

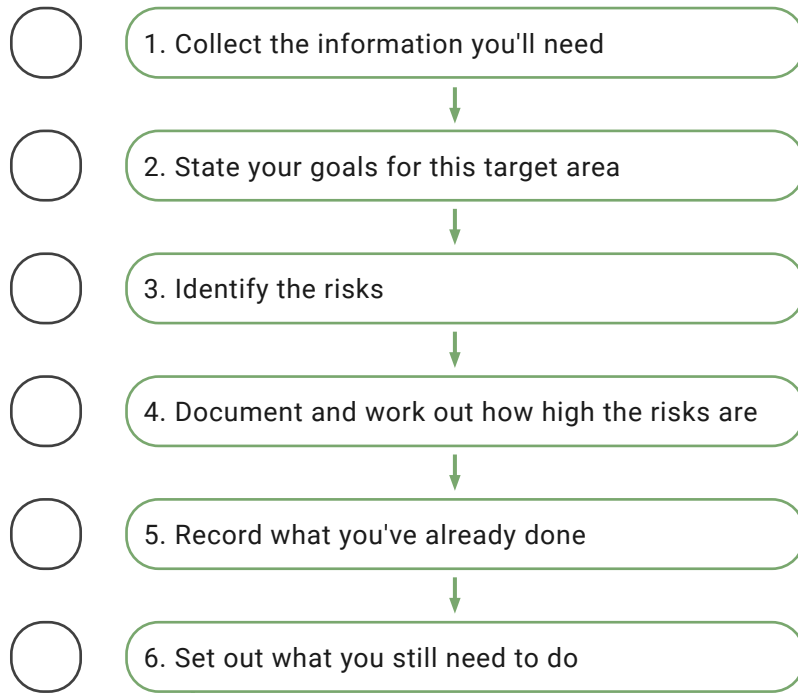
ACTION PLAN: PHOSPHORUS



01 What information will I need?

- Farm map showing risk areas
- Farm soil map
- Deer Industry Environmental Management Code of Practice: Critical Source Areas p19; Nutrient Management p39-41

Tick these off as you go



Then monitor progress, e.g., changes in Olsen P levels

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



02 Goals

Start by setting simple overall goals on phosphorus (P) and soil testing. **Here are some examples:**

My goals for P and soil testing are:

1. I want to have a clear understanding of the P status of my soils and match my fertiliser application to P requirements in different parts of the farm.
2. Better understand of how P levels on my farm are changing over time
3. Reduce P loss from my farm into waterways.



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 phosphorus?



DID YOU KNOW...

Where P comes from

- P in soil comes from fertiliser, animal waste (more from dung than urine) and natural weathering of soil and rock. Most phosphorus in the environment is stored in sediment and rock.
- P binds to soil particles and only dissolves slowly in water over time. It usually enters water bodies through runoff and erosion, although some passes through the soil profile.
- If you are losing sediment in runoff, then you are also losing P.

P for problem

- P is found naturally in low levels in water; however a slight increase in P levels can dramatically affect water quality.
- P and N (nitrogen) are the main nutrients that cause problems in waterways. They can cause weed and algae growth, leading to low oxygen levels, poor water quality and damage to ecosystems, compromising mahinga kai.



P for problem cont.

- Most P is lost from localised “hot spots”. Sediment and P run-off is also a major risk when feeding crops like brassicas and beets over winter.
- Superphosphate contains traces of cadmium that accumulates in the soil. On farms with a long history of superphosphate use, soil cadmium levels should be monitored. High levels of cadmium in produce may limit market access.

? **Rules about P**
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- New freshwater rules aim to manage P loss through Good Management Practices, particularly around Critical Source Areas where P is concentrated or there’s a high risk of loss.
- There is not a fixed limit for P loss against your nutrient budget, but it is a key area where on farm improvement in practice can dramatically improve water quality.
- It’s important to contact your regional council for advice if you are planning drainage or any other works in waterways that could increase sediment flows. The rules are strict and you may need a consent.



Check with your council before doing work in waterways.



04 How high are the risks from P loss?

Record the risks from P loss. **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)
Excess P loss from sediment runoff into waterways	○ ● ○	Using fenced buffer zones
Riverbank erosion putting sediment and P into the waterway	● ○ ○	Only happens once every 10 years in big floods. Have planted bush willows to hold the banks
P Runoff through critical source areas from a newly cultivated paddock	○ ○ ●	This year the cultivated paddock is next to a creek and I've had to re-grass so all of the critical source areas are exposed if we get a downpour.
Excessively high Olsen P levels in soil tests of some paddocks which means any runoff of soil, will put higher levels of P into the waterway.	○ ● ○	Need to change my fertiliser application in that paddock next year.
I'm putting a standard amount of P fertiliser across the whole farm- haven't soil tested some of the farm for a few years so not sure if all the paddocks need that amount	○ ● ○	Note to self – get some more soil tests done next time the fertiliser rep comes.
Compacted soils along several fence lines leading to increase risk of soil runoff (and therefore P) into the creek	○ ○ ●	Investigate ways to reduce the fence line pacing
Farming on rolling to steep country – increased likelihood of P loss from runoff down hill	○ ○ ●	Make sure wide riparian buffers if intensively stocking the paddock or cultivating to trap sediment and P before it gets to the creeks.



05 Actions to protect against P 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. **We've started with some examples below.** 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
Ensure there is not excessive P in the soil, increasing the risk of loss	Sediment and P loss during winter crop grazing High levels of Olsen P in the back paddock		Maintain soil Olsen P within or below the optimum range Less super applied to the back paddock next year.	Regular soil tests	2015	Me, farm staff
Reduce risk of high P run-off from cultivated soil and grazed crops	On slopes, especially cultivated paddocks		Use direct drilling; graze down slope; include buffer at bottom Put some hay bales at the bottom of the critical source area (swale) leading to the creek when we are cultivating to slow any runoff from rain events.	Visual inspection; regular soil tests; monitor water. Check during rain events that the bales are doing the job and add more if not.	2015	Me, farm staff, adviser, contractor
Reduce streambank erosion and therefore P loss into the creek	Riverbank alongside Bobs paddock, the hay paddock (make a note on the farm map)		Get Council engineering advice. Planting shrub willows (non invasive) on the eroding bends.	Photos before planting, and will take every couple of years at one of the bends to show the difference over time.	2021	Me
Reduce P loss into waterways	Reduce fence line pacing and the compaction that follows in the shelter paddock		Erect outriggers on fence to reduce chance of fence line pacing, change which mobs are next to each other, don't use that paddock for mob when first weaned as higher risk next to waterway of runoff	Photo of current fence line pacing, photo after change in practice. Add to farm plan.	2022	Me

Low

Medium

High



HANDY HINTS

Soil testing

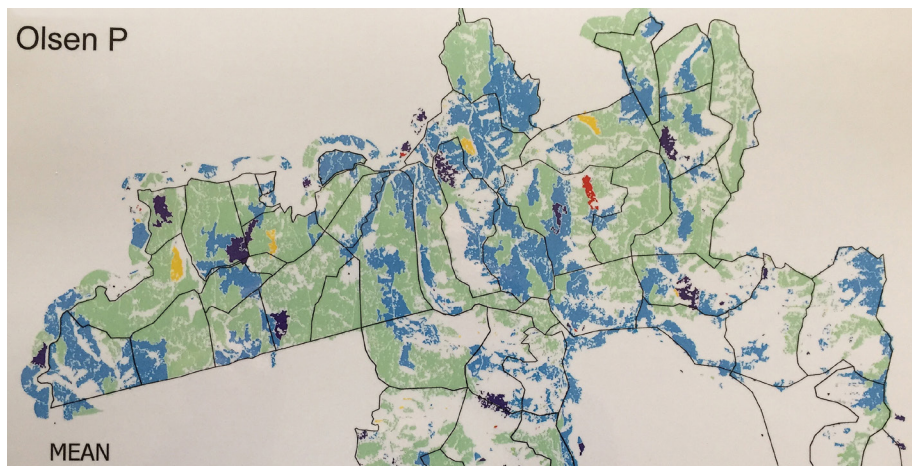
- Soil tests are a useful part of your Farm Environmental Plan. They allow you to track soil nutrient status, target fertiliser application, and take special care with areas where P levels are already high.
- Olsen P isn't the perfect measure for risk of P loss from soil, but it's a useful indicator.
- If you have paddocks with Olsen P over 40, plan how to limit soil loss in these areas until the Olsen P drops within the optimum range.



Soil core sample for testing



Olsen P maps like this are great for better targeting fertiliser application and identifying likely P trouble spots.





Reducing sediment and P losses
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- Change high-risk cropping paddocks to permanent pasture.
- Avoid intensive winter cropping where there's a combination of high-risk soils, slopes and proximity to waterways.
- Use direct drilling rather than cultivation.
- Graze crops progressively from the top of the slope and leave a generous buffer zone of long grass at the bottom of the slope to filter out sediment and P.
- Use sediment traps like the ones in the photo below to allow soil particles to settle out before water reaches waterways.



This series of linked sediment traps is reducing loss of sediment and nutrients.



1 Water entering sediment trap
2 Water leaving sediment trap

FOR FURTHER INFORMATION

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

TEMPLATE: PHOSPHORUS

Fill out your Action Plan for Phosphorus here.



02 Goals

My goals for P and soil testing are:



03 How high are the risks from P 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 P loss

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 P loss

Write down what you've still got planned to protect against P 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