Kakaho West main stem

SEV and improvements outcome for the Kakaho west main stem taken between the track culvert above the proposed retention wetland to the lower end of the retention wetland. The stream is currently open pastures with no fencing, bank erosions related to stocking, sedimentation and nutrients. The photo below illustrates the typical condition.

Typical condition of the waterway

The offset-restored SEV components have been conservatively added to the model, and many variables are not altered from the current measured. I have only changed those with clear outcomes related to the removal of stock and riparian revegetation. This includes the fish and macroinvertebrate metrics.

With respect to the fauna, I have conservatively used my knowledge of aquatic macroinvertebrates in such open pastural soft bottomed streams and assumed a low IBI, neither of which is elevated post enhancements. The following is the modelled current Kakaho West main stem SEV from site data collection and as it will score with the proposed riparian enhancements, fencing and removal of stock and improvements on fish passage - noting the upper culvert is a full passage barrier.

Function category	Function	Variable (code)	Kakaho west	Restored
		Vchann	0.58	0.61
		Vlining	0.80	1.00
		Vpipe	1.00	1.00
Hydraulic	**NFR**	**=**	**0.65**	**0.74**

		Vbank	0.84	0.84
		Vrough	0.20	0.90
Hydraulic	**FLE**	**=**	**0.17**	**0.76**
		Vbarr	0.30	0.30
Hydraulic	**CSM**	**=**	**0.30**	**0.30**
		Vchanshape	0.55	0.53
		Vlining	0.80	1.00
Hydraulic	**CGW**	**=**	**0.72**	**0.84**
		Hydraulic function mean score	**0.46**	**0.66**
		Vshade	0.00	0.60
biogeochemical	**WTC**	**=**	**0.00**	**0.60**
		Vdod	0.34	0.50
biogeochemical	**DOM**	**=**	**0.34**	**0.50**
		Vripar	0.00	1.00
		Vdecid	1.00	1.00
biogeochemical	**OMI**	**=**	**0.00**	**1.00**
		Vmacro	0.94	0.96
		Vretain	0.66	0.64
biogeochemical	**IPR**	**=**	**0.66**	**0.64**
		Vsurf	0.62	0.70
		Vripfilt	0.60	0.80
biogeochemical	**DOP**	**=**	**0.61**	**0.75**
		Biogeochemical function mean score	**0.32**	**0.70**
		Vgalspwn	1.00	1.00
		Vgalqual	0.25	0.25
		Vgobspwn	0.10	0.10
habitat provision	**FSH**	**=**	**0.18**	**0.18**
		Vphyshab	0.39	0.78
		Vwatqual	0.03	0.28
		Vimperv	0.70	0.30
habitat provision	**HAF**	**=**	**0.38**	**0.53**
		Habitat provision function mean score	**0.28**	**0.35**
		Vfish	0.17	0.17
Biodiversity	**FFI**	**=**	**0.17**	**0.17**
		Vmci	0.49	0.59
		Vept	1.00	1.00
		Vinvert	0.47	0.58
Biodiversity	**IFI**	**=**	**0.65**	**0.72**
		Vripcond	0.10	0.80
		Vripconn	0.00	0.00
Biodiversity	**RVI**	**=**	**0.00**	**0.00**
		Biodiversity function mean score	**0.27**	**0.30**
Total average score			**0.344**	**0.552**

The improvements proposed will result in a Circa 0.21 SEV benefit – that which was expected and estimated in the assessment.

The model and the used parameters is available on request.

I note that the lower river (lower has the same dimensions and substrates flows and habitat but the flood plains are more expanded to wide (10-20m) soft mud flats which are deep (>0.75m) contain largely semi-natural wetland pasture edges and the trees present which form a very loose canopy in places are macrocarpa. The riparian restoration here will focus on pukatea, kahikatea and swamp maire forest. This does not change the SEV gains out comes.

Transect photos (missing #9)

Transect 1

Transect 2

Transect 3

Transect 4

Transect 5

Transect 6

Transect 7

Transect 8

Missing
Transect 9

Transect 10