Proposed Water Quality Rules and Standards for Otago

Dunedin
6 Dec 2011

Otago Regional Council

Talk Outline

Govt requirements for water quality

- National Policy Statement

ORC's regulatory philosophy

New rules and standards

- How they apply in Otago

Questions

Background

- **State of Environment Report 2007**
  - Some rivers in Otago have declining water quality
  - Most rivers have good water quality

- **National Policy Statement (NPS)**
  - Targets for rivers and streams
  - Limits for discharges to water

ORC strategy

This Plan Change is about:

- **Maintaining good water quality and**
- **Improving degraded streams through:**

- Focussing on the water quality we want
- Using local solutions for local conditions
- Empowering land managers to innovate and manage water responsibly
- Supporting good water quality with prohibited activities

Otago rivers should meet these descriptive standards..

Clarity

Water is clear for recreation

The test: you can easily and clearly see your toes when knee deep, at below median flow.

Colour

Water is colour-free for recreation

Algae

Healthy levels of algae for ecosystem function and recreation

The test: Algae cover <30% of bed cobbles, algae strands <2 cm in length at normal and low flows. No slime on the water surface.

..Otago rivers should meet these descriptive standards

Sediment

Riffles and runs are sediment free for recreation and ecosystem function

The test: Walking across a riffle or run does not produce a sediment plume.

Smell

Water is odourless for recreation

River margin (bed or bank)

Vegetation has not been stripped off the bank of a river.

No land disturbance resulting from land practices (ie: pugging) and there is no animal excrement.

Effects and parameters

Effects based approach with descriptive standards

What to measure?

Clarity

- **Turbidity** - sediment, clarity, recreation

Algae

- **Nitrogen**(NNN) and **Phosphorus**(DRP) –recreation and ecosystem function

Sediment

- **Turbidity** - sediment, clarity, recreation and ecosystem function

Smell and river margins

- **E.coli -** Smell, and recreation

- **Ammonia (NH4)** - Effluent contamination, smell and recreation

» **A zero tolerance approach to effluent**

Proposed surface water targets

Rivers and streams

	NNN mg/L	DRP mg/L	NH_4 mg/L	*E.Coli* cfu/100ml	Turbidity NTU
Receiving water target; (Short accrual)	0.444	0.026	0.1	126	5
Receiving water target; (Long accrual)	0.075	0.006	0.1	126	5

Current state of rivers and lakes relative to proposed targets

Short accrual

Site Name	NNN	DRP	NH$_4$	*E.coli*	TURB
Proposed ORC limits	**0.444**	**0.026**	**0.1**	**126**	**5**
Catlins at Houipapa	0.377	0.0165	0.01	110	3.1
Kaikorai Stream at Brighton Rd	0.34	0.0135	0.02	**355**	3.4
Leith at Dundas Street Bridge	0.394	**0.026**	0.01	**210**	2.4
Waiareka Creek at Taipo Road	0.062	**0.124**	0.02	87	1.1
Kakanui at Clifton Falls Bridge	0.017	0.005	0.01	72	0.3
Pomahaka at Burkes Ford	**0.4895**	0.013	0.01	88	3.3
Waipahi at Cairns Peak	**0.616**	0.021	0.02	**250**	**8.8**
Heriot Burn at Park Hill Road	**1.19**	0.024	0.03	**440**	4.6
Waiwera at Maws Farm	**0.781**	**0.027**	0.02	**210**	3.6

Current state of rivers and lakes relative to proposed targets

Long accrual

Site Name	NNN	DRP	NH$_4$	*E.coli*	TURB
ORC proposed limits	**0.075**	**0.006**	**0.1**	**126**	**5**
Silverstream at Taieri Depot	**0.259**	**0.007**	0.01	77	1.6
Taieri at Outram	0.035	**0.008**	0.01	71	2.2
Kye Burn at SH85 Bridge	0.033	**0.008**	0.01	26	1.4
Tokomairiro at West Branch Bridge	**0.153**	**0.011**	0.01	**178**	2.6
Trotters Creek at Mathesons	**0.125**	0.005	0.01	43	1.6
Waianakarua at Browns	**0.149**	**0.007**	0.01	14	0.3
Waikouaiti at Orbells Crossing	0.026	0.005	0.01	30	0.8
Waitahuna at Tweeds Bridge	**0.106**	**0.012**	0.01	**138**	3.7
Waipori at Waipori Falls Reserve	0.054	0.005	0.01	6	2.5

Proposed surface water target
Lakes

	Chlorophylla	TN	NH$_4$ mg/L	TP mg/L	*E.Coli* cfu/100ml	Turbidity NTU
Receiving water target: eutrophic lakes	12	0.725	0.1	0.043	126	5
Receiving water target: Lakes Wakatipu, Wanaka and Hawea	2	0.157	0.01	0.009	10	3

Current state of rivers and lakes relative to proposed targets

Headwaters/Lakes district

Site Name	NNN	NH$_4$	DRP	*E.coli*	TURB
ORC proposed limits	**0.03**	**0.01**	**0.005**	*10*	**3**
Dart at The Hillocks	0.018	0.009	0.0045	4	**19**
Kawarau at Chards	0.022	0.009	0.001	**15**	2.5
Lake Wakatipu at Outflow	0.023	0.009	0.0045	1	0.4
Lake Wanaka at Outlet	0.027	0.009	0.0045	1	0.4
Matukituki at West Wanaka	**0.047**	0.009	0.0045	9	2.0

Current state of small lakes relative to proposed targets

Small lakes

Site Name	Chlorophyll a	TN	NH$_4$	TP	EC	TURB
ORC Proposed limits	**12**	**0.725**	**0.1**	**0.043**	**126**	**5**
Lake Tuakitoto at Outlet	7.5	0.07	0.02	0.007	**130**	**6.5**
Lake Waihola end of jetty	5.3	0.38	0.009	**0.046**	30	**7.8**
Lake Hayes Mid Lake – Surface	10.5	0.25	0.009	0.033	1	1.2
Lake Johnson at Surface	8.9	**1**	0.009	**0.1**	1	1.6
Lake Onslow Boat Ramp	2.9	**0.49**	0.009	**0.046**	1	4.8

Proposed groundwater standards, loads and targets

- To maintain or improve groundwater quality

Current state of groundwater quality

Sensitive Aquifers	Median Nitrate g/m³
Wakatipu	0.63
Roxburgh	2.62
Ettrick	3.62
Silverstream-Mosgiel	2.96
Shag Alluvium	0.81
North Otago Volcanic	**11.72**

Traditional consenting approach

Rules or Consents
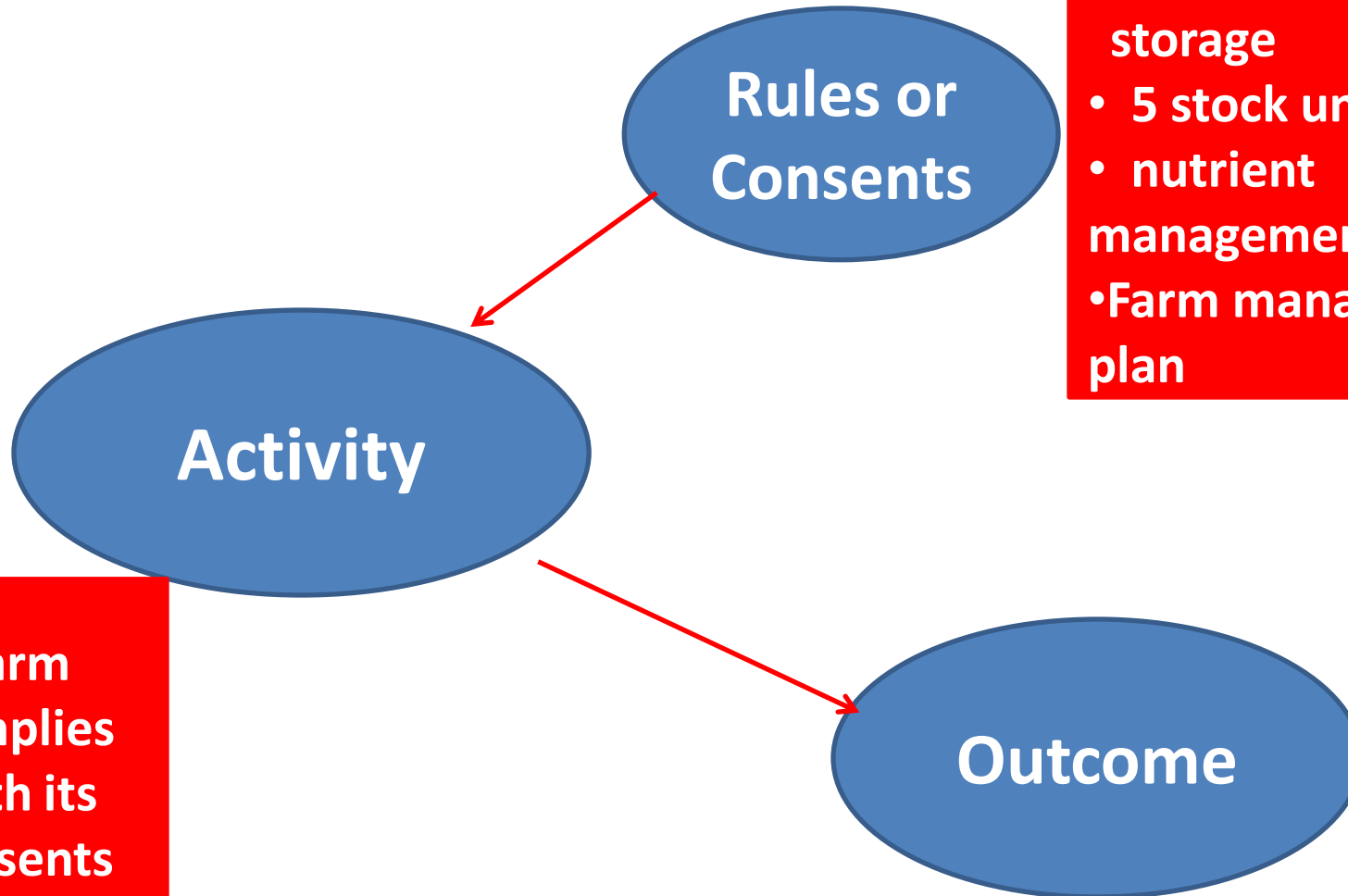
- **3 months effluent storage**
- **5 stock units per Ha**
- **nutrient management plan**
- **Farm management plan**

Activity

Farm complies with its consents

Outcome

??

Permitted activity based approach

Rules

- **Permit activities that have no negative effects**
- **Prohibits some activities**
- **Sets permitted discharge standards**

Activity

A compliant farm not affecting water quality

Outcome

Good clean water
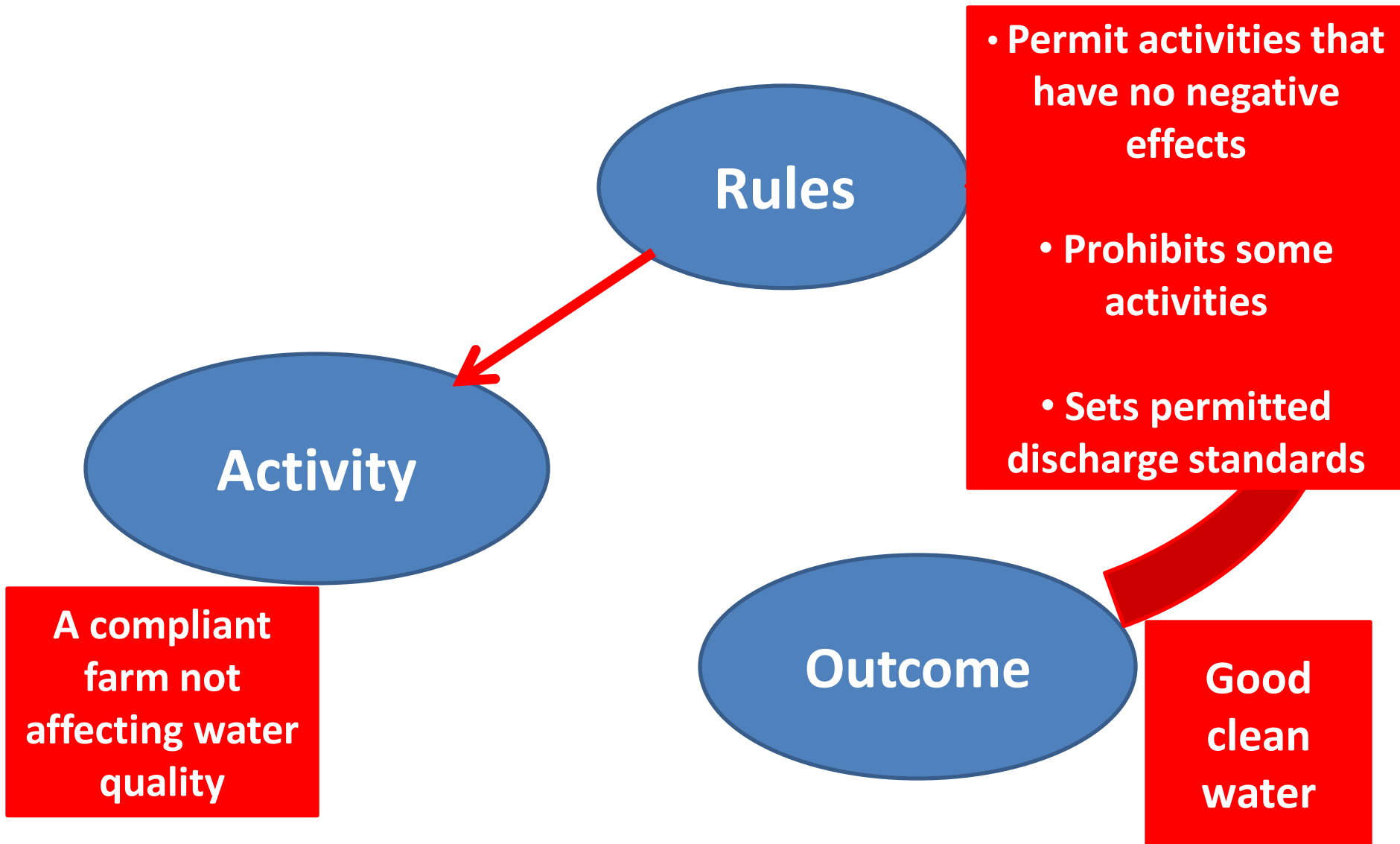
New rules approach
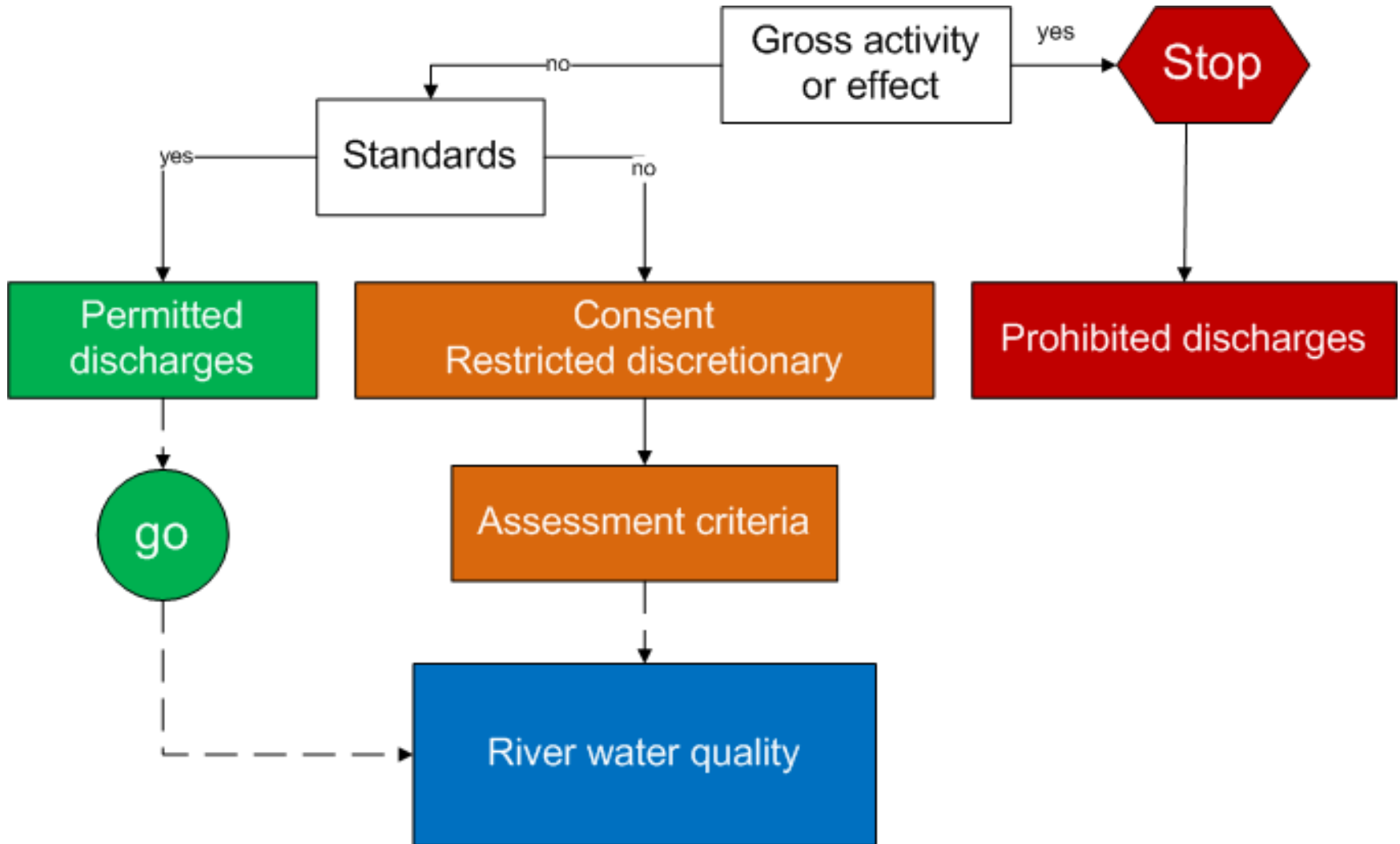
Farming to ensure good water quality

Prohibited Activities..

Effluent management

- Animal waste or silage **cannot**
- discharge to water; or
- discharge to saturated land; or
- run off from land to water; or
- result in ponding.

..Prohibited Activities

Sediment and bacteria management

- Exposing soils, where no mitigation measures have been taken to avoid sediment runoff to water.

- Stock causing or inducing slumping, pugging or erosion of the banks of a stream or any Regionally Significant Wetland or changing the colour or visual clarity of water.

Prohibited Activity

Exposed soils leading to sedimentation of stream

No attempt to prevent sediment entering a waterway

Prohibited Activity
Direct stock access to stream causing damage

Slumping

Sedimentation

Pugging

The impact of fencing-off and planting

2004　　　　　　　　　　　　　　**2009 – after fencing**

Permitted Activity standards

All surface water leaving the farm must be:

- Clear

- Odour free

- Free of oil or grease film, scum or foam.

All surface water leaving the farm must meet these standards:

	NNN mg/L	DRP mg/L	NH_4 mg/L	*E.Coli* cfu/100ml	Turbidity NTU
Accrual time >30 days	0.075	0.006	0.1	126	5
Accrual time ≤30 days	0.444	0.026	0.1	126	5

Timing for the application of permitted activity standards
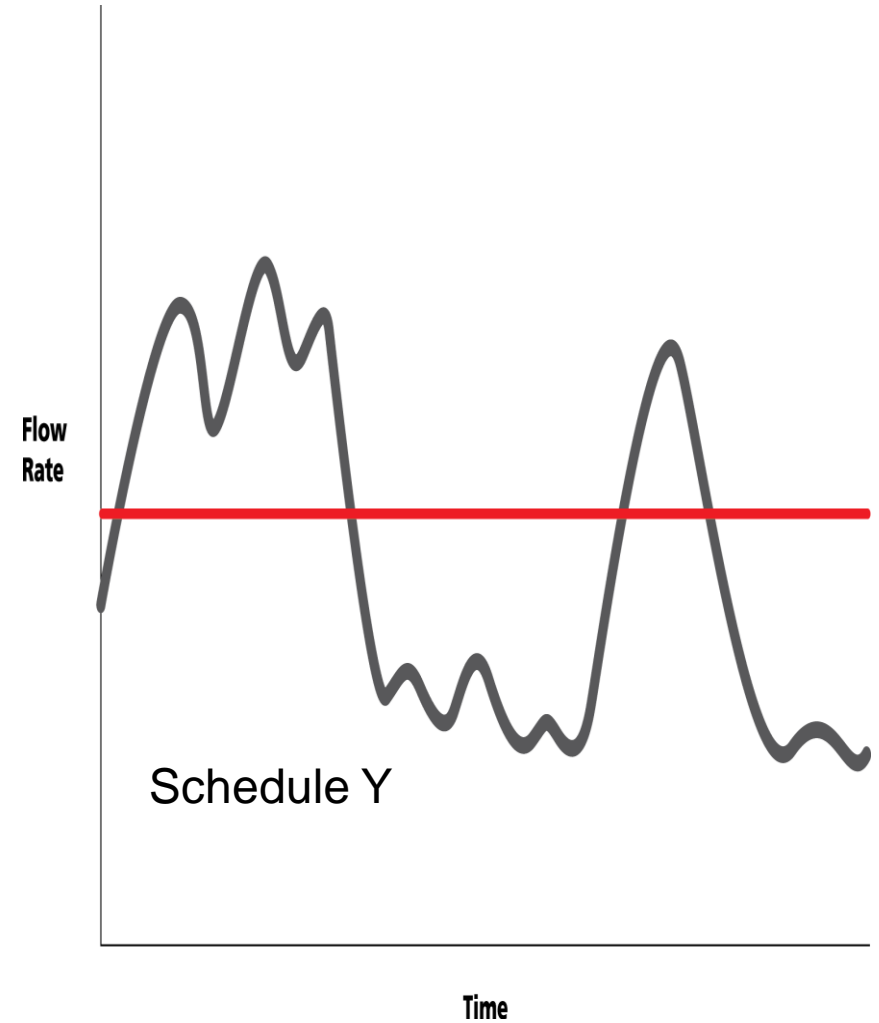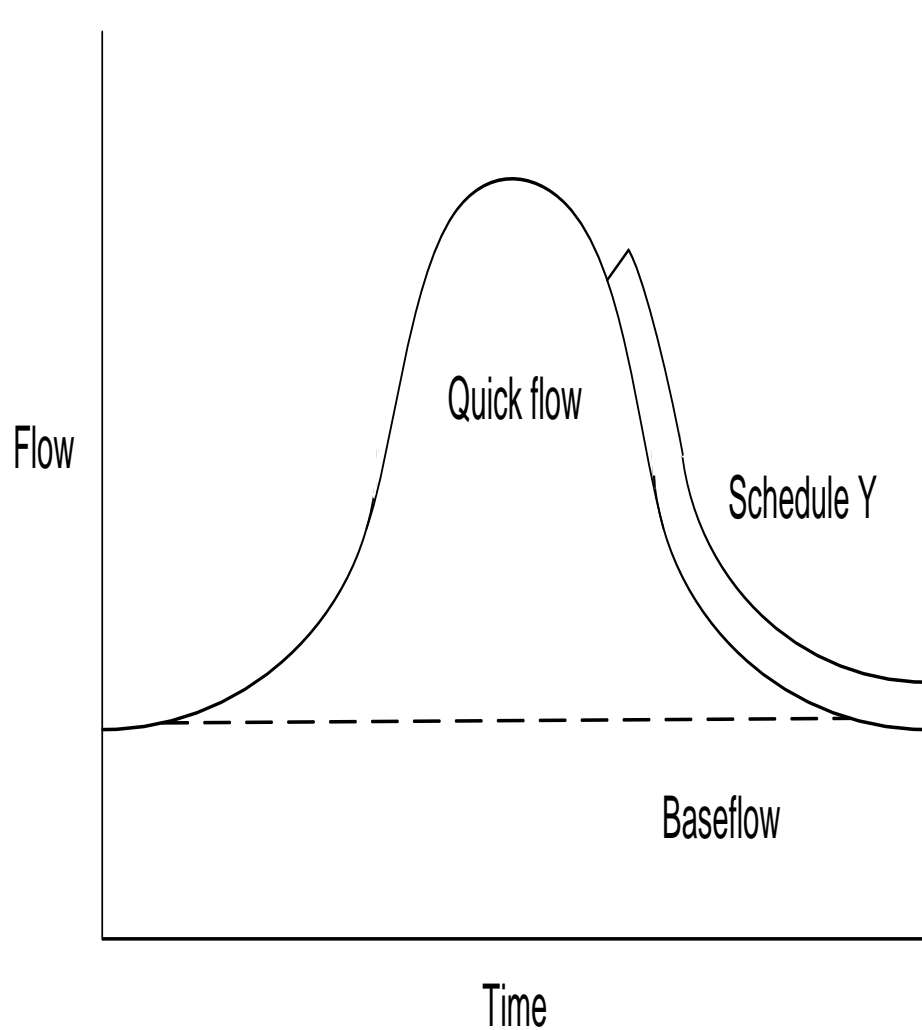
Permitted Activity Standards Groundwater

Two types of aquifers:

Low risk of nitrogen accumulation
Load limit 40kg/N/ha

Sensitive to nitrogen accumulation
Load limit 10kg/N/ha

Transitions

Prohibited activities - no transitions

- 5 years from notification(March 2012) to meet all discharge standards(except NNN)

- 7 years from notification to meet NNN

- 5 years from notification to meet stream targets

Farming practices to help meet water quality standards

Farming to meet water quality standards

- Restricting access where stock are damaging waterways
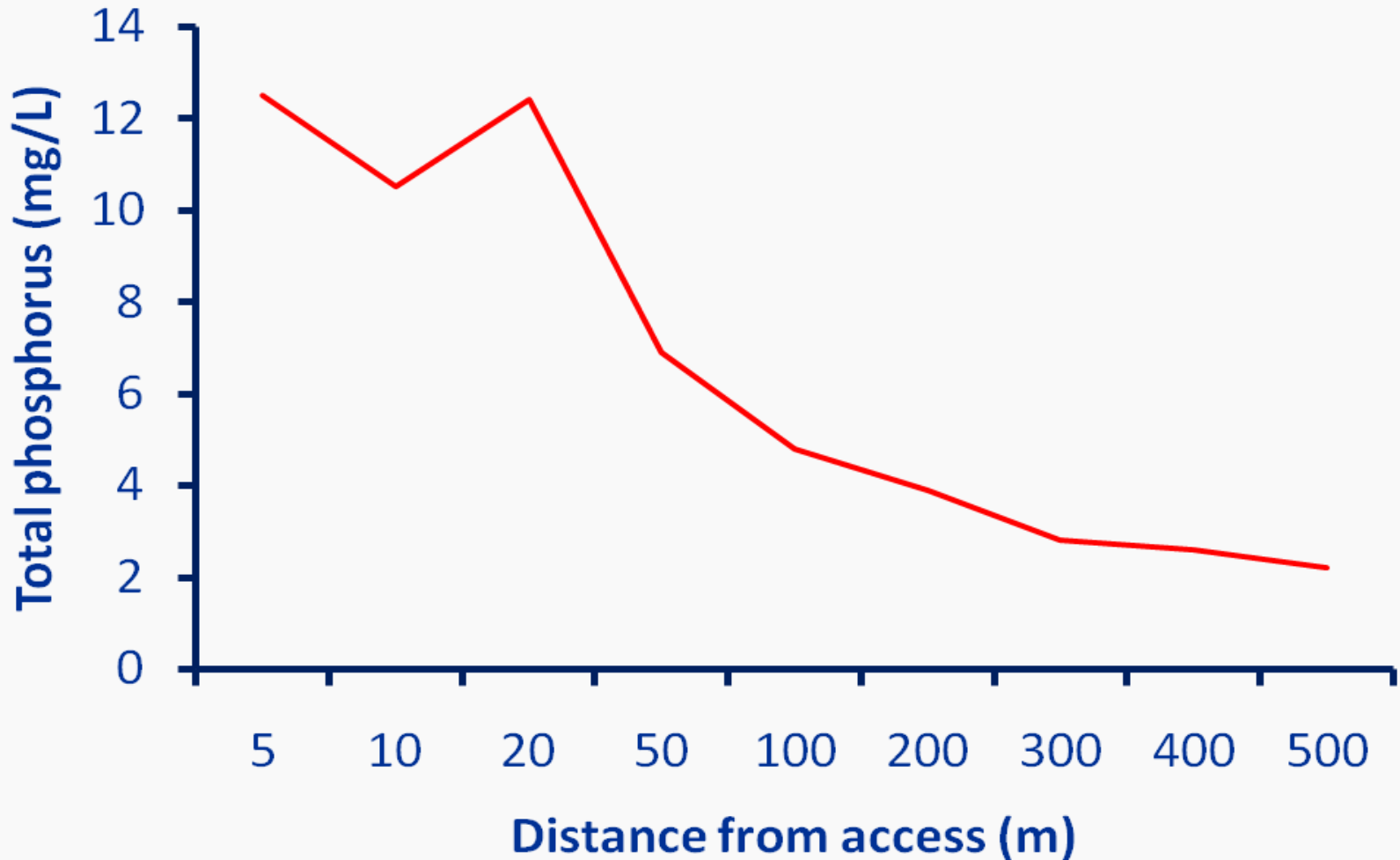- Install drinking troughs
- Install stock crossings

Irrigation runoff

- Stop runoff re-entering creeks

- Install more efficient irrigation methods to prevent runoff

- Restrict stock access to races and remove dead animals

The effect of stock in streams

Leads to an enriched source of phosphorus, NH_4^+-N and faecal bacteria
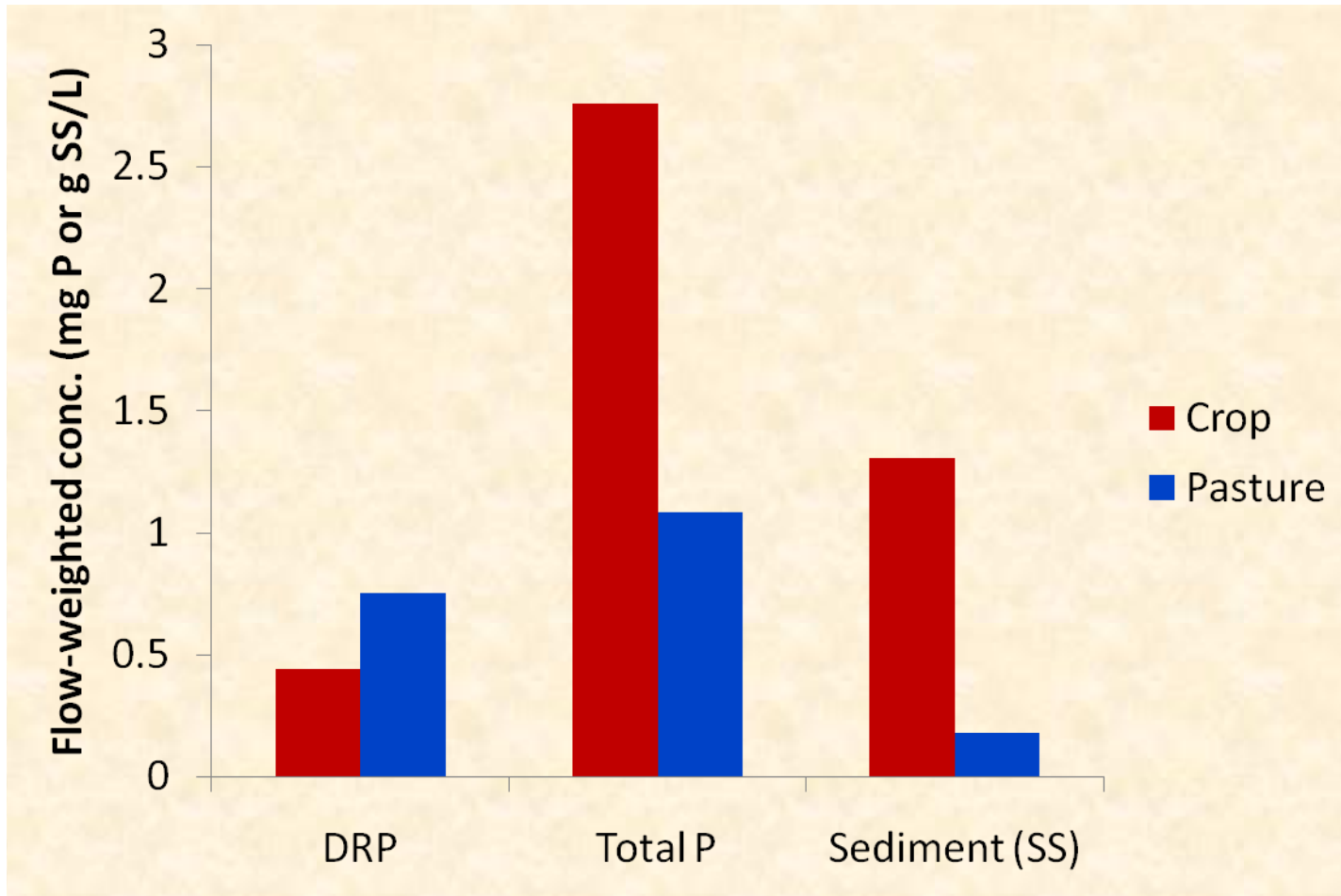
Farming to meet water quality standards

- Nutrient budgets for intensive blocks
- Checking the water quality leaving the farm

Leave a buffer between a stream & cultivation

Runoff losses from wintering block

All studies of losses from cattle, deer and sheep grazing forage crop and/or pasture in Otago & Southland

Nutrient management

Records must be supplied to council on request

- Stock type, and rate
- Dairy effluent system including amount of storage
- Winter management
- Fertiliser application
- Soil Properties
  - Olsen P etc
- Use of Nitrogen inhibitors
- Wetlands

Why: Nitrogen leaching from wintering blocks

- N deposition to grazed crop paddocks:

- For a 16 T brassica crop @ 25 g N/kg = 400 kgN/ha p.a. eaten, 85% excreted.

- Therefore: 350 kgN/ha deposited on bare ground in mid winter.

N leaching from different farm settings

N loss Kg/Ha vs Land use

Extensive sheep and beef, Milking Platform, Wintering block
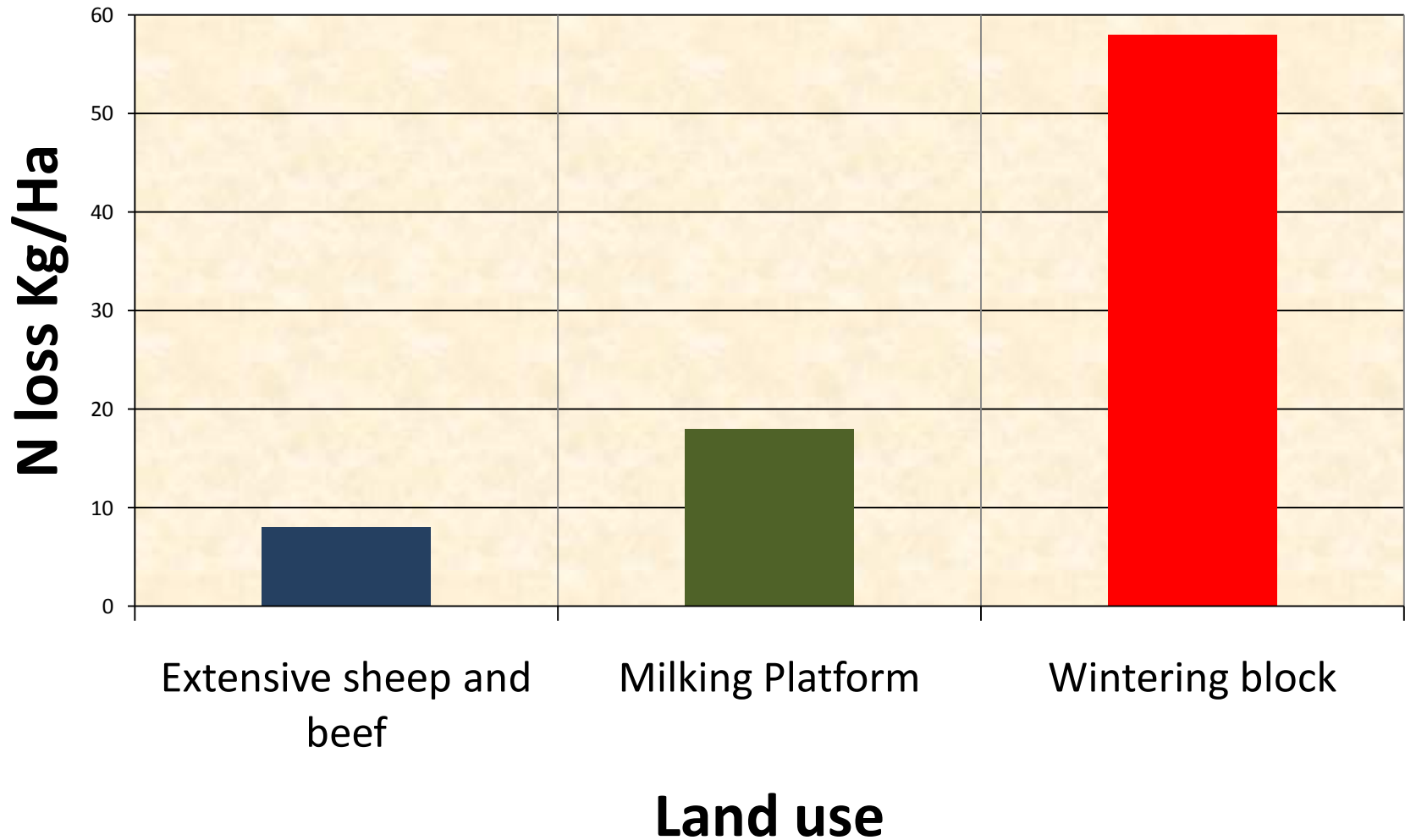
Farming to meet water quality standards

Reducing the nutrient
load on wet cold soil

Incorporating
impermeable stand-off
areas where you cut and
carry feed

Stock shelter options

Questions, comments