Recommendations of inclusion of Whangamarino FMU

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Technical considerations for a wetland FMU

Whangamarino wetland may be regarded as a water body type distinct from the river, lake-fed river and lake types already incorporated into Healthy Rivers: Wai Ora. As such Whangamarino wetland may require separate consideration to protect/restore its values.

Should the CSG decide to designate Whangamarino wetland as a distinct FMU then the National Objectives Framework should be applied to be consistent with the process for river and lake FMUs already designated under Healthy Rivers: Wai Ora.

Defining values for Whangamarino should be relatively straightforward, as the same three core values (Contact recreation, ecosystem health and mahinga kai) identified for lakes and rivers are likely to be relevant to the wetland.

Definition of appropriate attributes relevant to the core values raises a number of significant issues. There are no wetland attributes provided in the NPS-FM (2014). All existing attribute tables relate to lake, river or lake-fed river water body types. There are three possible options for defining attributes that could be considered for a Whangamarino FMU:

1. Developing a set of wetland-specific numeric attributes
2. Adapting or extending existing numeric attributes for use in a wetland context
3. Providing narrative attributes

Ministry for the Environment recognises the gap existing in the current NPS-FM (2014) and has implemented a work programme to develop attributes for wetlands. This work programme is in its early days, but MfE have indicated that the following are aspects to be managed within wetlands:

- Hydrological regime
- Substrate characteristics
- Indigenous species
- Wetland extent
- Connectivity
- Pathogens and toxins

Of these aspects we suggest that hydrological regime, indigenous species, wetland extent and connectivity all fall outside the scope of Healthy Rivers: Wai Ora. In contrast, a link can be made between sediment and wetland substrate characteristics (e.g. sedimentation in wetlands) and the pathogens and toxins aspect is within scope of Healthy Rivers: Wai Ora. The latter could include existing attributes of *E. coli*, cyanobacteria, nitrate and ammoniacal nitrogen.

With respect to trophic state, we have no NOF attribute tables for wetlands that we could apply directly. Existing trophic state attributes such as TN, TP, phytoplankton and periphyton are relevant to different water body types and it would be inappropriate to apply these attributes and their existing bands to wetlands without undertaking research to calibrate these attributes.

The NPS-FM (2014) provides for formulating freshwater objectives (to “protect the significant values of wetlands”) using narrative attributes if numeric are impracticable. This suggests we could have a

Whangamarino FMU that has narrative objectives for those aspects that we do not have numeric attributes for.

Determination of current state for any potential attributes (e.g. *E. coli*, nitrate toxicity) is not possible due to a paucity of monitoring data. Without knowledge of current state it would be difficult to determine the gap between current and desired states. The absence of monitoring data and relatively poor understanding of wetland ecosystems would also make modelling of wetland response to changing contaminant inputs very difficult. Determination of limits without current state information is impracticable.

The Whangamarino studies conducted to date provide strong evidence that nutrient and sediment inputs are having a deleterious effect on the ecosystem health of the wetland but there is nothing quantitative relating changes in ecosystem health to changes in sediment and nutrient levels that we could draw on. Inability to link cause-effect is a strong argument against numeric limits.

The current inclusion of the Whangamarino in the Lower River FMU requires that inputs from tributary streams are subject to the limits imposed for the Lower FMU either directly for sediment and E.coli or indirectly (by the needs of the main stem) for N and P. Analysis of current state attribute data versus desired state limits and the scenario modelling sees these catchments as having amongst the highest requirement for mitigation action. Likewise, the poor condition of Lake Waikare sees its contributing catchments also having a high requirement for mitigation action, and therefore a 'flow-through' benefit to the Whangamarino.

The TLG considers that the Whangamarino wetland is most likely to respond to contaminant inputs differently from other water bodies in the catchment and if targeted research is undertaken that elucidates those responses, and aided by the development of NOF to include wetlands, then future consideration could be given to establishing attribute limits specific to the Whangamarino if these prove to be more restrictive than those for the lower FMU (perhaps at the next plan change?).

The current treatment of the Whangamarino (within the lower river FMU) requires considerable attention be given to contaminant inputs from its contributing catchments in any case so the direction of staged improvement will be in place.

Summary

In considering whether to designate Whangamarino Wetland as a separate FMU the CSG should consider the following constraints:

- The NPS-FM (2014) does not include any attributes for wetlands
- Development of national wetland-specific attributes is some way off and some of the candidate attributes fall outside the scope of HRWO
- Some existing attributes could be extended for use in a wetland water body type – these include *E. coli* (human health), cyanobacteria (human health), nitrate (ecosystem health) and ammonia (ecosystem health)
- Given the paucity of monitoring data it is not possible to determine current state with respect to potential attributes. This is a significant barrier and may require CSG to consider narrative objectives for a wetland FMU rather than numeric objectives (i.e. limits), even for those attributes that may have numeric descriptors (e.g. *E. coli*).
- With respect to the N, P and sediment contaminants we have severely limited scientific research upon which we could robustly develop ecosystem health attribute tables and limits for the Whangamarino.

- Given the points above, the TLG could not currently provide the technically robust information needed to determine a full suite of attributes, current state or numeric limits for a separate FMU covering the Whangamarino wetland and its catchment.