

Report to: TANK Collaborative Stakeholder Group

From: TANK Lakes and Wetlands Working Group ('LWWG')

Date: for TANK Group meeting #40 on 31 May 2018

Recommendations & Summary

- A. Endorse the earlier proposals presented to the TANK Group regarding management of sediment and nutrients as also being generally suited to managing sediment and nutrients in catchments of TANK shallow lakes, particularly:
1. land owner collectives, industry programmes, farm plans, collaborative implementation, etc.
 2. adaptive and staged approach to nutrient and contaminant management; critical contaminant source area identification, nutrient budgeting, etc.
 3. prioritising water quality improvement in sub-catchments where water quality is degraded so as not to meet water quality objectives; and tackling key contaminant pathways especially sediment management to address phosphorus and bacteria losses.
 4. stock access to waterbodies and riparian margins.
- B. Agree that the TANK plan change provisions must integrate lakes (and their wetland margins) into the broader package applied to rivers, streams, groundwater and estuaries.
- C. Note that the issue of 'swimmability' targets and action planning to achieve those targets in the Hawke's Bay region is underway. Those actions are being considered as part of a region package which will have relevance to TANK, but not solely targeted to TANK's large lakes.
- D. Final regional 'swimmability' targets should not count the large TANK shallow lakes as being areas to be improved so they are safe for swimming more of the time (in terms of *E.coli* and cyanobacteria concentrations). TANK's shallow lakes exhibit many of the same characteristics as wetlands. The lakes have limited value and use for contact recreation involving immersion in water. Striving to make those shallow lakes 'swimmable' would not be straightforward, and would almost certainly be in conflict with ecological and cultural values of those lakes.
- E. In relation to recommended TANK plan change content:
1. note that the RRMP already features many provisions specifically relating to lakes, particularly the quality and quantity of water.
 2. the TANK plan change does not need to create entirely new sets of rules specifically for TANK lakes.
 3. objectives and policies need to express a goal of improving the state of TANK's shallow lakes – maintaining their current state is inadequate.
 4. interim freshwater limits (quality and quantity) should be introduced until statistically robust datasets and information is available about water quality of TANK's shallow lakes and catchment processes. One key goal of TANK implementation action should be enhancing our 'baseline' knowledge of TANK lakes.
 5. objectives and policies need to acknowledge the inextricable linkages of the shallow lakes' open water with wetland margins. These waterbodies function as a system so it would be artificial to separate TANK lakes from wetland margins.
 6. rules should not lead to discouragement or impediments to physical works and structures being used to improve the health and ecological functioning of TANK's shallow lakes (and their associated wetland environs).
 7. a 'water management zone' or similar spanning at least Lake Poukawa and its upper catchment should be identified in the plan. Specific objectives, policies and perhaps even rules would apply to that WMZ.
 8. adapt earlier sediment and nutrient management proposals (refer A above) to also be relevant to lakes.
 9. note draft provisions (objectives, policies and associated rules) will be progressively incorporated into the existing draft plan change/strawman proposals currently being reviewed by TANK Group members.

1. Preamble

- 1.1 In November 2017, the LWWG’s recommendations regarding TANK wetlands were presented to the TANK Collaborative Stakeholder Group. Those recommendations were generally well-received. In November, it was noted that many of the lakes within the TANK area also feature wetland margins, or are better characterised as wetlands, but named as a lake (e.g. Lake Te Roto Kare). These lakes are typically shallow – not deep like two of the region’s better known lakes Tutira and Waikaremoana.
- 1.2 As a reminder, the LWWG’s key purpose is *“to provide advice about issues and opportunities for lakes and wetland management in relation to the freshwater values and objectives identified by the TANK Group.”* Obviously, the LWWG’s advice and recommended actions may require further adaptation to ‘fit’ with the TANK Group’s broader package of actions and recommendations for management of land and freshwater in the TANK Catchment Area. That broader package is evolving week by week.
- 1.3 Lakes within the TANK catchment area (also refer map in Attachment 1) include:

Name	Main Catchment	Approx. lake area	Approx. headwater area	Name	Main Catchment	Approx. lake area	Approx. headwater area
• Lake Te Roto Kare	Tutaekuri	12 ha	TBC	• Lake Oingo	Ngaruroro	85 ha	1000 ha
• Lake Poukawa	Karamu	86 ha	5700 ha	• Lake Runanga	Ngaruroro	110 ha	750 ha
• Lake Roto Tuna*	Ngaruroro	8 ha	223 ha ¹	• Lake Roto Roa*	Ngaruroro	5 ha	223 ha
• Hurimoana swamp	Ngaruroro	19 ha	350 ha	• Kautuku swamp	Ngaruroro	13 ha	230 ha

* a.k.a. ‘Kaweka Lakes’

2. TANK Group’s interim agreements

- 2.1 In the TANK Group’s first Interim Report (Dec 2013), there were no specific agreements or recommendations in relation to lakes in the TANK area.
- 2.2 However, the TANK Group’s first interim report did often refer to lakes Poukawa, Oingo and Runanga as part of the commentary and agreements regarding ‘wetlands.’ The LWWG’s earlier work on wetlands similarly made references to those three lakes. The LWWG considers it would be futile splitting hairs about whether a body of still water is a lake or a wetland. Rather, a pragmatic approach is warranted.
- 2.3 A pragmatic course of action is for the TANK plan change policies to recognise the inextricable linkages and connectivity between areas of open water and the wetland fringes of those places named in paragraph 1.3.

3. What is the advice from HBRC scientists telling us?

- 3.1 HBRC’s State of the Environment monitoring, historic data and recent anecdotal evidence have allowed an estimation of current water quality state in some of the TANK lakes is known. However none of the TANK lakes’ water quality is currently routinely monitored by HBRC on shorter monthly or six-monthly snapshots.
- 3.2 Some data about Lake Poukawa comes from monthly monitoring by a consent holder. HBRC scientists have been working on approaches for increased sampling of Lake Oingo and Lake Runanga, but any such stepped-up sampling is subject to HBRC’s funding decisions through the 2018-28 Long Term Plan (due to be decided upon by 30 June 2018).
- 3.3 HBRC’s current lake water quality monitoring data for the Poukawa, Oingo and Runanga lakes is not yet statistically sufficient to provide a definitive answer on the lake water quality [NOF] attribute state is as per Appendix 2 of the NPSFM. But we do know enough to say that these shallow lakes would be below NOF bottom lines in terms of at least Total Nitrogen, Total Phosphorus, and/or Chlorophyll-a if the current datasets were extrapolated.

¹ *“Most of Kaweka Lake west’s catchment is dominated by dense vegetation cover of manuka/kanuka (70%), exotic forest (17%), and indigenous forest (9%). It has a short water residence time of 67 days, and this, combined with the relatively unmodified catchment, means there is a low risk from nutrient and sediment losses in its catchment.”*
(source: <https://www.lawa.org.nz/explore-data/hawkes-bay-region/lakes/kaweka-lakes>).

- 3.4 Dr Andy Hicks suggests that there is a great deal of correlation among the lake NOF attributes (TN, TP and Chl *a*) as they are all essentially an indicator of algal biomass of what is floating in the water column. The lake state targets are far more challenging than what we have for rivers, particularly given climate condition in Hawke's Bay and these lakes' shallow depths (less than 3m). The warm weather and limited water mean our shallow lakes are even better at trapping and converting 'gunk' into algal bloom than many other lakes in New Zealand. Hydrological management is going to be really key for these shallow lakes.
- 3.5 HBRC's Pawel Rakowski and Jeff Smith have led pioneering modelling work to enhance understanding of the groundwater and surface water interactions across the Heretaunga Plains. While highly sophisticated for its type, the current modelling grid scale does not enable detailed analysis and scenario-testing in each of the TANK lakes' small sub-catchments. NB: Lake Poukawa and its upper catchment are outside of the current TANK groundwater/surface water modelling domain. In future years, the model could be developed further (or an entirely new targeted model built) and with greater resolution on some particular 'areas of interest' (for example, Lake Poukawa's sub-catchment), but that detail is not currently available.

4. Other notable observations

Plant growth

- 4.1 To put it simply, for healthy functioning ecosystems we need more rooted aquatic plants in these shallow lakes than what we have now, but we need less aquatic weeds in the lowland streams than what we have now. In shallow lakes where there is low plant growth where planktonic algae dominate, even exotic species is better than nothing.

Landholdings, access and swimming value

- 4.2 Most of the TANK lakes noted in paragraph 1.3 above are on multiple blocks held by private owners (with the exception of the Kaweka Lakes which are within the Kaweka Forest Park (administered by DOC). Headwater catchments of the TANK shallow lakes' are short and relatively small (Lake Poukawa being an exception). This is favourable for implementing targeted collective actions by agencies and landowners.
- 4.3 Limited public accessibility to those shallow lakes means those places are not frequently used for a wide range of recreational activities typically associated with other lakes elsewhere in the region. According to earlier assessments and reviews of the use and values associated with waterbodies in the TANK catchment area, very few (if any) of the above lakes were identified as having present-day value for actual contact recreation involving immersion in the water. Achieving the region's 'swimmability' targets will need careful consideration of the TANK lakes' ecological values as well as the practicalities of achieving lower cyanobacteria concentrations suitable for swimming in those same large shallow lakes.
- 4.4 HBRC's Draft 'swimmability' targets for the Hawke's Bay region have been adopted. Final targets need to be adopted by 31 December 2018. The requirements for 'swimmability targets' apply in relation to large streams and rivers (fourth order and above) and large lakes (perimeter greater than 1.5km). The suitability for primary contact (e.g. swimming) is a measure of *E.coli* in rivers and large lakes, plus also cyanobacteria concentrations in large lakes. In the TANK catchment area, those 'large lakes' according to maps prepared by Ministry for the Environment are:
- a) Lake Oingo
 - b) Lake Poukawa
 - c) Lake Runanga
 - d) Hurimoana swamp
 - e) Kautuku swamp
 - f) an unnamed reservoir (possibly the artificial storage lake known as 'Te Tua')
 - g) an unnamed pond near the Westshore Wildlife Refuge west of the HB Expressway.

ICOLs

- 4.5 For the avoidance of any doubt, there are no 'ICOLs' (Intermittently Closing and Opening Lagoons) within the TANK catchment area, which some people could think are coastal lakes.

5. What does the TANK Plan Change need to do differently regarding lakes?

- 5.1 This question was the fundamental focus of the LWWG's latest exchange. Gavin Ide had prepared and pre-circulated a memo to LWWG members to prompt LWWG members' thoughts about what does the TANK plan change need to do differently (or as extras) in relation to TANK lakes.
- 5.2 In relation to lakes, the RRMP already features policies and rules specifically in relation to beds of lakes and both the quality and quantity of water. Objectives and policies in the TANK PC should strive for improvements to water quality in the shallow TANK lakes. Reasons for this include:
- 5.2.1 maintenance of those lakes' current water quality would fail to implement higher order policies in various planning documents (e.g. RPS and NPSFM).
 - 5.2.2 this would align with agreements made the TANK Group to date in relation to rivers and streams.
 - 5.2.3 nonetheless, numeric improvement in lake water quality by how much, how fast and how much cost will only become clearer when statistically valid datasets for monitoring NOF attribute states are available.
 - 5.2.4 let's start heading in the direction of improvement now.
- 5.3 In terms of objectives and limits for the quantity of water in these shallow lakes, there are a number of provisions (policies and rules) already in the RRMP that control the abstraction of water and impacts on lake and wetland levels. More specifically, the RRMP has minimum flows in place for four sites in the vicinity of Lake Poukawa. For those same sites, the allocatable volume of water (m³/week) is zero. Specific minimum flows and allocatable volumes for the other TANK lakes are not identified in the RRMP. Further model development in future would improve understanding of surface water and groundwater connections in relation to lake levels and water residency times. That could assist with setting specific limits and water levels for each lake in future years.
- 5.4 At previous meetings during 2018, the TANK Group had expressed general support of proposals for sediment and nutrient management. While those proposals largely focussed on water quality outcomes in rivers, streams and estuaries, the LWWG agrees most of the elements of those proposals could equally and easily be applicable to TANK lakes. For example:
- 5.4.1 land owner collectives, industry programmes, farm plans, collaborative implementation, etc
 - 5.4.2 adaptive and staged approach to nutrient and contaminant management; critical contaminant source area identification, nutrient budgeting, etc
 - 5.4.3 prioritising water quality improvement in sub-catchments where water quality is degraded so as not to meet water quality objectives; and tackling key contaminant pathways especially sediment management to address phosphorus and bacteria losses
 - 5.4.4 stock access to waterbodies and riparian margins.
- 5.5 In the discussion paper for managing nutrient losses to water, the executive summary acknowledged that *"there is still further research and investigation necessary to determine a defensible nutrient load limit, both for freshwater health and the estuaries health. However, in the interim, the TANK Group will determine appropriate objectives for concentrations of nutrients within freshwaters and will adopt measures to ensure nutrient losses from land use activities are reduced. There will be an initial focus on catchments where nutrient concentrations are not meeting the desired states in a priority order."* This seems equally relevant to TANK lakes, but some variants of the priority catchment criteria (i.e. 'Schedule W') are necessary to ensure the state of TANK lakes are not overlooked. For example, the converse relationship of plants in lakes compared to weed growth in streams needs criteria tailored for lakes (and wetlands). Similarly, elevated levels of nutrients in wetlands is not always a bad thing because of wetlands' innate ability to filter and convert this high energy into plant growth – and high ecological functioning.
- 5.6 The relatively small upper catchment areas of these shallow lakes offers opportunities for targeted actions with the small numbers of landholders – Lake Poukawa being an exception with the upper catchment area being approximately 5700 hectares.

TANK Lakes and Wetland Working Group report back

- 5.7 Lake Poukawa, its headwaters and its downstream waterbodies within the Karamu catchment could be the subject of a focussed sub-catchment plan of action (i.e. a priority catchment). Over the past few decades, there have been several attempts at developing management plans for Lake Poukawa, but none have been comprehensive multi-agency proposals working with landholders. The time seems right to get landholders, HBRC and various other agencies together to prepare an integrated [sub]catchment plan for Lake Poukawa headwaters, the lake itself and its downstream waterways. Identification of a Poukawa 'water management zone' in the TANK plan change would support that kind of 'working together' approach.

Plan change to enable physical works and services in lakes

- 5.8 With the intention being to start making improvements to the state and health of shallow lakes in the TANK area, the LWWG recommends that the TANK plan change should enable, (i.e. not unnecessarily restrict) physical works and structures in lakes that would help achieve improved ecosystem health.

6. Lakes and Wetlands Working Group membership

- 6.1 TANK LWWG members are Nathan Burkepile, John Cheyne, Neil Eagles, Peter Kay, Ivan Knauf, Connie Norgate, Aki Paipper, Gavin Ide (Convenor). For the discussions regarding lakes, the Working Group is thankful for the particular contributions from Keiko Hashiba, Dr Andy Hicks and Dr Gary Rushworth all from the Hawke's Bay Regional Council.

Attachments

1. Location map of large lakes within TANK catchment area.

Attachment 1

