Freshwater - Fresh Thinking

Enhancing impact assessment in water management



Thur 28 & Fri 29 Nov 2013 Caccia-Birch House, Palmerston North

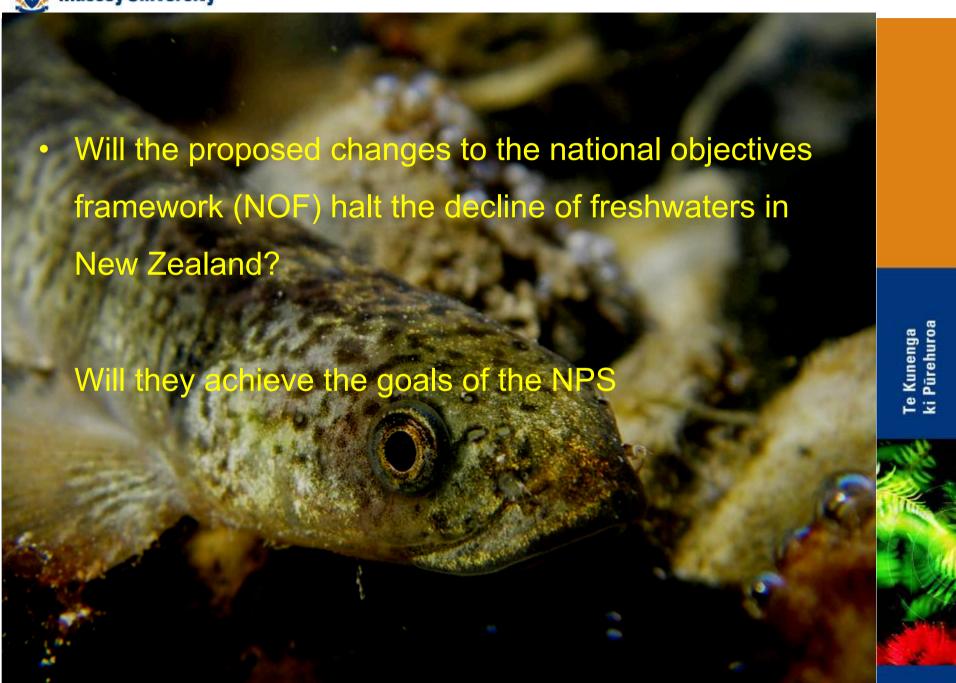
The following material is provided courtesy of the author following presentation at the New Zealand Association for Impact Assessment 2013 Annual Conference.

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Freshwater ecosystem and human health

- What are the important components of freshwater ecosystem health and function?
- What is important for freshwater human health
- Can these things be measured?
- Do we have accepted ways to measure them
- Are any of those components being measured now?
- Will the proposed changes to NPS and NOF measure these things and make a difference?

Crucial aspect to Attribute of **National** ecosystem and or measure assessment human health standard and or sampling protocols available Continuous/ later temperature NA maximum Yes (GPP) Continuous Oxygen variability Deposited Water clarity Yes (sampling sediment sediment protocols) **Biological** Indices of biotic Yes sampling communities protocols fish and integrity – IBI, MCI inverts

Attribute of Crucial aspect to **National** ecosystem and or measure assessment human health standard and or sampling protocols available Periphyton levels Periphyton cover Biggs Chlorophyll a Physical impacts Dams, barriers, Some regional databases channelising, stopbanking Nutrients N & P **ANZECC** Max/median (primary drivers of levels of DRP and guidelines many other attributes)

Too much nutrient = secondary ecosystem and biodiversity impacts long before toxic levels







Contact recreation (swimability)

Crucial aspect to measure

National
assessment
standard and or
sampling
protocols
available

Pathogens

E. Coli or similar indicator pathogen

Ministry of Health guidelines

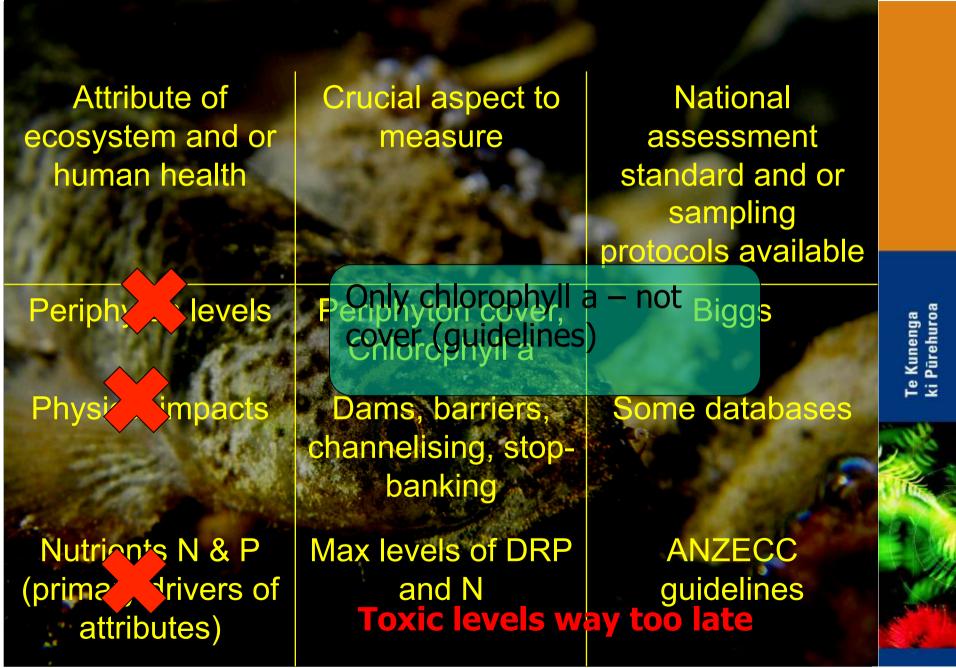
Periphyton/ cyanobacteria Area covered, Chlorophyll a levels & species phormidium Biggs standards
& PeriWCC (A
periphyton
weighted
composite cover)
black disc

Clarity

Suspended sediment







Contact recreation (Swimability – human health)

Crucial aspect to measure

National
assessment
standard and or
sampling
protocols
available

Pathogsecondary Econtactr signification you are in a bigaticator pathogen

Minist Health

Perio (ton/ cyanooacteria Area covered. Biggs standards
Planktonic Cyanobacteria
Chlorophyli a & PeriWCC (A
only - benthic not included
levels & species periphyton
phormidium weighted
composite cover)



Suspended sediment

black disc





New Zealand's harsh 'clean-green' reality:

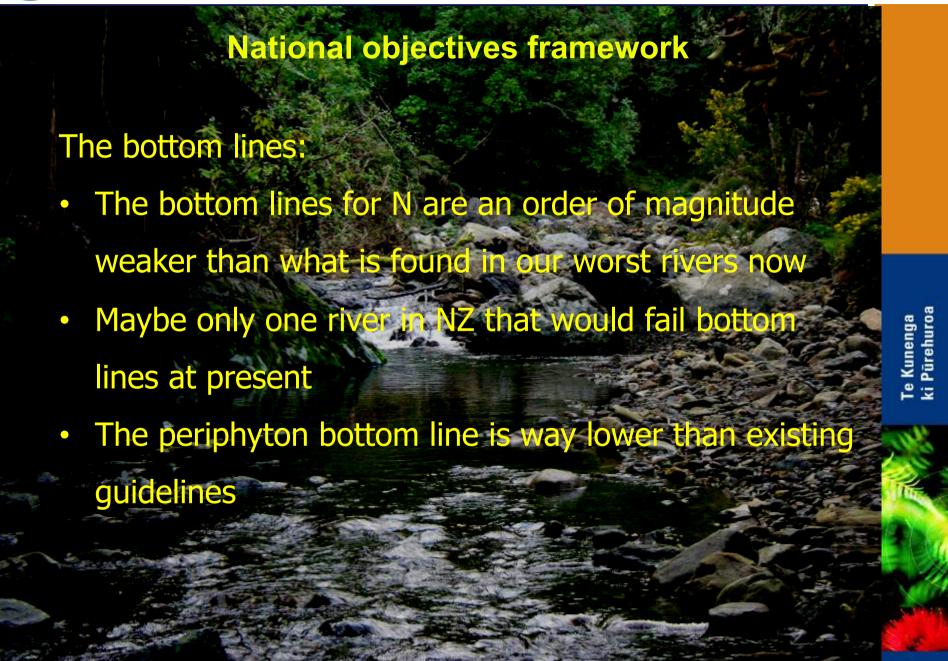
68% of native fish threatened

100% PURE NEW ZE

- > 90% lowland pastoral and urban rivers unswimmable
- 18 34,000 humans contract waterborne diseases/yr
- > 43% lakes polluted (nearly all lowland lakes)
- Groundwater nitrate levels increasing at most intensively farmed areas (ticking time bomb)















- Consultation with communities, collaboration...
- "stakeholder-led collaborative process"
- Great BUT scientific reality can't be consulted away.
- Is it collaboration or blackmail?



