

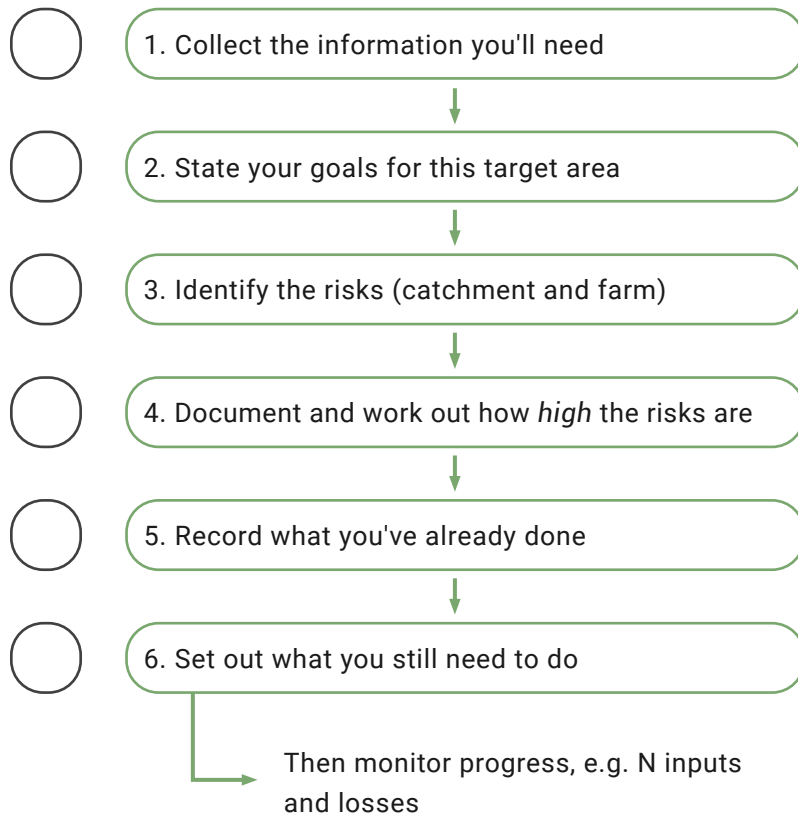
ACTION PLAN: NITROGEN MANAGEMENT



01 What information will I need?

- Regional and local information about N loadings in waterways
- Local council rules on N losses
- Nutrient budget for your farm, e.g. Overseer
- Deer Industry Environmental Management Code of Practice: p43 for planning actions

Tick these off as you go



There's a template to fill these in at the end of the document



02 Goals

Start by setting simple overall goals on nitrogen (N). **Here are some examples:**

My goals for managing nitrogen are:

1. I'm in a high nitrogen leaching area and want to reduce N losses
2. I want to document my N fertiliser use



Go to the template at the end of this document to fill in your goals and the other parts of your Action Plan.



03 What are the risks from nitrogen?



DID YOU KNOW...

N sources

N is introduced to the soil through fertiliser, stock effluent and nitrogen-fixing bacteria. When stock consume plants, they excrete excess nitrogen in urine and dung. Urine patches can be as concentrated as 1000kg/ha of urea in 1 spot. When there is more N in soil than plants can use, excess will be leached through the soil profile (a particular issue during bare-ground fallow periods). This pollutes groundwater, streams and rivers, lakes and coastal water. Too much N causes algal blooms and excessive weed growth, and can be toxic. This can significantly affect mahinga kai in some waterways.

Managing nitrogen (N) well improves pasture production and reduces impacts on the waterways and groundwater. It can save you money and increase production outputs.

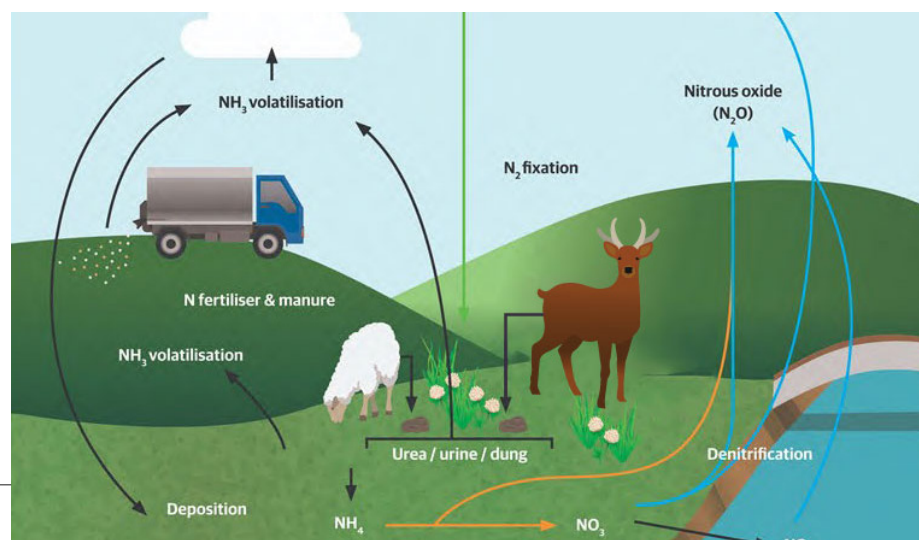


Illustration courtesy of Ravensdown



IN YOUR CATCHMENT

1. For a nationwide picture – [zoom in on your region](#)
2. Check the N levels in your catchment waterways on the [LAWA website](#)
3. Find out about groundwater and river N levels from your local council. Each regional council or unitary authority will be preparing catchment summaries to assist with farm plans. Ask your council for the summary of your catchment so you know if nitrogen is an issue in your catchment.

Regional rules

Some regions use the Land Use Capability (LUC) system to determine an N leaching limit for a property. (See page 12 of the [Deer Industry Environmental Code of Practice](#)).

Each LUC class has a leaching limit so a total limit for that property can be calculated. The LUC system allows similar properties to be treated similarly, and better land can be used more intensively. If your regional council uses LUC for limit setting, it can be worth investing in a paddock-scale farm remap where the national LUC map is not accurate enough.

Some councils have set a straight limit for N leaching and some are still setting limits. Check your council’s rules.



DID YOU KNOW

NZFAP+ and nitrogen
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Are you aiming for New Zealand Farm Assurance Plan Plus (NZFAP+) accreditation? [Check their standards here](#). The work you’re doing for the Deer Farmers’ Environmental Manual on nutrient management and nitrogen will get you well on the way to accreditation.

Grandparenting
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The LUC system for setting N limits isn’t the same as “Grandparenting”. That involves setting a limit based on a specified reference year. Grandparenting can lead to inequalities between similar properties, and reward poor historical environmental practices.



ON YOUR FARM

High N leaching is likely from intensive stock numbers, high rainfall and certain soil types. Talk over your OverseerFM results with your farm adviser or an experienced nutrient management specialist.



HANDY HINTS

OverseerFM nutrient budgets
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Overseer FM estimates nutrient flows and greenhouse gas emissions from your farm. You can access your farm details at fm.Overseer.org.nz and control access, e.g. to your farm consultant, fertiliser representative or the regional council (to submit nutrient budgets for audits or consents).

OverseerFM nutrient budgets cont.

Less cropping, cultivation and bare soil will usually result in less N loss in your nutrient budget.

Maintain nutrient budgets and good records of N use.

See: www.overseer.org.nz

Keep a record of the inputs needed to run Overseer. Ask your fertiliser rep or use the [B+L NZ template](#).

If you have a bore, test your water at that spot. The best way to estimate N loss across the whole farm is using [OverseerFM](#).

Deer don't generate the high N losses seen from intensive cattle or dairy farms, but there are still ways to reduce losses. The effect of most of these can be tested in your OverseerFM nutrient budget.

There is a small annual cost to use OverseerFM. Getting a consultant to prepare your Overseer budget is an additional cost.



04 How high are the risks from nitrogen?

Record the risks from nitrogen. **We've started with some examples below.** Tailor this to your situation using the template at the end. See the "Risk Assessment" module for how to assess level of risk:

Activity/location examples	Risk assessment	Comment (make a note of anything specific to your place)
Exceeding nitrogen limit for your region (if one applies in your area)	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	My application rates are low, but local catchment limits are tight
Applying more than 190kg/ha/year of synthetic nitrogen	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	This is well above the rates I use
Blocks with high nitrogen loss (in your OverseerFM nutrient budget)	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	One block is boggy with poor soil structure in winter.
High winter stocking rates	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	Most stags are housed in winter, off pasture
Winter cropping on gentle hill country	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	Safer location than my mole and tile drain paddocks
High stocking rate on free draining soils	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	Low rainfall in my region so less likely to have leaching through the profile but will check on Overseer.
Winter crop on subsurface mole and tile drains	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	Reducing area; lift and carry fodder beet. Putting next year's winter crop on paddocks with less mole and tiles.



05 Actions to reduce N loss

Write down (a) what you've already done to protect against excessive nutrient losses into waterways and then (b) what you have got planned. Link these back to your goals and risk assessment (above). Include timing and who's responsible. **Here are some examples.** Record your own completed actions and planned actions in the template at the end.

Goal	Risk identified	Risk level	Action	Measure and monitor	Date initiated	Who
Reduce N losses in winter	Losses from wetter paddocks in winter	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	Identify paddocks on farm best suited to wintering	Bi-monthly water samples; note conditions, weather, flows	31 May 2022	Me, council, Hills Lab
Reduce N losses in winter	Heavy stags on winter crop in wet low lying paddocks with mole and tile drains	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	Targeting paddocks on farm that are best suited to wintering next year. Investigating options to cut carry fodder beet or use old covered sheep yards as a wintering barn	Run Overseer and see what N losses estimated under those winter paddocks	12 June 2022	Me and my fert rep
Match my N use and N cycling on farm with what the pasture and crops need	Too much N will drain into the subsoil and eventually into groundwater or waterways	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	Nutrient plan for the property with my consultant or fert rep. Run Overseer	Review yearly with fert rep or consultant	Ongoing	Me, fert rep.
Document my N fertiliser use	High N fertiliser use can lead to N leaching	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	Make sure all my fertiliser records are stored in my farm plan each year	Put in diary to do once a year.	Ongoing	Me
Know the N risk in my catchment	Contributing N to my river catchment	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	Ask council staff or local catchment group for summary of N risk in my catchment and review the N on my farm in response to any N issues in the catchment	Update when council updates the summary	1 July 2022	Me



HANDY HINTS

Reducing N losses
.....

Deer produce smaller urine patches than cattle.



1. Target the application of N to plant growth stages and soil moisture levels. Nitrogen will just get washed through the soil if the plants can't use it.
2. Reduce winter cropping or shift to soils/topography where less likely to leach to groundwater
3. Direct drill crops rather than conventionally cultivate. (Cultivation increases breakdown of organic matter and release of N by microbes.)
4. Use catch crop species that continue to grow and take up nitrogen after grazing rather than leaving soil bare, for example, oats, ryecorn, triticale.

Oats are one type of catch crop that can be used to mop up excess N following winter grazing of crops such as kale. (Photo: Luisetti Seeds)



Reducing N losses cont.

5. Use feeds that reduce nitrogen consumption by animals such maize silage, Italian ryegrass, plantain, fodder beet and cereals.



Plantain can help reduce N consumption by animals.

6. Have a block of extensive farmland to offset your intensive paddocks. This will reduce your overall N leaching footprint.
7. Winter barns could help reduce N loss by removing stock from crop in winter.
8. Investigate low nitrogen loss genetics (not yet available in deer, but progress is being made with sheep and cattle).
9. Run smaller or fewer stock, eg, a smaller stock class or younger animals. Smaller animals have smaller urine patches.



Do's and dont's

Apply N only when:

- ✓ Soil tests and plant analysis are done
- ✓ Pasture is at least 25mm (1,000kgDM/ha)
- ✓ Soil temperature is >6° and rising
- ✓ Application rates are within rules for area
- ✓ Plants are in their vigorous growth phase

Do's and don'ts cont.

Apply N only when pasture is longer than 25mm and plants are growing vigorously.



Don't apply N when:

- × Soil temperature is <6°
- × Soils are at field capacity
- × Soils are severely compacted
- × It's the high-risk months (May-July)
- × Loss limits will be exceeded
- × Soils are too wet

FOR FURTHER INFORMATION

Deer Fact: [Effective nutrient management on deer farms](#)

Strategies to reduce N fertiliser use: www.dairynz.co.nz/environment/on-farm-actions/strategies-to-reduce-n-fertiliser-use

Forages for reduced nitrate leaching: www.far.org.nz/assets/files/blog/files/f1f6b00f-b669-5ef0-8ecc-897f0da8deee.pdf

TEMPLATE: NITROGEN

Fill out your Action Plan for Nitrogen here.



02 Goals

My goals for Nitrogen are:



03 How high are the risks from N loss?

See the "Risk Assessment" module for how to assess level of risk:

Activity/location	Risk assessment (low/medium/high)	Comment (make a note of anything specific to your place)
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	
	○ ○ ○	



Actions: What I've already done to protect against N leaching

Write down what you've already done to protect against excessive nutrient losses into waterways. Link it back to your goals and risk assessment (above). Include timing and who's responsible.

Goal	Risk identified	Risk level	Action	Measure and monitor	Date initiated	Who
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				



Actions: How I will protect against N leaching

Write down what you've still got planned to protect against N loss. Link it back to your goals and risk assessment (above). Include timing and who's responsible.

Goal	Risk identified	Risk level	Action	Measure and monitor	Date initiated	Who
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				
		○ ○ ○				

When you've completed this template, save this document onto your computer. You can amend it later if you need to.

● Low

● Medium

● High