

Policies and the management of shallow lakes in the Waikato

How do national, regional and district contributions stack up?

A personal view

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1. Some definitions

- Generally less than 6m deep in Waikato
- Associated with wetlands
- Product of their catchments
- Lake condition is all about land use
- Require integrated management by Territorial Authorities & Regional Councils

Lakes are located at the bottom of their catchments so their character and condition is usually determined by land use in the catchments. Consequently, they need an integrated management approach by Territorial and Regional Authorities.

2. Some shallow lake values

- Recreation, public amenity
- Conservation/biodiversity
- Flood storage, drainage sink
- Water use, food production

This is only a simplified list of values to illustrate that, particularly when lakes are considered together with their catchments, there are many potentially conflicting values. In such cases, policies and rules designed to support one value must often make provision for compromises with conflicting values.

Moreover, it doesn't make sense to consider the values of a lake without also taking into account the values of its catchment. The main management problems arise because of conflicts between catchment values determined by one sector of the public and lake values held by others. Policies need to address this.

3. Management issues

- Water quantity (shallow=vulnerable)
- Water quality, suspended sediments & temperature
- Aquatic weeds & algae, pest fish
- Catchment land use
- Relative roles of Ministry for the Environment, Regional Councils, Territorial Authorities (District & City Councils)

Shallow lakes are vulnerable because they are shallow. Their low storage capacity makes them particularly susceptible to changes in water quality deriving from catchment runoff. Summer temperature peaks are a particular worry as these can affect the viability of plant, invertebrate and fish populations. Catchment land use is therefore an important factor in lake condition and stability.

Because of the difficulties of managing such potentially unstable systems, policies should aim to keep all management options open for high value lakes – including the option of raising water levels in the future. This has obvious implications for Territorial Authorities when considering subdivision applications, esplanade takes and setback distances for lakeside buildings and roading. Councils have not been good at anticipating future needs – they have been reactive rather than proactive – and have actually lost management options as a result.

Lk Serpentine North – catchment land use influences lake characteristics



Lake Serpentine North is one of the best examples of a peat lake, as the water body is completely surrounded by deep peat. However, the lake is several metres shallower than it used to be and intensive farming is causing the peripheral peat to compact and oxidise. The lake level is now fixed by a weir, but nutrients continue to flow into the lake from farming activities. Note the mob-stocking in the foreground, pugging the soil. Surface runoff from this paddock is intercepted by a drain which runs straight towards the lake.

To sustainably manage this lake a buffer of at least 100m would be needed, but the cost is restricting - agricultural land prices are very high. Nor are farmers necessarily willing to sell, as retiring land can potentially affect farm viability. Moist land near lakes is also valuable for summer grazing, when higher mineral ground is dry.

4. Central government

- No national policies or guidelines since RMA (1991)
- Management devolved to RAs & TAs, but MfE makes submissions on Regional Policy Statements (RPSs)
- MfE State of Environment reports (1997, 2007)
- Parliamentary Commissioner for the Environment “*Growing for Good*” report 2004

The role of central government, the Ministry for the Environment, is simply to administer the RMA and ensure that Councils comply with its requirements by, for instance, making submissions, as necessary, on draft Regional Policy Statements. The government of the day (early 90s – and since) decided that the MFE would play a passive, or advocacy, role in environmental management and consequently, until recent changes in government environmental policy, there have been no national policies or guidelines issued by the MFE to which Councils were required to give effect. The OECD has been calling for us to introduce national environmental policies and standards for well over 10 years, but neither National nor Labour delivered until 2008, by which time the RMA has become almost impossible to administer adequately.

The MFE has also released two important environmental reports: the highly acclaimed “*State of New Zealand’s Environment, 1997*” and its upgrade in 2007. The 1997 report expressed some concern about several aspects of the state of the environment but, as it was not a statutory document, there was nothing in it that imposed a formal compliance requirement on Councils or landowners. The excellent 2004 report “*Growing for Good*” from the Parliamentary Commissioner for the Environment rang alarm bells, particularly regarding land-use intensification and water quality, even more loudly but, again, it was not a statutory policy document, so there was no urgency to enact legislation (or institute other local government measures) to address the increasing scale of environmental problems with our water bodies.

5. The Resource Management Act 1991

- Not prescriptive, provides no accountability
- General policy framework within which regional councils and territorial authorities operate and set specific management policies and rules
- eg: s.5 “...*promotes the sustainable management of natural & physical resources...whilst avoiding, remedying, or mitigating any adverse effects of activities on the environment*”
- eg: s.6 “...*preservation of natural character of...lakes ...& margins...from inappropriate subdivision, use and development*”
- Lack of adequate statutory provision for mediation, rather than the Environment Court.

The Water and Soil Conservation Act, 1967, was prescriptive in nature and it was replaced in 2001 by the Resource Management Act, which is not. Under the RMA, on-the-ground management responsibility, including the setting of Rules, is devolved to the Regional and Territorial Authorities. Hereby lies a problem: the RMA provides no accountability – there is nothing to measure things against – no base levels. Councils themselves can independently interpret many of the more general RMA policies and decisions are often taken at a political or planning level, with short time-perspectives. There has been too much reliance on planning-based, rather than science-based and longer-term solutions to problems.

The mandate for, as well as the responsibilities of, the regional and local councils is encapsulated in sections 5 and 6 of the RMA, but each Council interprets the vaguer terms (eg 'inappropriate') in these policies quite separately, using a variety of appropriate (for them) solutions. Of major concern is the extent to which Councils have used the expensive Environment Court, rather than less formal, non-adversarial means to resolve disputes.

Another source of concern in the implementation of the RMA has been the selective application of the clause requiring the treatment of adverse effects. This has clearly not been applied adequately or consistently in respect of drainage or runoff effects resulting from farming in shallow lake catchments.

6. The planning context

- Resource Management Act
- Regional Policy Statement – policies
- Regional Plan –
 - Policies*
 - Strategies*
 - Rules (discretionary/non-discretionary)*
 - Guidelines etc (non-statutory)*
- Long-Term Council Community Plan
- 'Affected parties' & agencies with advocacy roles

All Regional Councils are required, by the MfE, to produce Regional Policy Statements, in which they present their policies for environmental management. The Rules which give effect to the policies are laid out in the Regional Plan. Regional Plans are not required by the MfE, but almost all of the regional councils produce them anyway. Discretionary rules require a resource consent and non-discretionary ones ('permitted activities') do not.

A policy, rule or management activity may be contested by anyone likely to be directly affected by it. This is an essential democratic provision, but it is also one reason why Plan changes and authorisation of new developments and management activities can be very slow. Councils therefore need to be very perceptive in anticipating future needs so that, for example, legislation to protect shallow lakes is not delayed by 'due process'.

Agencies such as the Department of Conservation and iwi have statutory advocacy (advisory) responsibilities with regard to the natural environment (eg all water bodies) even beyond the boundaries of their own land holdings. Other organisations frequently involved as affected parties are the Royal Forest and Bird Protection Society, New Zealand Fish and Game, Federated farmers, etc. However, affected parties have vested, and often conflicting, interests and it is therefore up to the regional and territorial authorities to establish policies within which it is possible to achieve a fair and reasonable balance between those vested interests. The continued deterioration of the Waikato's shallow lakes suggests that these policies have not been adequate to do this.

A strategy is a ‘long-term action plan for achieving a goal’ – it specifies the way in which policies will be implemented. In a ‘Message from the Chair and the CEO’ in the 2006 LTCCP, Environment Waikato stated its general policy on land-use management: ‘...*the Regional Plan takes an essentially ‘deregulated’ approach...*’. This was despite the dire findings of the Commissioner for the Environment’s 2004 *Growing for Good* report and EW’s own finding that ‘*farms...compliance with important regulations was not nearly as good as it should be*’. The strategy of ‘softly, softly’-an educational approach – has not been a roaring success.

7. Policy examples: Regional Plan, Water Module s.3.2.3

- Policy 1: *Manage all water bodies to enable a range of water use activities, whilst ensuring a net improvement in water quality...over time...*
- Policy 3: *...preserve natural character of lakes... & protect...from inappropriate use & development*

These are examples of two policies from the Environment Waikato Regional Plan. Note that both policies contain terms which need to be defined by the rules. It is normal for policies to be a little vague, because this makes it easier for them to be achievable. A good policy is one that is achievable, implemented by enforceable rules and achievable within a specified timeframe.

In Policy 1, the council has committed itself to achieving a ‘net improvement’ in water quality and the way in which this improvement will be measured should be explained in the rules. Not only is the concept of ‘net improvement’ poorly defined, but the 2007 Waikato RPS Evaluation concluded that the policy objectives had not been met. Not a good sign, when even a vague policy cannot be implemented. Policy 3 is taken almost verbatim from s.6 of the RMA, but three vague terms still need to be defined before its effectiveness can be assessed.

8. Management of the catchment

- TAs issue Resource Consents (Land Use)
- Concerned with land development, public amenity
- TAs do not address farming runoff or land-use intensification
- In general, TAs lack expertise in natural character, conservation, soils, lake management

Management of a lake catchment is shared by the regional and the territorial authorities, with the TAs administering land use and public amenity. However, land use consents do not address issues such as controlling agricultural runoff; most drainage issues are dealt with by the RCs. Also, in general, staff dealing with soils, scientific issues and natural history are generally located in regional councils. Some District Councils (such as Waipa) give greater consideration to conservation/heritage issues, although the emphasis is still mainly on public amenity and recreation values.

Liming near riparian zone of Lk Ngaroto



Lake Ngaroto has high contact recreation values (e.g. boating). It is managed by Waipa District Council and has had its own Management Plan for over 10 years. Despite this, it frequently has blue-green bacterial blooms, which can cancel boating events. There are no rules restricting intensive farming in the immediate catchment and heavy liming is shown above, adjacent to the riparian zone and visitor boardwalk. In fact, liming is occurring well within the ecological (as opposed to the cadastral) boundary of the lake, if 5/10-year weather extremes are considered. By attempting to manage a lake within artificial cadastral boundaries, using average water levels, sustainability becomes near impossible.

9. Territorial Authorities and lake management

- Do not usually address riparian management
- May take esplanade reserves for public access or ecological enhancement during the subdivision process.
- Concerned only with public access lakes, eg Hakanoa, Te Koutu, Ngaroto, Serpentine
- To date, District Plans have not been specifically required to give effect to the RPS, but the RMA does make clear provision for this to happen in order to ensure compliance with the Act.

Territorial Authorities do not usually get involved directly in lake or riparian zone management, unless there is a public amenity issue, as with Lakes Hakanoa (Waikato District Council), Te Koutu (Waipa District Council) or Rotoroa (Hamilton City Council). However, the 1992 Waipa Draft District Plan (Rule 2.4.3) went further than this and required “protection of peat lakes and margins...(and) no activity...which...alters the hydrologic regime...or discharges any nutrient-rich substances into the catchment of any peat lake”. Admirable policy, but not achievable without the direct involvement of the Regional Council. Also ‘discharge’ needs

defining to confirm (or otherwise) that it refers to both point- and non-point source discharges.

Although the RMA makes provision (s.229) for esplanade reserves having an ecological enhancement role, because esplanade establishment is a Territorial Authority responsibility, they are generally only taken from a subdivision when public access is necessary or desirable. Failure to get better ecological value out of esplanade reserves is an issue which needs urgent consideration now that subdivisions are so widespread and water quality is a very hot topic. Indeed, there is also provision in the RMA for esplanades to be wider than 20 metres, but there has been considerable resistance on the part of both Councils and landowners to consider this option. This is also regrettable, as many lakes need much better buffering of their ecological boundaries. Esplanade policies of District Councils vary; Waikato District Council, for instance, only takes esplanades from subdivisions of less than 4ha, and only where public access is a relevant issue. Waipa District Council, on the other hand, in its 1993 Draft Strategic Plan, declared it would "...establish and secure esplanade reserves around 13 peat lakes by 2010" (that policy was presumably irrespective of subdivision applications occurring).

So considering that wise catchment management is so important for shallow lakes, it is more than a little odd that, for 17 years, District Plans have not been required to give effect to the RPS (although in some respects they have done so). The MfE did not have to suggest this: the RMA has always had provision for this to happen, but the Regional Council has not required this to happen, mainly because the Regional Plan has so few Rules to support its own catchment management policies and this lack of strong direction meant that TAs had little to give practical effect to! Nor do TAs usually have the facilities or personnel to implement the RP policies themselves.

10. Waipa Peat Lakes and Wetlands Accord

- Waipa District Council, Environment Waikato, Department of Conservation, Auckland/Waikato Fish & Game, Ngaa Iwi Toopu O Waipa
- To align the activities of management agencies when working with landowners, tangata whenua and interested parties, towards the restoration and enhancement of the lakes and wetlands in the Waipa District
- Waipa District Peat Lakes and Wetlands booklet

The Waipa District Council is more active in lakes management than most territorial authorities, but then it has more lakes (at least 16) than most. The District Council set up the Waipa Heritage Council to help ensure conservation and maintenance of heritage features and the Manager Heritage Development and Reserves Planning (Tony Roxburgh) coordinates Council management and restoration activities in the lakes area; a 23-page booklet is available describing the Waipa peat lakes. However, in a report to the Biodiversity Council in August 2008, Tony Roxburgh expressed concern that progress in achieving protection for the lakes has recently taken a step backwards. The reasons are firstly the soaring price of land and the unwillingness of

most farmers to accept purchase or incentive deals offered by the Council for land adjacent to reserves which, if retired, would increase lake buffering. Also land adjacent to lake/wetland reserves is more valuable during a dry summer than good productive pasture. It would be helpful to see some real farm economics figures to support farmer's perceived value of wetland pasture – especially compared with lake management costs related to farming inputs to the lakes. Reasonable compensation can then be negotiated.

Secondly, Roxburgh observes that most peat lakes have shown continued decline in water quality and that there are no rules either controlling fertiliser application in peat lake catchments, or requiring landowners to manage farm runoff prior to discharge from their properties. There is almost total reliance upon voluntary adoption of 'best land management practices' and only a proportion of farmers respond in this way.

So policies adopted by the regional and territorial authorities which are aimed at restoring or enhancing peat lakes simply have no teeth to achieve their objectives in the face of powerful economic drivers.

The Waikato District Council, which also administers a number of lake catchments, is currently considering the merits of some sort of multi-agency agreement along the lines of the Waipa Accord.

Lake Te Koutu – an urban shallow lake with problems



Lake Te Koutu, Cambridge, is not a peat lake, but it does have high recreational and aesthetic values, with walkways and picnic areas. Unfortunately it is very shallow and cannot easily be deepened, because of the low elevation of peripheral tracks. During the summer, high water temperatures favour blue-green bacterial blooms and there are frequent avian botulism outbreaks among the over-large duck population. Management effectiveness is an issue of cost for the Waipa District Council.

11. Waikato Regional Council

- Resource consents for water use
- Responsibility for lakes and lake beds
- Only limited influence over riparian zone & erosion-prone land
- Limited control over point-source discharges, but little over diffuse discharges
- Make submissions to notified land-use & subdivision hearings
- Project Watershed

Even though regional councils have statutory responsibility for the management of most shallow lakes and for issuing water use consents, their degree of control over the riparian zone depends upon land ownership and there are not many effective restrictions that TAs can impose on private land for the purpose of lake management. Diffuse discharges (non-point surface and groundwater runoff), for instance, can only be tackled through voluntary land-use agreements and even point-sources discharges such as farm drains can only be targeted without landowner cooperation if the water quality is lower than that of the lake.

Erosion prone land is not adequately managed by any specific policy or rule at present, although the RMA (s.30) does require RCs to manage soils for 'soil conservation purposes'. The current LTCCP promises: ...'*exclusion of stock from erosion-prone areas such as steep hillsides and riparian areas and the completion of soil conservation measures such as tree planting and erosion control structures*', but there are still no regulatory teeth attached to this policy

RCs can only have input into land-use consent applications if they are publicly notified and if the regional council makes a formal submission.

None of this is very satisfactory. It means that progress towards lake improvements to date has been pretty slow.

However, in 1999, EW established the Waikato River Catchment Services Project ('Project Watershed'), to address issues of flood protection, soil conservation and river management. In doing so, the Waikato Regional Council formally recognised the obvious: that the ultimate responsibility for the management of flood protection rests with EW and not with the territorial authorities. By the same token, EW is assuming responsibility for land-use management in order to give effect to its RMA responsibilities for shallow lake management. Project Watershed therefore overlaps with the 'Clean Streams' Project (see later). We are now ten years down the track with this facet of Project Watershed and there is as yet a long way to go.

Stream fenced under Clean Streams Accord, but erosion potential remains



This stream (out of picture, lower left) has been fenced to exclude stock under the Clean Streams Accord, a partnership with Environment Waikato. However, of greater concern, but not covered by the Accord, is the highly erosion-prone stepland outside the fencing, which is heavily grazed by a large herd of heifers. Nor does the fencing restrict nutrient runoff. The Clean Streams Accord urgently needs a ‘Phase 2’ to address these issues – perhaps by comparing farm economics with the community cost of erosion and nutrient runoff and coming up with a compensation deal, as appropriate.

12. Management role of iwi

- Iwi policies
- Treaty of Waitangi
- Consultation as part of the Resource Consent application process

Iwi groups have their own policies regarding land use, many of which arise from the Treaty of Waitangi provisions. Iwi Management Plans (usually dealing with natural resources or customary use) must be taken into account by local authorities when they preparing Plans or making changes to them. Iwi ‘signoff’ is required for most resource consent applications, particularly those affecting, or potentially affecting, the natural environment or aspects of Treaty claims settlements.

A problem often faced by resource consent applicants is identifying which iwi (or iwis) has jurisdiction over the area in question, or is likely to be an affected party through knock-on effects of a development or management proposal. Some iwi boundaries are clear and some are disputed or overlap. Nevertheless, the iwi consultation process is a critically important part of catchment management and iwi policies ought to be better integrated within local government policies and Plans (see settlement and co-management process later).

13. Effectiveness of policies to date

- Lake management policies have not worked well
- RMA overwhelmed
- There has been a lack of consistency across the country and poor integration of management policies and activities at any scale
- There is a continuing decline in freshwater quality
- Poor management of diffuse discharges

Lakes management has not been very effective to date. There are no strong policies and rules are inadequate to facilitate rapid progress. During the 1990s there were two phases of land-use intensification and we are now witnessing another, much more extensive phase. Because of inadequate policies, shallow lake condition declined during the 90s. There are some indications from recent EW lake monitoring that there may be early trends in water quality improvement in two or three lakes, but it is uncertain whether this has been brought about by local government policies.

RMA procedures have worked quite well for site-specific consents, such as a house or a point-discharge, but have proved inadequate in the wider context of landscape scale and, in particular, in dealing with rapid growth in the housing and agricultural sectors. Agricultural output has increased by over 50% since the RMA was introduced on 1991, and cows have increased in number by at least that. In dealing with this, and with impacts on the natural environment and biodiversity, Council management tools have proved to be cumbersome, slow and costly.

The current LTCCP states that: *'EW is a leading advocate for sustainable agriculture, which ensures that we don't pollute our streams or damage our region's soils'*. Unfortunately, the policy of 'deregulated management' to date has not only been inadequate to prevent deterioration of soil and water resource quality, it leaves us in a pretty hopeless position to deal with the current rapid rate of expansion of intensive dairying and widespread subdivision developments.

In addition, collaboration between key catchment management agencies has been poor. It is not good enough to simply involve them in the implementation of regional policies: they need to be directly involved in the development of these policies. The lack of integration is most obvious with Regional and District Plans, but agencies such as iwi, DOC, farming bodies, etc also have policies.

14. Poor soil management

- Increases flash-runoff rates, decreases runoff frequency, increases evaporative losses
- Increases nutrient losses and erosion rates
- Decreases soil carbon and reduces denitrification potential
- Chemical agriculture & high stocking rates destroys soil biota & soil structure
- Nitrification inhibitors do not reduce land-use intensity

- ‘Deregulated approach’ to land-use management will not improve soil health

A lot of the problems facing shallow lakes, particularly small ones, derive from the spectacular mis-management of catchment soils, especially during the past 15-20 years. Heavily used pastures and manicured slopes usually increase the rate at which runoff discharges, taking nutrients and soil with it. However, runoff frequency is low, because agricultural soils have high evaporative losses. This means that for much of the year soil water is too diminished to provide evaporative cooling and the soil heats up, damaging soil physical structure and biota – thus further diminishing the soil’s capacity to regulate water supplies and control particulate transfer to lakes.

Worse than that, intensive landuse ‘burns off’ the soil carbon, especially when nitrogen levels are high, reducing denitrification capacity and increasing nutrient mobility to groundwater (or surface losses). A square metre of healthy soil has about half a kilogram of microbial biomass, but an overheated, overfertilised, compacted soil can soon lose 90% of this. Spectacular losses of soil carbon occur around peat lakes (see earlier).

Nitrogen inhibitors have the potential to improve fertiliser use efficiency, but they will not reduce stocking density, so even if they reduce N runoff to lakes by 50%, 50% of ‘a lot’ may be still ‘too much’ for maintaining a healthy lake. Policies are usually vaguer than even using ‘percentage improvements’.

As the Parliamentary Commissioner for the Environment (PMC) declared, with abundant supporting evidence, in 2004, we need a ‘paradigm shift’ in agricultural practice, because much of the present form of agriculture is simply unsustainable. The shallow lakes are at the end of the chain, bottom of the catchment – starved of water and sinks for nutrients and sediment – and the shallowest are already unhealthily warm because they have too little water.

If this isn’t enough to raise concerns, don’t forget that human-induced overheating of soils is part of our contribution to global (and often also local) climate change. The evaporation of water from damp soils or vegetation produces a cooling effect; without it, soil structure is damaged, its microfauna and microbial components incapacitated or destroyed and the extra heat load is radiated into the atmosphere, where it accelerates drought conditions. Wherever possible, maintaining evaporative cooling processes through soil and catchment management (such as tree planting) is wise management. True, it can be done through irrigation, but that creates its own problems (like where does the water come from); the primary measures should be taken on-site.

Landowners cannot handle this paradigm shift in landuse management alone. Local Government needs to plan for a system of incentives to bring this about. Shallow lakes will benefit more from this than any amount of in-lake restoration (‘ambulance at the bottom of the catchment’).

15. Prospects for the future – MfE direct involvement

- Water Programme of Action 2003
 - Improve quality & efficient use of fresh water*
 - Improve management of undesirable effects of land use on water quality*

The Ministry for the Environment started to take a more active approach towards environmental management of freshwaters when it instituted its Water Programme of Action in 2003. The scope of this programme is defined by these two policies. They are very general, but their main intent is clear. They need now to be supplemented by other more specific policies and plans, particularly at local government level.

16. MfE: a relevant National Policy Statement

- NPS for Freshwater Management
 - Incl: “*District Plans give effect to RPS*”
- NES: *Measurement of Water Take*
- NES: *Ecological Flows and Water Levels*
- 25yr time frame for NPS

The Water Programme for Action has this year produced the first National Policy Statement on Freshwaters and, although it is vaguely worded, one of its most valuable policies is to require a District Plan to give effect to the Regional Policy Statement. The NPS is still out for public submissions, but hopefully it can be formally adopted soon in 2009 and the process of translating it into regional and local policies and rules can be implemented much more quickly than has been the norm for environmental legislation to date. It certainly has implications for shallow lake management, although they are not specifically mentioned.

There are, of course, risks both in not acting, and in implementing the NPS. Risks associated with **not** acting include further degradation of water quality with increasing land-use intensification, lack of integration between freshwater and land-use management, etc. The main risk associated with implementing the NPS is that Councils may not have the resources to address the additional work required by the NPS and also that, because the NPS is vaguely worded, Councils may choose to interpret their existing RPS and plans to be satisfactory, even when they are not. Auditing may be necessary and an independent Environmental Protection Agency is a strong contender for fulfilling this role.

The two National Environmental Standards are aimed at Water Takes and shallow lakes are deliberately excluded from the proposed standards, because they are not considered to be a significant source of water for abstractors (see p 25 of NPS), although Section 7 of the NPS does recognise lakes and wetlands as a gap and a ‘priority area in which work is needed’.

In fact, shallow lakes and wetlands need to be brought into the National Environmental Standard on Ecological Flows. Shallow lakes may not be a significant source of water for economic abstraction, but they still need to be protected from high

‘diffuse water usage’ by farming and subdivision communities, so that there are always reliable base-flows to maintain aquatic and wetland ecologies.

17. Prospects for the future: the Regional Council

- EW report: *Condition of rural water and soil in Waikato Region 2008*.
- Dairying & Clean Streams Accord 2002
Policy: *Sustainable dairy farming*
Targets: incl. *Exclusion of stock from waterways*
- Concern over international perceptions & implications for dairy farming and tourism

Although there have been authoritative accounts and reports of the deteriorating condition of our shallow lakes for well over 10 years, none of them imposed any actual obligation on regional or local authorities to fix the problems urgently and so, at best, appropriate policies and rules only appeared very slowly. The release of EW’s own technical report “*Condition of rural water and soil in the Waikato Region 2008*”, on the other hand, appearing in the same year as the NPS, has introduced a new and much overdue measure of urgency to regional environmental management and a realisation that current statutory tools are inadequate for an appropriate response.

The alternative approach to enforcement through Rules is to encourage voluntary efforts to improve water quantity and quality problems in the region. This is the approach which Environment Waikato has chosen to take and it is typified by the *Dairying and Clean Streams Accord*, a non-binding 10-year agreement, signed in 2002 by the Ministry for the Environment, Regional Councils and Fonterra. The Accord’s over-arching policy is ‘*sustainable dairy farming*’, but the degree to which economic sustainability incorporates environmental sustainability is only vaguely addressed.

Environment Waikato supports the Accord through s. 3.4.5 of its RPS, specifically Policy 3: “*Ensure that the adverse effects of land use on water quality and aquatic habitats are avoided, remedied or mitigated*”. However, this policy is only implemented by ‘a mix of education, advocacy and advice’ – there are no specific, enforceable rules. Moreover, much of the emphasis has been on mitigation and this has tended to lead to a ‘mitigation culture’ which does not focus on fixing the root causes of environmental problems which lead to the need for mitigation activities in the first place. Even s. 3.9.4 of EW’s Proposed Regional Plan, which aims to build on the RPS policy direction supporting the Accord, by establishing a contestable fund to facilitate streamside enhancement, is a purely voluntary measure and it doesn’t mention lakes (although it could be argued that their inclusion is implied).

Consequently, although the Clean Streams Accord statistics are impressive (187 projects approved in the Waikato), the reality is less so. Uptake of the funding support options by farmers has been low and most projects have only addressed the minimum goal (3-metre strip excluding stock from waterways). There is no provision for on-going maintenance support and only 15% of farmers have opted for the recommended add-on of riparian planting, which enhances the ability of the riparian

zone to cope with erosion and particulate runoff. By contrast, Horizons Regional Council offers to organise manage and fund riparian planting, thus improving the effectiveness of their policies under the Clean Streams Accord.

And what if we don't improve our 'clean and green' image – and quickly? The recent draft NPS estimates that a tarnished image, as perceived by international markets and visitors, could cost the dairying industry up to \$500M per annum with maybe an impact of \$1B on the tourist industry. These are probably minimal estimates if medium-term damage to soils is taken into consideration.

18. Some challenges for policies

- The RPS is vaguely worded: need to define “*appropriate*”, “*inappropriate*”, “*avoid further degradation*”, *etc*
- Achieve balance between cultural, ecological, economic & social goals
- To achieve “*net improvement*”, should different water management standards be set for lakes in different use categories?

The RPS is vaguely worded and key terms need to be carefully defined in appropriate contexts. Achieving a balance between often-competing goals is a requirement of the National Policy Statement, but achieving an **appropriate** balance must involve giving priority to long-term goals, particularly environmental and ecological ones, if there is to be any real hope of the **sustainable** management of shallow lakes. The RPS policy is ‘achieving net improvement’; the NPS requires ‘swimmable water quality in all lakes which are supposed to be swimmable’. For either policy to be achievable within a reasonable timeframe, lakes must be categorised and prioritised for attention.

In 1994, Murray & Swaffield (NZ Geographer, 50:1) predicted that ‘*Regional policy statements...will require a sufficient degree of generality in order to enable potentially conflicting local interests to reach agreement in principle*’. How true this has proved to be! In fact, in the Waikato, the ‘...*sufficient degree of generality...*’ has been very much to the detriment of the natural environment in general and shallow lakes in particular.

19. Some challenges for policy implementation

- Strategies are long-term, but they need short-term milestones to validate them
- Need to better manage land use (& clean-green image) & yet also address landowner needs.
- Better integration of land and water management planning, especially near riparian zones
- Compliance monitoring often difficult & expensive, eg most significant runoff events are episodic

A policy which aims for net improvement (by a specified date) can be achieved by improving the condition of some lakes but not others. This means prioritising lakes for attention. The relative need for attention (the '*conservation need*') can be based upon scientific interest, a need to restore ecological equilibrium, a need to mitigate the effects of economic development, etc. However, each lake with a 'need' will have a relative '*conservation worth*' (naturalness, biodiversity, recreational value, etc). Those ranking highest for 'worth' should then be assessed for relative '*conservation potential*' (hydrological status, unwanted nutrient inputs, achievability of biodiversity targets). The overall strategy can now have achievable milestones, as prioritised lakes are targeted first. The greatest challenge, though, is how to give priority to conservation or recreation values where land values are high and farming usage is intensive.

Catchments of highly valued lakes need to be better managed for run-off water quality and sustainability of the soil resource, whilst also recognising the production and economic realities of farming operations. Integration of regional and district planning objectives is essential and greater use of landowner incentives, such as rates relief, should be considered.

Compliance monitoring is specified in policy but it is both difficult and expensive, especially since it must be in place for all significant runoff events. Most nutrient runoff and soil erosion occurs during relatively rare, episodic events and policies can only be implemented if this is recognised in land-use planning.

Clean Streams fencing. Winter flood level 4-6m higher than at present.



Clean Streams fencing to exclude stock from a waterway. However, this is only a very basic level of protection for the stream, based upon its summer water level. The fence is far above the stream in the foreground, not to prevent erosion or to restrict farm nutrient runoff, but as a safety measure to prevent stock from falling on steep terrain. On the other hand, centre left (distant), the fence is located only just beyond the minimum 3m distance from the stream, because the ground slope, though still very erosion-prone, is not dangerous for stock. These slopes are, in fact, the scoured

banks formed by winter flood-flows, which regularly reach 4-6metres above the summer stream level.

There is an urgent need to put stream and lake management on a more sustainable basis, by acknowledging that most erosion and nutrient runoff occurs during major and extreme weather events. Management of the natural landscape cannot be effective if it is based only upon average measurements. Engineers regularly use 20/50-year return periods in flood-control planning, or in specifying set-back distances for buildings near water-bodies in subdivision applications: why not also in erosion and nutrient control and setting realistic ecological boundaries for shallow lakes? In the above illustration, even annual highwater levels are not used in the fencing formula.

20. LTCCP: some achievable policies?

- 1. Develop indicators of ecological health for shallow lakes (by June 2008)
- 2. Public access to lakes and rivers and their margins will have increased (by 2016)
- 3. Percentage of lakes ...meeting recreational water quality standards remaining the same or increasing (by 2016)
- 4. Recognise full impacts of non-point source contamination...(and sources...will have reduced (by 2016)
- 5. Fair and equitable allocation of water in all water bodies ('goal' for 2016)

The operative Long Term Council Community Plan has a number of policies relevant to the management of shallow lakes:

Although the most important indicators of ecological health (hydrology, depth, nutrients, catchment land-use intensity) have been well enough known for over 10 years to prompt urgent management action (which hasn't happened), EW is now compiling a comprehensive database, with each lake ranked for various parameters of status and condition. This will enable tasks to be prioritised.

Policy 2 is easily achievable, because objectives are not quantified and Policy 3 is not very helpful, because it doesn't promise anything except maintaining recreational standards for the mere 15-20% of the Waikato lakes currently 'recreational' (swimmable? What water quality standards are required for recreational hunting...?!).

The impacts of diffuse-source pollution are known now and 'knowing more' will not, in itself, contribute towards mitigation measures. 'Reduced' is not quantified, so there is no challenge.

Policy 4 is almost certainly unachievable, because 'fair and equitable' means different things to different classes of stakeholder. For instance, the depths of all peat lakes have been reduced and many are now too shallow to be ecologically sustainable.

Quantities and durations of water flows to lakes have modified lake ecologies and lake-level setting has reduced, or potentially reduced, the extent of riparian zones.

21. Policies that work

- Must be achievable and within a specified time frame
- More attention should be paid to translating into workable strategies & upgrading as soon as they clearly need it
- Plan changes need to be quicker, often even pro-active
- More emphasis on correcting basic problems and less on compromise & mitigation ‘solutions’
- Better feedback to public on progress towards meeting policies
- Policies supported by a good mix of penalties **and** incentives
- Better cooperation between management agencies – effective integration of catchment management policies.

If policies are to be more precisely worded so that purpose, goals and benefits are more obvious, they must be revisited regularly and upgraded as necessary, especially if they are not working as well as originally intended. A major deficiency of the present system is that Plan changes take too long – they do not keep up with economic developments and therefore cannot control them. This is especially true of the pace of subdivision development and dairying conversions, where the need for policies to control such developments should have been anticipated.

The RMA policy of ‘...avoid, remedy or mitigate’ has created a ‘mitigation culture’ among land-use planners and managers, because compromise and mitigation is easier than fixing the problem or avoiding it. This culture has to be heavily regulated if significant long-term improvements in shallow lakes condition are to be achieved. There is still an important role for mitigation activities, but they should no longer be the automatic first choice in catchment and water management conflicts. Mitigation is for where remedies or avoidance are impossible or inappropriate. Similarly, compromise is not a desirable option as all Waikato shallow lakes have already been compromised, many several times over.

Policies must be seen to be fair to (and by) all legitimate stakeholders and this means more provision needs to be made for public feedback on the progress being made towards meeting policy goals. This has, in general, not been well done to date. Policies should also be supported by a good mix of penalties and incentives, so that landowners feel themselves to be part of the solution, rather than part of the problem.

A major deficiency of shallow lakes management policies and plans to date has been the lack of integrated effort by, or at least the inconsistency of cooperation between, the various management agencies (MfE, Regional and District Councils, iwi, DOC, Federated Farmers, Fonterra, etc). If tangible progress is to be made towards lakes restoration, catchments must be recognised as ‘managed ecosystems’, not as a loose collection of fiefdoms with quite separate purposes

22. Policy examples: RP s.3.7.4.5-6

- 5. Statutory levels set for specified lakes. **But:**
Minimum levels based only on existing ones
Gives false sense of security especially for peat lakes
- 6. Drainage within 200m of a listed lake requires a resource consent. **But:**
Only applies to listed wetlands & difficult to enforce
- Rules developed 10yr ago and only recently fully operational

These two examples illustrate policy limitations, the need for public feedback, regular policy revision, and more rapid implementation of important policies and rules. S.3.7.4.5 has resulted in the installation of outlet weirs on several shallow lakes, which fix minimum levels for the lakes. However, these levels are based only on existing lake levels and do not necessarily represent recommended ecological levels. In this sense level-setting tends to impart a false sense of security – that the lake hydrology is now ‘safe’. In many cases this is simply not true, because all of the Waikato shallow lakes have had their levels lowered significantly over recent decades and many are now too shallow to have long-term viability – or to sustain healthy, natural aquatic ecosystems.

S.3.7.4.6 applies only to those wetlands listed in the operative Regional Plan and drainage compliance is notoriously difficult to enforce.

The most sobering observation, though, is that these two rules, and the policies which gave rise to them, have taken nearly 10 years to become fully operational. In fact, policy review is already well overdue just after implementation. It is difficult to believe that a Council can be serious about sustainability if systems as delicate as shallow lakes are managed in such a tentative, hesitating way. It is acknowledged that making progress through a political minefield is difficult, but the longer-term implications for not moving more quickly are worse.

Lk Maratoto – Level set, but too low. Deep peat in foreground



Lake Maratoto is a high-profile conservation lake, featuring in the top three for Regional and District Councils and the Department of Conservation. The brown area is all managed under a National Trust covenant, the lake is over 7 metres deep and it has its own management plan. However, management is still not sustainable. The northern boundary (left centre) is farmed to the lake edge, the outlet weir is set over a metre too low to support wetland vegetation throughout most of the covenanted block, and all the intensive farmland in the foreground is on deep peat, which is subsiding at about 30-40mm per year. Although the lake itself is in good condition, with perhaps 70% of its original depth still intact, management is still only as effective as the least secure feature.

23. Policy example: water allocation

- Policy 2 (RP): (paraphrased) *Quality of discharge should not be worse than that of the receiving water body.*
- Usually only maintains *status quo* where receiving body is already of low quality – no incentive to improve quality of receiving water

This policy also tends to feed the ‘mitigation culture’, because it is no more than a holding operation to try to ensure that the condition of a receiving water body doesn’t get any worse. If the receiving body is already high quality water, then most (particularly intensive) farmland runoff would need an altogether higher level of technology to meet acceptable quality standards. But most shallow lakes are already highly eutrophic and therefore this policy, though probably limiting further degradation, does nothing to improve lake quality unless the policy is reworded to require discharges to be, say, twice as ‘clean’ (or whatever) as receiving water.

24. The Waikato River Settlement process and Co-management

- Vision & strategy, co-management
- Guardians of the Waikato River (GWR) – Governance, coordination, liaison with Crown
- Waikato River Statutory Board (WRSB) – Implementation of vision & strategy and transferred functions under RMA & LGA
- GWR Establishment Committee and WRSB Establishment Committee
- Includes all river-related lakes and associated land and acknowledges catchment use as potentially affecting water bodies.

A historic deal was struck during 2008, between the Waikato iwi and the Crown to co-manage the Waikato River and its immediate catchment. The deal is laid out in the Deed of Settlement, which provides for two new statutory bodies: the Guardians of the Waikato River and the Waikato River Statutory Board. The GWR Establishment Board has already developed a Vision and Strategy:

Our Vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come.

The Vision is an expression of the Kingitanga Accord, between the Waikato-Tainui and the Crown, to support and protect the health of the Waikato River.

The Guardians will comprise iwi- and Environment Waikato-appointed members and they will oversee the vision and strategy, coordinate and integrate the approach to management of the river, and liaise with the Crown and Crown agencies.

The Statutory Board will be made up of five iwi and five local government (EW and the four District Councils) representatives and will be responsible for on-the-ground implementation of the Vision and Strategy and for exercising the transferred functions of the RMA and the LGA (Local Government Act). The WRSB Establishment Board is currently identifying those functions of the RMA and the LGA which can reasonably be transferred from local government sole responsibility.

The detailed version of the Vision and Strategy will have the status of a National Policy Statement under the RMA and a Statement of General Policy under the Conservation Act. Local authorities will therefore need to give effect to the Vision and Strategy when they develop or change their Plans or consider Resource Consent applications.

Implementation of the Vision and Strategy will be supported by a Waikato River Clean-up Trust, which will administer a contestable Waikato Clean-up Fund set up with initial Crown funding of \$7m per year over 30 years and, within three years of the signing of the Settlement, the Guardians and the WRSB will release an Integrated River Management Plan for the river and land that affects it. In the interim, a

Waikato-Tainui River Management Plan will be developed and will have the status of an Iwi Management Plan, which must be taken into account in Regional Plan changes.

Without any doubt, the Waikato River Settlement is a major development with considerable potential significance for shallow lake restoration and management. However, the key component is ‘co-management’ rather than ‘transfer of powers, functions and duties’ so it does not detract from the need to push for maximum value from imminent Regional Plan and LTCCP upgrades. Although the Settlement is still vague about the extent to which landuse will come under the River Management Plan, because both river and lake condition is largely a function of what’s going on in their catchment, it can be assumed that the River Co-management process will have to be far-reaching.

25. Summary: policy & management inadequacies

Current policies & their implementation (Strategies, Plans & Rules) are not adequate for today’s problems with shallow lake management. The problems are:

- Water quantity (hydrology)
- Water quality (particularly runoff)
- erosion control
- soil health
- land use (particularly subdivisions, farming intensification)

Lake characteristics and condition are a product of landscape, water supply and catchment land-use. All of these have a range of values, often conflicting and, because both the NPS and the RPS require ‘*a balance between cultural, ecological, economic and social goals*’, policies at national, regional and local levels are all relevant – and, in one way or another, generally inadequate.

26. Why policies have failed

- Non-prescriptive climate of the last 17 years and lack of national guidelines
- Plan changes usually take 3-4 years; economic forces act quicker
- Most lake management to date has been short-term, in-lake fixes instead of long-term corrective management in catchments
- Too much reliance on voluntary compliance without tangible incentives
- Lack of integrated effort by catchment management agencies
- Policies usually need to be a bit vague (so they are achievable) – but should not be so vague as to remove all sense of urgency.

Achieving a ‘*balance*’ between cultural, ecological, economic and social values is easy to say, but different stakeholders have different weighting systems to achieve what is an **appropriate** balance – for them, but not necessarily for others. ‘*Sustainable*’ is probably the most misused policy word, ‘*adverse effects*’ the most

abused term and '*natural character*' the most difficult to define. '*Appropriate/inappropriate*' is the most factionally divisive descriptor. Policies need to be less open to alternative interpretations, so that implementation is more consistent and lawyers can be denied opportunities to argue ill-defined issues in court to reach very expensive legal 'resolutions' which sometimes make little environmental or ecological sense.

Either there has to be a quicker way to effect plan changes, or else Councils need to better anticipate management requirements. In fact both are needed. The result of inadequacies on both counts has made a significant contribution to the continued decline of lakes condition during recent years. Education is important, to build awareness of the problems and to provide advice on best practice (in land management) and mitigation measures, but universal compliance was never going to be anything close to achievable by relying predominantly on voluntary cooperation. Moreover, many mitigation measures that have been taken do not go anything like far enough to significantly improve prospects for shallow lakes – or even to halt further degradation (see, for instance, Clean Streams efforts).

27. Future policies: innovation

- Higher priority for shallow lake management
- Need for new and innovative policies and management approaches: paradigm shift
- Carrot and stick

To date, economic factors have dominated in determining the 'appropriate balance' between cultural, ecological, economic and social needs and, because economic factors have predominantly short-term perspectives, the long-term needs of shallow lakes have not been seriously considered in catchment management planning (the classic 'development wants v environmental needs' conflict) – although they have been addressed in vague policies and strategies. Now, there can be no further compromises in shallow lake management in conflicts between development and conservation – at least for the priority lakes – otherwise we will inevitably lose them.

It's reached a stage at which policies need to be innovative to regain management control over the forces of degradation. For example:

- Policies are needed to improve rainwater harvesting in catchments, so that soils and aquifers are fed rather than drains; financial assistance or rates relief could be given to landowners who do this successfully.
- Irrigation applications should include evidence of effective water conservation policies.
- Mob stocking and high stocking rates should be restricted near water bodies and on steep slopes.
- Maintaining a satisfactory soil condition should be mandatory, particularly in sensitive areas within the immediate catchment of shallow lakes.
- Carbon sequestration and conservation is something that the wetlands of many shallow lakes do very well and government needs to recognise this in its carbon trading scheme.

- Tree-planting can not only generate carbon credits: on catchment slopes, it can also combat erosion, ameliorate local climate and draw water closer to the soil surface. Maybe subsidise 'grazed woodlands'?
- Negotiate deals with landowners to deepen lakes, which are then made available for limited irrigation during the summer to compensate for flooded land.
- Many high-priority lakes need their own local government management policies to give effect to management plans developed for them.
- Artificial wetland technology should be mandated where significant wetland and lake benefits can be predicted.
- Use of advanced wastewater treatment systems should be subsidised.
- As catchment land-use continues to intensify, maintaining adequate ecological flows to shallow lakes during summer will become critical. Shallow lake hydrology needs to be ring-fenced and a start could be made by bringing them into the MfE National Environmental Standard on maintaining ecological flows.
- Replace classical/conventional economic assessments with ecological economics planning. For example, compare the cost to a farmer of retiring land adjacent to a lake with the cost to DOC/EW/Ngaroto Boat Club/whoever resulting from diminished access/restoration measures/loss of biodiversity/etc. Opportunity costs and loss of future options could then be the basis for subsidy/compensation/etc.
- Funding should concentrate on measures which will improve long-term lake sustainability (depth, hydrology, catchment management), rather than short-term fixes. For example, sediment traps are tedious if erosion sources are not progressively stabilised; sediment capping is not reliable in a shallow lake subjected to even a 10-year storm event; nitrogen inhibitors are primarily measures to improve fertiliser use efficiency and they don't reduce stocking densities; lake-level setting does not guarantee summer water supplies.
- Sub division applications should be better scrutinised and esplanade strip widths (or, at least, no-build distances) based upon ecological and other 'no lake detriment' criteria.
- Lakes need to be prioritised for their conservation worth, and the most valuable lakes given priority over conventional economic benefits.
- Whilst acknowledging that septic tank overflows generally don't contribute as much as intensive farming to lake eutrophication, their effects are not insignificant. Several studies (eg Fleur Lusby, 1996 at Lake Okareka) have shown that septic tank discharges can travel considerable distances. Engineering criteria for septic tank design and installation may need revision.

Obviously, landowners' rights must be respected and the economic viability of farming units protected. This has to be done through an enhanced programme of incentives, so as to 'soften' the more regulated catchment management which is needed in the future (and should have happened in the past).

28. Future policies and co-management

- Co-management – return of the concept of catchment management
- Planning for an independent Environment Protection Agency

- Policies alone cannot heal, but they are needed to provide the impetus for healing strategies
- Policies need to be well supported by scientific facts and advice

In 1941, the Soil Conservation and Rivers Control Act laid the foundation for the sensible concept of land and water management on a catchment scale. Catchment Boards were established, such as the Waikato Valley Authority, and the old River and Drainage Boards were either abolished or made directly responsible to the new Catchment Boards. The essentially prescriptive 1967 Water and Soil Conservation Act reinforced the principle of integrating management policies on a catchment-wide scale, Ministry of Agriculture farm advisors provided a free service and the DSIR Soil Bureau complemented this with soil research and land-use classification studies.

Under the RMA., and without the farm-scale input of the MoA, plus the loss of the Soil Bureau, catchment management has become increasingly fragmented – we need to return to the principles of integrated management, together with a more effective mix of prescription (rules), education and incentives. The best way to do this is through co-management and the River (and its catchment) Settlement Process is an exciting development with tremendous opportunities which should be fully embraced. The process should not be regarded as one primarily concerned with the ‘transfer of power’ to the iwi, but as an opportunity for the major catchment management agencies to both prepare and also to implement joint policies which more fairly address issues and the aspirations and needs of the various stakeholders. Only an integrated management approach can adequately address long-term needs and goals and fairly balance cultural, ecological, economic and social needs.

Co-management promises to be the break that the Waikato’s shallow lakes need and an Environmental Protection Agency independent of government agencies and lobby groups should provide the essential monitoring – the effective checks that should fairly balance cultural, ecological, social and economic interests and perspectives.

29. Sustainability

- Exploitation of natural capital
- By definition, natural ‘resources’ must be used
- Lack of understanding of ecosystem dynamics
- ‘Sustainability’ is only a catchphrase.
- “I want it now”

There are lots of ways of putting it, but they all mean the same thing: for whatever reason, we have not looked after our shallow lakes very well. We have talked the talk, but not walked the walk. The ‘policies of generality and wishful thinking’ have been there, but they have been vague enough to avoid urgency. The short time-frames of conventional, development-oriented economics have not recognised the needs of our shallow lakes. ‘Sustainability’, as a word, has been hijacked (sustainable development, sustainable business, sustainable drainage, sustainable housing, etc) and now retains little of its real meaning for most people.

The long timeframe of ecological processes makes things difficult for policymakers and funding agencies, but the draft National Policy Statement recognises the long road to real sustainability by acknowledging that significantly reversing the deteriorating trend in natural water quality may take 25 years. As with human-induced global climate change, repairing the damage it's a tough call, but if we don't get serious about policies (and their implementation) for protecting our shallow lakes, they will certainly get worse and the clear economic benefits that come from healthy lakes will transform yet further into economic detriment. We are very vociferous about human rights and 'fairness', so perhaps it's time to accord similar 'rights' to the environment.

[KT upgraded 28.12.08]