TLG Recommendation on Lakes FMU

A summary prepared by the TLG for CSG#14
29 July 2015

Background
The TLG paper to CSG#13 "The Lakes Conundrum – Options for Lakes FMU" provided a summary of information on the lakes in the Waikato and Waipa catchments and set out some pros and cons of six options for lake assignment to Freshwater Management Units (FMUs).

Following discussion at CSG#13, four of the six initial options were supported by CSG. The TLG was asked to provide a refined pros and cons paper to answer a number of outstanding questions, and to provide a preferred option(s).

These questions are addressed below and a recommendation is put forward by the TLG for CSG consideration. In addition, advice was sought on policy implications of various options and this was provided by WRC Policy Staff (summary appended below).

Options for assignment of lakes to FMU(s)
The four options selected by the CSG, plus the pre-existing interim decision on the lakes FMU, are set out below. A description of each option is provided to assist with delineating the options and how they apply to the catchments:

Option 1: Selected monitored lowland lakes and their catchments:

- Lakes Maratoto, Rotopiko-Serpentine East, Rotopiko-Serpentine North, Rotomanuka, Tutaeinanga, Waahi, Milicich, Ngahewa, Hakanoa, Ohinewai, Okowhao, Whangape, Mangahia, Mangakaware and Waikare
- characterised by not meeting the NPS-FM bottom lines for Chlorophyll *a* and/or Total Nitrogen and /or Total Phosphorus
- long term monitoring data available

Option 2: All lakes to sit within the riverine/geographic FMU (Upper Waikato, Middle Waikato, Lower Waikato and Waipa) where they fall. Lakes and their catchments are not differentiated from catchments draining directly to rivers or their tributaries.

Option 3: One lakes FMU containing all 59 lakes (excluding geothermal) and their catchments, including streams flowing into them.

Option 4: Lake FMUs delineated by type of lake, resulting in 4 lake FMUs

- peat (35 lakes), lowland riverine (15 lakes), dune (4 lakes), volcanic (5 lakes)
- geothermal lakes (3 lakes) excluded on policy advice that they are not fresh water as defined by the RMA and therefore the NPS-FM does not apply (see Appendix 2)

Option 5: Lake FMUs that are based on lake management requirements.

- requires identification of the types of management required for a particular policy approach, and/or
- development of criteria or characteristics which would allow definition of lakes on basis of likely management required (e.g. current state, catchment land use, whether or not water body is outstanding, etc).

The options have been assessed in terms of whether each option is well supported or informed by data, what monitoring is required, implications for identifying attributes and setting limits and targets, and the requirement to establish and operate a water quality accounting system. Table 1 provides an assessment of each option.

Summary

The NPS-FM recognises lakes as a distinct freshwater body type. Including lakes within the riverine FMUs does not account for significant differences in values, attributes and current attribute states between lakes and rivers in the Waikato-Waipa catchment. Also, given that many lakes will fall into the D-band for some attributes, and consequently will need targets, rather than limits, a specific FMU that focuses management attention on lakes is appropriate. Given this rationale, Options 3, 4 and 5 are preferred over Options 1 and 2.

Options 3, 4 and 5 are essentially the same option from a policy perspective. These options recognise that different objectives and limits are appropriate for lakes, separate from the rivers. They do not limit approaches to freshwater accounting, monitoring and the range of management approaches that may be applied through decisions made later in the process. These options allow for specific lake attributes to be applied and monitored at representative monitoring sites.

Option 3 maintains a level of relative simplicity, but there is also support in the TLG for Option 4, which recognises that different lake types may vary in values, issues and management responses.

The TLG recommends that CSG focus attention on Option 3 or 4 when deciding on how lakes should be designated within FMU(s).

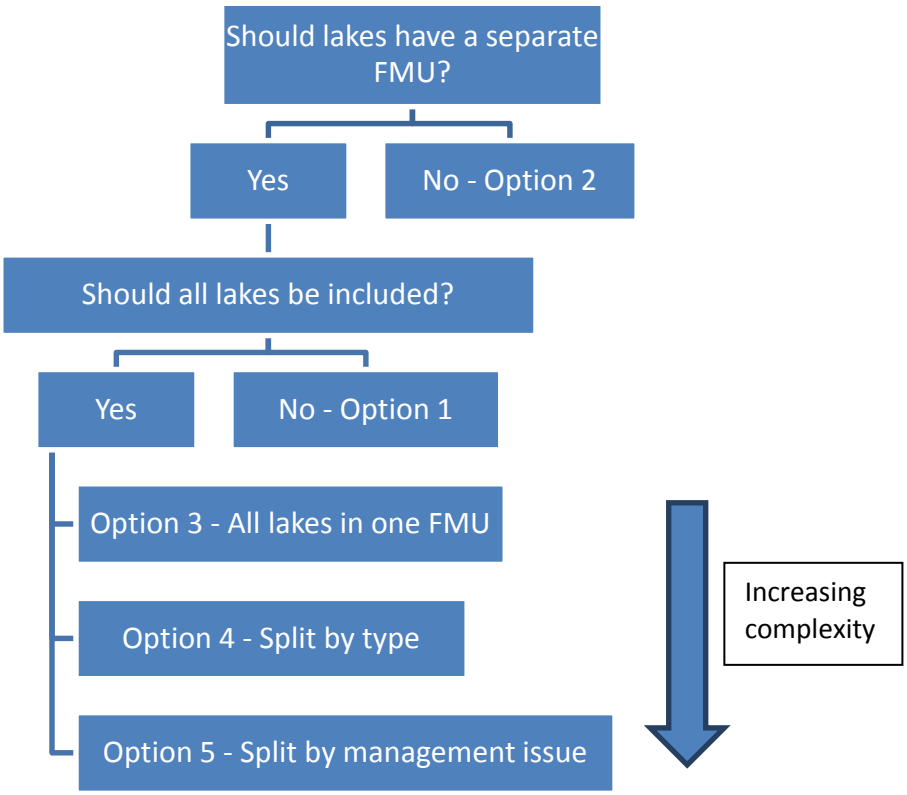

Table 1 – TLG assessment of lakes FMU options

	Option 1 Selected lakes FMU	Option 2 No specific lake FMU	Option 3 All lakes - one FMU	Option 4 FMUs - by lake type	Option 5 FMUs by lake management
No. of lake FMUs	1	0	1	**4**	many
No. of FMUs total	5	4	5	8	many
Monitoring data exists	• Yes – all lakes in this option have monitoring data	• Yes, in part • Some lakes have no monitoring data	• Yes, in part • Assume monitored lakes are representative	• Yes, in part • Assume monitored lakes are representative of lake type	• Yes, in part • The greater the number of FMUs the poorer the representation by monitored lakes • Lack of long term data record for most lakes
Implications for monitoring	• Existing monitoring would be continued • All lakes monitored	• Existing monitoring may be continued • Need to estimate or model lake state and expected individual lake improvement for un-monitored lakes • Estimates of state could be based on expert assessment, one-off sampling or based on catchment pressures	• Existing monitoring would be continued • Need to estimate or model lake state and expected individual lake improvement for un-monitored lakes • Need for additional monitoring if existing monitoring not representative • Estimates of state could be based on expert assessment, one-off sampling or based on catchment pressures	• Existing monitoring would be continued • Need to estimate or model lake state and expected individual lake improvement for un-monitored lakes • Need for additional monitoring if existing monitoring not representative	• Could require increase in monitoring sites to address particular lakes • If not monitored, need to model or estimate lake water quality, or need to assume will respond in same way as monitored lakes in each type

	Option 1 Selected lakes FMU	Option 2 No specific lake FMU	Option 3 All lakes - one FMU	Option 4 FMUs - by lake type	Option 5 FMUs by lake management
Implications for setting attributes	• Use NPS-FM attributes for lakes • Attribute bands readily identified for monitored lakes	• Use NPS-FM attributes for lakes • Attributes bands for monitored lakes readily set but not for other lakes • Factors such as connectivity, lakes fed by streams compared to those fed by ground water and rain, lakes with managed water levels, need to be considered	• Use NPS-FM attributes for lakes • Attributes bands for monitored lakes readily set but not for other lakes • Factors such as connectivity, lakes fed by streams compared to those fed by ground water and rain, lakes with managed water levels, need to be considered	• Use NPS-FM attributes for lakes • Bands set by type based on monitored lakes rather than individual lakes	• Use NPS-FM attributes for lakes • Potentially problematic and complex to set attribute bands for each lake FMU • All lakes need assessment to differentiate on basis of management required
Implications for setting limits and targets	• Can set limits and targets based on monitoring data available • Limit/target setting for lakes made more difficult due to legacy issues from past land use, flood control schemes and pest fish	• Difficult to set for individual lakes within river FMUs, but not precluded if have monitoring data or specific issue needing to be addressed • Limit/target setting for lakes made more difficult due to legacy issues from past land use, flood control schemes and pest fish	• Complex if individual lakes differ in management required • Doesn't preclude grouping lakes for setting limits/targets, but may be lack of data to guide limit setting	• More complex • Depends on representativeness of monitored lakes • May better allow for legacy issues to be taken into account • May better allow for setting limits for flood control scheme water bodies	• Most complex • Depends in part on representativeness of monitored lakes • Lack of long term data to indicate trends • Requires identification of criteria on which to base grouping of lakes or identification of individual lake management requirements

	Option 1 Selected lakes FMU	Option 2 No specific lake FMU	Option 3 All lakes - one FMU	Option 4 FMUs - by lake type	Option 5 FMUs by lake management
Implications for management	• Facilitates targeted actions within lake FMU • Lacks specificity of management options for lakes not in FMU, but this is not precluded within the River FMUs	• Improvement of lakes through consequential effects of actions taken for rivers • Risk that lakes are 'lost' within large FMU with potentially differing issues • Won't know if unmonitored lakes have improved over time	• Potentially could manage on individual lake basis • Increased likelihood that individual properties span both lake and river FMUs	• Lakes of each type managed similarly • Increased likelihood that individual properties span both lake and river FMUs	• Complex to administer • Difficult to assess changes over time except for monitored lakes • Increased likelihood that individual properties span both lake and river FMUs
Overall assessment	• Simple • Specifically targets known D band lakes but doesn't provide for lakes that might be D band but have no data • long term monitoring data available for lakes in FMU • The majority of lakes are not explicitly recognised	• Simple • Doesn't preclude differential approach to different lakes for monitoring and limit setting • Lakes may be "lost" in whole of catchment approach • Integrated management approach	• Simple or complex depending on ability to identify lake issues • Doesn't preclude differential approach for monitoring and limit setting • Identifying a representative monitoring site(s) may be problematical and add complexity	• Relatively simple • Allows differentiation by type and/or associated with characteristics of each type	• Complex to administer • Provides opportunity to tailor management to individual lakes or specific lake types and issues • Lack of data to support individual lake management

Appendix 1
Policy considerations in setting Lakes Freshwater Management Unit(s)

Background
An FMU is the water body, multiple water bodies or any part of a water body determined by regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes.

Freshwater Management Unit(s)
- To meet the requirements of the NPS-FM all water bodies must be in an FMU
- Good resource management practice recognises that simplicity is best.

Values
- CSG can identify values for a lake FMU, a group of lakes within an FMU, or each lake separately, and this is not affected by the FMU option chosen
- CSG has already considered the national values, and the FMU must contain the compulsory values and include other values that CSG consider appropriate. This choice is not affected by the lake FMU option chosen

Objectives
- The FMU options do not limit CSG's ability to consider the following points in making decisions about freshwater objectives:

    i. the current state of the FMU, and its anticipated future state on the basis of past and current resource use;
    ii. the spatial scale at which FMUs are defined;
    iii. the limits that would be required to achieve the freshwater objectives;
    iv. any choices between the values that the formulation of freshwater objectives and associated limits would require;
    v. any implications for resource users, people and communities arising from the freshwater objectives and associated limits including implications for actions, investments, ongoing management changes and any social, cultural or economic implications;
    vi. the timeframes required for achieving the freshwater objectives, including the ability of regional councils to set long timeframes for achieving targets; and
    vii. such other matters relevant and reasonably necessary to give effect to the objectives and policies in the NPS-FM.

Attributes
- In setting objectives the CSG also need to decide what the relevant attributes are, and assign attribute states at or above the minimum acceptable state for each attribute.
- The decision on river and lake attribute states is still to come. Defining the lake FMU does not limit those decisions.

Targets and limits
- Although the definition of FMU refers to limits and a spatial scale, FMUs defined by the time required to reach the limit (or target) are not excluded
- The same limit might apply over a large part or all of the catchment but a FMU is defined by the time and methods required to achieve the limit

- Lakes grouped by one factor e.g. band D or type, does not change how easy or difficult management policy options and methods will be.

Accounting and monitoring

- Monitoring can be tailored to the FMU option chosen. Monitoring against freshwater objectives need only be undertaken at representative sites within the FMUs. This may require regular monitoring of certain lakes as a reference (monthly up to annually), combined with less frequent surveys of other lakes (annually to 5 yearly).
- It is not possible for Waikato Regional Council to monitor every drop of fresh water. The FMU option chosen does not limit the choices for monitoring.
- A lake's ecological health may not be reflected in data by only monitoring the four contaminants
- Monitoring plans are also intended to recognise the importance of long term trends in data, and allow for more accurate modelling of lake condition, for lakes not regularly monitored.

Other management considerations

- The Healthy Rivers Wai Ora plan change is not the only approach required to achieve the limits and targets, because of factors outside the project scope
- It is important to keep in mind the long-term future of the lakes, where other methods such as the river restoration strategy will be implemented as well
- Other methods will remain critical to the successful management of lakes:
    a) A range of scales for actions
    b) Lake by lake approach
    c) Adaptive management approach
    d) Need for long-term interventions and monitoring
- Shallow lakes are particularly vulnerable to the effects of land use, and require a targeted management approach
- If lakes are grouped in the river FMU where they lie, it has little implication for setting policy and methods

Setting attributes states for lakes

- Some attributes for lakes have already been discussed as part of the decision made at CSG13
- That decision and any subsequent decision about attributes are not limited by the decision on lake FMU(s).
- National bottom lines in the NPS are not standards that must be achieved immediately. Where lakes FMU(s) are below national bottom lines, they will need to be improved to at least the national bottom lines over time. It is up to CSG to determine the methods and timeframe for the lakes FMU(s) to meet the national bottom lines. Improvements in lake water quality may take generations depending on the characteristics of the lakes FMU(s).

National Objectives Framework

CSG should consider the following:

- the current state of each lake type in relation to the surrounding river catchment/s, and the expected future state of each lake type based on the past and current surrounding land use and management
- the geographic spread in the catchment and relative size of the lake catchments within the river FMUs

- the targets and limits necessary to achieve the objectives, and the implications for the timeframes that would required
- any choices between the values that is required to meet the objectives and associated limits
- the implications for resource users, people and communities arising from the objectives and limits, including the implications for land use and management changes
- the timeframes required to achieve the objectives for the each lake (if at all possible), including the ability of CSG to set long timeframes for achieving the targets.

Setting attributes
Some lakes are currently below the national bottom line for lakes attributes. Setting attribute objectives above the national bottom line aligns with the NPS-FM and the Vision and Strategy for the Waikato River. The likely extent of change required to achieve these objectives means that timeframes to achieve the targets will be longer than for other water bodies in the catchment.

Transitional arrangements under the NPS-FM allow for attribute objectives to be set below the national bottom line (through policy CA4) if it can be justified. Policy CA4 allows an objective to be set below the national bottom line on a transitional basis for a period of time (in appendix 4).
These policies allow for more pragmatic targets to be set. However, this may require a full public consultation and notification process (under the RMA) and the outcome is not certain.

Whichever option is chosen can then be implemented with management options that are:

a) immediate for each lake catchment
b) staged over time, by either:
    i. Rules coming into effect over a number of years, or
    ii. Deferring to the Regional Plan Review
c) generic catchment wide rules (i.e. not lake specific)

Lake management can occur lake by lake, and lakes can be clustered into 'types' (i.e. riverine, dune, peat, volcanic) despite lack of individual lake monitoring data. Waikato Regional Council can use modelling, estimates and measurement to manage lakes in this way. The Regional Plan review also provides the opportunity to revisit attribute objectives if necessary.

It is important to remember that the values related to lakes will also be met by other methods and actions, such as through catchment management plans. This includes funding available through river restoration strategies.

Attribute state options for lakes
The decision on FMUs for lakes does not preclude any of the following approaches from being used when setting attribute states for lakes:

- Use same attribute states as surrounding lake FMU, which may mean:
    - Don't set states for lakes
- Different attribute states set for lakes as surrounding lake FMU, which may include:
    - Setting attribute states by lake type or by lake condition
    - Different attribute states set below minimum standard using Policy CA4

Appendix 2
Geothermal Lakes

Geothermal lakes (3) are not included in the plan change based on the following:

1. The Resource Management Act (RMA) definition of **Fresh Water** means all water except coastal water and geothermal water.
2. The RMA definition of **Water Body** means fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer, or any part thereof, that is not located within the coastal marine area
3. The National Policy Statement Freshwater Management (NPS-FM) uses the term **freshwater** which is interpreted (either as an adjective or a noun) to have the same meaning as the RMA definition of **Fresh Water**, which excludes geothermal water.
4. The NPS-FM uses the term **Body of Fresh Water**, which is interpreted to mean a Water Body (river, lake, stream, pond, wetland, or aquifer, or any part thereof), containing fresh water and not any other type of water (i.e. a water body specifically containing fresh water).
5. The NPS-FM uses the term **Freshwater Body** , which we assume to mean the same as a body of fresh water (i.e. a water body specifically containing freshwater)
6. Additionally, the Waikato Regional Policy Statement (RPS) introduced the concept of a **Fresh Water Body** which excludes geothermal water.
7. Therefore, for the purposes of the Waikato Regional Plan Change 1, any geothermal lake (i.e. a water body, or any part thereof, containing geothermal water) is not considered to be a freshwater body.