

R(r)estoring Te Waihora/Lake Ellesmere (aka 'the lucky lake'): moving from the glass $\frac{1}{2}$ full, to the glass $\frac{3}{4}$ full

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Based on a keynote address given to the National Wetland Restoration Symposium,
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Outline

- Some background ecology etc
- The 2000s and the 'dead' lake question – what the Pope and the Smiths have had to say about Te Waihora
- The response – how alive is the lake?
- Where to from here? The future of the lake: WTW, WET, others
- Getting to these futures: the little 'r' and the **big 'R'** approaches – are they mutually exclusive or complementary necessities?
- The institutional 'solutions' and longer term questions
- Conclusions

Some ecological context

- NZ's 5th largest lake by area
- Around 2m deep at deepest point
- Brackish – naturally closed to sea for most of the time
- Enormous habitat diversity: open water, freshwater swamps, mud flats, salt tolerant plant communities
- Hyper-trophic – i.e., super nutrient rich
- Really, and given what we have done and continue to do to it the lake should be 'dead' – the reason its alive is largely down to 'luck' which is directly linked to the fact that in Canterbury it is windy most days and it is this wind that keeps the lake oxygenated and alive. So ...

What the Smiths and a Pope
have had to say about Te
Waihora/Lake Ellesmere –
multiple judgements

Judge Smith - 2005

- Judge Smith (Lynton Dairy Ltd v. The Canterbury Regional Council, Environment Court C108/2005: at paragraph 101) stated:
- “Te Waihora (Lake Ellesmere) was a significant shock to the Court. The lake is eutrophic, green in colour and seems to be devoid of any riparian management. For example, stock seem to have free access to the water, the margins appear to be subject to chemical spraying regimes and lake levels manipulated for farming rather than the natural values. The lake water is in a serious ecological condition and is in urgent need of attention. Riparian management is required as an absolute minimum.”

The media and politicians 2005 ...

- Media refined Judge's statement to "... the heavily degraded lake was declared technically dead this year after Environment Court Judge Jeff Smith found it was in a serious ecological condition and virtually unable to sustain animal life".
- Jeanette Fitzsimons, the Green Party Co-leader, used the phrase "Lake Ellesmere is biologically dead" in the Address in Reply Debate in Parliament, 15th November 2005

(Source: http://www.waternz.co.nz/archives/2005_09_01_nzwaternews_archive.html
Accessed 24 October 2007.)

Sustainable Water Programme of Action – 2005 onwards

“There are some unacceptable trends that need reversing. We want to improve and protect our special places like Lake Taupo, the Rotorua Lakes and Lake Ellesmere.”

David Benson–Pope: Minister for the Environment 10 April 2006

To date over \$80 million has been invested in the Taupo and Rotorua lakes catchments

\$11.6 million clean up plan for NZ's most polluted lake

Minister for the Environment, Nick Smith, 25 August, 2011

- “Te Waihora/Lake Ellesmere is New Zealand's most polluted lake and a co-ordinated cleanup is overdue. This plan involves ... millions of dollars to fund clean up work, changes to farm practices in the lake's catchments, riparian planting and relationship agreements”
- “\$11.6 million is being committed to clean up the lake made up of contributions of \$6.1 million from the Government, \$3.5 million from Environment Canterbury, \$1.3 million from Fonterra, \$500,000 from Ngāi Tahu and the balance from the Selwyn District Council, Waihora Ellesmere Trust and Lincoln University.”
- “This is the most significant fresh water clean up project New Zealand has undertaken because of the severity of the pollution and the size of the lake. It has taken 50 years for it to get into this mess and it will take a long-term commitment to put it right.”

The state of the lake –
the glass is at least $\frac{1}{2}$, if not a
lot more, full!

Waihora Ellesmere Trust

- In response to concerns about the decline in the water quality of Te Waihora/Lake Ellesmere, an Issues group was formed in 2002.
- This group represented a wide range of interests and they met regularly over 2 years and consulted widely to develop a vision and Strategy for future management of the Lake and catchment.
- To implement the Strategy a charitable trust was formed in 2003 – the Waihora Ellesmere Trust.
- One of the early questions we faced was in response to concerns about the health of the lake – how alive is it?

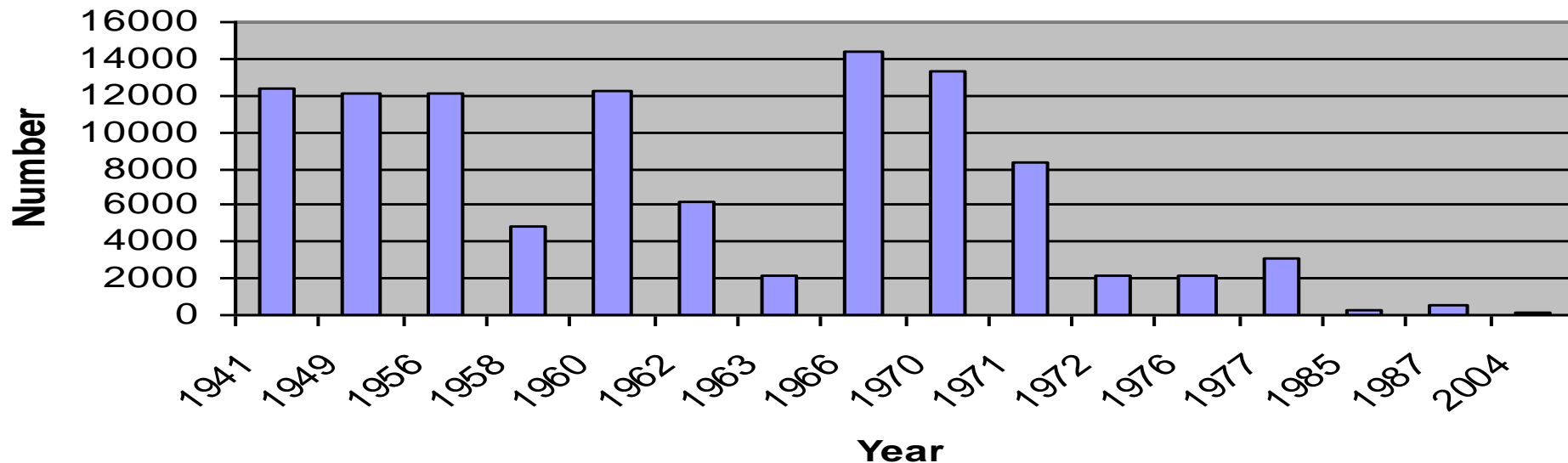
In response to all these concerns the WET decided to assess 'how dead the lake was'

- 2007 'Living Lake' symposium focused on determining the state of the lake
- Asked (and contracted) experts to report on the state of the lake and its resources as at 2007, compared for earlier, typically against the regional council's 1995 report.
- Overall, the lake is 'alive', with lots of values rated highly but others in a poor and sometimes worsening state of health – the brown trout fishery was worst of all ...

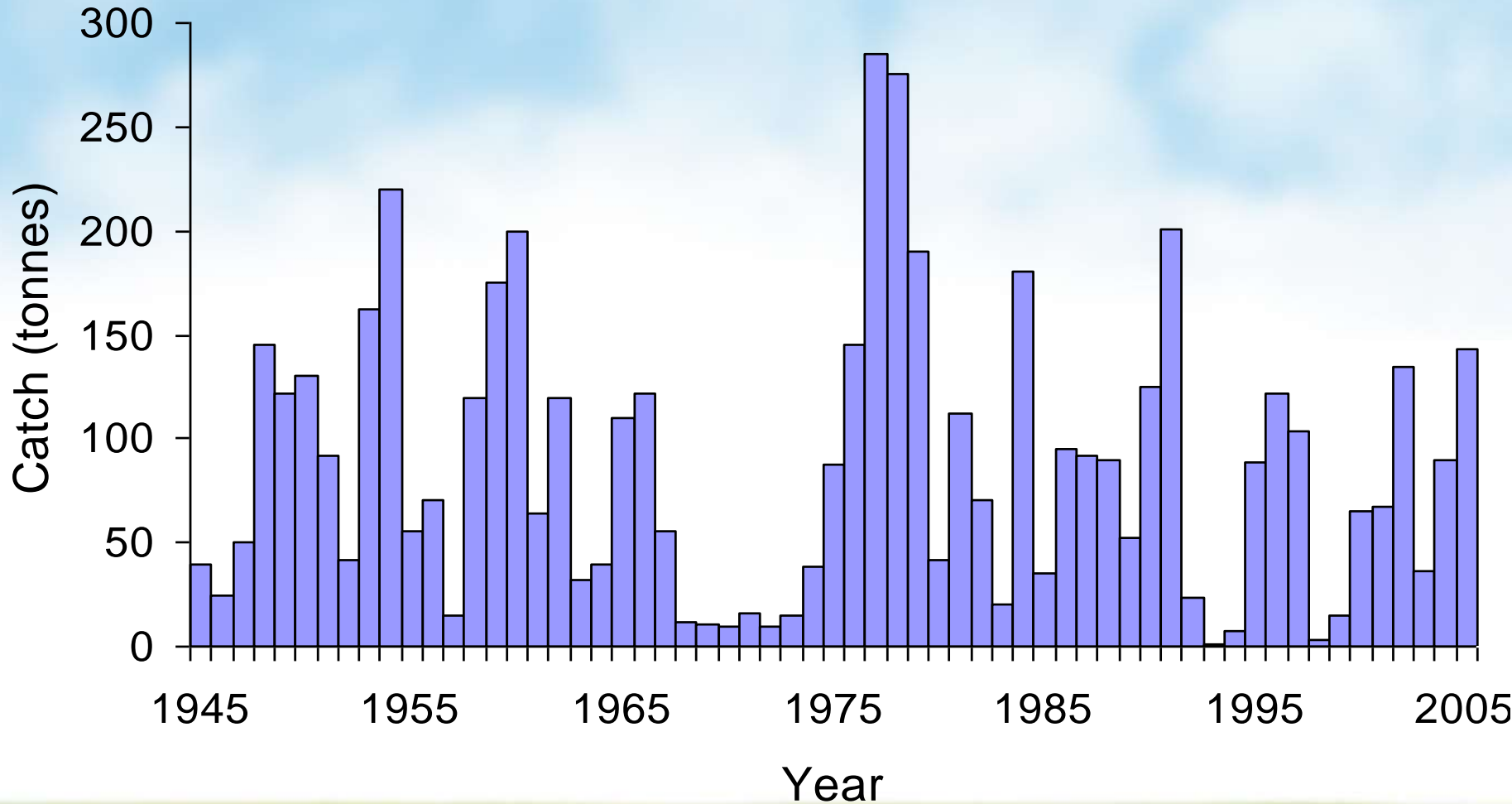


A splendid catch is the result of two nights' fishing on the Lower Selwyn.
Mr John Greenslade caught these trout in 1900 and the combined weight of the fifteen fish was 97lbs.

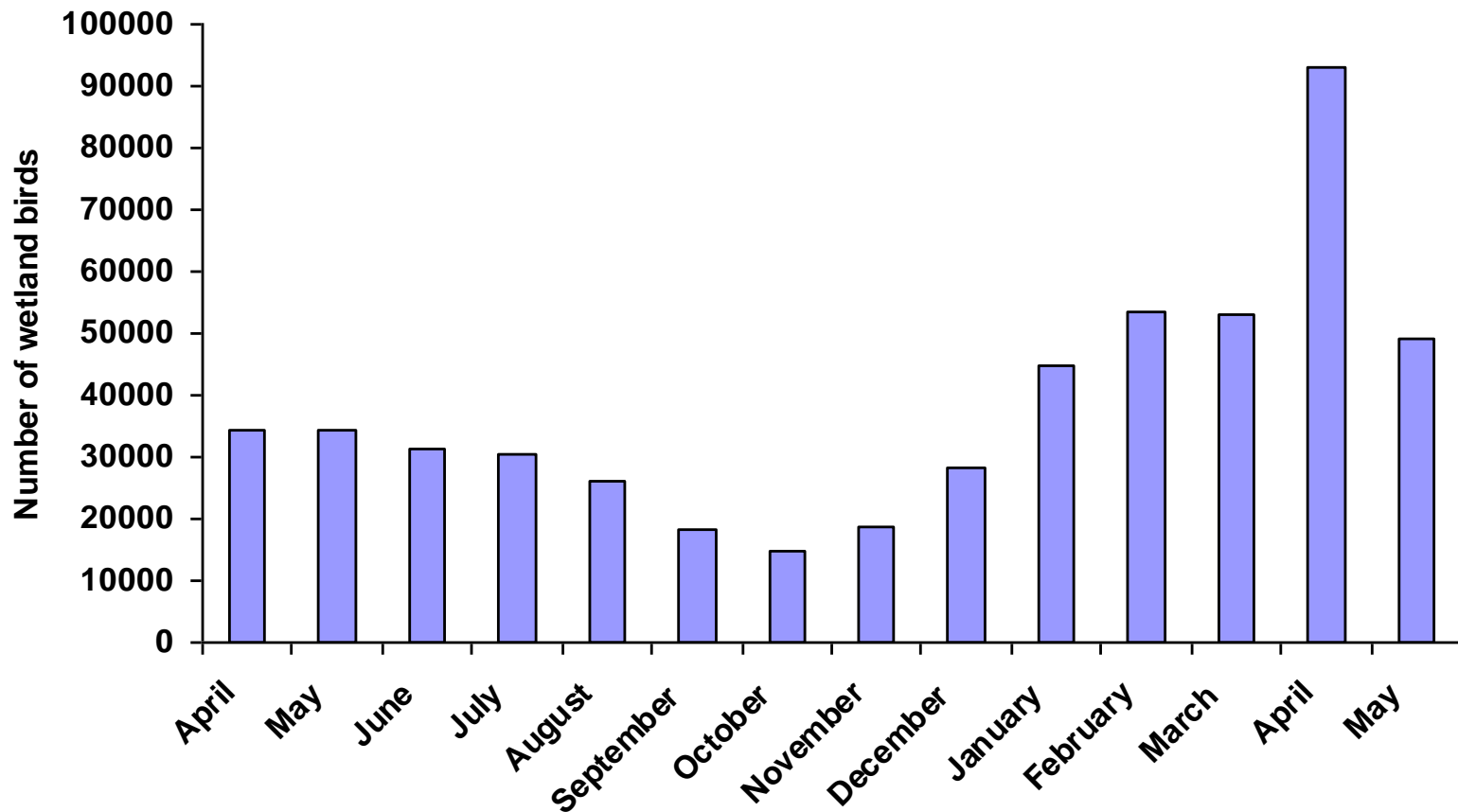
Trout trapped in Selwyn River/Waikirikiri 1941-2004



Annual commercial flounder catch



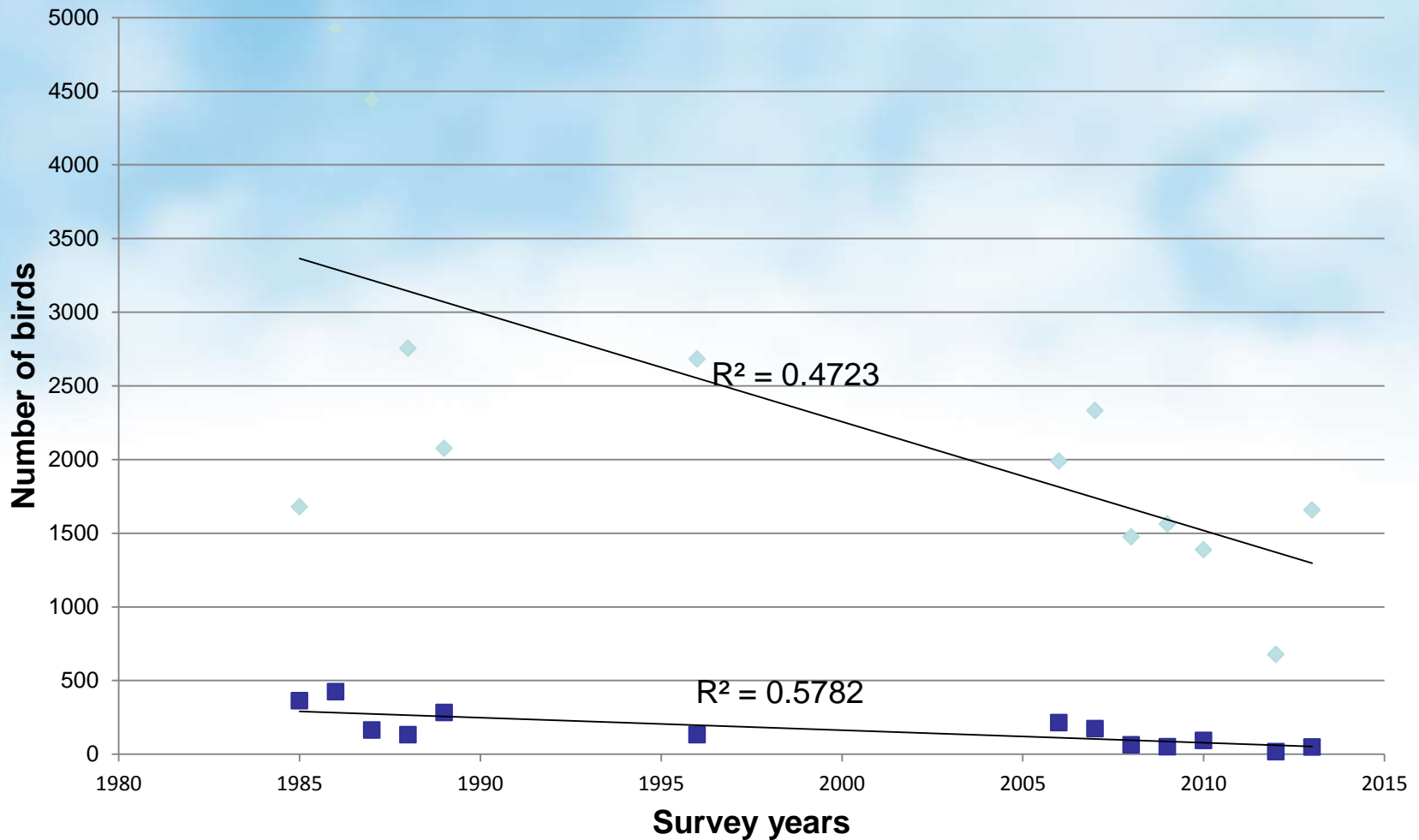
The total wetland bird cycle of numbers for Te Waihora/Lake Ellesmere: 1986-87



Bird species guilds and key species (2007)

Guild	Key Species - common name	Percentage of national population using the lake per year	
		1985-88	2006-07
1. Open water divers	Little shag	5%	5%
2. Deep water waders	Pied stilt White heron	33% 19%	33% 19%
3. Shallow water waders	Banded dotterel	10%	10%
4. Dabbling waterfowl	Black swan Canada goose Australasian shoveller Scaup	25% 30% 10% 0%	25% 30% 10% 1%
5. Aerial hunting gulls & terns	Black-billed gull Caspian tern	5% 2%	10%? 2%
6. Swamp specialists	Australasian bittern	3-5%	3-5%
7. Riparian wetland species	None chosen		

Trends in Guild 3 – shallow water migratory waders



- ◆ NZ shallow water migrant waders
- Arctic shallow water migratory waders

Restoring Ngai Tahu access to traditional taonga – harvesting black swan eggs 2009



Summary: state of values – 2007: the glass half full or half empty question!

'Value'	Range of states
Catchment Hydrology	Upper: 'very good' Lower: 'very bad'
Water quality of tributaries	'good' to 'very bad'
Water quality of lake	'fair' to 'bad', i.e., TLI in excess of 7
Vegetation	Vegetation (incl. macrophytes): 'very good' to 'poor' Rare plants: 'very good' to 'very bad' Woody weeds: 'very bad'
Brown trout recreational fishery	'very bad'
Commercial fisheries	'good' to 'bad'
Wildlife	'very good' to 'bad'
Recreation	'very good' to 'very bad'
The Ngai Tahu Values	'bad'

Where to from here? Longer term objectives for the lake

Future scenarios

Based on these findings and multiple other considerations and given the international and national level importance of the lake for multiple values, in 2007 we proposed three future scenarios, which from 2009 (in brackets) have been referred to as:

1. An Improved Status Quo & Maintenance
(An improved environmental future);
2. Realistic and Resilient Environmental Future
(Enhanced environmental future);
3. Ideal Conservation Based
(Strong environmental future).



Evaluation of the scenarios by value set

Resource	1. Improved Status Quo & Maintenance	2. Resilient and Realistic Environmental Future	3. Ideal Conservation Based
The Ngai Tahu Values	Moderate Ngai Tahu values	High values including improved mahinga kai access	Outstanding values including improved mahinga kai access, restoration activities
Indigenous vegetation	High value native vegetation protected, some revegetation	High value native vegetation, including restored areas, all diversity retained	High value native vegetation, including restored areas, all diversity retained, major revegetation efforts
Indigenous fisheries	Sustainable commercial eel fishery	Sustainable eel & flounder fishery	Maintain / increase species diversity, increase eel nos., increased customary harvest
Wildlife	High wildlife values including maintenance of species diversity	High values incl. maintenance of species diversity, including restoration of swamplands	High values incl. maintenance of species diversity, restoration of swamplands, and reintroduction of brown teal and SI fernbird
Recreational fishing	Poor value trout fishery	Regionally significant trout fishery	Nationally important trout fishery
Recreation	Moderate recreation in terms of both level and quality	High level and quality of use, aware of opportunities, not conflicting with conservation & Ngai Tahu values	Very high levels and quality of recreation use, not conflicting with conservation and Ngai Tahu cultural values
Farming	Individual value to farmers retained, some minor loss due to changes in lake level management	Reduced farming around edge as land purchased and more conservation grazing	Conservation grazing only; Fencing off stock from all inflowing streams, or supplementation of flows

Getting to these futures:
the little 'r's' and the **big 'Rs'**

The little 'rs': revegetation, postage stamp projects – community participation, bottom up, symbolic, the sum of ...



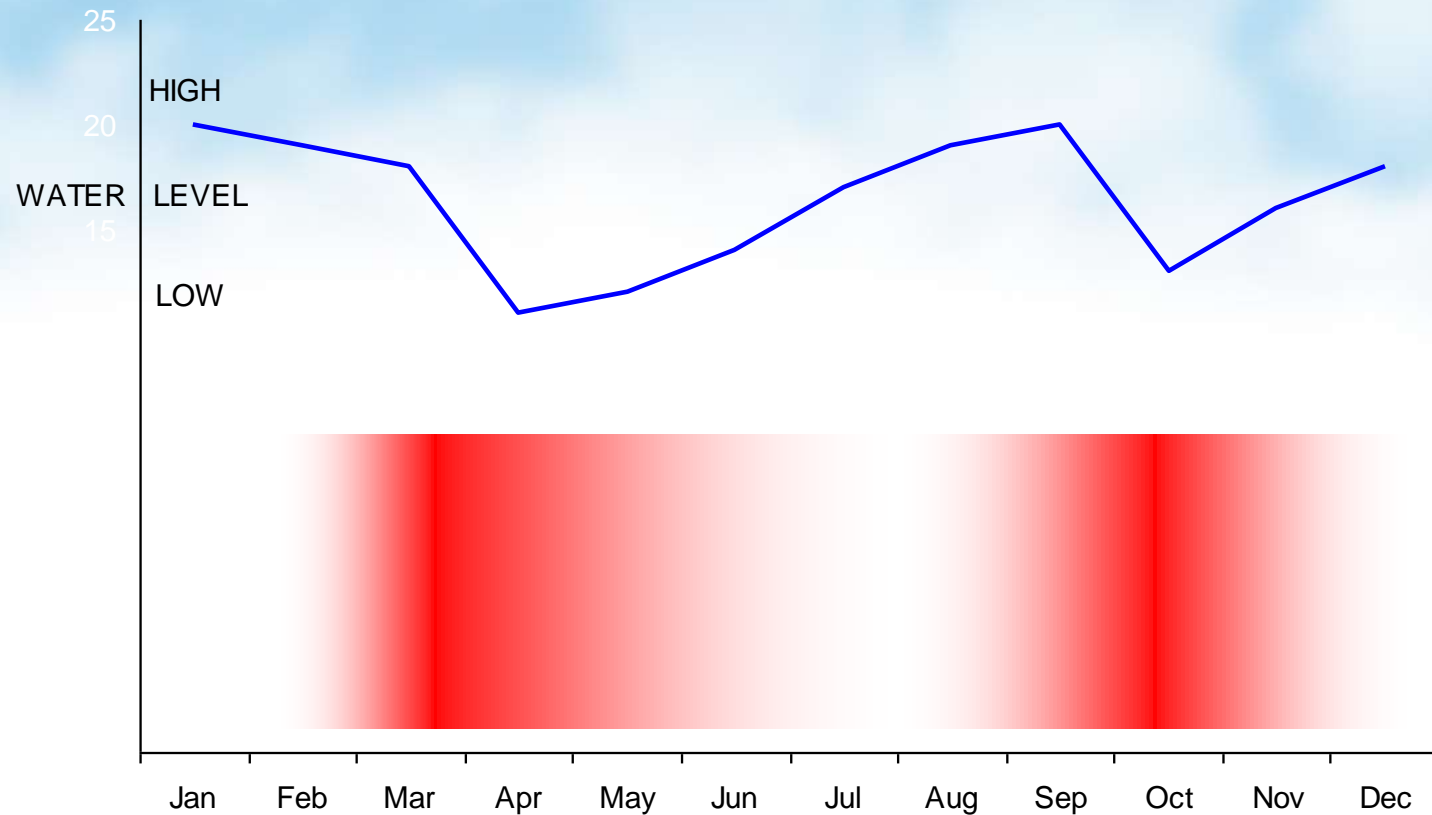
Insights:

- Involvement in the little 'rs' maintains community interest and involvement
- The sum of the little 'rs' is important but rarely, if ever, addresses the **big 'R'** issues
- A single minded focus on the little 'rs' can divert attention from the **big 'R'** issues

Some of the big 'R' issues

- Lake management enormously challenging – I described it at the 2009 WCO hearing, when appearing for Ngai Tahu, as **“being crude at best”**
- Six big issues, or are they symptoms of a bigger problem?
 - lake opening regime, primary ‘control’ on many values
 - Water quality – Too much N and too much P can lead to nasty ‘A’
 - Riparian management
 - ‘Weed’/macrophyte bed restoration
 - Terrestrial weed management
 - Perception – TLI, glass >1/2 full, etc
- WCO recognises range of values, prevents wetland drainage below a defined contour level – provides for lake openings at certain times for key values, e.g., eel migration, inward migrating juvenile flounder
- But, managing the lake-sea interface is fraught with challenges, technical and values related ...

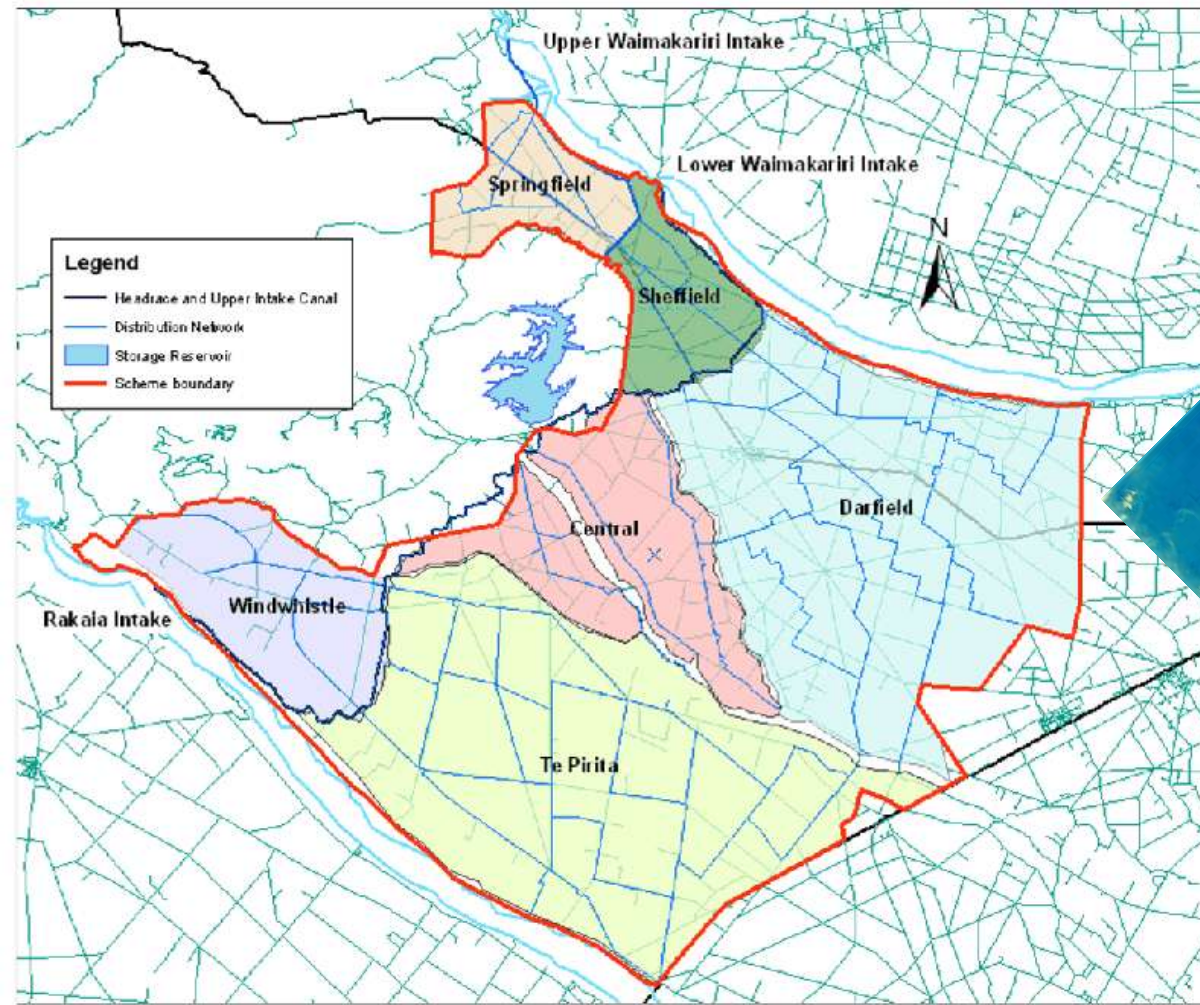
A suggested lake opening regime for fish – but fish only one of the values!

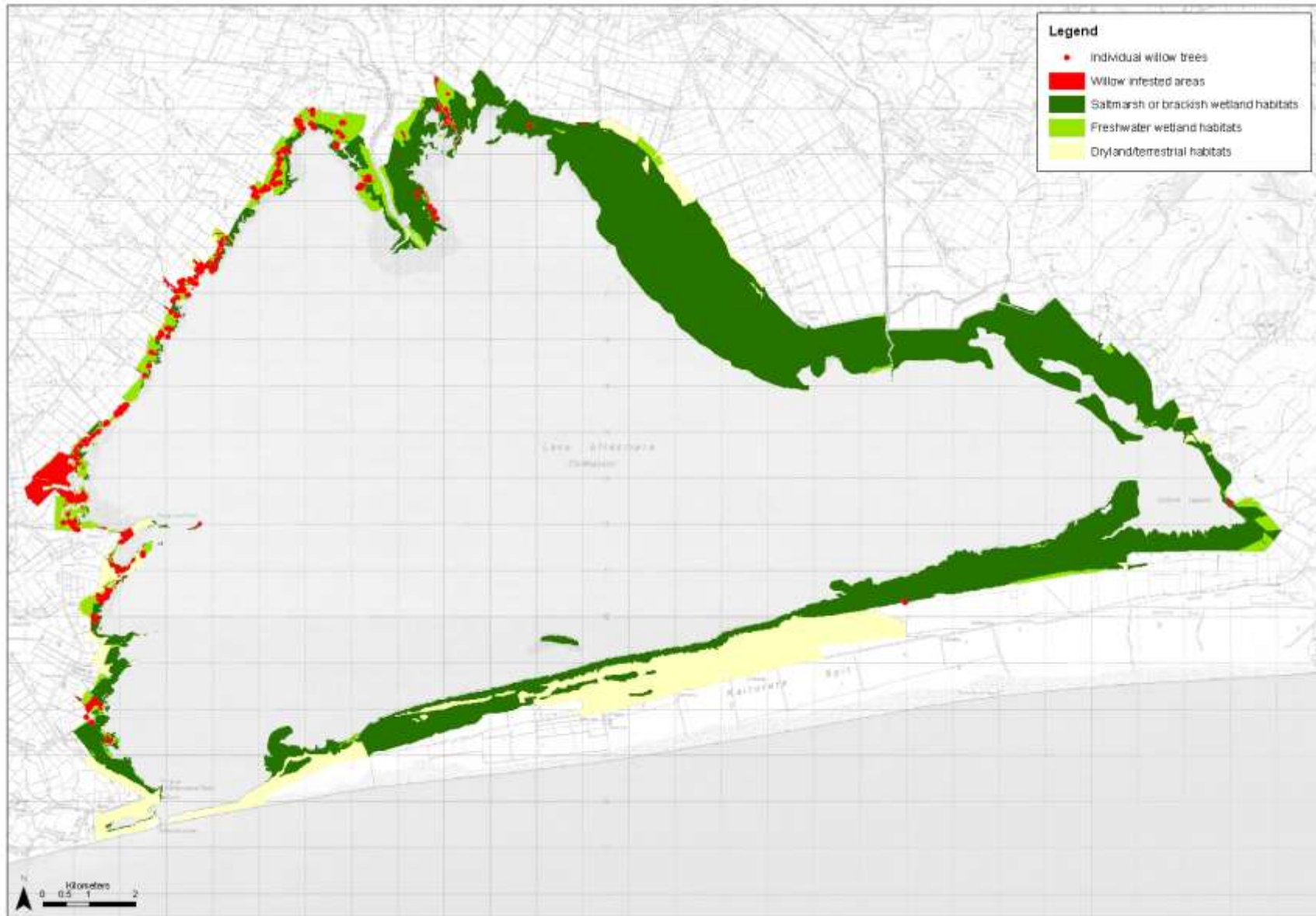




- Lake openings for farming alone are an out dated single bottom line policy
- Having an adaptive, stakeholder involved process in managing lake openings, emphasising the quadruple bottom line is more likely to achieve a better range of outcomes, but is challenging

The Central Plains Irrigation Scheme – another 60,000ha of intensively developed farmland in the lake's catchment: how do we manage for the N, the P and the faecal coliforms?





Willow encroachment is incremental and ecologically disastrous to conservation aims – unfortunately willow control is not ‘sexy’ and risks being left behind.

But, there is a set of bigger issues

- ‘push back’
- Institutional inertia
- Lack of focus
- Dreamworld
- Perceptions are reality but there are implications
- Many of the above are then related, in a hotly contested set of institutional arrangements

The institutional 'solutions'

- 'Statutory' organisations: ECan, 2xDC (CCC & SDC), MPI, DoC, F&G, TRONT, 'WET' – coordination attempted by Statutory Agencies Group (but does it now have a place?)
 - Agencies produced CMS, JMP (DoC & Ngai Tahu), WTW (Ngai Tahu & Ecan), RPS, DPs etc, but little significant change
- Now added to by the Selwyn-Waihora Zone Committee under the CWMS framework
 - Zone Implementation Programme (ZIP) – Water quality remains the biggest question here!
- Businesses
 - ASM, leadership

Major future challenges:

or R_{estoration} vs P_{revention}?

- Short to medium term, 5-10yrs: additional 60,000ha of intensive irrigation, probably dairy farming – issues with nitrogen runoff, but also with phosphorus: put the two together and major potential issues with algal blooms
- Medium to longer term, 10-25yrs: growing urban populations in Rolleston and Lincoln with increasing non point source polln; continuing agricultural intensification
- Longer to much longer term, >25yrs: climate change and rising sea levels – these occurrences will challenge all existing ideas around lake management

Conclusions

- Te Waihora/Lake Ellesmere is an amazing place that deserves to be more amazing!
- But - huge challenges faced in managing the lake for its largely conservation and cultural values – the challenges are largely economically driven, and have short, medium and long term implications and response needs
- Having the community more broadly involved, and working with tangata whenua and others, gives me some hope for the future
- But, ultimately, if we are to have any more than cosmetic little ‘r’ improvements then we are going to require a culture change in land use practices and this is the largest **big ‘R’** challenge this lake faces, in my view.