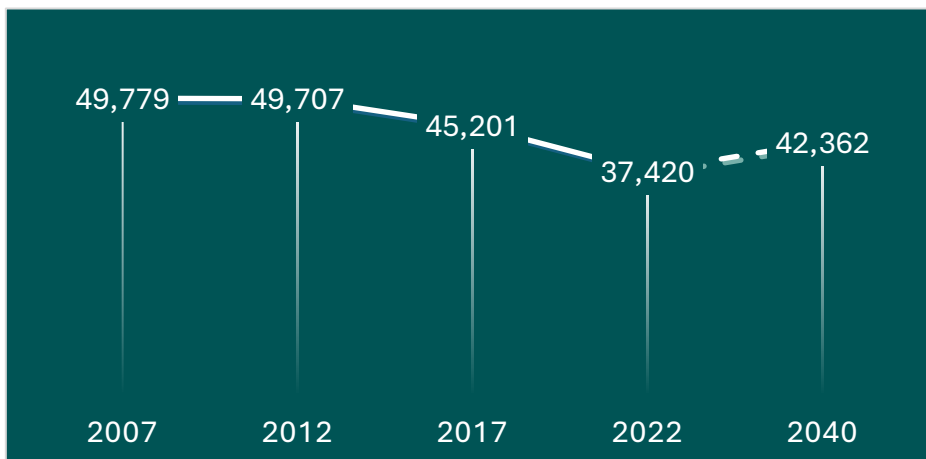
⁹ Ministry of Health. [Annual Update of Key Results 2023/24: New Zealand Health Survey](#). 19 November 2024. Accessed 13/01/25.

¹⁰ Ministry of Health. [Annual Update of Key Results 2023/24: New Zealand Health Survey](#). 19 November 2024. Accessed 13/01/25.

¹¹ Dr. Christina Cleghorn, University of Otago. August 2020. [The health and health system cost impacts of increasing vegetable prices over time](#). Accessed 22/07/25.

¹² StatsNZ. ["New Zealand's population likely to reach 6 million before 2040"](#). 4 June 2025. Accessed 16/07/25.

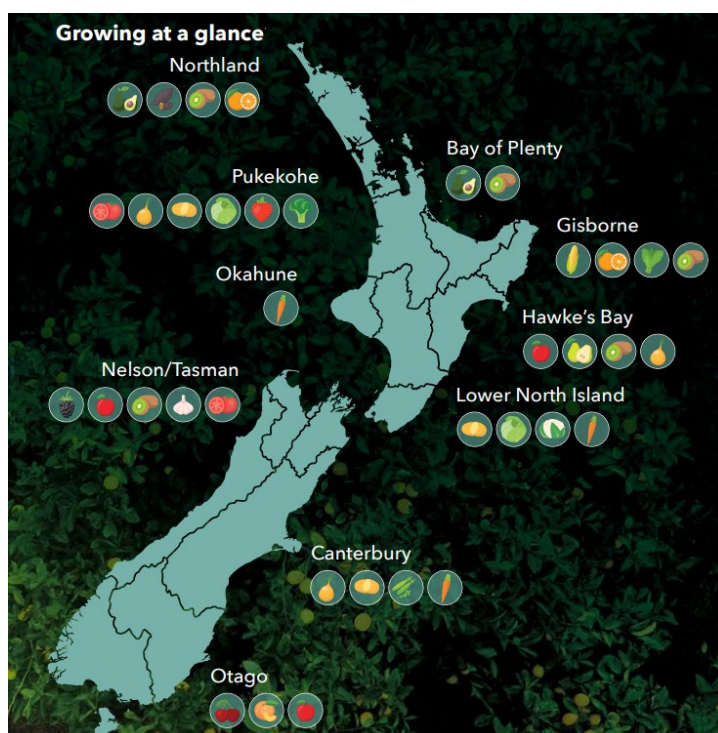
Figure 4: New Zealand vegetable growing over time if linked to population growth (ha)¹³



1.2. Vegetables are grown all over New Zealand

Vegetable growing occurs in every region of New Zealand, but it is concentrated in regions with the best combination of fertile soil, appropriate climate, proximity to population centres (for labour and distribution) and supporting infrastructure. The biggest vegetable growing areas are Pukekohe, Tairāwhiti (Gisborne), Ohakune, Horowhenua, the Heretaunga Plains (Hawke’s Bay), the Waimea Plains (Tasman), and the Canterbury Plains, shown in Figure 5.

Figure 5: Crops grown in New Zealand regions



¹³ United Fresh, Plant & Food Research. [Fresh Facts 2024](#), [Fresh Facts 2017](#). Accessed 16/07/25.

1.3. Vegetables are grown using crop rotation

All outdoor vegetables in New Zealand are grown using crop rotation, a regenerative practice that’s been used by agriculturalists for over a thousand years to manage soil health and pest and disease pressures. Crop rotation is the successive cultivation of different crops in a specified order. For example, land might be planted in potatoes, then oats, then carrots. Rotations occur across time (through changing the crop on a paddock) and space (through leasing or swapping land). Over time, crops in a rotation generally perform better than those in continuous production. Crop rotations often include cover crops within their sequence that are not harvested but allowed to break down and return organic matter to the soil. Crop rotations also frequently include animal phases such as grazed pasture.

Figure 6: An example of crop rotation over time¹⁴

Year	Month	Crop	Year	Month	Crop	Year	Month	Crop	
1	Feb.	Fallow	3	May	Carrots	5	May	Barley	
	Mar.								
	Apr.								
	May	Onions		June					
	June								
	July								
	Aug.								
	Sep.								
	Oct.								
	Nov.								
	Dec.								
	2	Jan.		Fallow		4	Jan.	Fallow	6
Feb.									
Mar.									
Apr.		Potatoes	Feb.	Lettuce	Jan.				
May									
June									
July									
Aug.									
Sep.									
Oct.		Oats	Mar.	Fallow	Feb.				
Nov.									
Dec.									
Jan.	Fallow		Apr.		Broccoli	Mar.			
Feb.									
Mar.									
Apr.									

¹⁴ Adapted from Muller, C. and Inness, M. 2023. Horticulture Typology Modelling for the FWMT: a technical modelling report. A report prepared for Auckland Council and Horticulture New Zealand.

1.3.1. CROP ROTATION FOR PLANT AND SOIL HEALTH

Repeated cropping of the same species depletes specific nutrients. Rotating crops with different root systems (shallow vs. deep) improves nutrient uptake. Legumes in rotations fix nitrogen, which can be taken up by subsequent crops. Cover crops help retain nitrogen and reduce nutrient losses to the environment.

Good soil structure supports healthy crops by improving drainage, aeration, and erosion risk. Pasture phases, legumes, and fibrous-rooted plants add organic matter and promote soil organisms like earthworms. Deep-rooted crops help open subsoil layers. Cover crops also protect the soil surface between plantings.

1.3.2. CROP ROTATION FOR PEST AND DISEASE MANAGEMENT

Rotating crops disrupts pest and disease cycles by removing hosts and reducing pathogen build-up. Some crop residues act as biofumigants, a natural phenomenon where certain crops release compounds that control pests when they decompose. Other crops suppress weeds through dense ground cover. Strategic rotation of flowering plants allows growers to be more selective with herbicide use. Integrated Pest Management practices, which are the focus of significant industry research and trials, work toward managing pests across entire rotations and regions.

1.3.3. CROP ROTATION DETERMINES HOW AND WHERE GROWERS OPERATE

Commercial vegetable growers often specialise in a small range of crops because it is more operationally efficient to purchase a limited amount of specific packing equipment and build up crop-specific expertise. To achieve longer, more diverse rotations, growers negotiate land swapping and lease arrangements with other businesses.

Figure 7: Crop rotation over owned and leased land

Landowner	Paddock	Land User							
		Feb-May	Jun-Dec	Jan-Apr	May-Nov	Dec-Apr	May-Dec	Jan-May	Jun-Nov
Grower A	Paddock 1	Grower A	Grower A	Leased by Grower B	Leased by Grower B	Leased by Grower B	Grower A	Grower A	Grower A
	Paddock 2	Grower A	Grower A	Leased by Grower B	Leased by Grower B	Leased by Grower B	Grower A	Grower A	Grower A
Landholding Company	Paddock 3	Leased by Grower B	Leased by Grower B	Leased by Grower A	Leased by Grower A	Leased by Grower A	Leased by Grower A	Not available for vegetables	Not available for vegetables
	Paddock 4	Leased by Grower B	Leased by Grower B	Leased by Grower A	Leased by Grower B	Leased by Grower B	Leased by Grower B	Not available for vegetables	Not available for vegetables
Farm C	Paddock 5	Not in vegetable production						Leased by Grower B	Leased by Grower B
	Paddock 6	Not in vegetable production						Leased by Grower B	Leased by Grower B

The complexities of crop rotation, and the need to alternate management of growing land between businesses, mean individual growers usually operate across multiple non-contiguous land holdings that are a combination of owned, leased and swapped land. It is common for growers to lease 50% or more of their growing land. Over time, changing leases and the need to manage soil health will lead growers to change the physical location their operations, even when they are still growing the same volume of vegetables. Total area of

land under production does not necessarily change (except where contraction occurs), but the location of where it occurs does.

2. The vegetable industry is committed to environmental improvements

The vegetable industry has shown a sustained effort and commitment to reducing the environmental effects of vegetable growing. Our industry is driving good practice adoption with farm plans to continue this work into the future and meet the growing expectations of markets, consumers and regulators. Examples of collaborative projects and industry research dedicated to making environmental improvements are included in Appendix D.

2.1. Growers operate under Industry Assurance Schemes

Domestic supermarkets and overseas retailers require that growers prove that they meet food safety standards and other conditions for sale. Industry assurance programmes are designed to give markets the confidence that growers are meeting both regulatory and market requirements.

2.1.1. NEW ZEALAND GOOD AGRICULTURAL PRACTICE (NZGAP)

New Zealand Good Agricultural Practice (NZGAP) is an industry assurance programme for the New Zealand horticulture industry. It provides confidence to consumers, markets and the Government in the safe and sustainable production of New Zealand fruits and vegetables. A GAP label means that a grower is meeting an agreed standard of good or best practices. To maintain NZGAP certification, growers are regularly audited against the standard by independent auditors. Failure to comply with the standard can lead to a loss of certification and inability to sell their product, which is the incentive to maintain compliance.

Before vegetable growers can sell their produce in the domestic market, supermarkets require that they have NZGAP food safety and social practice certification. This shows that growers have met both market and regulatory requirements for food safety and worker welfare. For this reason, *all* commercial-scale vegetable growers in New Zealand have the core NZGAP food safety and social practice certifications.

GAP is an integrated farm planning solution for growers. The one system achieves multiple outcomes. When new requirements come along or old requirements change, GAP can update or develop new standards. Then, they seek recognition of their standards from regulators to meet new the requirements. If the regulatory system provides for full recognition of industry assurance programmes, growers only need to interact with one system to meet all of their regulatory and market requirements. Because growers are already using NZGAP, it is an effective vehicle to drive compliance for regulatory requirements beyond food safety and social practice, including environmental farm planning.

2.1.2. ENVIRONMENTAL MANAGEMENT SYSTEM

The horticulture industry is working to deliver farm plans through the NZGAP Environmental Management System (EMS) add-on. The EMS standard covers the management of environmental risks on farm, including soil health, erosion and sediment control, nutrients, irrigation, mahinga kai, biodiversity and waterways. The EMS enables growers to systemise

complex environmental issues by mitigating identified risks with appropriate control measures found in industry guidelines and codes of practice.

The EMS is currently under review and will be updated in 2025/26. This update aims to respond to the new freshwater farm plan regulations and to incorporate updated industry codes of practice.

2.1.3. VEGETABLE GROWERS ARE COMMITTED TO FARM PLANS

The vast majority of vegetable growing land in New Zealand is already managed through farm plans, specifically to manage freshwater risks. 110 growing businesses are registered with the NZGAP EMS, covering approximately 28,000 hectares of vegetable growing land, about three-quarters of the country’s total vegetable growing area. Industry and growers are making a concerted effort to demonstrate progress towards freshwater outcomes. The EMS isn’t the whole picture - some growers are using different farm plan pathways. For example, vegetable growers in Canterbury often undertake farm planning requirements through irrigation scheme consenting obligations.

Through the Growing Change programme, a three-year partnership between HortNZ and the Ministry for the Environment (MfE), we have been working to prepare growers to meet freshwater farm plan requirements under Part 9a of the RMA. As part of the Growing Change project, growers received free advisor support to complete EMS farm plans or review and update existing EMS plans. Growing Change also facilitated nutrient, erosion and irrigation workshops with experts on the latest practices and tools which were well-attended by growers.

Figures 8 and 9 show the percentage of the 82 vegetable growers participating in Growing Change who have committed to particular practices in an audit-ready EMS plan. Green indicates that the practice is in place, yellow is partially in place, red is not in place, and grey is not applicable. Invalid responses were omitted.

Figure 8: Fertiliser management practices adopted by vegetable growers participating in Growing Change

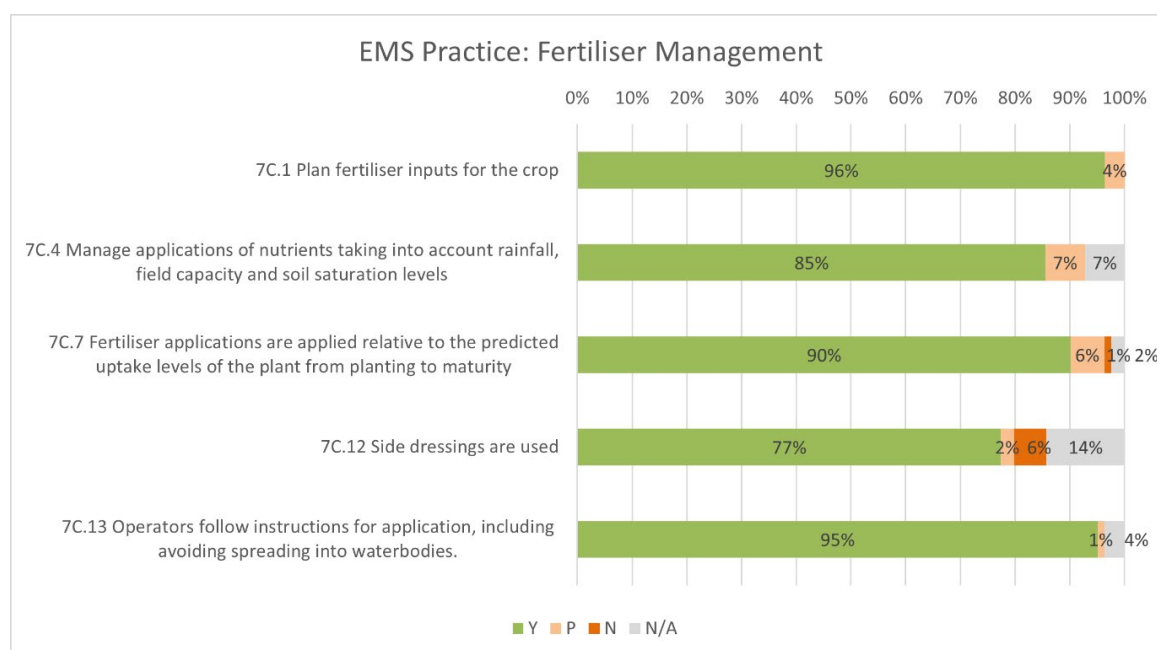
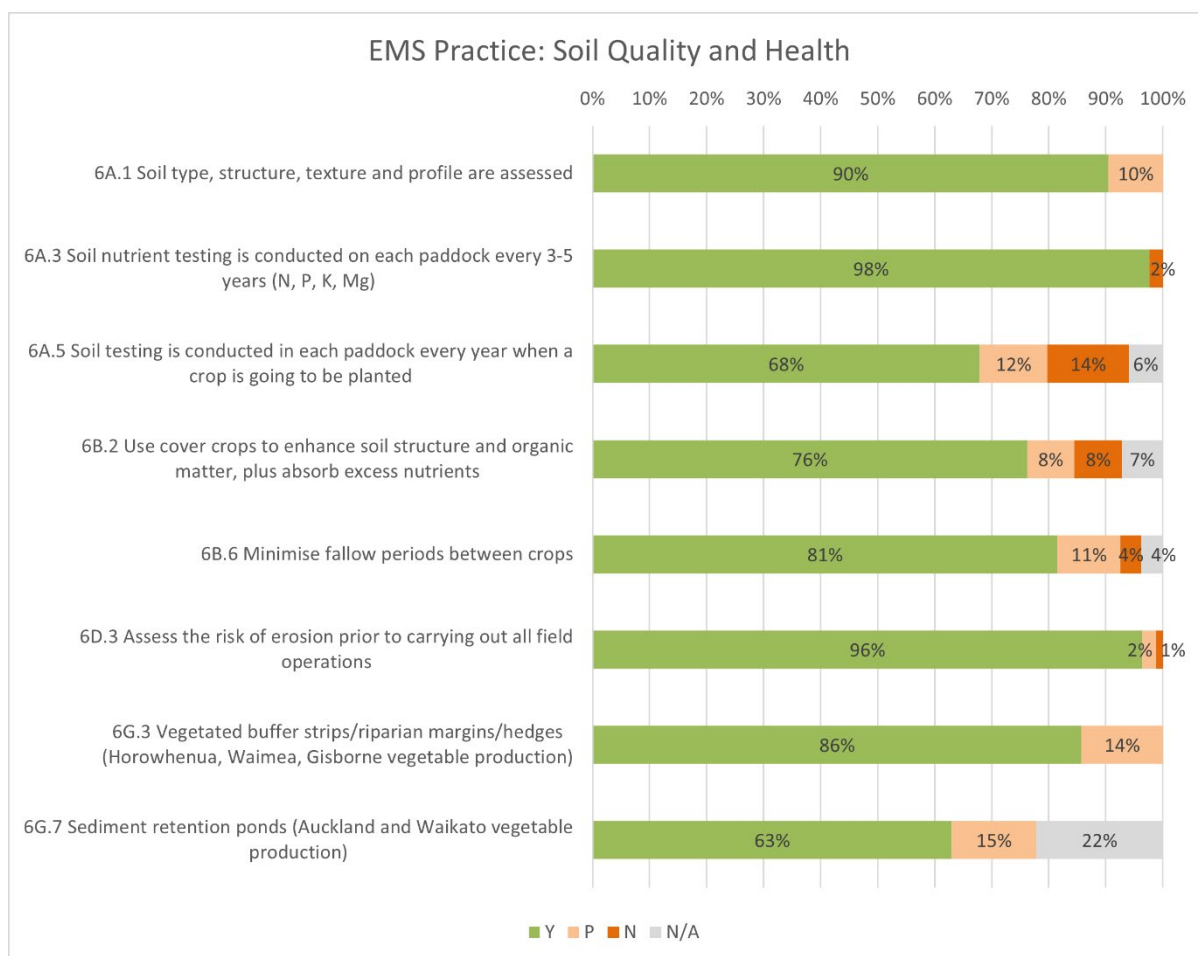


Figure 9: Soil quality and health practices adopted by vegetable growers participating in Growing Change



3. Why vegetable growing needs national policy support now

To date, regional councils have found it difficult to design workable rules for commercial vegetable production despite its national importance for public health. Regional councils have tried to apply frameworks designed to manage pastoral farming to vegetable growing. Vegetable growing is a highly complex and dynamic farming system, and rules that work for grass don't necessarily work for 70 kinds of vegetable crops as they rotate across owned, leased and swapped land.

HortNZ seeks that vegetable growing is permitted to operate **within cumulative environmental limits** with a risk-based farm plan and compliance with minimum standards. That way, New Zealanders can buy healthy, fresh food at affordable prices while protecting the environment – a win-win.

3.1. National benefits and local effects

In two of New Zealand's largest vegetable growing areas, Horowhenua and the Waikato-side of Pukekohe, regional councils have accidentally designed their freshwater rules to make it very difficult or impossible to get a resource consent to grow most vegetables or

rotate crops. This is playing out through Horizons Regional Council's Plan Change 2 (PC2) and Waikato Regional Council's Plan Change 1 (PC1), which are currently in Environment Court subject to HortNZ appeals.

MfE's *Interim Regulatory Impact Statement: Commercial vegetable growing* (the RIS) notes that "if Horizons PC2 and Waikato PC1 are made operative, [the Government] expect[s] growers producing up to 16% of planted vegetable area (but up to 27% of broccoli, cauliflower and cabbage) will be required to apply for resource consent."¹⁵ The details of PC1 and PC2 are described in Appendix B of this submission.

Waikato PC1 and Horizons PC2 frameworks are not designed to allow commercial vegetable growing to continue, even when growers are using good management practices. Instead, the councils have designed rules that allow existing pastoral farming to continue but require existing vegetable growing to contract. Decisionmakers in Waikato PC1 have dismissed the importance of vegetable production for domestic food supply.¹⁶

This problem is likely to extend beyond the Waikato and Horizons regions. The RIS states that "regional council annual reporting demonstrates the problem may also extend beyond key growing 'hubs' in future". In reporting to Central Government, regional councils have expressed difficulty with providing for vegetable production and allowing for expansion within current frameworks.¹⁷ Should councils in other regions follow the precedent of PC1 and PC2, New Zealand could see domestic vegetable production shrink across the country with compounding effects.

3.2. Unworkable methods

HortNZ seeks an NES for Vegetables that prevails over more and less stringent rules in regional plans and over regionally specific freshwater farm plan requirements. It is important that the NES prevails because if it does not and regional councils are able to add additional requirements through rules or freshwater farm plan requirements, we have no confidence based on their performance to date that these would be designed in a manner that can be implemented by vegetable growers. Every region's vegetable production contributes to national supply and needs practical, consistent regulation.

The unworkable nature of regional rules is described in the following sections.

3.2.1. NITROGEN LOSS INTENSITY USED WITHOUT CONSIDERING ACTUAL LOAD

Some plans seek to manage high nitrogen intensity at the property-scale rather than targeting reductions based on overall contribution to the total contaminant load. This inequitably targets commercial vegetable growing, which often contributes a small share of catchment nitrogen while growing a lot of food on a small land area (leading to higher nitrogen intensity where it does occur). For example, commercial vegetable growing has no permitted activity pathway in Waikato PC1, despite contributing just 3% of total nitrogen

¹⁵ MfE. [Interim Regulatory Impact Statement: Commercial vegetable growing](#). 19 March 2025. (para 31). Accessed online 17/06/25.

¹⁶ PC1 Interim Decision para 690

¹⁷ MfE. [Interim Regulatory Impact Statement: Commercial vegetable growing](#). 19 March 2025. (para 32-33). Accessed online 17/06/25.

load. Meanwhile, up to 80% of dry stock is a permitted activity, even though this activity contributes 20% of the nitrogen load to the Waikato River.

3.2.2. RULES ARE FOCUSED ON NITROGEN RATHER THAN OUTCOMES

Nitrogen limits are often used to manage water quality, even when other contaminants like sediment or *E. coli* are the main problem. These rules are ineffective for improving water quality. A sole focus on nitrogen disadvantages commercial vegetable growing compared to other land uses with lower nitrogen contributions but higher impact on freshwater degradation.

3.2.3. REQUIRING THE USE OF INAPPROPRIATE MODELLING TOOLS

Overseer, as a modelling tool, is not well-suited to represent many commercial vegetable growing rotations. Despite HortNZ and growers presenting evidence on these matters for many years, regional councils continue to insist on using this tool.¹⁸ They wish to capture all land uses with the same rules and tools for ease of management, but this has perverse outcomes for vegetable growers when the tools cannot accurately represent their activity. The recent PC1 Waikato Environment Court interim decision indicates acceptance from the Court that Overseer is not an appropriate tool, but another hearing will be required to determine whether the requirement can be removed from the plan.¹⁹

3.2.4. LAND USE CONSENTS THAT RUN WITH THE LAND

Attaching consents to land parcels restricts the ability of commercial vegetable growers to rotate crops and maintain soil health. Leasing and rotation may require repeated re-consenting, making vegetable production unworkable under current rules. Within a permitted activity framework, this could just be managed through a farm plan.

3.2.5. ALLOWING FOR CROP ROTATION

One pitfall for regional freshwater rules is the failure to account for crop rotation and business turnover when distinguishing between new and existing commercial vegetable production. Moving to a new leased, swapped, or purchased paddock is often just relocating existing production—not expansion—but may erroneously trigger expansion rules if consents are tied to land parcels.

If a consent is tied to a land parcel, it governs the leaseholder's activity but remains with the landowner after the lease ends. When a vegetable grower's lease ends, this could allow the landowner to intensify land use to an activity that is not vegetable production. As a result, vegetable growers may need to re-consent their operations after each lease, and there may be less room to do so if landowners are intensifying other activities. Given the short duration and the number of leases that many growers manage, requiring new consents for each lease is unworkable.

Most plans regulate limits under the RMA using a land use control (Section 9), either alongside or instead of, a discharge control (Section 15). While the RMA does not specify that land use consents run with land parcels, they have become the default unit for such consents, which are commonly sold with the land. The problem for commercial vegetable

¹⁸ Memorandum of Counsel for Waikato Regional Council in the matter of Plan Change 1 to the Waikato Regional Plan. 28 April 2025. (para 29)

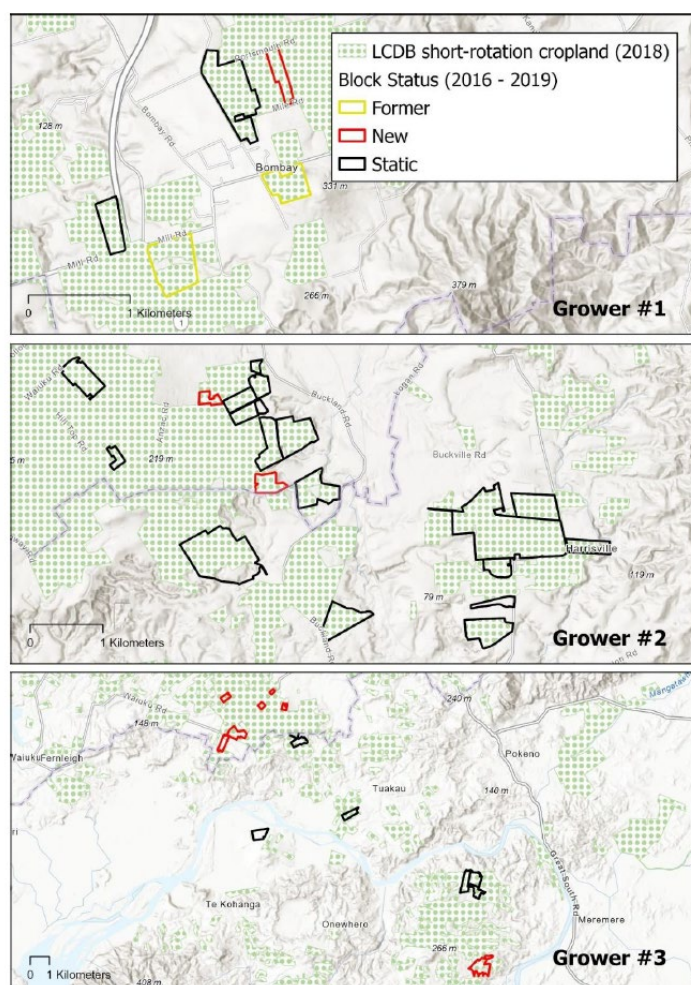
¹⁹ Decision [2025] NZEnvC 170. Part H

production is that the allocation of a nitrogen limit to parcels or enterprises does not provide for crop rotation.

Vegetable production may rotate within a catchment onto land that has not previously been used for cropping. That land may lack sufficient nitrogen discharge allocation (due to grandparenting or natural capital approaches) to support commercial vegetable production. If nitrogen use exceeds a set threshold, consent may be required, even if the grower continues the same activity (e.g. same crop area and rotation) within the same catchment.

Figure 10 illustrates that in the Waikato, most growers are rotating onto and off of land that has previously been in commercial vegetable growing, with a much smaller amount of land coming into the rotation from long-term pasture. Overall, the area of commercial vegetable growing land is static, but the location of a particular grower's business changes over time, including across sub-catchment boundaries. The maps of Grower #1 and Grower #2 show only a subset of total grower blocks. All blocks not shown here are "static".

Figure 10: Change in growing area for three commercial growing farms in the Waikato²⁰



²⁰ Easton, S. 28 July 2023. [PC1 Evidence](#). Waikato Environment Court.

A national permitted activity for vegetable production could resolve this problem. National direction must support the transfer of consents between growers and allow for rotation without triggering the need for a consent.

Read more about the challenges to crop rotation from regional rules in HortNZ's [Position Paper on National Direction for Vegetables](#).

3.2.6. ALLOWING FOR BUSINESS TURN OVER

Similarly, when one grower exits and another enters the market, the new grower may farm in a different location without expanding the sector's total production. This is a replacement, not expansion, but current rules often don't reflect that.

In plan changes such as Waikato PC1, Horizons Plan PC2 and Canterbury PC7 where grandparenting approaches for commercial vegetable production have been developed, the "existing" allocation is to a business operating on land within a catchment rather than to specific parcel of land. HortNZ supported this approach in these plan changes to respond to the rotational nature of vegetable growing. However, this approach to grandparenting creates another issue where the allocation to "existing" growing is lost when businesses change hands.

3.2.7. ALLOWING FOR EXPANSION

Current consenting regimes make the expansion of commercial vegetable growing uneconomic, even where land and climate are suitable. Without workable expansion pathways, domestic supply will not be able to match population growth and demand, pushing up vegetable prices and impacting cost of living for New Zealanders.

First-in-first served is one of many possible allocation frameworks, but when resources are fully allocated, the cost of maintaining the existing state is passed onto new resource users. In some situations, the first-in-first served approach may be reasonable, but in the context of domestic vegetable supply, growers cannot expand if allocation is not available to do so. If vegetable growers cannot expand due to regulation, vegetable supply will contract relative to population and the price of vegetables will increase.

This scenario was tested in Deloitte modelling of the Pukekohe Hub, which looked at the expected increase in the price of vegetables if vegetable growing area was prevented from expanding with population.²¹ The report found that if vegetable production was constrained by land use restrictions, prices could be expected to rise 43-58%.

There is an opportunity for export vegetable crops (onions and process crops) to expand beyond domestic population growth,²² but these crops are grown integrated with arable and pastoral farming in more extensive rotations that have similar nitrogen leaching rates to pastoral farming. However, in PC1, growing vegetables is specifically excluded from the farming rules, discouraging diversification within businesses.

Into the future, there will be a greater need for land use diversification as farms look to diversify their revenue streams and manage their environmental effects. We anticipate that

²¹ www.hortnz.co.nz/assets/Environment/National-Env-Policy/JR-Reference-Documents-/Deloitte-Pukekohe-Food-Story-Final-Report.pdf

²² Holmes, G. 28 July 2023. [PC1 Environment Court Evidence](#). Accessed 30 July 2024.

more land users will be looking to manage pastoral and horticultural systems within the same businesses and permitting expansion will enable this.

3.3. Advocating for workable rules is expensive for growers

Seeking workable rules in each regional planning process carries uncertainty, high costs and risks to the sector's ability to supply a range of vegetables year-round. The pressure on growers' mental health has been intense from participating in these highly uncertain plan change processes, sometimes for over a decade.

HortNZ submits on nearly every district and regional plan in the country (of which there are over 100), seeking similar workable rules for growers in each one. These considerable efforts, funded by growers through the fruit and vegetable commodity levy, require educating council after council about how vegetable growing works and convincing them of the importance of fresh produce.

4. HortNZ's preferred approach

4.1. Vision under the future Planning and Natural Environment Acts

The EAG report on the incoming RMA replacement system suggests a wider role for national permitted activity standards.²³ HortNZ sees national direction for vegetables fitting neatly into that approach, even providing a first case study to show how implementation can work.

The EAG report notes that Central Government may have an interest in regional spatial planning and could participate where there is an agreement with local authorities. Matters of national significance may be covered in the spatial plans, particularly infrastructure with national rather than regional benefits.²⁴ HortNZ sees vegetable growing for domestic food supply in the same vein - a nationally important activity with national, rather than regional, benefits due to the centralised nature of the supermarket supply chain. Planning for vegetable growing within environmental limits under the Natural Environment Act can be enabled through related national policy direction that directs this consideration in spatial planning.

The discussion document for this consultation says that permitting vegetable production would, "pre-empt the allocation of scarce resources...in the absence of an allocation framework"²⁵. Permitting vegetable production now doesn't prevent renegotiation under a future allocation framework. The RMA replacement acts, as described in the EAG report, will still address cumulative impacts under the future allocation system. In the meantime, a permitted activity standard for vegetables ensures this essential land use is not lost due to regulatory paralysis.

²³ Report from the Expert Advisory Group on Resource Management Reform. [Blueprint for resource management reform: A better planning and resource management system](#). 2025. (para 99e)

²⁴ Report from the Expert Advisory Group on Resource Management Reform. [Blueprint for resource management reform: A better planning and resource management system](#). 2025. (para 283e)

²⁵ Ministry for the Environment. 2025. [Package 3: Freshwater - Discussion Document](#). (p. 23)

4.2. Support in the NPSFM

4.2.1. NPSFM OBJECTIVE TO ENABLE VEGETABLE GROWING

The Government has proposed two options to enable commercial vegetable production. The first is a new objective in the National Policy Statement for Freshwater Management (NPSFM) to enable continued domestic supply of fresh vegetables and provide for crop rotation. HortNZ strongly supports this option.

HortNZ's proposed wording is as follows:

Recognise the national significance of commercial vegetable production by enabling new and existing commercial vegetable production, such that New Zealand has a resilient supply of vegetables for current and future generations.

This objective will provide regional councils with a framework to manage the balance between all the NPSFM objectives in vegetable growing areas and the need for water quality improvements.

We also need an objective and policies in the NPSFM because, in the Waikato River catchment, an NES cannot override PC1 due to the primacy of Te Ture Whaimana. In this catchment, a new plan change will be needed to enable commercial vegetable growing. Decision makers in the Waikato region will need national direction to support them to develop rules that enable vegetable growing and crop rotation.

Our hope is that with a clear national objective and national policy, decision makers in Waikato will adopt the NES Commercial Vegetable Growing. In our view, the provisions we have proposed for the NES Vegetables are consistent with achieving Te Ture Whaimana Vision and Strategy.²⁶ This is why the changes to the NPSFM and the introduction of the NES Vegetables are needed as soon as possible, rather than waiting until the RMA replacement bills are passed into law.

HortNZ mostly agrees with the benefits and limitations of an NPSFM objective outlined in the RIS. An NPSFM objective will help make future resource management plans more supportive of commercial vegetable production, but it will not fix the immediate effects of decisions on PC1 and PC2.

Table 3: HortNZ response to the RIS analysis of limitations of an NPSFM objective for vegetables²⁷

Limitation in the RIS	HortNZ response
Implementation will vary between regions, and how councils interpret this may lead to inconsistencies that do not meet	HortNZ agrees with this assessment and considers that the introduction of national

²⁶ Waikato River Authority. [Te Ture Whaimana o Te Awa o Waikato \(Vision & Strategy\)](#). Accessed online 22/07/25.

²⁷ MfE. [Interim Regulatory Impact Statement: Commercial vegetable growing](#). 19 March 2025. (para 54). Accessed online 17/06/25.

Limitation in the RIS	HortNZ response
Government objectives. This will likely be exacerbated if national standards and/or guidance do not underpin the policy direction.	standards is essential to support a new NPSFM objective.
It will take time (i.e., years) for regional councils to update their plans to reflect changes to the NPS-FM.	HortNZ agrees with this assessment and seeks interim policy to address current plan changes that may constrain vegetable growing.
In some regions, particularly over-allocated areas where [commercial vegetable growing] is highly concentrated, it may be challenging for regional councils to give effect to such policies, given the trade-offs that may be required with other sectors in order to achieve environmental outcomes required through the NPS-FM.	Trade-offs are always required in allocation decisions. In the past, Councils have traded equity for administrative efficiency through the use of grandfathering for resource allocation. An approach that prioritises a national value such as commercial vegetable production is surely of greater national benefit than an approach based on who got in line first.
It won't address current plan changes that may restrict and / or constrain existing growing and future expansion in some regions.	HortNZ agrees with this assessment and seeks interim policy to address current plan changes that may constrain vegetable growing.

4.2.2. NPSFM POLICY TO SUPPORT VEGETABLE GROWING

HortNZ seeks a policy within the NPSFM that supports councils to design limits and action plans in the catchments that are important for vegetable growing. The method that they have been using to date - to reduce vegetable growing - will no longer be available to them once an NPSFM objective to enable vegetable growing and the NES Commercial Vegetable Growing are in place, so they will need guidance to follow an alternative pathway.

We seek the following policy to support the vegetable growing objective:

Commercial vegetable growing is enabled as a standalone activity and as part of diversified farming operations.

Standalone commercial vegetable growing and associated crop rotation is authorised as a permitted activity with a farm plan²⁸ that demonstrates that the diffuse discharge risk is managed.

²⁸ This could be a certified freshwater farm plan or an industry assurance plan developed under the NES Vegetables.

Commercial vegetable growing as a standalone activity, and crop rotation, are enabled and provided for when outcomes and limits are set. An action plan approach is used in catchments that support commercial vegetable production in addition to limits.

With these policies in place, water quality will improve where it is degraded and be maintained or improved elsewhere. Given the relatively small load associated with vegetable growing, and with the action plan approach, we expect that other activities will not be subject to stricter limits than they would be if they were not located in a catchment important for vegetable growing.

4.2.3. AN ACTION PLAN APPROACH FOR VEGETABLE GROWING

Many of the areas that are important for vegetable growing have highly modified catchments including imperviousness, drainage, stormwater networks and flood protection. These modifications are related to wider catchment activities, which usually include other farming, as well as lifestyle and urban uses. In these catchments, an action plan approach, in addition to resource use limits, is needed to drive improvements. In some of these catchments, regional exceptions to national bottom lines may be justified due to their highly modified state, rather than because of the commercial vegetable production.

Action plans are a critical tool to drive improvements in water quality and water quantity. Action plans should be used to supplement water use limits and water take limits in catchments that support activities of national importance, such as commercial vegetable growing, if providing for those activities as a priority could reduce flexibility for other activities within the catchment.

Clause 3.12 of the NPSFM requires limits to add up to target attribute states. In some catchments, achieving bottom lines may require land use change or catchment-scale mitigations. HortNZ's view is that all activities, including commercial vegetable production, should implement good management practices, make continuous improvements and adopt new practices as innovation occurs to make further progress towards farming within limits.

If stricter limits than good management practice would be required in a catchment to achieve the target attribute state, and the catchment is used for commercial vegetable growing, we propose an action plan approach can be used to complement limits. In this case, we seek that limits and actions plans are designed together to achieve target attribute states.

We have positive experiences with the Pukekohe Te Tautara Trust, described in Appendix D of this submission. This is an example of how non-regulatory actions, investment and collaboration can operate.

4.2.4. A FRESHWATER VALUE FOR VEGETABLE GROWING

A vegetable growing freshwater value should be added as a compulsory value in the NPSFM.

We propose the following drafting:

The target attribute states provide sufficient assimilative capacity to provide the resource use limit needed to support commercial vegetable growing.

4.3. NES for Commercial Vegetable Growing

The second Government proposal is to introduce national standards for a permitted activity for vegetable production with certified freshwater farm plans or new standards. HortNZ strongly supports this proposal. The following sections explain what features we recommend in an NES Vegetables.

4.3.1. AN NES THAT APPLIES TO EXISTING VEGETABLE GROWING AND EXPANSION

HortNZ's perspective is that expansion of vegetable growing should be a permitted activity for reasons of environmental, economic and regulatory efficiency, coupled with the limited potential for expansion discussed in Sections 1.1. and 3.2.7. of this submission.

For the water quality analysis commissioned by HortNZ, we have assumed a 15% expansion in commercial vegetable growing by 2043. This is likely an over-estimate, given the history of contraction we have seen in recent years.

4.3.2. AN NES THAT DOES NOT RESTRICT CROP ROTATION BASED ON SPATIAL SCALE

Council rules struggle to accommodate crop rotation. As crops rotate, leaching rates change across time and location across a mix of owned, leased and swapped land. Councils have been unsuccessful at designing effective regulation that accounts for this complexity and allows this standard growing practice to continue.

4.3.2.1. Designing rules for crop rotation

Crop rotation has a temporal dimension which means that on a given parcel of land, crops change from year to year. This means that the inputs and effects of the activity at the parcel scale are variable from year to year. Any rules that require benchmarking from one year to the next can be problematic because they don't allow for a sequence of crops to be grown on the same piece of land. Therefore, we don't support rules which require a numeric indicator like a risk score that benchmarks a piece of land at a particular point in time. We support a practice-based approach, that directs growers to do best practice for the crop that is present on the block at a particular time.

Crop rotation has a spatial dimension which means that over time, the location of a farm will change. Therefore, if land use change rules are triggered when land changes from pastoral farming or arable crops to vegetable growing, it can prevent crop rotation. We think that land use change from any activity that is part of a crop rotation to vegetable production needs to be a permitted activity. For example, the change from pastoral or arable land use to vegetable production should be a permitted activity.

4.3.2.2. The sub-catchment is too small a spatial constraint on rotation

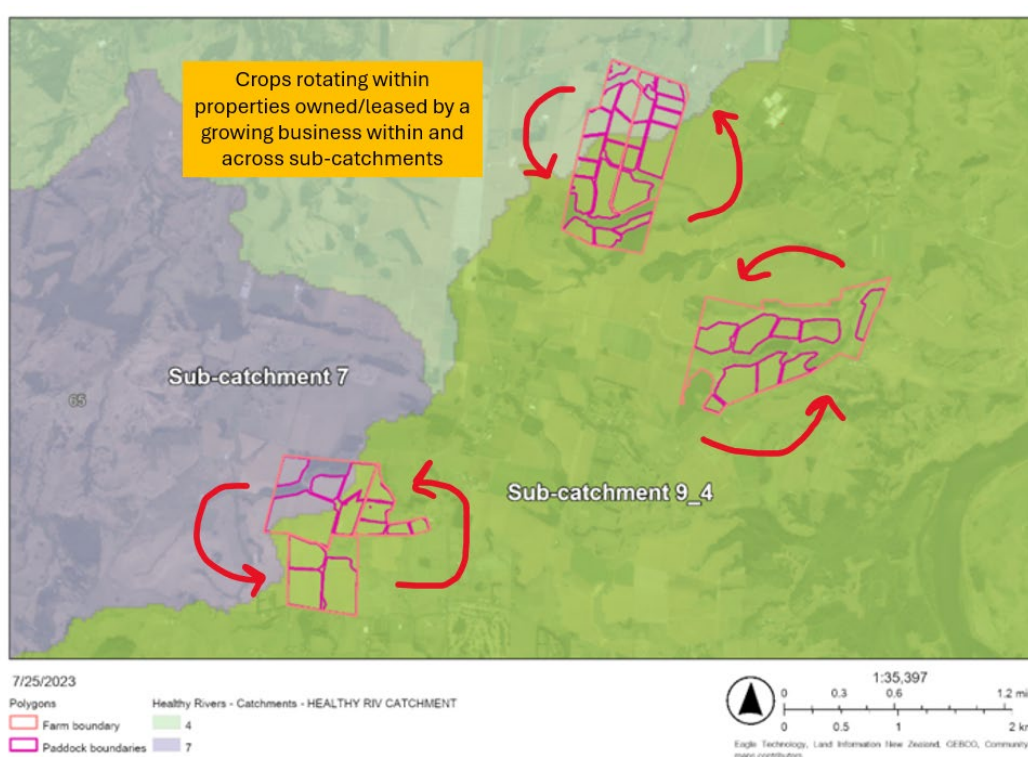
If rules are designed so existing vegetable growing and rotation are permitted but not expansion, there needs to be a way to differentiate existing vegetable growing that has changed location from new increased areas of vegetable growing. This is extremely difficult administratively. This has been attempted in some regions by capping vegetable growing within a spatial unit, such as a sub-catchment.

However, the spatial unit at which vegetable growing is capped needs to be sufficiently large to allow growers to rotate onto land that meets the needs of vegetable growing. Where growers rotate their crops is dependent on the suitability of the land. Vegetable growing

typically occurs on LUC 1, 2 or more productive 3. It needs an appropriate microclimate and access to water or sufficient rainfall. It is also dependent on the availability of leased and owned land, as well as prior land uses. The same crop cannot be grown back-to-back on the same piece of land without consequences from pests and disease and soil health degradation. For instance, broccoli (or other brassicas) grown season on season in the same paddock can become subject to clubroot, a common soil-borne fungal disease which affects the roots of plants and prevents them from absorbing nutrients and water.

In some areas, such as Waikato and Horizons, the sub-catchment area allowed by the councils for rotation is too small to be practical. It is much more common than not for a vegetable grower to grow in more than one sub-catchment. In current practice, crop rotation is not confined to particular freshwater boundaries. An example is shown in Figure 11.

Figure 11: One Grower's Farm with Leased and Owned Land²⁹



As explained in the evidence of Gillian Holmes for PC1 Waikato³⁰, allowing rotation at the FMU scale or the whole-of-river scale is predicted to have a negligible impact on water quality compared with constraining it at the sub-catchment. Rotation at the FMU scale has negligible impact on water quality because in the catchments where there is a high proportion of vegetable growing, for example Pukekohe and Horowhenua, the rotations occur with other vegetable growing land for the most part. In catchments where rotations occur with pasture and arable, for example Manawatū, Hawke's Bay and Canterbury, vegetable growing makes up such a small contribution to the overall load, that even if the

²⁹ Adapted from Statement of Evidence of Brent Wilcox on Behalf of Pukekohe Growers Association, 23 July 2023. In the matter of Proposed Plan Change 1 of the Waikato Regional Plan.

³⁰ Holmes, G. 28 July 2023. [PC1 Environment Court Evidence](#). Accessed 30 July 2024.

location is more dynamic, the overall effect on contaminant load is negligible. With a national permitted activity, we do not expect a spatial scale will be applied to limit crop rotation.

When councils set freshwater outcomes and limits, they need to create models at the catchment, FMU and sub-catchment scale. The calibration of models relies on sufficient data and the architecture of the model sufficiently representing localised characteristics. Freshwater models calibrated to monitoring data in receiving waters may be reliable at the national, regional, FMU and large river scales. These models have lesser reliability at the catchment scale for smaller streams, and they are unsuitable to assess effects at the farm scale.³¹ The water quality modelling provided in [Appendix H](#) shows that the contribution of commercial vegetable growing to overall contaminant loads is small, and the predicted changes in the load associated with rotation, good management practices and expansion will make a small positive contribution to catchment-wide water quality outcomes.

Vegetable growing is particularly impacted by a planning system that applies a rigid interpretation to the scale of limits, as their farms are made up of small non-contiguous properties and crop rotation requires the movement across changing land. Other farming activities also require some degree of flexibility beyond the property scale. Flexibility in the scale of limits should enable farming, without allowing overs-and-unders that lead to more than minor effects as any scale.

4.3.3. AN NES THAT APPLIES NATION-WIDE

HortNZ does not prefer an approach which only applies the NES to specific locations. As noted in the RIS, other regions are likely to fall into the same pitfalls as PC1 and PC2. Only nationally consistent direction for vegetables will prevent subjecting further vegetable production to unworkable rules. Where neighbouring regions have different rules, growers who rotate crops between those two regions have difficulty complying with two different planning regimes at once. A nationally consistent regulatory framework for vegetables will resolve this issue.

4.3.4. AN NES THAT PREVAILS OVER REGIONAL RULES

HortNZ seeks an NES that prevails over more stringent and more lenient regional rules.³² This approach would prevail over regionally specific freshwater farm plans, or other farm planning requirements.

This approach would not prevail over existing consents. Farmers could still grow vegetables as part of consented farming activities, or within consented irrigation schemes, subject to those consented activities.

If sheep or cattle are part of the crop rotation, in order to be a permitted activity under the NES Commercial Vegetable Growing, the stock management aspects would need to meet the permitted activity standards of the relevant region. This would be subject to audit and certification through a farm plan.

When a vegetable grower leases land from a farmer with a farming consent or permitted farming activity on the same property, the commercial vegetable growing standards would

³¹ Easton, S. 28 July 2023. [PC1 Evidence](#). Waikato Environment Court, paragraph 39,40. Accessed 30 July 2024.

³² We recognise that [Te Ture Whaimana](#) legislation means an NES cannot prevail over in the Waikato

apply during the period the land is used for vegetable growing. Once the vegetable growing activity ceases, the original farming consent or permitted farming standards would apply. In other words, multiple activities can be associated with the same property, but the rules for vegetable growing would apply to the part of the farm where commercial vegetable growing was occurring.

Where vegetable growing does not meet the permitted activity criteria under the NES Vegetables, there should be multiple clear consenting pathways. Regional councils should be encouraged to create flexibility with pathways for vegetable growing within mixed farming systems where that approach is more appropriate. For example, in Canterbury, vegetable growing can be consented as a standalone activity, as part of a broader farming system, or through an irrigation scheme.

4.3.5. AN NES THAT INCLUDES SPECIFIC MINIMUM STANDARDS AND RISK BASED FARM PLANNING BASED ON INDUSTRY CODES OF PRACTICE

The RIS expresses reservations about whether an approach with national minimum standards can provide for regional variation and local conditions.³³ HortNZ seeks an approach that relies on a risk-based, certified and audited farm plan and clear, enforceable minimum standards, with these requirements identified within the NES. We do not support an approach that solely relies on freshwater farm plans. The nationally consistent approach to risk assessment drives uptake of actions that are tailored to activity and location specific risks.

HortNZ recently reviewed and updated the *2025 Nutrient Management Code of Practice*³⁴ and the *2025 Erosion and Sediment Control Code of Practice*³⁵ for outdoor horticultural production. These Codes of Practice, available [on the HortNZ website](#) and provided as Appendix F, direct growers through a risk-based approach to determine which mitigations they need to use given their biophysical and management risks. The Codes of Practice guide growers through completing comprehensive nutrient management plans and erosion and sediment control plans. Workbook templates for these plans are provided. These management plans are important components of a grower's freshwater farm plan. The Codes of Practice have been tested with growers. They will be applicable for all horticulture, including intensive and more dispersed crop rotations of vegetable production.

Figure 12, copied from the *Nutrient Management Code of Practice*, shows the steps to completing a Nutrient Management Plan. The first step is to complete risk assessments for nitrogen, phosphorus and erosion. This requires the grower to know their biophysical and management risk factors. Risk assessments are based on dominant risk factors. For nitrogen, these are rainfall, soil profile available water, and fertiliser use. For phosphorus and sediment, these are soil disturbance, slope and erosivity.

The level of risk for each block directs growers to minimum and recommended practices and suitable decision support tools. Groups of paddocks with the same risk level can be managed together, within a land management group. The level of practice across land

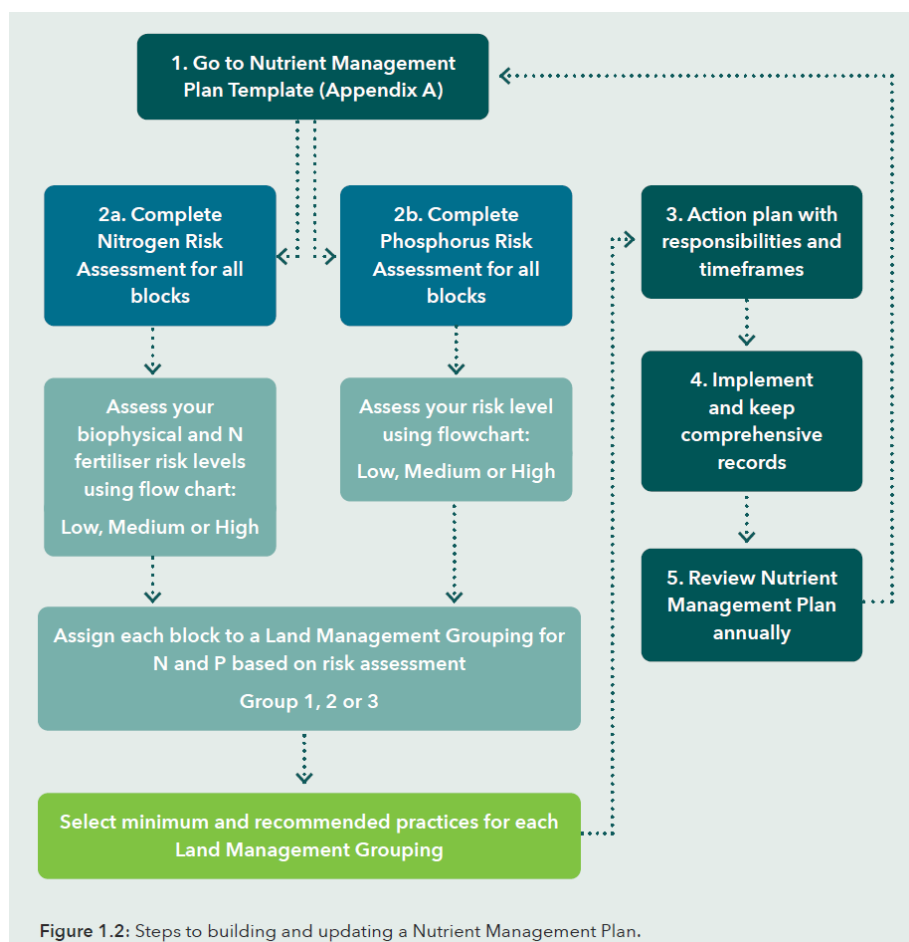
³³ MfE. [Interim Regulatory Impact Statement: Commercial vegetable growing](#). 19 March 2025. (para 58). Accessed 18/06/25.

³⁴ HortNZ. [Nutrient Management Code of Practice](#). July 2025. Accessed 25/07/25.

³⁵ HortNZ. [Erosion & Sediment Control Code of Practice](#). July 2025. Accessed 25/07/25.

management groups increases with increasing risk. Alongside minimum practices, growers are required to implement a percentage of recommended practices based on level of risk.

Figure 12: Steps to complete a Nutrient Management Plan



Additional steps include records and evidence, action plans, implementation timeframes, and review and update cycles. In the *Nutrient Management Code of Practice*, vegetable growers are directed to a suite of minimum practices aligned to HortNZ's proposed minimum standards for the NES Vegetables. One of the key required practices is to complete the Nitrogen Risk Assessment Tool (NRAT). The NRAT is required for commercial vegetable growers at medium or high nitrogen loss risk (using risk assessments in the *Nutrient Management Code of Practice*).

The NRAT drives practice change based on nitrogen loss risk using a scoring system. The target score is based on rainfall and soil profile available water, with lower scores indicating higher risk. More practices are required to achieve lower scores. Each practice is applied across a percentage of total productive area of the farm. Key practices to reduce leaching include using a nitrogen budget and soil nitrogen testing, supported by the SVS decision support tool for nitrogen budgets. Growers have responded positively to the NRAT as it supports meaningful practice change.

4.3.6. AUDITED AND CERTIFIED FARM PLANS

HortNZ proposes that the farm plan requirement of the NES Vegetables be delivered through a certified and audited farm plan. HortNZ envisions that the NZGAP EMS would be one option, as described in Section 2.1. of this submission. The EMS 2.0 will require growers to be independently audited and certified against the NES Vegetables standard and the updated Codes of Practice. Thus, growers' freshwater farm plans, when developed through the industry assurance pathway, will be tailored to local conditions through the consideration of catchment context and biophysical risk. NZGAP's process is robust and already trusted by markets and regulators. The EMS has been recognised by Environment Canterbury and Gisborne Council.

The RMA Resource Management (Consenting and Other System Changes) Amendment Bill Part 9A 217KA has introduced criteria for the Minister to approve industry organisations to provide certification or audit services for freshwater farm plans. Our expectation is that NZGAP would seek and receive approval under that process to audit and certify the Commercial Vegetable Growing Farm Plans to demonstrate they meet the NES.

4.3.7. AN NES WITH MEANINGFUL REPORTING REQUIREMENTS

We propose meaningful data reporting for the permitted activity standard. We propose that growers would report on the location of the farm and changing properties with rotation, the crops grown at the farm scale, and the certification and audit status of the farm. The farm plan could be supplied to the regional council on request.

5. Effects of HortNZ's proposal

This section describes why the NES approach that HortNZ has proposed is a suitable planning approach with economic and social benefits. HortNZ's approach will result in less than minor environmental effects as well as environmental benefits.

5.1. Water quality

Vegetable production, like all farming activities, contributes localised risks and cumulative effects on water quality and the freshwater values water quality supports. Vegetable growing contributes a small proportion of the nutrient, sediment and pathogen load at a national level (much less than 1%) and makes up a minor proportion of the contaminant load in almost all catchments, as shown in [Appendix H](#).

Contaminant load is the most relevant metric for assessing the environmental effects of diffuse discharges, because it is contaminant load, once attenuated and combined with flow volume, that will determine the concentration of discharges in the receiving environment.³⁶

5.1.1. NITROGEN

While commercial vegetable production produces higher nutrient losses per hectare than other land uses, it accounts for a smaller portion of total N load, as shown in [Appendix H](#).³⁷

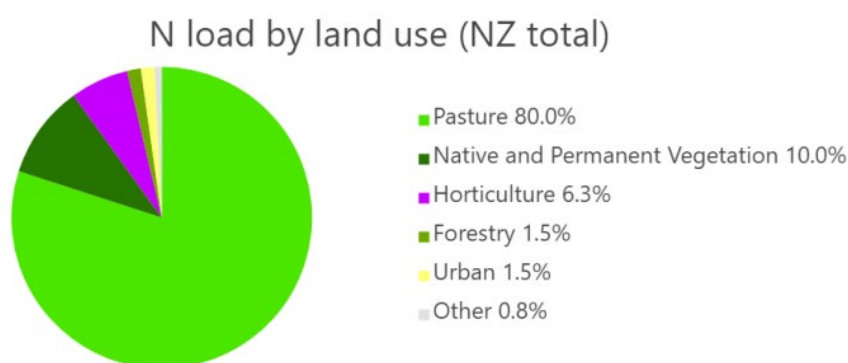
³⁶ Holmes, G. 13 October 2023. [PC2 Evidence](#), paragraph 21. Accessed 30 July 2024.

³⁷ Stuart Easton, Tom Nation. "[Nitrogen Load Modelling of Commercial Vegetable Production](#)". March 2025. Collaborations. Prepared for HortNZ. (Appendix H)

While nitrate leaching intensity (measured in kg/ha) is often used as an indicator metric for environmental effects, this is a metric of farming intensity, which does not account for the cumulative size of the farms.

The water quality modelling in [Appendix H](#), shows the proportion of nitrogen associated with vegetable growing in the monitored sub-catchments where vegetable growing is located. In general, it is predicted that commercial vegetable growing contributes a very small proportion of total N load (less than 5% across the 46 modelled sub catchments). For six small lowland streams, commercial vegetable growing systems are predicted to contribute the majority of the total N load across land uses in those catchments (ranging from 58% to 73%). The combined area of the six sub-catchments (8,605 ha) equates to 0.25% of the assessed area (3,505,792 ha across 46 sub-catchments where vegetable growing occurs).

Figure 13: N load by land use (NZ total, horticulture includes fruit production)³⁸



5.1.1.1. Proposed mitigations for nitrogen

The proposed mitigations in the NES including a minimum standard for nutrient budgets and nutrient practices. The standard also requires that the audited and certified farm plan is developed in accordance with the *HortNZ Nutrient Management Code of Practice*. A range of studies have been undertaken to predict the effectiveness of good management practices for nutrient management, and currently HortNZ has commissioned Plant & Food Research to update this modelling.

HortNZ engaged consultants from Collaborations to model the nitrogen load of vegetable growing throughout New Zealand. This analysis is presented in [Appendix H](#). This assessment relied on published data, which predicts reductions in nitrogen losses between 4% and 46% with good management practices.³⁹ The variation is dependent on the specific vegetable crops, the intensity of the rotations, the mitigations tested and the assumed baseline. The analysis assumes that the implementation of good management practices in more intensive rotations would achieve greater load reductions.

³⁸ Stuart Easton, Tom Nation. "[Nitrogen Load Modelling of Commercial Vegetable Production](#)". March 2025. Collaborations. Prepared for HortNZ. (Appendix H)

³⁹ Stuart Easton, Tom Nation. "[Nitrogen Load Modelling of Commercial Vegetable Production](#)". March 2025. Collaborations. Prepared for HortNZ. pg 8 (Appendix H)

Three scenarios were modelled to estimate the change in catchment N load following an expansion of vegetable growing area in line with population growth to 2043. The percentages refer to the reduction in N loss expected from adopting varying levels of good management practices.

- Scenario 1: -5% (broadacre vegetables) and -10% (intensive vegetables).
- Scenario 2: -10% (broadacre vegetables) and -20% (intensive vegetables).
- Scenario 3: -15% (broadacre vegetables) and -30% (intensive vegetables).

Determining the likely reduction is partly related to the baseline. In some catchments, the percentage is particularly high; for example, 89% of growers in the Kuku catchment in Horowhenua are already registered.⁴⁰ The graphs in Section 2.1.3. of this submission illustrate the uptake of practices for those registered with the NZGAP EMS. For example, 96% of growers are planning fertiliser inputs for their crops. As growers implement their farm plans, this percentage might increase. As the NES is implemented, more growers will develop farm plans and implement the required actions, and improvements compared to the current state are expected in all catchments.

We expect that Scenario 2 of the modelling, with a 10-20% reduction in N loss, is the most likely overall scenario but stress that the percentage reduction achieved by individual growers will vary. To be conservative, we have tested Scenario 1, with 5-10% reductions in N losses, as well as Scenarios 2 and 3.

5.1.1.2. Expected change in nitrogen loads

We expect that improvements associated with the implementation of the NES will be at least consistent with Scenario 1 (5-10% reductions in N loss) in all sub-catchments. In sub-catchments where there is currently a lower level of adoption of farm plans, improvements may be more consistent with Scenario 2 or 3 (10-30% reductions).

Table 8 of the Collaborations report shows that when the good management practices are applied and assumed to achieve 5% or 10% reductions in loads to the area of existing commercial vegetables growing, a reduction is predicted in nitrogen load in all catchments. In some cases, where the existing level of good management practice is currently lower, we would expect greater improvements.

The modelling has assumed a 15% expansion in commercial vegetable growing by 2043 to align with population growth. Given that vegetable growing has been contracting, this is likely an over-estimate. The modelling has assumed that the expansion will occur in all catchments on highly productive land and accounts for the change in nitrogen load associated with the change in land use, as well as the change associated with good management practices.

This modelling indicates that if the mitigations reduce the load by 5% or 10% (Scenario 1), 15 of the 46 sub-catchments are expected to experience a small increase in nitrogen load.

⁴⁰ Stuart Easton, Tom Nation. "[Nitrogen Load Modelling of Commercial Vegetable Production](#)". March 2025. Collaborations. Prepared for HortNZ. (Appendix H)

Only five of these sub-catchments are predicted to see increases more than 0.5%, and all sub-catchments have increases less than 2%.

When a reduction of 10-20% of N loss is modelled (Scenario 2), all sub-catchments experience a reduction in nitrogen load. Five sub-catchments are predicted to have a reduced nitrogen load of more than 5%.

The sub-catchment scale has been used for this assessment to link the LAWA monitoring data. At the FMU or river catchment scale, the proportion of vegetable growing will be less, and the changes in load associated with the adoption of good management practice and expansion will be even smaller.

5.1.1.3. Impact of rotation on the distribution of loads

Constraining vegetable production based on limits at the sub-catchment scale is not compatible with crop rotation. The water quality analysis undertaken through Waikato PC1, which analysed the Land Cover Database (LCDB) and Land Use and Carbon Analysis System (LUCAS), shows that cultivated land expanded up until 2008. From 2008 to 2018, there was limited net change or a small decrease in cultivated area in all FMUs. No sub-catchment shows a net increase in area in either dataset since 2008. This suggests that the total cultivated area, and therefore vegetable growing area, is currently static or declining.⁴¹ This analysis also showed that individual growers are moving their operations, but overall, the location of commercial vegetable growing is similar over time. As explained in previous sections of this submission, this means rotation is unlikely to impact the distribution of loads because vegetable growing tends to occur in the same areas over time, or it is so interspersed with arable and pastoral production that its contributions to the load are minimal.

5.1.1.4. Cumulative assessment of effects

In the modelling, a cumulative effects assessment is undertaken to consider the improvement in contaminant load associated with the adoption of good management practices by other land uses. Table 6 and 7 in [Appendix H](#) show that in the scenario where good management practice achieves a 5%-10% reduction in N loss, and commercial vegetable growing expands by 15%, the largest increase in load is 1.7% in the Karamu sub-catchment. The water quality in this catchment is in the B band. In this catchment, 54% of the load is from pastoral farming. We expect a reduction in load greater than 1.7% is very likely to be achieved by the adoption of good management practices.

The discussion document for this consultation says that nationally permitting vegetable growing would, "have the greatest impact in areas that are environmentally stressed".⁴² Commercial vegetable production is frequently located in catchments with poor water quality. These catchments have poor water quality for a range of reasons. While vegetable production contributes to the water quality problems, it is rarely the dominant contaminant source.⁴³

⁴¹ Easton, S. 28 July 2023. [PC1 Evidence](#). Waikato Environment Court, paragraph 39, 40. Accessed 25/07/25.

⁴² Ministry for the Environment. 2025. [Package 3: Freshwater - Discussion Document](#). (p. 23)

⁴³ Stuart Easton, Tom Nation. "[Nitrogen Load Modelling of Commercial Vegetable Production](#)". March 2025. Collaborations. Prepared for HortNZ. (Appendix H)

Table 5 of [Appendix H](#) provides the LAWA data describing the attribute band for monitored catchments where vegetable growing is located. This data indicates that there are eleven catchments where the attribute band is C or D. Of these eleven, commercial vegetable growing contributes 50% or more of their load in five. All eleven catchments will experience improvements in water quality if the proposed NES is implemented for existing growers. If vegetable growing expands in these catchments, and good management practice achieves 5-10% reductions in N loss, small increases in nitrogen load of less than 1.2% are predicted in all of these C and D band catchments. If 10-20% N loss improvements are achieved, reductions in the nitrogen load are predicted in all catchments.

The catchments with an attribute state in the C or D band may have to achieve significant reductions in nitrogen load to achieve the bottom lines. Allowing commercial vegetable growing to operate and expand in these catchments may contribute negligible increases in contaminant load, for example 1.2% in the Borck catchment in Tasman. The scale of these increases is likely to be less than the improvements achieved by other land uses which occur at a larger scale. However, the uptake of good management practice by all land users in this catchment and others, while resulting in improvements, may not be sufficient to achieve bottom lines without land use change or catchment scale mitigations, which is when an action plan approach is required.

5.1.1.5. Assessment of effects - nitrogen

If existing vegetable growing did not expand but was managed using the proposed NES, a small improvement of in-stream nutrient concentrations and loads and a small improvement on ecosystem health values is expected.

An increase in vegetable production of 15%, if managed with appropriate nutrient management controls as required by the proposed NES, is expected to result in a small increase of in-stream nutrient concentrations and loads, and a small decrease in ecosystem health values is expected in most catchments.

When a cumulative assessment is undertaken that accounts for the improvement in contaminant load associated with the adoption of good management practices by other land uses, then the expansion of commercial vegetable growing can be accommodated in all catchments and an improvement in water quality be achieved for all parameters.

5.1.2. SEDIMENT AND PHOSPHORUS

Vegetable growing produces a similar sediment loss to pastoral farming. In the Waikato, vegetable growing tends to occupy flatter land, and slope often has a more direct and significant impact on sediment loss from erosion because increased slope steepness and length exponentially increase runoff velocity and erosion potential.⁴⁴

5.1.2.1. Proposed mitigations for sediment loss

The proposed mitigations in the NES include a minimum standard for setbacks or buffers from rivers and a maximum slope for cultivation. The standard also requires that the audited and certified farm plan is developed in accordance with the *HortNZ Erosion and Sediment Control Guidelines*. The *HortNZ Erosion and Sediment Control Guidelines* was developed

⁴⁴ EPA. [Estimating Sediment Yield Using the Universal Soil Loss Equation \(USLE\)](#). Accessed 25/07/25.

following Don't Muddy the Waters research, which supported the design requirements for all of the erosion and sediment control measures. Different mitigations have different expected performance ranging from 30-99% reductions in sediment losses compared with unmitigated paddocks.⁴⁵

The graphs in Section 2.1.3. of this submission illustrate that for those growers who have already signed up to the NZGAP EMS, very high percentages are adopting erosion and sediment control practices. There are more improvements to be made; for example, 79% of Auckland and Waikato growers are using sediment ponds, but as they work through their farm plans, they may need to increase the size or install additional devices. As the NES is implemented, more growers will develop farm plans and implement the required actions, and improvements compared to the current state are expected in all catchments.

5.1.2.2. Expected change in sediment loads

With erosion and sediment control measures in place, the erosion rate from commercial vegetable growing is comparable to pastoral farming.⁴⁶ This can be calculated using the Don't Muddy the Water app.⁴⁷

5.1.2.3. Assessment of effects – sediment loss

If existing vegetable growing did not expand but was managed using the proposed NES, a small improvement in sediment loads, including suspended sediment and deposited sediment, and a small improvement toward ecosystem health values is expected.

An increase in vegetable production, if managed with appropriate erosion and sediment controls as required by the proposed NES, is expected to have neutral impact on sediment loads, including suspended sediment and deposited sediment, and a neutral effect on ecosystem health values.

5.1.3. PATHOGENS

Vegetable growing produces lower pathogen losses per hectare than other land uses. For example, in the Waikato Region, vegetable production was estimated to generate 6% of the pathogen yield per hectare compared with sheep and beef farming.⁴⁸ The combined low yield and small area means that vegetable growing contributes a very small contribution of the pathogen load that is delivered to freshwater.

5.1.3.1. Proposed mitigations for pathogens

The mitigations for stock management in the proposed NES are related to the typical permitted activity standards in regional plans, for example, stock exclusion requirements for permitted pastoral farming activities.

⁴⁵ HortNZ. [Erosion & Sediment Control Code of Practice](#). Version 2.0. July 2025.

⁴⁶ Barber A, 2019 Statement of Evidence for HortNZ Waikato PC1 Hearing

⁴⁷ [Don't Muddy the Water - Agrilink](#). Accessed 25/07/25.

⁴⁸ [Waikato Regional Council Technical Report 2018/62](#). Accessed 25/07/25.

5.1.3.2. Assessment of effects for pathogens

If existing vegetable growing did not expand but was managed using the proposed NES, no change in instream *E. coli* concentrations or contact recreation and mahinga kai values is predicted.

An increase in vegetable production, if it displaced pastoral farming, would be expected to result in a small reduction of instream *E. coli* concentrations with a small improvement in contact recreation and mahinga kai values.

5.2. Freshwater accounting

To undertake freshwater accounting, councils need to be able to estimate the diffuse discharges for all contaminants for all land uses and estimate the effectiveness of mitigations. Catchment-scale nutrient models generally rely on representative farm modelling in software like Overseer and APSIM, then applied to land use data and calibrated to instream monitoring data. The Overseer review found that Overseer was not suitable tool for setting numeric limits in plans and that it is too uncertain to be used as a regulatory tool for vegetable growing. However, the use of catchment models may be appropriate. This interpretation is consistent with the approach HortNZ has taken in providing information and supporting catchment-scale freshwater models, including the information that is provided in [Appendix H](#), to support this assessment of water quality effects.

HortNZ has commissioned Plant & Food to develop updated nationwide APSIM modelling of 19 vegetable rotations and nine growing regions. This modelling is based on workshops and surveys of grower's current practices in 2024 and predicts the effectiveness of the uptake of good management practices, consistent with the updated HortNZ Codes of Practice. For example, these practices include making greater use of Sustainable Vegetable Systems (SVS) crop budgets (described in Appendix D and E) and supported by soil tests.

These catchment scale models are then applied across suitable soils, using the Whitiwhiti Ora Land Use Opportunities nationwide APSIM modelling (Figure 14). A higher-level version of this research has been developed with only three rotations, compared to the 19 we are developing.⁴⁹ When the updated modelling is complete, it will provide a more robust estimate than is currently available of the nitrogen losses that can be expected from vegetable growing and the effectiveness of mitigations. This work is due to be completed in 2025.

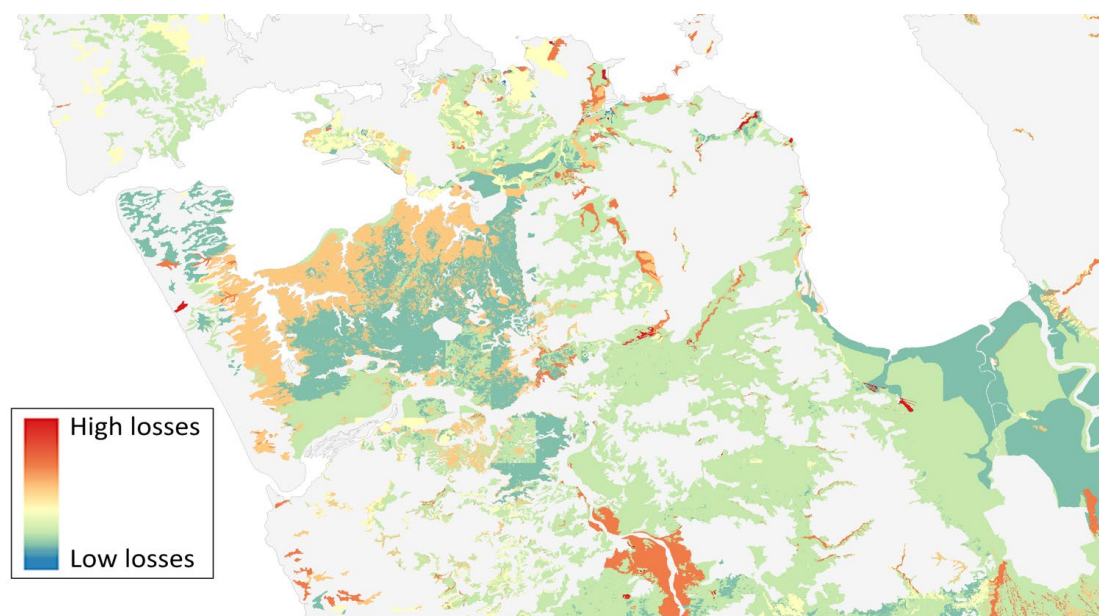
The advantage of a nationwide modelling approach, using the detailed representative APSIM models of vegetable rotations, is that it doesn't require the vegetable growing area to be fixed in a specific location. As shown in Figure 14, this modelling allows prediction of leaching if vegetable growing was located on other soils than where it is currently located. Analysis of this map needs to consider that there is limited realistic prospect of vegetable expansion beyond New Zealand population growth.

For the purpose of limit setting, the load associated with a realistic area of commercial vegetable growing (the existing area plus a percentage for expansion) within an FMU or river catchment can be estimated, accounting for crop rotation. Any small variations in load

⁴⁹ Data Supermarket. [Crop rotation nitrogen leaching loss estimate maps](#). Accessed 25/07/25.

associated with rotation can be accounted for at the time that models are built and calibrated.

Figure 14: Whitiwhiti Ora Land Use Opportunities nitrogen leaching mapping, soon to be updated with more refined information



5.3. Future water quality mitigations

We expect that with the horticulture industry's ongoing commitment to research and innovation, further improvements to environmental practice will be possible over time. Examples of the industry's commitment to research are included in Appendix D. One promising research project at the trial stage is crop stacking, which involves the interplanting of vegetables and cover crops. This practice is unlikely to work for all crops in all places, but current trials indicate reductions in leaching in the order of 31%.

Over time, we may also see changes in the way vegetables are grown. For example, hydroponic growing systems have few freshwater quality impacts. While these are predominately used to grow high value crops like tomatoes and capsicums, these growing systems may become more economically viable for a wider range of greens crops as innovation takes place. We may also see greater integration of pastoral farming with vegetable growing, in a way that is neutral or beneficial for water quality.

5.4. Human health, food supply and vegetable prices

New Zealand's population is growing. More people will need to eat more vegetables, so vegetable growing expansion needs to keep pace with population growth.

5.4.1. PRICES

HortNZ agrees with the RIS that, "Decreased or flat vegetable production may contribute to price inflation for fresh vegetables."⁵⁰ Over one-fifth of the country's supply of fresh

⁵⁰ MfE. [Interim Regulatory Impact Statement: Commercial vegetable growing](#). 19 March 2025. (para 49).

vegetables is vulnerable to imminent disruption from unworkable regional plan provisions. Without overriding national direction, the impact on the price and accessibility of fresh vegetables for New Zealanders will be severe. It is predicted that a 20% price increase is likely, but prices may increase by more than 100%.^{51, 52}

5.4.2. SOCIAL COHESION

The public interest in accessible, affordable vegetables is high because they provide an immediate, essential social good. Fruit and vegetable prices are often used as a bellwether for the overall health of the economy and the cost of living.⁵³ When consumers feel squeezed by grocery prices, they are more dissatisfied with the state of the economy, which contributes to general social dissatisfaction, often blamed on the Government of the day.

5.4.3. CONSUMER CHOICE

If vegetable growing contracts, the industry will consolidate, and so will the number of crops. Smaller product lines like fresh herbs, Asian vegetables, and other specialty crops will shrink in availability as smaller growers go out of business.

5.4.4. PUBLIC HEALTH

University of Otago researchers have found that a 2% per annum vegetable price increase would result in a loss of 58,300 health adjusted life years, describing the combined burden of disease (morbidity) and mortality because increased prices lead people to eat fewer vegetables, thus missing out on critical nutritional value.

A 2% price increase would cost the New Zealand health care system \$490 million over the collective lifespan of the population living in 2011. A 2.5% price increase would lead to 25% more health adjusted life years lost (72,800) and a \$610 million cost to the health care system.⁵⁴

5.4.5. CHILDHOOD FOOD INSECURITY

Childhood food insecurity is on the rise in New Zealand. In 2023/24, one in four children (27%) lived in households where food ran out often or sometimes, up 5.7% from the previous year, and a similar number reported eating less due to a lack of money.⁵⁵

The Helen Clark Foundation's recent report on social cohesion found that one in four New Zealanders reported experiencing food insecurity, "with much higher levels among Māori, Pasifika and renters".⁵⁶

⁵¹ Agchain 2023. [Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area](#). Report for MfE.

⁵² NZIER. 2024. [Making the case for vegetable production in New Zealand](#). A report for Horticulture New Zealand.

⁵³ Hewett, William. 5 February 2024. [Economist says fruit and vegetable prices still 'flipping expensive' but cost of living challenges starting to ease](#). Stuff.co.nz.

⁵⁴ Cleghorn, C. August 2020. [The health and health system cost impacts of increasing vegetables prices over time](#). University of Otago. Accessed 23/12/24.

⁵⁵ Ministry of Health. [Annual Update of Key Results 2023/24: New Zealand Health Survey](#). 19 November 2024. Accessed 13/01/25.

⁵⁶ [Social Cohesion in New Zealand - The Helen Clark Foundation](#). (p. 12) Accessed online 17/06/25.

There are complex social and economic reasons why people struggle to meet their nutritional needs. Addressing the issue of food insecurity will be even more difficult, however, should unworkable resource management rules preclude commercial vegetable production from achieving consents, decreasing domestic vegetable supply and reducing access to affordable, healthy food. This is the intersection where resource management rules become a public health concern.

5.4.6. RESILIENCE OF THE NATIONAL FOOD SUPPLY

Supply shocks after the North Island Weather Events demonstrated that the vegetable production supply is vulnerable, and some expansion is needed to enable a resilient supply of vegetables for New Zealand. This is also why vegetable production needs to be enabled nationally – if a few key growing regions are taken out of production, it can affect the whole supply chain.

5.5. Other resource users

The RIS expresses concern that national direction for vegetables may prioritise “allocation to [commercial vegetable growing] at the expense of other uses (eg, dairy)”.⁵⁷

Our recommended approach is to make changes to Clause 3.12 of the NPSFM, so an action plan is used in addition to limits to achieve nutrient bottom lines in catchments that important for vegetable growing. With this policy in place, there is no disadvantage to other sectors.

The reality is that any impact on the pastoral sector would be negligible because the vegetable sector is very small and contributes a lesser nitrogen load than dairy in almost all catchments in New Zealand. The overall area actively growing vegetables is estimated at about 37,000 ha.⁵⁸ By comparison, the dairy industry covers 1.7 million hectares.⁵⁹ At a national scale, 80% of the nitrogen load is from pastoral farming; only 6% is from horticulture.⁶⁰ The water quality analysis in [Appendix H](#) indicates this issue is very minor. Even with a very conservative estimate of reductions in N loss from vegetable growing under the NES veg and a generous estimate of vegetable expansion, the largest increase in load in a sub-catchment with vegetable production is 1.7% in the Karamu. We expect the pastoral sector, which makes up over 50% of load in this catchment, can achieve improvements more than 1.7% of nitrogen load with good management practice.

In current regional plans, activity statuses and rules are used to allocate resources. Many farming activities have a permitted activity status. When deciding whether or not an activity should be permitted, councils have often looked at which activities are existing or focused on nitrogen leaching rates. The allocation to discharge is then given to the land rather than the activity taking place. This allocation method disadvantages commercial vegetable growers because it does not account for the need for commercial vegetable growing to

⁵⁷ MfE. [Interim Regulatory Impact Statement: Commercial vegetable growing](#). 19 March 2025. (p. 2) Accessed online 17/06/25.

⁵⁸ United Fresh, Plant & Food Research. “[Fresh Facts 2024](#)”. (p. 47)

⁵⁹ DairyNZ. [Dairy Sector Quickfacts 2024](#). Accessed online 17/06/25.

⁶⁰ Stuart Easton, Tom Nation. “[Nitrogen Load Modelling of Commercial Vegetable Production](#)”. March 2025. Collaborations. Prepared for HortNZ. (Appendix H)

expand with population growth or rotate. This method also favours larger farms, which have a lower kg N per hectare because it is averaged over a larger land area.

We are seeking allocation for vegetable growing within a cumulative limit. From a water quality perspective, an NES Vegetables is no different to a permitted activity for any other activity. Dry stock is often authorised with a permitted activity status, and it has a much larger nitrogen allocation than vegetable growing. For example, in Waikato PC1, up to 80% of dry stock would be authorised by permitted activity, even though this activity contributes 20% of the nitrogen load to the Waikato River. In contrast, no commercial vegetable growing is permitted, even though it contributes only 3% of the nitrogen load to the Waikato River.⁶¹

The horticulture sector does not seek to influence the design of limits that apply to other farming activities; however, other sectors, who do not have experience with vegetable production, have created significant problems for our sector by persuading the Court to make unworkable rules for vegetable growing.

The problems that vegetable growers face with the One Plan in Horowhenua can be traced back to an appeal. The appeal sought that the Overseer LUC limits apply to vegetable growing because, "Fonterra considers that all N-leaching land uses should be captured by the regime, otherwise dairying will be left to carry an unfair burden, but that to bring in extensive sheep and beef farming at present would be premature, and that it should be to a future plan change."⁶²

The concerns HortNZ raised about the workability of the regime, which relied on Overseer modelling of the grass-curve, were dismissed. Council described HortNZ's concern that no vegetable grower would be able to get consent as "fanciful".⁶³ The appeal position was accepted by the Environment Court and was not overturned by HortNZ's appeal to the High Court. The reality is that only one consent was granted to a vegetable grower under the One Plan. The concerns HortNZ raised in the hearing were not fanciful and have been borne out over time.

5.6. Planning assessment

Commercial vegetable growing meets the national significance test due to its importance for domestic food supply and its public health benefits. Therefore, an objective in the NPSFM is warranted.

5.6.1. CERTAINTY OF AN INDEPENDENT AUDIT

The NES Vegetables proposed by HortNZ in this submission includes minimum standards, in addition to a risk-based farm planning approach which will hold growers accountable to good environmental practice. The risk-based approach is defined in accordance with the HortNZ Codes of Practice, which are supported by research and publicly available. The farm approach will be independently certified and audited. This approach will provide certainty to the regulator that the activity will be undertaken in accordance with the permitted activity

⁶¹ Michelle Sands, Tom Nation, Tim Baker, Catherine Sturgeon. 31 January 2017. [Values and Allocation of Responsibility for Contaminant Discharges](#). Prepared by Jacobs for HortNZ. Accessed 25/07/25.

⁶² Environment Court NZ. [Decision: Part 5 - Surface Water Quality - Non-Point Source Discharges](#). April-June 2012. para [5-18]

⁶³ [HortNZ v Manawatu-Wanganui Regional Council](#) [2013] NZHC 2492 [24 September 2013] para [82]

standard. This audit and certification process provides much greater certainty than permitted activities that are not supported by independent audit.

5.6.2. COST RECOVERY AND ECONOMIC EFFICIENCY

The audit and certification approach proposed is economically efficient. Audit and certification costs will be borne by the grower, which ensures the cost associated with monitoring and compliance for the permitted activity standard is borne by the people conducting the permitted activity. This approach is economically efficient because it will reduce the cost of monitoring for regional councils. We note that the RMA already allows monitoring costs to be recovered, under Section 43A (8), and the proposed changes in the Resource Management (Consenting and Other System Changes) Amendment Bill also provide for cost recovery under Section 36 (1) (caaa).

5.6.3. EFFECTS ASSESSMENT UNDER SECTIONS 43A, 70 AND 107

RMA Section 43A (3) requires an effects assessment that is not cumulative. The water quality analysis provided in Appendix H illustrates that the diffuse discharge loads associated with commercial vegetable production are small. With the mitigations of the NES Vegetables applied, an improvement is expected in discharges. When expansion is accounted for, the change in water quality will be minimal in most catchments. The water quality effects associated with the proposed NES are not significant and can be provided for as a permitted activity under an NES.

When regional plans are developed, the effects assessment tests under Sections 70 and 107 are cumulative. If an NES Vegetables is created as proposed by HortNZ, a regional council would need to take that discharge load into account when designing the activity status, permitted activity standards, or consenting pathways for other activities under Sections 70 and 107.

We note that the changes to Section 70 under the Resource Management (Consenting and Other System Changes) Amendment Bill make it clear that permitted activities can be provided for in catchments experiencing significant adverse effects, provided that the permitted activity standard, in combination with other provisions, contributes to a reduction in effects over a period no greater than 10 years, commencing at the date the provision becomes operative. The NES Vegetables will meet this requirement.

While we seek an NES that prevails over regional rules, we acknowledge the legislation that means an NES cannot prevail over Waikato PC1 because PC1 is more stringent by requiring that all commercial vegetable growing is consented. PC1 is unworkable and will undoubtedly require another plan change to alter the provisions for commercial vegetable growing before it can be implemented. When that plan change is developed, HortNZ will seek a permitted activity pathway for commercial vegetable growing with the same standards as the proposed NES standards.

A permitted activity rule for commercial vegetable growing that is consistent with the proposed NES Vegetables would meet the requirements of Section 70 (as proposed in the Amendment Bill), and it would be consistent with the Vision and Strategy for the Waikato River, which is “for a future where a healthy Waikato River sustains abundant life and

prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come”.⁶⁴

We also note that the proposed changes to Section 70 and the recent changes to Section 107 require that councils are satisfied that a reduction in effects will occur before granting permitted activity status. The interim decision for PC1 required a method be added to the plan that sets out how Waikato Regional Council will ensure that the risk of nitrogen losses from vegetable production activities are to be determined, monitored and/or enforced. The decision has indicated that a qualitative assessment is adequate,⁶⁵ stating,

“Without wishing to step into the planning arena, but wanting to ensure that PC1 proceeds as efficiently and effectively as possible, a degree of pragmatism is likely to be required to address the s 107 requirement, as has been necessary for other aspects of PC1. In our view, it would be reasonable to expect that when a CVP activity undertakes a robust risk assessment, complies with Good Management Practices and the relevant industry requirements and sets them out in an FEP that will be independently certified and audited, all of which are likely to be updated over the 10-year term of PC1, that a reduction in nitrogen use and nitrogen loss from site could be expected. This would likely be limited in extent but should be a reduction”.⁶⁶

This indicates that the approach proposed by HortNZ in the NES Vegetables would meet the requirements of section 70 and 107 as well as section 43A.

From a water quality perspective, providing for commercial vegetable production (existing and expansion) to be a permitted activity with the proposed NES would have negligible non-cumulative water quality effects, and overall water quality improvements will be achieved expected when vegetable production is provided for within regional plans developed consistently with the NPSFM, Section 70 and Section 107. In addition to the minimal impact on water quality, making vegetable production a permitted activity is beneficial from a social, economic and health perspective.

6. Discussion questions

This section responds briefly to the discussion questions for the consultation document.

Q. 14 What are the pros and cons of making commercial vegetable production a permitted activity?

PROS

1. Domestic vegetable production is necessary and cannot be replaced by imports.
2. Enabling commercial vegetable production will enable a stable domestic supply of vegetables at reasonable prices.

⁶⁴ Waikato River Authority. [Te Ture Whaimana o Te Awa o Waikato \(Vision & Strategy\)](#). Accessed 25/07/25.

⁶⁵ PC1 Environment Court. Minute of the Environment Court. (8 July 2025) Introduction

⁶⁶ PC1 Environment Court interim decision (para 681)

3. Vegetables are essential for a healthy population.
4. More expensive vegetables will worsen childhood food insecurity.
5. Vegetable prices impact social cohesion.
6. Enabling vegetable production expands consumer choice.
7. There will be limited effects on freshwater quality.
8. Advocating for workable rules in each region is expensive for growers.
9. Regional councils are not prepared to make decisions about national benefit.
10. A permitted activity for vegetables makes it easier for pastoral farmers to diversify their land use.

CONS

Some people will be concerned about the potential environmental effects of making vegetable production a permitted activity. Given the limited potential for expansion, and the practice improvements expected under an NES Vegetables, freshwater quality impacts are expected to be minimal.

These pros and cons are described in greater detail in our pdf submission.

Q. 15a. How do you think policies and/or rules should be designed to provide for crop rotation?

HortNZ seeks a policy within the NPSFM enabling crop rotation and provision for crop rotation as a permitted activity within an NES Vegetables. These will need to be accompanied by a definition of crop rotation. HortNZ has provided drafting in our pdf submission.

Q. 15b. Do you think these should be considered within sub-catchments only?

NO

The term “sub-catchment” is entirely subjective. It could be infinitely small or as large as a catchment, depending on the whims of local decision-makers. Growers often rotate across multiple sub-catchments, or even multiple catchments, meaning this arbitrary spatial restriction would restrict normal growing practices.

Q. 16 For the proposal to develop nationally set standards, what conditions should be included?

HortNZ’s proposal for national standards for vegetables are provided in full in our pdf submission. In summary, they are an audited and certified farm plan alongside minimum conditions for managing risk from nutrients, sediment and erosion.

Drafting for NPSFM and NES Vegetables

Without limiting the generality of the above, HortNZ seeks the following decisions on the NPSFM and a new NES Vegetables, as set out below, or alternative amendments to address the substance of the concerns raised in this submission and any consequential amendments required to address the concerns raised in this submission.

Table 4: Provisions sought

Provision	Decision sought
New NPSFM definition for commercial vegetable growing	Commercial vegetable growing means the commercial growing of vegetables intended for human consumption, and other crops as part of crop rotation.
New NPSFM definition for crop rotation	<p>Crop rotation: means the practice of the systematic planting of different vegetable and arable crops in sequence, or in combination, over multiple years within the same property, and/or on changing properties across sufficient suitable land, which may include fallow periods, catch crops, cover crops, biofumigant crops, pasture phases and may include stock.</p> <p>The purpose of this practice is to help reduce soil erosion, maintain soil structure and nutrients in the soil, reduce plant diseases and pests, and improve biodiversity. The practice is critical to the maintenance of productive vegetable yields.</p>
New NPSFM objective	Recognise the national significance of commercial vegetable production by enabling new and existing commercial vegetable production, such that New Zealand has a resilient supply of vegetables for current and future generations.
New NPSFM Commercial Vegetable Growing policy	<ol style="list-style-type: none"> 1. Commercial vegetable growing is enabled as a standalone activity and as part of diversified farming operations. 2. Standalone commercial vegetable growing and associated crop rotation is authorised as a permitted

Provision	Decision sought
	<p>activity with a farm plan⁶⁷ that demonstrates that the diffuse discharge risk is managed.</p> <p>3. Commercial vegetable growing as a standalone activity, and crop rotation are enabled and provided for when outcomes and limits are set. An action plan approach is used in catchments that support commercial vegetable production in addition to limits.</p>
NPSFM value to enable commercial vegetable growing	The target attribute states provide sufficient assimilative capacity to provide the resource use limit needed to support commercial vegetable growing.
NES Commercial Vegetable Growing relationship to other activities, consented activities and regional plans.	<ol style="list-style-type: none"> 1. The NES for Commercial Vegetable Growing prevails over more stringent and more lenient regional rules, including freshwater farm plans, or other farm planning requirements, but not over existing consents. 2. To support crop rotation, vegetable growing can be authorised on a property that is consented or permitted for another farming activity, but the rules for vegetable growing would apply to the part of the farm where commercial vegetable growing was occurring. 3. The NES specifies that vegetable growing can also be authorised as part of mixed farming activities by Regional Plans.

⁶⁷ This could be a certified freshwater farm plan or an industry assurance plan developed under the NES Vegetables.

Table 5: Proposed NES Vegetables

Proposed Drafting for the NES Vegetables

- 1) A commercial vegetable growing operation over 5 ha must be undertaken in accordance with an independently audited and certified farm plan developed within one year of the commencement date. The farm plan must include the following minimum criteria:
 - a. The freshwater farm plan and associated action plan must include a risk assessment that considers:
 - i. The biophysical characteristics of the farm including soil, rainfall and slope,
 - ii. The risk factors and practices associated with the activity, and
 - iii. Demonstrate the use of suitable tools to support decision making on appropriate risk mitigation.
- 2) The farm plan must:
 - a. Demonstrate that the grower is adopting a risk-based approach to managing risks over time through implementation of the action plan.
 - b. In determining the appropriate actions to manage risk, the grower must apply industry Codes of Practice or guidelines for managing nutrients (nitrogen and phosphorus) and sediment.
 - c. The grower must demonstrate they have adopted the following minimum standards in their first audit:
 - i. Nutrients
 1. Nutrient crop budgets that:
 - a. Account for plant uptake, and
 - b. Are informed by a minimum of one soil mineral nitrogen test per crop per annum.
 2. Fertiliser application practices that:
 - c. Minimise drift for ground application, and
 - d. Ensure application equipment is calibrated annually.
 - ii. Sediment and Erosion control
 1. 5m uncultivated setbacks from rivers, or a 4m vegetated buffer strip setback from rivers, or contouring such that water flows to a sediment treatment device rather than flowing into the river via overland flow.
 2. The slope of any land cultivated for commercial vegetable production must be 10 degrees or less, calculated as a block average.
 - iii. Irrigation
 1. A farm scale irrigation plan accounts for rainfall, evapotranspiration, and fertiliser inputs and sets out the methods undertaken to ensure the efficient operation of

Proposed Drafting for the NES Vegetables

- the irrigation system in a way that minimises impacts to freshwater.
- iv. Stock
 - 1. Stock farmed as part of crop rotations must meet the permitted activity standards of the relevant Regional Plan, or be consented as part of a farming activity.
 - d. The farm plan must be updated annually to reflect crop rotation or expansion onto new land not previously included within the farm plan in the following manner:
 - i. As properties change due to crop rotation or expansion, the freshwater farm plan risk assessment and action plan must be updated.
 - e. The farm plan must document the location of all properties that are being used for commercial vegetable production, including fallow, cover crop and pasture phases, and the actions relevant to each property.

Plan Change 1 and Plan Change 2

1. Waikato Plan Change 1

Waikato Plan Change 1 was developed under the NPSFM 2014. The council's proposed approach will result in an extremely difficult consenting regime and a likely reduction in vegetable production.

The Environment Court released an interim decision in May 2025. Our understanding of the interim decision is that a large proportion of current commercial vegetable growing is unlikely to be able to achieve consent through the proposed controlled activity pathway and may not be able to achieve consent at all. The plan provides a very constrained pathway for the expansion of commercial vegetable growing. The key problems are as follows:

- The definitions and rules don't allow anything other than vegetables to be grown in the crop rotation, including pasture or cover crops grown in rotation with vegetables. All growers grow in crop rotations that include non-vegetable crops. It appears growing vegetables in crop rotations that include arable crops or stock may be a non-complying activity. This issue may be able to be resolved prior to the final decision.
- The controlled activity rule applies to "existing" commercial vegetable production. The rule defines existing vegetable growing area as an individual grower's maximum area across sub-catchments in one year, and a maximum area within each sub-catchment in that same year. The drafting of the rule means that not all vegetable growing area that was operating in the baseline period will be able to be consented as a controlled activity. Some growers will be able to consent their activity, or part of their activity, under the controlled activity rule.
- The discretionary rule is for expansion, but it captures land that was in vegetable growing in the baseline period that has changed ownership in the past 10 years. It also captures vegetable growing operations that are no bigger overall at the FMU scale but have changed sub-catchments due to changes in leases in the past 10 years. In many sub-catchments, the directive nature of this policy means that these vegetable growing areas will not be able to achieve consent as a discretionary activity.
- The restricted discretionary rule for the Whangamarino sub-catchments is drafted in a way that means that most or all existing vegetable growing will be unable to gain a restricted discretionary consent.
- Vegetable growing that cannot meet the controlled, discretionary or restricted discretionary pathways has a non-complying rule path. This path will apply to most existing vegetable growing in the Whangamarino, and existing vegetable production in excluded sub-catchments, that cannot meet the controlled rule. The

directive nature of the vegetable policy and recent changes to the interpretation of Section 107 of the RMA mean that it will not be possible to consent vegetable growing areas in many sub-catchments through the non-complying path.

- There is a discretionary activity path for expansion. It is theoretically possible in some sub-catchments, but the sub-catchments where it can theoretically occur are still unknown due to the drafting of Policy 5 of PC1.
- The plan requires commercial vegetable growers to calculate a nitrogen loss leaching rate in Overseer, which is an unsuitable tool to model vegetable production. The interim decision indicates a Section 293 hearing will be required to remove this modelling requirement.

No consent applicant is guaranteed to be successful when applying for a discretionary or non-complying consent. Depending on the final Environment Court decision, the viability of over 20% of New Zealand's vegetables for domestic supply may be uncertain.

2. Horizons Plan Change 2

Horizons Plan Change 2 was also developed under the NPSFM 2014. The council's proposed approach would result in the contraction of existing vegetable growing and an extremely difficult consenting framework for expansion.

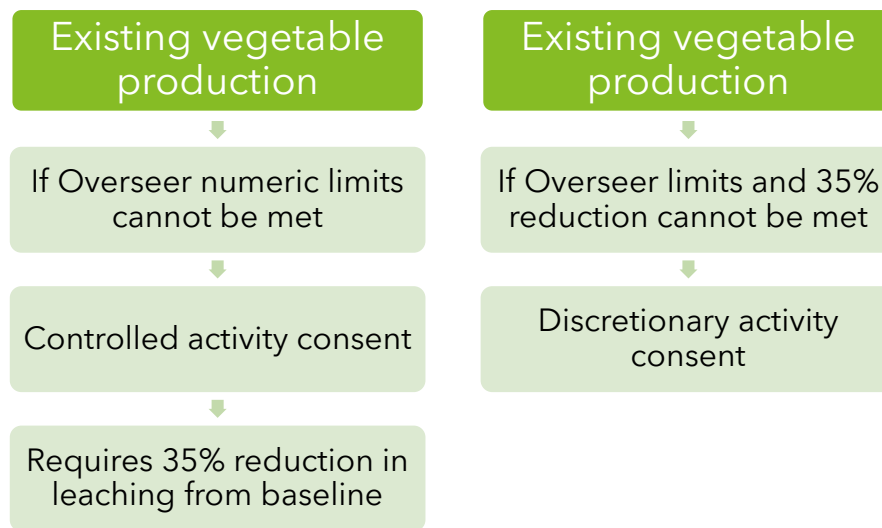
PC2 sought to improve the workability of the One Plan provisions that manage existing dairy farming, commercial vegetable growing, cropping and intensive sheep and beef. Under the One Plan, consent is required for existing intensive farming land uses within targeted Water Management Sub Zones. These zones cover a large portion of vegetable growing area in the Horowhenua.

Under the One Plan, vegetable production had to meet absolute Overseer numbers to get consent. These numbers were set based on grass growth rates (the grass curve) using modelling of dairy farms, rather than modelling of vegetable production. This meant that it was never possible for vegetable production to meet the numeric limits required for consent.

Under this framework, only one vegetable grower was granted consent. This situation persisted for several years, and PC2 aimed to amend the One Plan to enable consenting for existing intensive farming land uses by updating the Overseer numeric limits and providing a viable consenting pathway for activities that could not meet the updated limits. No growers of green vegetable rotations can meet the updated Overseer numeric limits required for the controlled activity consent. This is because the update did not change the methodology of basing the limits in the plan on the grass-curve; it just updated the numbers in the plan to align to a different (since superseded) version of Overseer.

The consenting pathway for vegetable growing from the Commissioners' Decision on PC2, issued on 19 March 2021, is shown in Figure 15.

Figure 15: Vegetable growing consent pathway under Horizons PC2 decisions version



This decision was appealed by several parties, who sought that vegetable production would still need to meet the numeric limits for a controlled activity consent. HortNZ, Horizons Regional Council, and Federated Farmers opposed the appeals, seeking a controlled activity pathway where good management practice leading to leaching reductions could be demonstrated.

If the appellants are successful, then nearly all commercial vegetable production will require a discretionary consent in the Horowhenua. No consent applicant is guaranteed to be successful when applying for a discretionary consent. Depending on the Environment Court decision, the viability of 20% of New Zealand's green vegetables for domestic supply may be uncertain.

Alignment with Government Priorities

1. Election promises

The National Party “Primary Sector Growth Plan” commits to introducing an NES for vegetables and making crop rotation within catchments a permitted activity. The Growth Plan notes that “The NES will prevail over existing rules and consents.”⁶⁸

2. Coalition agreements

National direction for vegetables delivers on the following priorities from the Government’s coalition agreements.

National-ACT Coalition Agreement:⁶⁹

- “Amend the Resource Management Act 1991 to make it easier to consent new infrastructure including renewable energy, allow farmers to farm, get more houses built, and enable aquaculture and other primary industries.”
- “Improve Farm Environment Plans so they are more cost-effective and pragmatic for farmers”.

National-NZ First Coalition Agreement:⁷⁰

- “Amend the Resource Management Act 1991 to: Make it easier to consent new infrastructure including renewable energy, allow farmers to farm, get more houses built, and enhance primary sector including fish and aquaculture, forestry, pastoral, horticulture and mining.”
- “Replace the National Policy Statement for Freshwater Management 2020 and the National Environmental Standards for Freshwater to better reflect the interests of all water users.”

3. Aotearoa Horticulture Action Plan

National direction for vegetables will deliver against the Aotearoa Horticulture Action Plan (AHAP), a sector strategy which aims to double the sector’s value by 2035.⁷¹ AHAP is jointly owned by Government, industry, the science sector and Māori. AHAP alignment is shown in Table 6.

⁶⁸ National Party. [Primary Sector Growth Plan](#). Accessed 17/06/25.

⁶⁹ National Party, ACT Party. [Coalition Agreement](#). Accessed 18/06/25.

⁷⁰ National Party, NZ First Party. [Coalition Agreement](#). Accessed 18/06/25.

⁷¹ HortNZ. [Aotearoa Horticulture Action Plan](#). Accessed 11/07/25.

Table 6: Alignment of national direction for vegetables with the Aotearoa Horticulture Action Plan

AHAP Section	Policy Alignment
KEY PRIORITY 1.1: ADOPT OPTIMISED AND ENVIRONMENTALLY POSITIVE GROWING PRACTICES	
Action: Develop suitable decision-support tools and frameworks for best practice nutrient management by crop.	An NES for Vegetables will include standards which direct good practice for nutrient management.
Outcome: Growers are practising integrated farm planning for managing fresh water, climate change and biodiversity.	An NES for Vegetables will include farm plans.
KEY PRIORITY 1.4: SUPPORT HORTICULTURE WITH SOUND POLICY	
Action: Develop nationally consistent regulation for some aspects of horticulture through national direction (e.g. national environmental standards and national planning standards).	An NES for Vegetables directly delivers on this action.
Action: Identify where policy could enable the horticulture sector, where it is adversely affecting the sector and investigate options for policy review.	An NES for Vegetables directly delivers on this action by overriding unworkable regional rules or preventing their development in the first place.
Outcome: There is a clear understanding of the horticulture sector's challenges and opportunities, with industry and government working together to design enabling policy settings.	A collaborative effort to design robust standards for vegetable production would deliver this outcome.

Industry Environmental Projects and Research

1. Growers collaborate to drive catchment environmental action

Horticulture is a collaborative industry, and there are many present and historical examples of growers working together to solve local problems. This section contains two current collaborations for environmental benefit.

1.1.1. TE TAUTARA O PUKEKOHE

Te Tautara o Pukekohe is a collaborative strategic project between mana whenua, vegetable growers and industry, funded by Government, to achieve improved collective environmental, social and economic outcomes in Pukekohe. Mana whenua in Pukekohe approached MfE during the implementation of the Specified Vegetable Growing Areas (SVGA) clause of the NPSFM 2020. Pukekohe was previously identified as an SVGA in the NPSFM 2020.⁷² This clause was subsequently removed through a Judicial Review process related to the Government's consultation process, not the content of the policy.⁷³ The Ministry for the Environment decided to set aside \$10 million from the Jobs for Nature Fund (later revised to \$5.6 million)⁷⁴ and established the Integrated Catchment Management Project (ICMP) in Pukekohe.

Through the Pukekohe ICMP process, representatives from interested parties came together and discussed how freshwater quality issues could be addressed while recognising that Pukekohe is a key vegetable production area.

The group developed the Pukekohe Action Plan which has a collective vision to achieve:

Te Ora o te Wai: a healthy freshwater environment flowing within and from Pukekohe where its wellbeing is protected and enhanced while supplying fresh vegetables for the health and wellbeing of the peoples of Aotearoa/New Zealand.

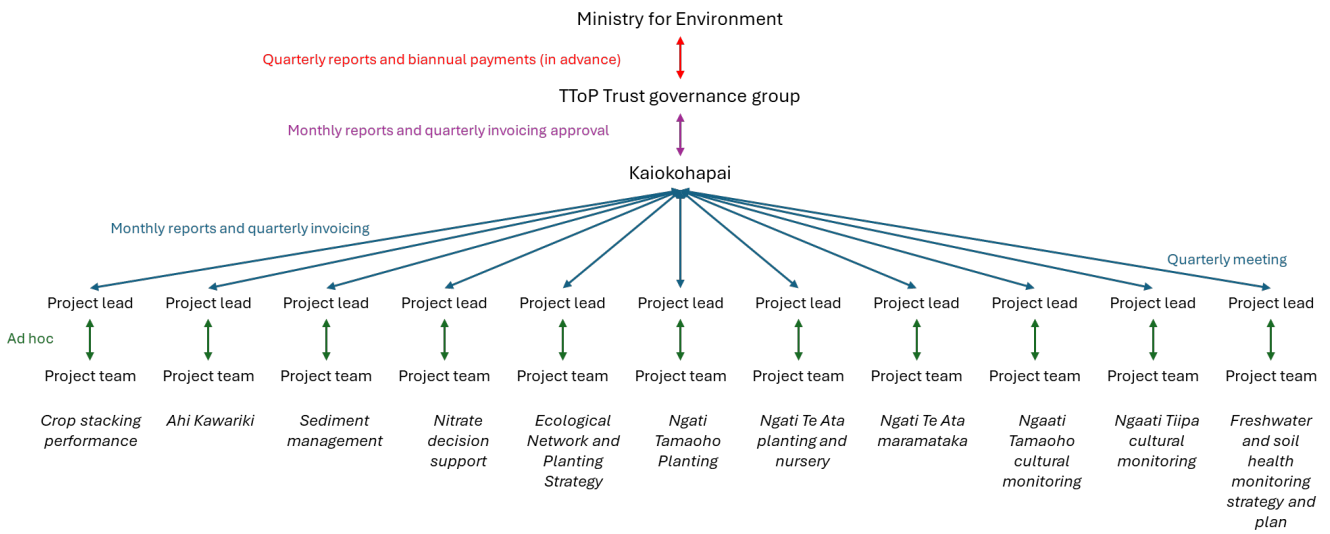
Te Tautara o Pukekohe Trust is a collaborative Trust with representatives from Ngaati Tiipa, Ngaati Tamaoho and Ngaati Te Ata, as well as from the Pukekohe Vegetable Growers Association and HortNZ. Te Tautara o Pukekohe Trust oversees 11 approved projects that resulted from the Pukekohe ICMP process and administers \$5.6 million in funding.

⁷² New Zealand Government. [National Policy Statement for Freshwater Management 2020](#). August 2020. Accessed 16/07/25.

⁷³ Rousseau, Alecia. [Court quashes freshwater exemption](#). 16 December 2023. *Manawatu Standard*.

⁷⁴ Jobs for Nature. [Funded projects](#). "Pukekohe Action Plan priority projects". Accessed 16/07/25.

Figure 16: Te Tautara Trust Structure



The Trust has received an extension to continue work on existing projects until May 2026; however, some of the Trust’s projects are designed to be continue over a long period of time, such as the Freshwater Cultural Indicator Tool and Te Ahikawariki (the Vegetable Industry Centre of Excellence). The Pukekohe Action Plan will be an enduring document to guide collaborative work towards environmental improvements into the future. The value of creating a collaborative trust with mana whenua, growers and HortNZ together is the shared vision and commitment to improving freshwater quality and the benefits of working closely together to achieve the collective vision.

1.1.2. ARAWHATA WETLAND

The Arawhata Wetland Complex project involves the construction of engineered treatment wetlands and restoration of natural wetlands in the Arawhata Stream catchment of Punahau/Lake Horowhenua near Taitoko/Levin. The project was awarded consent in 2024, and the appeals have been resolved in May 2025.

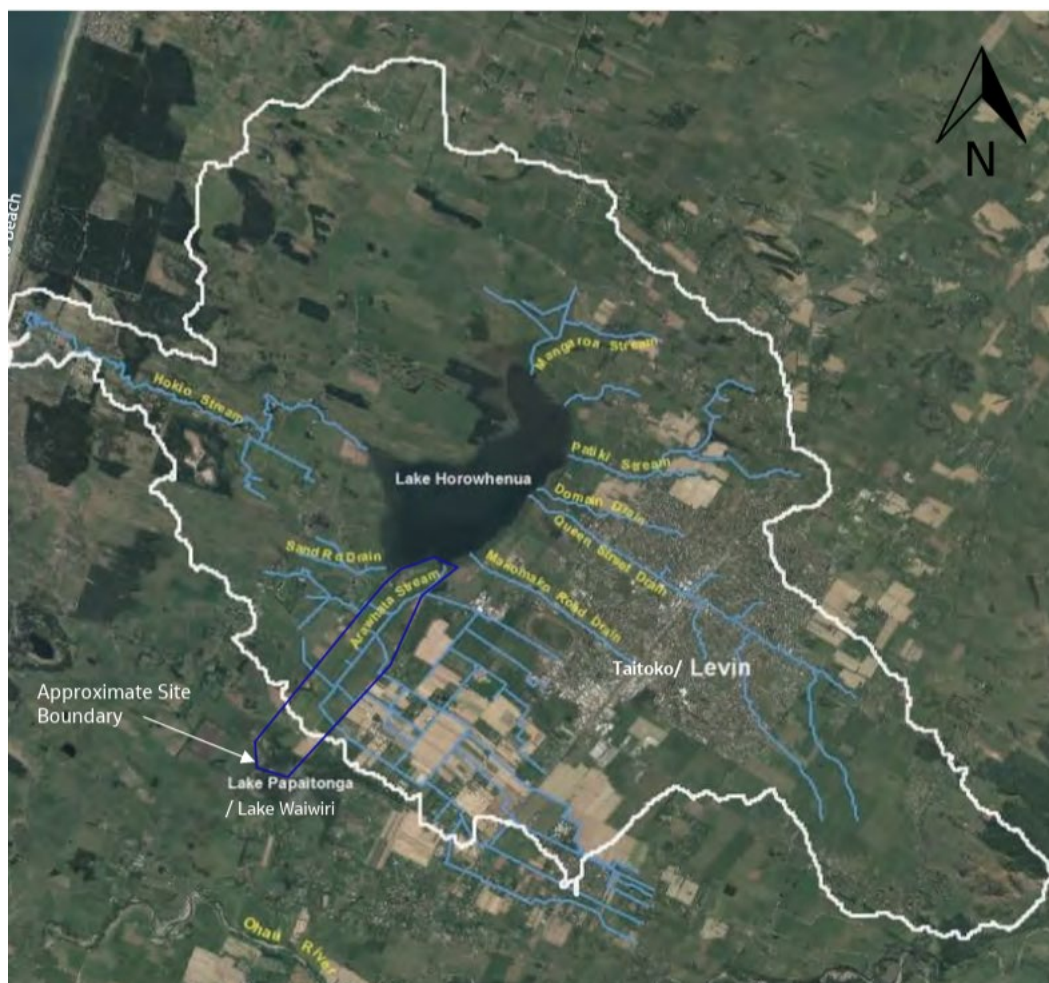
The Arawhata Stream and contributing waterways which feed into Lake Horowhenua are high in nitrogen, phosphorus, and sediment. The proposed Arawhata Wetlands Complex project will contribute to an improvement in water quality for Punahau/Lake Horowhenua and its interconnected water bodies such as the Arawhata Stream. The wetland will mitigate freshwater impacts from vegetable growing and other land uses.⁷⁵

Muaūpoko writes that, “This project recognises Muaūpoko mana whakahaere, involvement through all levels of decision-making, management, monitoring and implementation; the exercise of our kaitiakitanga that maintains our roles as guardians and protectors of Punahau/Lake Horowhenua and its surrounding environment; and upholds manaakitanga which sees everyone working towards restoration outcomes for the lake”.⁷⁶

⁷⁵ Horizons Regional Council. 12 December 2023. [Consenting Technical Report: Arawhata Wetland Complex](#).

⁷⁶ [Muaūpoko Te Mana o Te Wai Assessment: Arawhata Wetlands Complex](#). For Horizons Regional Council. December 2023. Accessed 22/07/25.

Figure 17: Map of the Arawhata Wetland Complex within the Lake Horowhenua Catchment



Vegetable growers were involved in the early stages of the project, working with Muaūpoko and Horowhenua District Council to develop a concept. Woodhaven Gardens, the region's biggest vegetable growing business, funded early hydrological assessments that supported an application to the Crown Infrastructure Shovel-Ready Programme in 2020. After the project was awarded funding, the Tararua Growers Association, Woodhaven Gardens and HortNZ participated in the Community Stakeholder Group, attending regular meetings of that Group over the course of 2021 to 2023.

2. Growers invest in industry research

The vegetable industry is committed to research, including toward environmental improvements. For example, the vegetable industry's crop-specific product groups come together through HortNZ's Vegetable Research and Innovation Board⁷⁷ to collaborate on pan-vegetable sector research. Below are two examples of recent research projects that are focused on reducing the environmental impact of vegetable growing.

⁷⁷ <https://www.vri.org.nz/>

2.1. Crop stacking project

Crop stacking is the practice of interplanting a vegetable crop with a cover crop. The aim of the project is to find ways to mitigate erosion and soil loss and reduce N leaching from commercial vegetable growing.

An initial pilot was funded through SFFF in 2023, and initial results showed the following:⁷⁸

- 31% reduction in N losses,
- Improved structure in the top 15 cm of the soil profile, and
- Improved uniformity of mineralisation of N down the soil profile.

The next phase of the project, supported through Te Tautara o Pukekohe, built on the initial pilot and trialled the crop stacking concept in a commercial crop of broccolini. Results of the next project trial have demonstrated:

- Negative value for potential nitrogen losses, indicating the crop accessed nitrogen from deeper soil layers beyond 30cm, and
- 200kg/ha less nitrogen in the top 90cm of soil compared with the baseline, showing active uptake and reduced leaching risk.

The next aim of the crop stacking project is to see if the concept is effective in other commercial vegetable production operations, crop types and soil types.

2.2. Sustainable Vegetable Systems tool⁷⁹

The Sustainable Vegetable Systems (SVS) programme is an industry-led project funded by the Ministry for Primary Industries, Potatoes New Zealand and the Vegetable Research and Innovation Board, aiming to provide New Zealand vegetable growers with support tools to help manage nitrogen and reduce nitrate leaching. The SVS nitrogen budget decision-support tool has now been designed and launched.

In New Zealand, the vegetable sector is actively transitioning towards more sustainable production practices. Amongst a raft of practice considerations, nitrogen stands out as a key economic and environmental consideration in an extremely complex and ever-changing vegetable growing system. The SVS project has turned this invisible element into a visible nitrogen budget that integrates the latest modelled flows with soil nitrogen testing.

Planning requires a model to project into the future, but it is the SVS Tool's ability to overwrite modelled numbers with measured in-season soil tests that has created a powerful decision support tool that reflects this season's actual conditions.

⁷⁸ Vegetables New Zealand. [31% reduction in nitrogen loss. Is grass the answer?](#) 8 July 2025. Accessed 16/07/25.

⁷⁹ This section is adapted from the Sustainable Vegetable Systems Factsheet by Andrew Barber, Agrilink New Zealand and SVS Programme Manager.

Vegetable growing is extremely complex. All growers have a nitrogen fertiliser plan based on many years of experience. However, plans are for a typical season, and there is never a typical season. The SVS Tool, through the integration of soil testing, helps support a grower's decision making to drive their crop to the end given the season they are facing here and now.

Achieving environmentally sustainable vegetable production involves managing inputs to meet economic crop production needs, while reducing environmental impact. To reduce environmental impact and optimise production, a sophisticated approach to crop management is necessary, considering the variability within fields, from field to field and year to year. The SVS Project delivered controlled experiments that informed the development of more accurate models. Alongside this was four years of ground truthing using monitoring sites from right around New Zealand that built grower engagement and trust.

The user base of the SVS Tool is both growers and their trusted advisors, including independent agronomists, fertiliser representatives, and researchers. Ultimately, the SVS Project has improved understanding of nitrogen management, thereby enabling growers to improve nutrient use efficiency through the adoption of management practices that are built upon years of experience and sound scientific knowledge. The SVS tool is a decision-support tool in the 2025 HortNZ Nutrient Management Code of Practice.

The SVS Tool can be accessed here: [SVS Tool](#)

The User Guide and the Final Report is available from: [VR&I Environmental Resources](#)