RWC management options for Gold Scenario

Consolidated by Project Team from material developed by Committee at 05.09.2016 and 19.09.2016 workshops.

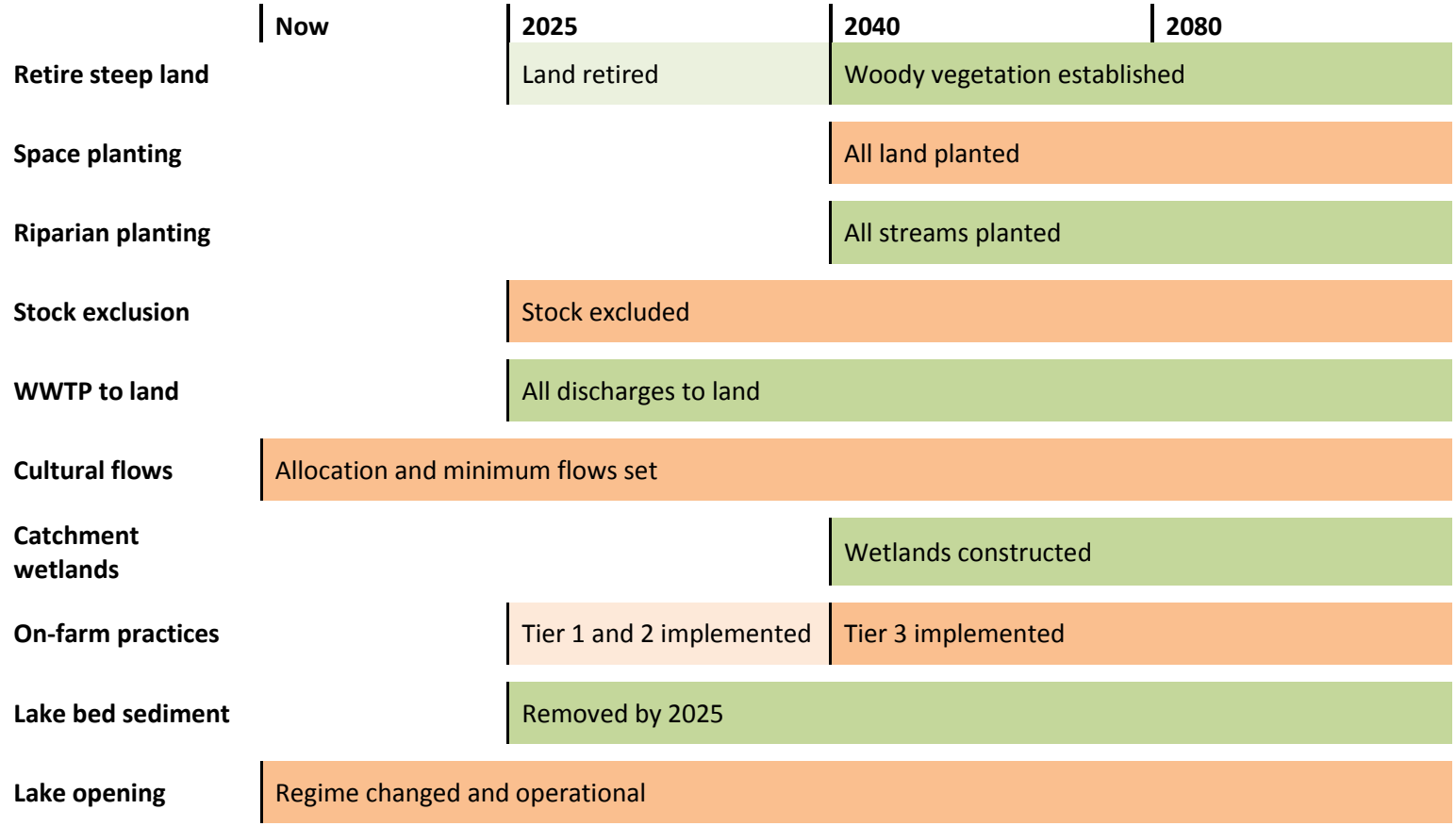
In the workshop material, timeframes for implementation of the same option at times differed between groups and/or timeframes did not align directly with the time-steps of the model architecture. The Project Team has suggested timeframes here based on the workshop material – Committee members should take the time to check these are appropriate.

	Management options				*Questions/clarifications*
	What?	**Where?**	**When?**	**Notes**	
Sediment	Retirement of very steep slopes and afforestation/reversion to bush	Very steep land in Eastern Hill country (the top ~5% of sediment load in source model)	1. Retire all land by 2025 2. Woody vegetation cover achieved by 2040	Woody vegetation could be gorse or planted species, and is assumed to be permanent	
	Space planting on steep slopes	All land of LUC class 6e and above (less top 5%, as above)	All trees planted by 2040		
	Riparian planting[1]	All streams	All trees planted by 2040	Note also a management option for pathogens, nutrients and ecosystem health	*Clarify definition of 'stream'* *What width of planting?*
	Stock exclusion from water ways[1]	All streams	Exclusion complete by 2025	Could be fencing or by another means (e.g. cliffs)	*Clarify definition of 'stream'* *Clarify which stock, i.e. are sheep in?*
Wastewater	Wastewater treatment plant are discharging only to land	All municipal WWTPs (Featherston, Martinborough, Greytown, Carterton, Masterton)	All by 2025	WWTPS must have storage and deferred irrigation	

[1] Also has benefits for reducing pathogens and nutrient inputs, and benefits to stream habitat

	Management options				*Questions/clarifications*
	What?	**Where?**	**When?**	**Notes**	
Water allocation	Total allocation and minimum flows to meet cultural values	All rivers and streams with identified cultural flows in Royal (2011)	Immediately	Will require economic analysis	*Need to establish minimum flows/allocations for water bodies not in Royal (2011)*
Wetlands	Construct wetlands throughout catchment	Catchment-scale	All plants in by 2040*		*Confirm location(s) e.g. x km around Lake Wairarapa margin* *Can this be informed by status quo output?*
On-farm mitigations	All mitigation practices from Tiers 1, 2 and 3 good management practice	All dairy, dairy support and sheep and beef farms	Tier 1 and 2 mitigations by 2025 Tier 3 mitigations by 2040	Note timing Tier 3 mitigation package (which includes riparian planting) to coincide with riparian planting option above Note reduced fertiliser use incorporated into Tier 2 mitigations	
Lakes	Remove sediment from beds of lakes	Lake Wairarapa Lake Onoke	Completed by 2025		*What method? e.g. flushing or dredging* *To what extent? e.g. to x m depth*
	Change lake opening regime (both barrage gates and Lake Onoke mouth opening)	Lake Wairarapa Lake Onoke	Start regime immediately		*What sort of regime? Open more or less often and what time of the year?*

Time line version:



Hold onto for policy approaches

Incorporates material from tables that is either a management option not possible (or efficient) to model, or is a policy option. It is proposed that these items are dealt with by recommending a policy solution in the WIP.

	Policy approaches			
	What?	**Why not in the model?**	**Any other analysis useful?**	**Notes**
Sediment	Restriction of cultivation of steep slopes	Too difficult		
	Management of sediment from cultivation of medium slopes	Farm-scale mitigation, but not part of mitigation packages modelled by Richard Muirhead		
	Sediment traps	Too difficult to identify where to place in catchment and load reduction factor		
Wastewater and stormwater	Manage onsite wastewater (septic tanks) discharges	Not enough data to model meaningfully.		Existing PA rule in plan may be sufficient, but lack of compliance big issue
	Separate stormwater and wastewater	Not able to be modelled, insufficient data		
	Manage stormwater discharges	Not able to be modelled, insufficient data. May be possible to model pathogens and sediment but not metals and hydrocarbons		Check existing policy position in PNRP
	Solids separation of agricultural effluent	Farm-scale mitigation, but not part of mitigation packages modelled by Richard Muirhead		

	Policy approaches			
	What?	**Why not in the model?**	**Any other analysis useful?**	**Notes**
Water allocation	Efficient use of water	Not able to be modelled within CMP model, but analysis will be required		
	Water metering on all users, including urban			
	Clawback water where over allocated			
On-farm mitigation	Farming to land use capacity	Policy approach. Will look into nutrient allocation options following scenario modelling	Analysis of impacts of allocation options (for nitrogen only)	
Lakes	Growing macrophytes	Policy approach. Too fine a scale option to model	The model will be able to identify conditions at which growing macrophytes could occur	
Other	River bed level management to maintain aquifer recharge	Not enough data at this stage		
	Land compaction improvement	Policy approach		