

MEMO

TO Te Awarua-o-Porirua Whaitua Committee

FROM Project Team

DATE 27 November 2018

SUBJECT Spatial scale for objective setting

Introduction

This memo describes proposed changes from the original 23 WMUs and current draft objectives and seeks the Committee's endorsement of five new proposed WMUs and their associated freshwater objectives.

The memo outlines:

- the reasons why the project team is recommending simplifying and consolidating the WMUs
- describes the five new WMUs and discusses the changes to the existing 23 WMUs
- identifies where shifts in the draft objectives occur as a result of this process.

Simplifying is difficult to get perfect and whatever way it is done there will always be bits that don't quite fit perfectly. This exercise has resulted in some catchments being split or grouped in ways that change the objectives from those set during the objective setting process.

The project team has identified five freshwater WMUs and three coastal WMUs for Te Awarua-o-Porirua Whaitua:

- Taupo
- Western Headwaters
- Northern Hills
- Eastern Hills
- Urban
- Onepoto Arm
- Pauatahanui Inlet
- Coast

The proposed WMU names are indicative at this stage and, if endorsed, we invite suggestions for the names.

The coastal WMUs have not changed from those considered during the objective setting for the harbour.

Decisions for the Committee:

- Endorse proposed new WMUs, including
 1. Splitting of sub catchments within the Hongoeka to Pukerua and Pukerua into the Western headwaters, Northern hills and Urban WMUs
 2. Splitting of Hukarito and Mahanawa Streams into the Western headwaters and Urban WMUs
 3. Inclusion of upper Duck Creek in the Eastern Hills WMU (recommended) or Northern Hills WMU
 4. Inclusion of lower Duck Creek in the Urban WMU (recommended) or Eastern Hills WMU
 5. Inclusion of Stebbings Valley in the Urban WMU (recommended) or Eastern Hills WMU
 6. Inclusion of small urban and urban fringe catchments in the Urban WMU
- Endorse proposed freshwater objectives for each of the five new WMU, including
 7. Updating of the Ammonia toxicity current state and associated objectives to maintain current state
 8. Reconsidering the nitrate toxicity objectives in the Urban WMU
- Endorse proposed WMU names or suggest alternatives

Why simplify and consolidate?

Te Awarua-o-Porirua Whaitua includes highly valued fresh and coastal water environments. The Committee has adopted the terminology of 'Water Management Units' (WMUs) instead of 'Freshwater Management Units' (FMUs) to help set objectives that recognise the value of both these types of environments and to manage activities in the catchments of both to achieve the objectives.

The Committee has used catchments and sub catchments as WMUs to date, with a fine scale consideration of the differences and similarities of values for each catchment, specification of current draft objectives and potential changes to management responses throughout the process to date. There have been a number of assumptions and sources of uncertainty within the information to support this, including:

- our understanding of current conditions in a given catchment
- potential improvements required and possible in a given catchment
- extent of a particular risk/activity in a given catchment
- the effectiveness of a particular management change

This uncertainty has been manageable to support the Committee in considering 'band' objectives at a catchment scale and exploring the likely magnitude of change required to reach a given objective state. However, as we shift to confirming and justifying the objectives and the recommendations to help achieve them, maintaining this level of specificity may lead to:

- an unwarranted level of implied accuracy in our ability to understand and articulate the water quality changes required to set limits and management responses specific to each catchment

- too much complexity in planning which has the potential to confuse and be difficult to justify and implement.

For these reasons, the project team has reviewed the current WMUs with an aim to create WMUs that reflect:

- Similarities in the values and objectives between catchments, that the Committee has set through their catchment scale consideration of knowledge and information
- Similarities in the predominant land uses within catchments
- The level of certainty in our ability to determine water quality differences between catchments
- That recommended policy package and management responses apply equally across all catchments and WMUs.
- Being administratively as simple as possible and technically justifiable

Description of the five new proposed Freshwater WMUs

The extent of the five WMUs are briefly outlined below. Table 1 and Figure 1 illustrate how the current freshwater WMUs have been split and joined to create the five new proposed freshwater WMUs.

Taupō

Taupō WMU is the Taupō catchment. It has been specifically recognised as a separate WMU because of the significant ecological value of Taupō Swamp and the significance of this place to Ngāti Toa.

Western Headwater

This WMU covers the upstream/headwater areas of streams along the western side of the Whaitua and will need some specific work to delineate the 'headwater' areas. It aims to provide for the recognition and protection of the good water quality and habitat of these streams and their catchments.

Much of the land areas within this WMU have legal protection, for example as reserves, though small parts of some catchments do have other land uses, including some areas of land currently or previously farmed which may create some challenges to achieving the objectives. The lower reaches of streams draining this proposed WMU have potentially significant fish passage barriers that may be challenges to achieving native fish objectives in the headwaters.

Northern Hills

This WMU covers many of the predominantly rural catchments draining directly to the sea or the northern side of Pauatahanui Inlet, including Kakaho, Motukaraka, Horokiri Streams and Ration Creek. The Committee has considered these catchments to have greater opportunity to provide for recreational and ecological values than some other rural catchments.

Eastern Hills

This WMU covers the predominantly rural catchments on the eastern side of Pauatahanui Inlet, including Pauatahanui Stream and upper reaches of Duck Creek and the predominantly rural upper catchments of Porirua Stream, particularly the upper Kenepuru and Takapu Streams.

Urban

This WMU covers the streams and catchments draining predominantly urban areas. Streams in these areas are generally subject to flow, physical habitat and contaminant-related stresses from urban development.

Onepoto Arm (Coastal WMUs are included for completeness)

This refers to the Onepoto Arm side of Te Awarua-o-Porirua Harbour. Some objectives will be set for intertidal and/or sub-tidal areas to recognise differences in the conditions of these two environment types.

Pauatahanui Inlet

This refers to the Pauatahanui Inlet side of Te Awarua-o-Porirua Harbour. Some objectives will be set for intertidal and/or sub-tidal areas to recognise differences in the conditions of these two environment types.

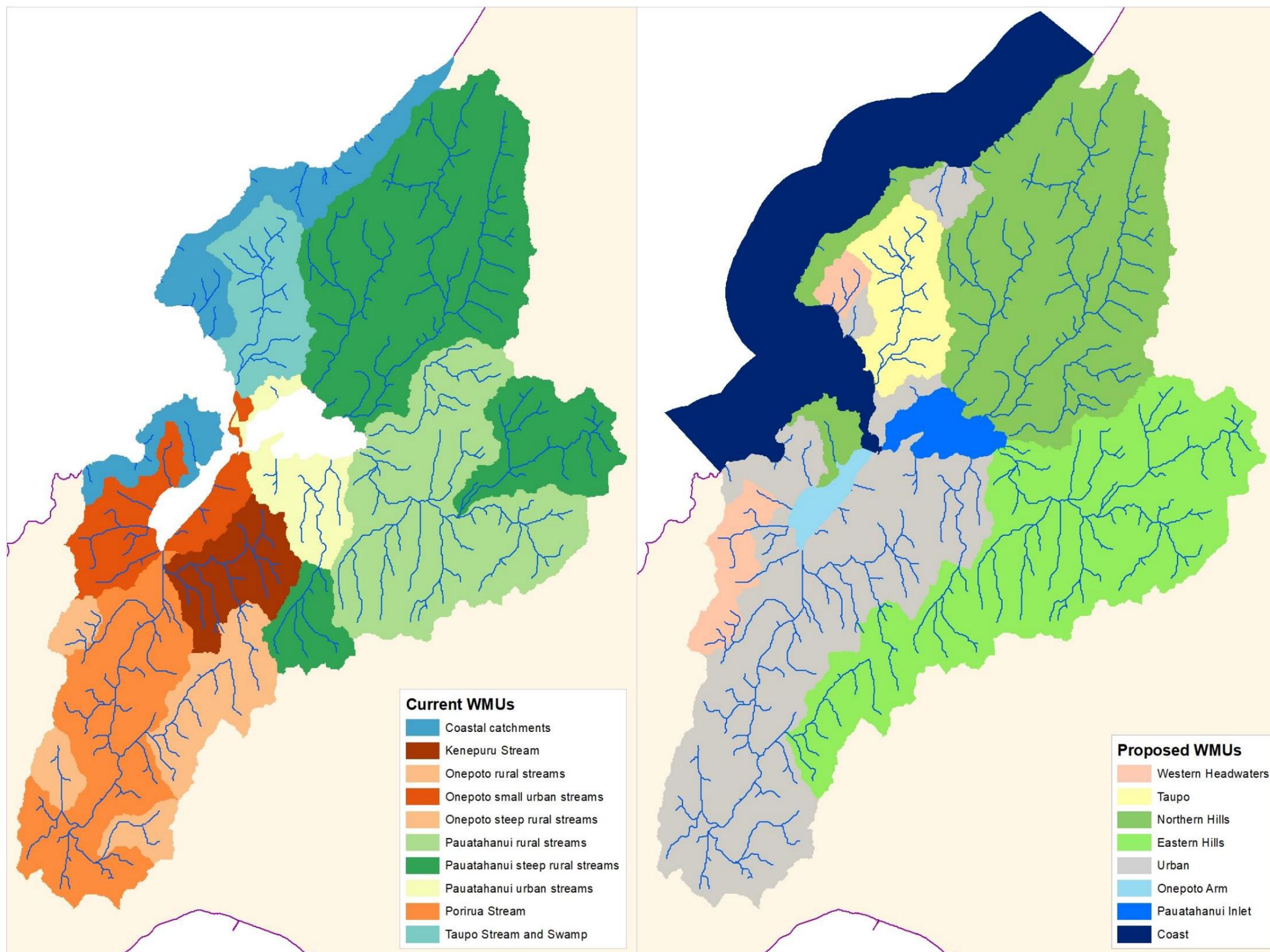
Coast

This is the open coast along the western coast of the whaitua and includes the throat and outer harbour of Te Awarua-o-Porirua Harbour.

Table 1: Current freshwater WMUs, catchments and proposed new WMUs

WMU Group	WMU name	Proposed WMU
Coastal catchments	Hongoeka to Pukerua	Western Headwaters
		Northern Hills
		Urban
	Pukerua	Northern Hills
		Urban
	Whitireia	Northern Hills
Taupo Stream and Swamp	Taupo Stream	Taupo
Pauatahanui steep rural streams	Horokiri and Motukaraka	Northern Hills
	Kakaho Stream	Northern Hills
	Judgeford Stream	Eastern Hills
	Upper Duck Creek	Eastern Hills
Pauatahanui rural streams	Ration Creek	Northern Hills
	Pauatahanui Stream	Eastern Hills
Pauatahanui urban streams	Lower Duck Creek	Urban
	Pauatahanui fringe streams	Urban
Onepoto steep rural streams	Rangituhi Stream	Western Headwaters
	Takapu Stream	Eastern Hills
	Upper Kenepuru	Eastern Hills
Onepoto rural streams	Belmont Stream	Urban
	Stebbings Stream	Urban
Onepoto small urban streams	Hukarito Stream	Western Headwaters
		Urban
	Mahinawa Stream	Western Headwaters
		Urban
	Onepoto Fringe	Urban
Titahi	Urban	
Kenepuru Stream	Kenepuru	Urban
Porirua Stream	Porirua	Urban

Figure 1 –Current freshwater WMUs and proposed new WMUs



Discussion of changes to freshwater WMUs and associated objectives

The proposed groupings alter the current draft objectives for some WMUs, and these are outlined for you consideration and to seek your endorsement. The current draft objectives and the proposed WMU objectives are shown in Appendix 1.

1. *Hongoeka to Pukerua and Pukerua*

These two current WMUs have had parts of them separated into three WMUs based on the predominant land cover. This change aims to ensure that objectives are appropriate to the quite different parts of these catchments rather than applying single objectives across all.

Decision for the Committee

Endorse the splitting of sub catchments within the Hongoeka to Pukerua and Pukerua into the Western headwaters, Northern hills and Urban WMUs

2. *Hukarito and Mahinawa Streams*

The current draft objectives for these catchments apply to the whole catchments which include the lower urban reaches and the relatively natural upper reaches. These current draft objectives were generally set with high attribute states (ie, A and B) and the comments supporting that Committee decision noted the high value of these streams to Ngati Toa, their proximity to Takapuwahia Marae, and the high ecological value of the upper reaches in bush.

The new proposed approach splits upper and lower reaches of the Hukarito and Mahinawa Streams. This aims to recognise:

- The upper reaches of these streams are near natural and that all near natural areas of the whaitua have the same freshwater objectives and management recommendations.
- The lower reaches of these catchments are urban and that all urban areas of the whaitua have the same freshwater objectives and management recommendations.

If the Committee prefers to set high objectives for the whole lengths of these streams, you may also need to consider further interventions and recommendations specifically to achieve those high objectives in the more challenging urban lower reaches. The current draft objectives for these catchments are higher than for urban areas elsewhere in the whaitua.

Decision for the Committee

Endorse the splitting of Hukarito and Mahanawa Streams into the Western Headwaters and Urban WMUs

3. *Upper Duck Creek*

The current draft objectives for upper Duck creek match well to the Northern Hills WMU or the Eastern Hills WMU. The key difference in objectives for these two WMUs is the *E. coli* and MCI objectives. The current arrangement proposed includes upper Duck Creek in the Eastern Hills WMU. This creates spatial continuity of objectives across those neighbouring steep rural catchments.

This changes the *E. coli* objective for upper Duck Creek changes from B to C. The current draft objective was set noting the opportunity to use regional council land to make higher improvements

and the mana whenua values of the lower reaches. However, the scenario modelling did not change from E attribute state.

An alternative is to include this in the Northern Hills WMU, which maintains the current draft *E. coli* objective and create higher *E. coli* and MCI objectives than neighbouring catchments.

Decision for the Committee

Endorse the inclusion of upper Duck Creek in the Eastern Hills WMU (recommended) or Northern Hills WMU

4. Lower Duck creek

The current draft objectives for lower Duck creek match well to the Eastern Hills WMU, with exceptions being the dissolved copper and periphyton objectives, which seek greater improvements than the current draft objectives. It is uncertain whether the generally applicable interventions and recommendations for urban areas would achieve those high objectives in the more urban lower reaches. Comments recorded in relation to Committee decisions on the current draft objectives noted that:

- It is more practical and achievable to achieve a B dissolved copper objective instead of an A
- Cost is the main limitation to setting a periphyton objective better than C.
 - “Developers won't do riparian planting at the bottom.”
 - “Council need to maintain strip for tractor etc. Total conflict.”
 - “Weeds are important for spawning habitat.”
 - “Area very visual (aesthetically appealing).”

An alternative is to include the lower reaches of Duck Creek in the Urban WMU, however, that too will result in changes to the draft Duck Creek objectives. Using the Urban WMU objectives would set the periphyton objective in a higher attribute state than the current draft objective, and set six other objectives in a lower attribute state than current draft objectives. This approach would reduce the risk of needing further interventions and recommendations specifically to achieve objectives that are higher than for urban areas elsewhere in the whaitua.

While the inclusion in the Urban WMU may appear to allow degradation, the management responses are designed to be consistently applied across the Whaitua to help control and minimise the effects of activities wherever they occur. Coupled with harbour scale metal load reductions targets of ~40%, this approach aims to avoid localised degradation of streams even where the instream conditions may be better than the objective state.

The changes in objectives for these alternative are illustrated in Table 2 over the page.

Decision for the Committee

Endorse the inclusion of lower Duck Creek in the Urban WMU (recommended) or Eastern Hills WMU

Table 2 – current draft objectives for Lower Duck Creek and objectives for alternative WMUs

Current WMU name	Proposed WMU	E.coli				Ammonia toxicity				Nitrate toxicity				Dissolved zinc toxicity			
		Current draft		Alternative		Current draft		Alternative		Current draft		Alternative		Current draft		Alternative	
		Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective
Lower Duck Creek	Eastern Hills	E	C	E	C	B	A	A	A	B	A	A	A	B	A	A	A
	Urban			E	C			A median and C max	A median and C max			A median and B 95%	A median and B 95%			D	C
Current WMU name	Proposed WMU	Dissolved copper toxicity				MCI				Periphyton				Native Fish			
		Current draft		Alternative		Current draft		Alternative		Current draft		Alternative		Current draft		Alternative	
		Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective	Current State	Objective
Lower Duck Creek	Eastern Hills	C	B	A	A	C	B	C	B	C	C	C	B	B	A	B	A
	Urban			D	C			C	C			B	B			C	B

5. *Stebbing's Valley*

Similar to Lower Duck Creek, the current draft objectives match well to the Eastern Hills WMU. However, the small scale of this catchment means the scenario modelling of this catchment was highly uncertain of absolute conditions, though may give a reasonable indication of the relative changes possible under different scenarios. This means there is uncertainty about current water quality and the impacts of existing and anticipated development in this catchment.

Inclusion in the Eastern Hills WMU may warrant specific investigation to estimate the current conditions of the sub-catchment. Depending on those results, further interventions and recommendations may be needed specifically to achieve objectives that are higher than for urban areas elsewhere in the whaitua.

Stebbing's Valley is proposed to be included in the 'Urban' WMU. This will result in the objectives for the catchment being set lower than the current draft objectives across a number of attributes. The inclusion of the Stebbing's catchment in the Urban WMU:

- recognises that this catchment is currently in transition to an urban catchment
- recognises there is uncertainty around its current condition and the effect of changing land use

While the new objectives for this catchment may appear to allow degradation, the greenfield development management response is designed to be consistently applied across the Whaitua to help control and minimise the effects of those activities wherever they occur. Coupled with harbour scale metal load reductions targets of ~40%, this approach aims to avoid localised degradation of streams even where the instream conditions may be better than the objective state.

Decision for the Committee

Endorse the inclusion of Stebbing's Valley in the Urban WMU (recommended) or Eastern Hills WMU

6. *Small urban and urban fringe catchments*

All of these are proposed to be grouped into the Urban WMU and given the same objectives and management framework. This collection of catchments have been given a range of current draft objectives to date, particularly for the metals. The small scale of these catchments meant the scenario modelling these catchments was highly uncertain of absolute conditions, though may give a reasonable indication of the relative changes possible under different scenarios. This means that the scenario modelling results may not be a reliable basis to discriminate differences between this collection of catchments.

The proposed WMU group and setting of a single objective across the group means there is less reliance on uncertain modelled differences between these small catchments. The WMU scale objective seeks to improve from the estimated conditions in the Porirua Stream.

Decision for the Committee

Endorse the inclusion of small urban and urban fringe catchments in the Urban WMU (recommended)

7. Ammonia toxicity current state and objectives

For ammonia, we have undertaken a pH correction to the current state, which suggests current conditions are an A attribute state, except for peak concentrations in the urban WMU. The current state has been updated to reflect this and all new objectives have been set to maintain. For the Urban WMU objective, this means the objective is split to maintain the current A attribute state for the median and the current C attribute state for the maximum.

Decision for the Committee

Endorse the updating of the Ammonia toxicity current state and associated objectives to maintain current state

8. Nitrate toxicity current state and objectives

For nitrate, monitoring data suggests the modelling may be overestimating the 95th percentiles and current state is therefore likely to be overestimated and placed into a worse attribute state by using the model results. The estimates of current state have been updated by adjusting the 95th percentile to reflect available monitoring data. All objectives have then been set to maintain the current A attribute state, with a split objective for the Urban WMU to maintain the current A attribute state for the median and the current B attribute state for the 95th percentile.

While earlier modelling suggested it was hard to improve attribute state in the urban streams, applying the modelled relative change for improved and water sensitive scenarios to the newly updated estimates of nitrate current state suggests that these improvements may be enough to move up an attribute state band.

The current draft objective was to maintain, however, the Committee may want to reconsider an A attribute state objective for nitrate as improvement is likely to be possible for the Urban WMU.

Decision for the Committee

Endorse the updating of the Nitrate toxicity current state and associated objectives to maintain current state. Reconsider the attribute state objective for the Urban WMU.

Appendix 1: Current draft objective and proposed WMUs, current state assessments and objectives

WMU group	Catchment name	Proposed WMU	E coli			Ammonia			Nitrate			Dissolved zinc								
			Current draft objective	Proposed Current State	Proposed Objective	Current draft objective	Proposed Current State	Proposed Objective	Current draft objective	Proposed Current State	Proposed Objective	Current draft objective	Proposed Current State	Proposed Objective						
Taupo Stream and Swamp	Taupo Stream	Taupo	B	E	B	A	A	A	A	A	A	A	B-C	A						
Onepoto steep rural streams	Rangituhi Stream	Western Headwaters	A	A	A	A	A	A	A	A	A	A	A	A						
Onepoto small urban streams	Hukarito Stream		A			B			A			A								
Onepoto small urban streams	Mahinawa Stream		A			B			A			A								
Coastal catchments	Hongoeka to Pukerua		B-A			A			A			A								
Coastal catchments	Pukerua	Northern hills	B	E	B	A	A	A	A	A	A	A	A	A						
Coastal catchments	Hongoeka to Pukerua		B-A			A			A			A								
Coastal catchments	Whitireia		B			A			A			A								
Pauatahanui steep rural streams	Horokiri and Motukaraka		B			A			A			A								
Pauatahanui steep rural streams	Kakaho Stream		B			A			A			A								
Pauatahanui rural streams	Ration Creek		B			A			A			A								
Pauatahanui steep rural streams	Judgeford Stream	Eastern hills	C	E	C	A	A	A	A	A	A	A	A	A						
Pauatahanui rural streams	Pauatahanui Stream		C			A			A			A								
Onepoto steep rural streams	Takapu Stream		C			B			A			A			B	A	A	C	A	A
Onepoto steep rural streams	Upper Kenepuru		C			A			A			A			A	A	A	A	A	A
Pauatahanui steep rural streams	Upper Duck Creek	B	A	A	A	A	A	A	A	A	A	A								
Coastal catchments	Pukerua	Urban	B	E	C	A	A median and C max	A median and C max	A	A for median & B for 95%	A for median & B for 95%	A	D	C						
Pauatahanui urban streams	Pauatahanui fringe streams		C			B			A			A								
Pauatahanui urban streams	Lower Duck Creek		C			A			A			A								
Onepoto rural streams	Belmont Stream		C			C			B			C								
Onepoto rural streams	Stebbings Stream		C			B			B			A								
Onepoto small urban streams	Onepoto Fringe		C			B			A			B-A								
Onepoto small urban streams	Hukarito Stream		A			A			B			A								
Onepoto small urban streams	Mahinawa Stream		A			B			B			A								
Onepoto small urban streams	Titahi		C*			B			A			A								
Kenepuru Stream	Kenepuru		C			C			B			B								
Porirua Stream	Porirua		C			C-A			B			C								

WMU group	Catchment name	Proposed WMU	Dissolved copper			MCI			Periphyton			Native fish										
			Current draft objective	Proposed Current State	Proposed Objective	Current draft objective	Proposed Current State	Proposed Objective	Current draft objective	Proposed Current State	Proposed Objective	Current draft objective	Proposed Current State	Proposed Objective								
Taupo Stream and Swamp	Taupo Stream	Taupo	B-A	D-C	B	B	C	B	B	C	B	B	C	B								
Onepoto steep rural streams	Rangituhi Stream	Western Headwaters	A	A	A	-	B-A	A	-	A	A	-	C	A								
Onepoto small urban streams	Hukarito Stream		B			-			A			-			A	A						
Onepoto small urban streams	Mahinawa Stream		B			B			A			A			A							
Coastal catchments	Hongoeka to Pukerua		A			C-B			A			C										
Coastal catchments	Pukerua	Northern hills	B	A	A	-	C-B	A	-	C	B	-	B-A	A								
Coastal catchments	Hongoeka to Pukerua		A			C-B			A			C										
Coastal catchments	Whitireia		A			-			-			-										
Pauatahanui steep rural streams	Horokiri and Motukaraka		A			A			A			A			C-B	A	B	C	B	A	B-A	A
Pauatahanui steep rural streams	Kakaho Stream		A			-			-			-										
Pauatahanui rural streams	Ration Creek		A			-			-			-										
Pauatahanui steep rural streams	Judgeford Stream	Eastern hills	A	A	A	-	C-B	B	-	C	B	-	B	A								
Pauatahanui rural streams	Pauatahanui Stream		A			B			B+			A										
Onepoto steep rural streams	Takapu Stream		A			A			A			B			C-B	B	B	C	B	B	B	A
Onepoto steep rural streams	Upper Kenepuru		A			-			-			-										
Pauatahanui steep rural streams	Upper Duck Creek	A	-	-	-																	
Coastal catchments	Pukerua	Urban	B	D	C	-	C	C	-	C-B	B	-	C-B	B								
Pauatahanui urban streams	Pauatahanui fringe streams		B			-			-			-										
Pauatahanui urban streams	Lower Duck Creek		B			B			C			A										
Onepoto rural streams	Belmont Stream		C			-			-			-										
Onepoto rural streams	Stebbing Stream		A			B			B			A										
Onepoto small urban streams	Onepoto Fringe		C			-			C			C			C	C-B	B	-	C-B	B		
Onepoto small urban streams	Hukarito Stream		B			-			-			-										
Onepoto small urban streams	Mahinawa Stream		B			B			A			A										
Onepoto small urban streams	Titahi		C			-			-			-										
Kenepuru Stream	Kenepuru		C			C-B			C			B										
Porirua Stream	Porirua		C			C+			B			B										

