

## River Template File

This memo discusses the format of the river template files. MODFLOW uses the river file to obtain the location of the river, the riverbed conductance, the riverbed thickness, and the stage of the river. PEST uses the river template file to identify where it should insert the riverbed conductance values it wants used in the next model run.

## Definitions

Template files tell PEST how to supply the model with the parameter values PEST wants the model to use for the current model run.

Riverbed conductance is a lumped parameter consisting of the hydraulic conductivity of the riverbed material (K) times the average width of the river in the model cell (W) times the length of the river in the model cell (L) divided by the thickness of the riverbed material (M). Riverbed conductance =  $KLW/M$

## Discussion

The first line of a pilot point template file consists of the letters "ptf" followed by a parameter delimiter. The parameter delimiter is chosen by the user but it cannot be an alpha (a-z, A-Z) or numeric (0-9), and it must not be used in any other capacity within the file. MODFLOW ignores lines beginning with a pound sign (#). These lines frequently are used to annotate the file. The following two lines contain the typical header information from a MODFLOW river file. 2394 is MXACTR which is short for maximum number of river cells active during any stress period. 50 is IRIVCB which is both a flag and a unit number, if IRIVCB is greater than zero, then cell-by-cell flow terms will be written to this unit number. The NOPRINT option request that the river file not be reproduced in the list file. The next line contains the number of active river cells during this stress period (2394 = ITMP) and the number of MODFLOW parameters used this stress period<sup>1</sup> (0 = NP). The next line begins a listing of the 2394 active river cells, one per row. Each line contains layer (LAY), row (ROW), column (COL), stage (STAGE), the parameter space identified by the two parameter delimiters, and the river bottom (RBOT). The parameter space consists of the space between and including a pair of parameter delimiters. The parameter name lies

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<sup>1</sup> The joint USGS and IDWR Wood River Model is using PEST as its parameter estimation software, not the parameter estimation capabilities associated with MODFLOW.

between the pair of parameter delimiters. The adjustable parameters in this template file are all riverbed conductance parameters, PEST will replace the parameter delimiters and the parameter name with a new riverbed conductance value every time it runs the model. Table 1 is the key to the parameter names, and Figure 1 is a map showing the location of the reaches identified in Table 1.

**Table 1. River and spring reaches and their associated parameter names.**

<b>Reach</b>	<b>Parameter Name</b>
Wood R. nr Ketchum-Hulen Rd	WR_nKe_Hul
Wood R. Hulen Rd-Ketchum	WR_Hul_Ket
Wood R. Ketchum-Gimlet	WR_Ket_Gim
Wood R. Gimlet-Hailey	WR_Gim_Hai
Wood R. Hailey-North Broadford Rd	WR_Hai_NBr
Wood R. North Broadford Rd-South Broadford Rd	WR_NBr_SBr
Wood R. South Broadford Rd-Glendale Rd	WR_SBr_Gle
Wood R. Glendale Rd-Sluder Rd	WR_Gle_Slu
Wood R. Sluder Rd-Wood R Ranch	WR_Slu_WRR
Wood R. Wood R Ranch-Stanton Crossing	WR_WRR_StC
Willow Cr	WillowCr
Buhler Drain above Hwy20	BuhlerDrn
Patton Cr above Hwy20	PattonCr
Cain Cr above Hwy20	CainCr
Chaney Cr above Hwy20	ChaneyCr
Mud Cr above Hwy20	MudCr
Wilson Cr above Hwy20	CoveCr
Cove Cr above Hwy20	CoveCr
Loving Cr above Hwy20	LovingCr
Spring Cr below Hwy20	SpringCr
Silver Cr = Sportsman Access-nr Picaboo	SilverCr

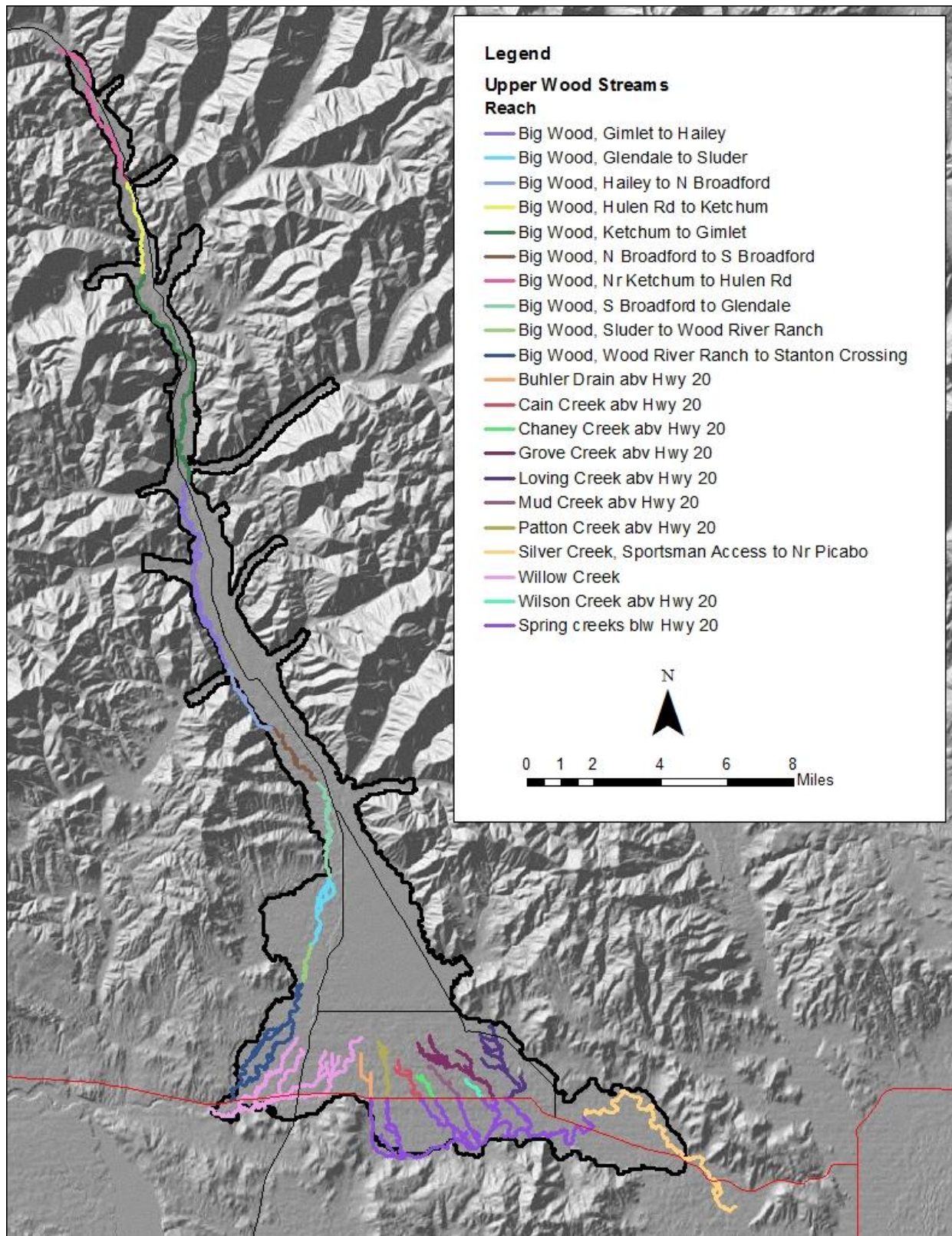


Figure 1. River reaches with adjustable riverbed conductances.

ptf \$

#WRV----STEADY STATE

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2394 50 NOPRINT MXACTR,IRIVCB

2394 0 ITMP,NP

1	2	2	1899.494045	\$	WR_nKe_Hul	\$	1898.579645	LAY,ROW,COL,STAGE,COND,RBOT
1	2	3	1898.125150	\$	WR_nKe_Hul	\$	1897.210750	
1	2	4	1896.774109	\$	WR_nKe_Hul	\$	1895.859709	
1	3	4	1894.983317	\$	WR_nKe_Hul	\$	1894.068917	
1	3	5	1895.763764	\$	WR_nKe_Hul	\$	1894.849364	
1	4	5	1893.095442	\$	WR_nKe_Hul	\$	1892.181042	
1	4	6	1892.112913	\$	WR_nKe_Hul	\$	1891.198513	
1	4	7	1892.844821	\$	WR_nKe_Hul	\$	1891.930421	
1	5	7	1889.912886	\$	WR_nKe_Hul	\$	1888.998486	
1	5	8	1889.247486	\$	WR_nKe_Hul	\$	1888.333086	
1	6	8	1888.020802	\$	WR_nKe_Hul	\$	1887.106402	
1	6	9	1888.686015	\$	WR_nKe_Hul	\$	1887.771615	
1	7	8	1886.563128	\$	WR_nKe_Hul	\$	1885.648728	
1	7	9	1888.300645	\$	WR_nKe_Hul	\$	1887.386245	
1	8	8	1886.096607	\$	WR_nKe_Hul	\$	1885.182207	
1	8	9	1885.575804	\$	WR_nKe_Hul	\$	1884.661404	
1	9	9	1884.667826	\$	WR_nKe_Hul	\$	1883.753426	
1	11	11	1881.687149	\$	WR_nKe_Hul	\$	1880.772749	
1	12	11	1880.750780	\$	WR_nKe_Hul	\$	1879.836380	
1	13	11	1879.505983	\$	WR_nKe_Hul	\$	1878.591583	
1	14	11	1878.702827	\$	WR_nKe_Hul	\$	1877.788427	
1	15	11	1877.615558	\$	WR_nKe_Hul	\$	1876.701158	
1	16	11	1876.103029	\$	WR_nKe_Hul	\$	1875.188629	
1	17	11	1873.710477	\$	WR_nKe_Hul	\$	1872.796077	
1	18	10	1876.748075	\$	WR_nKe_Hul	\$	1875.833675	
1	18	11	1872.083545	\$	WR_nKe_Hul	\$	1871.169145	
1	19	10	1877.321496	\$	WR_nKe_Hul	\$	1876.407096	
1	19	11	1870.230805	\$	WR_nKe_Hul	\$	1869.316405	
1	20	11	1868.641063	\$	WR_nKe_Hul	\$	1867.726663	
1	21	10	1869.645932	\$	WR_nKe_Hul	\$	1868.731532	
1	21	11	1867.613630	\$	WR_nKe_Hul	\$	1866.699230	
1	22	10	1867.279615	\$	WR_nKe_Hul	\$	1866.365215	
1	22	11	1867.233025	\$	WR_nKe_Hul	\$	1866.318625	
1	23	11	1867.366225	\$	WR_nKe_Hul	\$	1866.451825	
1	23	12	1867.298190	\$	WR_nKe_Hul	\$	1866.383790	
1	24	12	1865.724193	\$	WR_nKe_Hul	\$	1864.809793	
1	25	12	1866.419991	\$	WR_nKe_Hul	\$	1865.505591	
1	25	13	1865.763339	\$	WR_nKe_Hul	\$	1864.848939	
1	26	13	1863.109211	\$	WR_nKe_Hul	\$	1862.194811	
1	27	13	1861.650164	\$	WR_nKe_Hul	\$	1860.735764	
1	27	14	1863.293764	\$	WR_nKe_Hul	\$	1862.379364	
1	28	14	1860.316241	\$	WR_nKe_Hul	\$	1859.401841	
1	29	13	1862.526970	\$	WR_nKe_Hul	\$	1861.612570	