APPENDIX D: MODELLING QUALITY REPORT

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TECHNICAL NOTE

DATE	10 July 2010
TO	Moreton Bay Regional Council
FROM	Leonard Cheung
COPY	
PROJECT	301001-01156
SUBJECT	Upper Pine River Modelling Quality Report
DOC NO	
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INTRODUCTION

A detailed TUFLOW model of the Upper Pine River (UPR) minor basin has been developed as part of Moreton Bay Regional Council's (MBRC) Regional Floodplain Database (RFD) Stage 2 project.

This technical note is prepared to demonstrate that the performance of the UPR model is suitable for the intended use and the associated model outputs can be adopted by MBRC for the RFD to deliver reliable flood information across the Upper Pine River minor basin.

MODEL PERFORMANCE

Model stability, warning messages and mass errors were monitored throughout model simulation periods to ensure that the model performance was acceptable. Careful attention has been paid to ensure that flows through the 1D structure elements in the model as well as flows over the floodplain in the 2D domain were stable during model simulation period.

Overland flow hydrographs were checked at key locations in the floodplain (PO lines) and the North Pine Dam to ensure the simulation extended well beyond the peak throughout the UPR study area, especially the downstream boundary at the spillway of North Pine Dam.

To demonstrate there are no significant loss or gain of flood volumes during model runs, a check of the mass balance of the flood volumes for the three selected critical durations of the 10Yr, 100Yr ARI and PMF flood events has been undertaken and presented in the following Table 1.

Table 1: Mass Balance Check

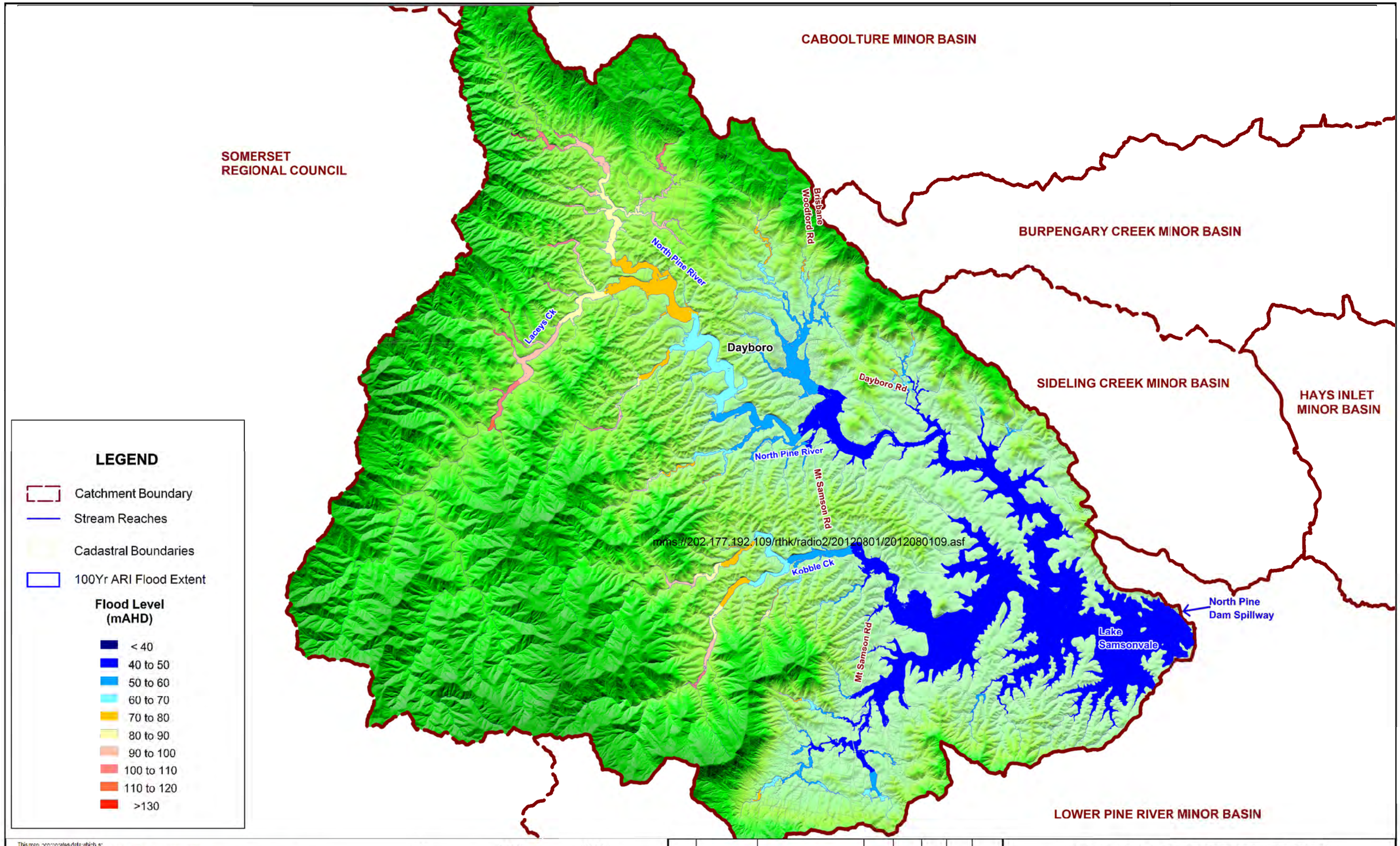
Event	10Yr ARI			100Yr ARI			PMF		
Critical Duration	**120M**	**180M**	**1440M**	**120M**	**180M**	**1440M**	**120M**	**180M**	**300M**
Volume at Start (m3)	150279643	150279643	150279643	150279643	150279643	150279643	150286372	150286372	150286372
Volume at End (m3)	152107881	152110211	154098262	152310816	152324251	156452171	194571075	210209130	234258971
Total Volume In (m3)	29717201	33884391	62052618	46497672	53630859	109996627	221094484	270587084	338217864
Total Volume Out (m3)	27903777	32039001	58193128	44529767	51577001	103696482	176782843	210623717	254211260
Volume Error (m3)	14814	-14823	-40872	63268	-9250	-127617.00	-26937	-40608	-34005
Final Cummulative ME (%)	0.01%	-0.01%	-0.03%	0.04%	-0.01%	-0.06%	-0.01%	-0.01%	-0.01%

The above table shows that there are no significant loss and gain of flood volume during the modelling and the mass balance errors are within the range of -0.06% to +0.04% for the critical duration runs of the three design events.

CONCLUSIONS

The quality of the UPR model run has been reviewed. It is considered that the overall model performance is suitable for the intended use and the associated model outputs can be adopted for the MBRC RFD to deliver reliable flood information across the Upper Pine River minor basin.

APPENDIX E: FLOOD MAPS – 100 YEAR ARI



LEGEND

- Catchment Boundary
- Stream Reaches
- Cadastral Boundaries
- 100Yr ARI Flood Extent

Flood Level (mAHD)

- < 40
- 40 to 50
- 50 to 60
- 60 to 70
- 70 to 80
- 80 to 90
- 90 to 100
- 100 to 110
- 110 to 120
- >130

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE E1 PEAK FLOOD LEVEL MAP - 100 YEAR ARI

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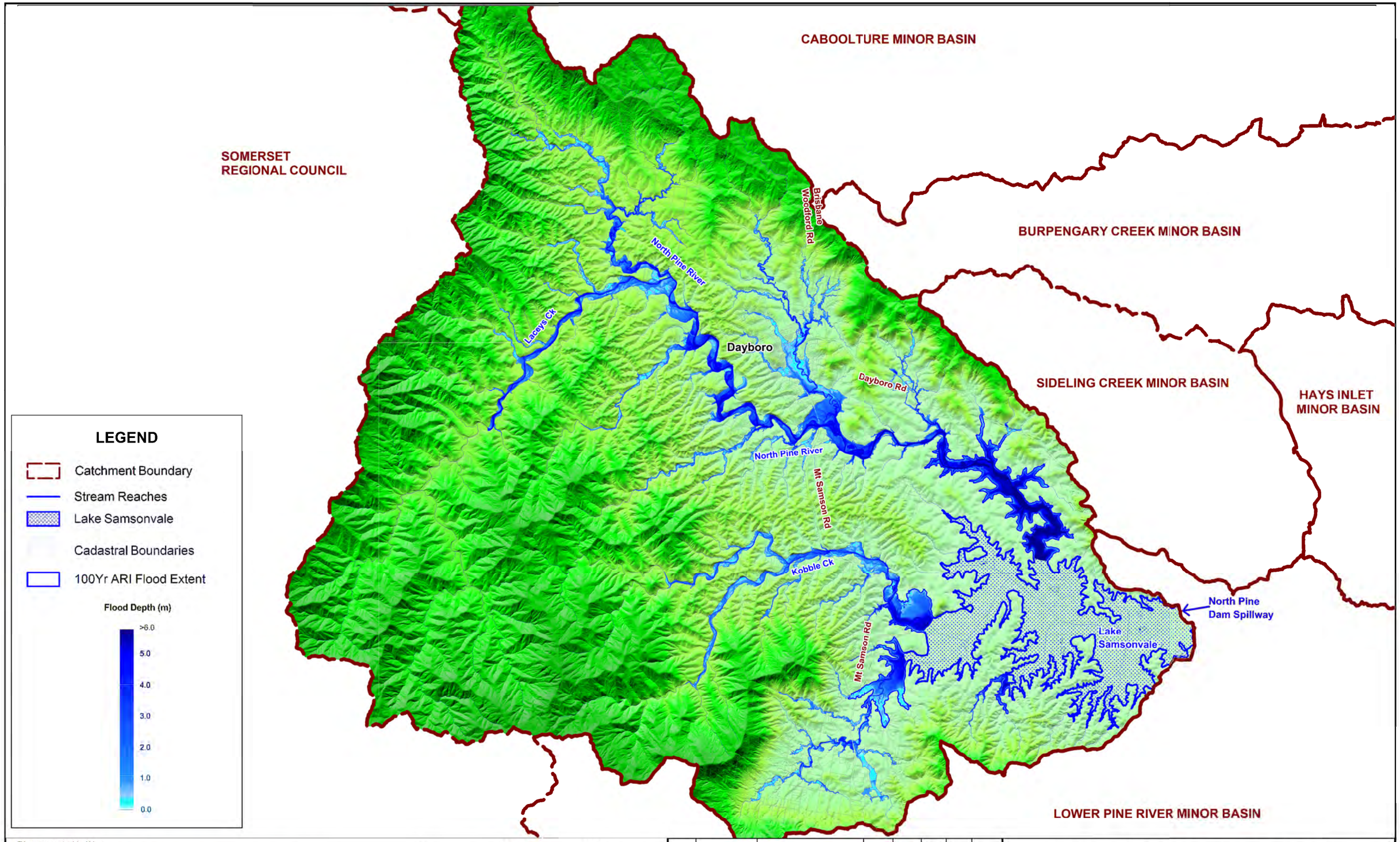

0 2500 5000m

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UPPER PINE RIVER
FIGURE E2 PEAK FLOOD DEPTH MAP - 100 YEAR ARI

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SIDELING CREEK MINOR BASIN

HAYS INLET
MINOR BASIN

LOWER PINE RIVER MINOR BASIN

Brisbane Woodford Rd

North Pine River

Lacey's Ck

Dayboro

Dayboro Rd

North Pine River

Mt Samson Rd

Kobble Ck

Mt Samson Rd

North Pine
Dam Spillway

Lake
Samsonvale

LEGEND

- Catchment Boundary
- Stream Reaches
- Lake Samsonvale
- Cadastral Boundaries
- 100Yr ARI Flood Extent

Flood Velocity (m/s)

8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0

0 2500 5000m

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE E3 PEAK FLOOD VELOCITY MAP - 100 YEAR ARI

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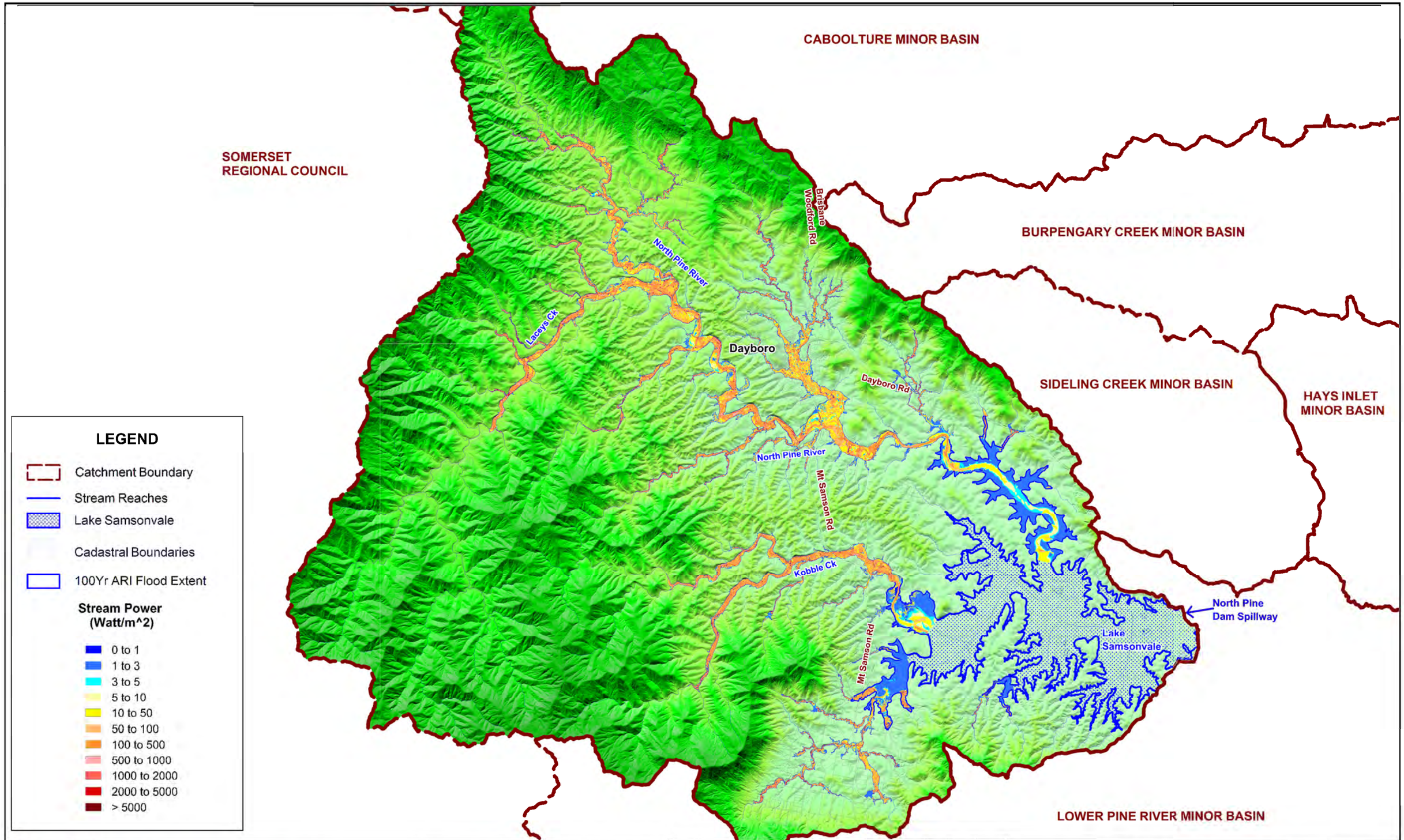

0 2500 5000m

SCALE - 1:100,000 (at A3)

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UPPER PINE RIVER
FIGURE E4 PEAK STREAM POWER MAP - 100 YEAR ARI

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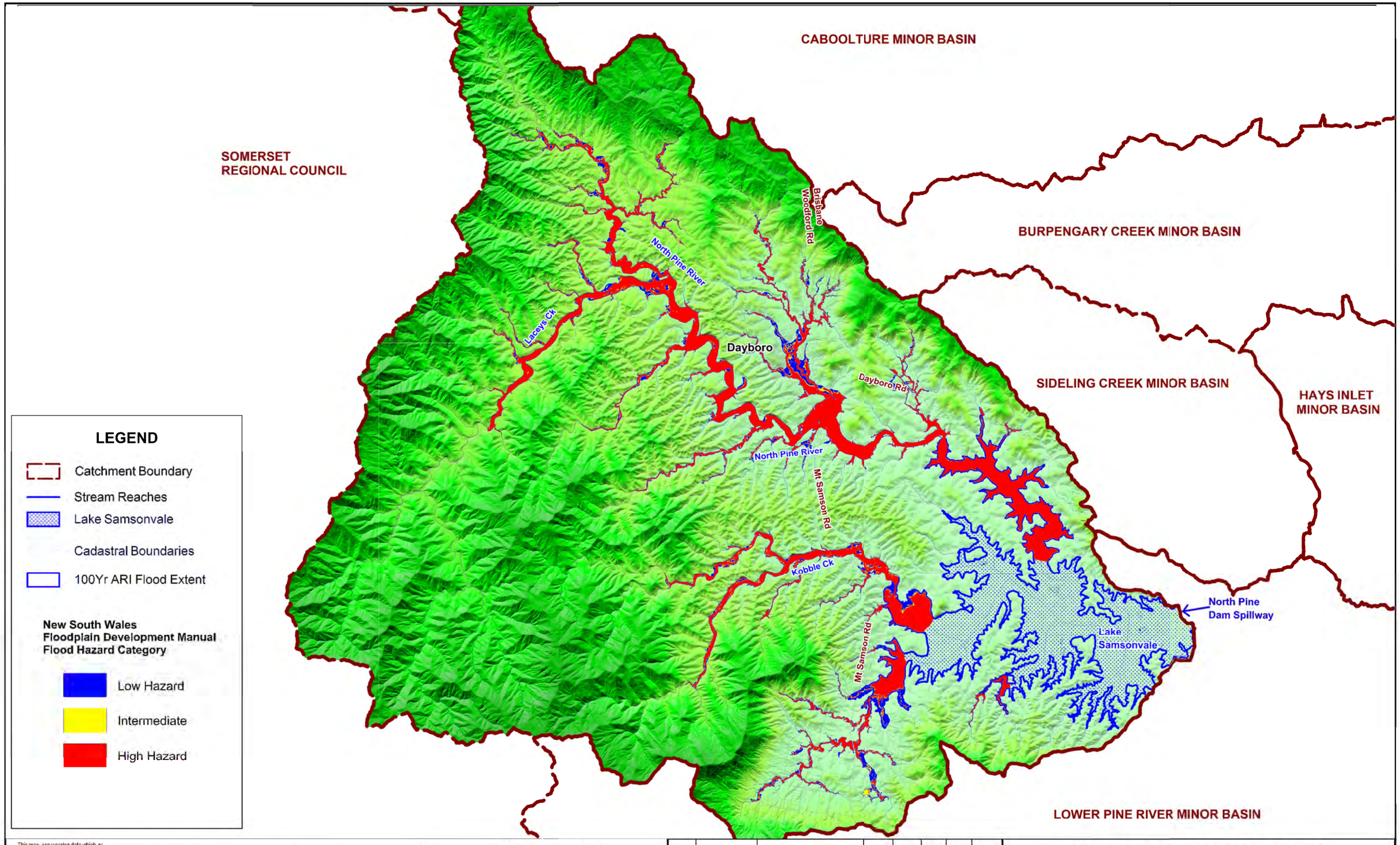

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE E5 PEAK FLOOD HAZARD MAP - 100 YEAR ARI

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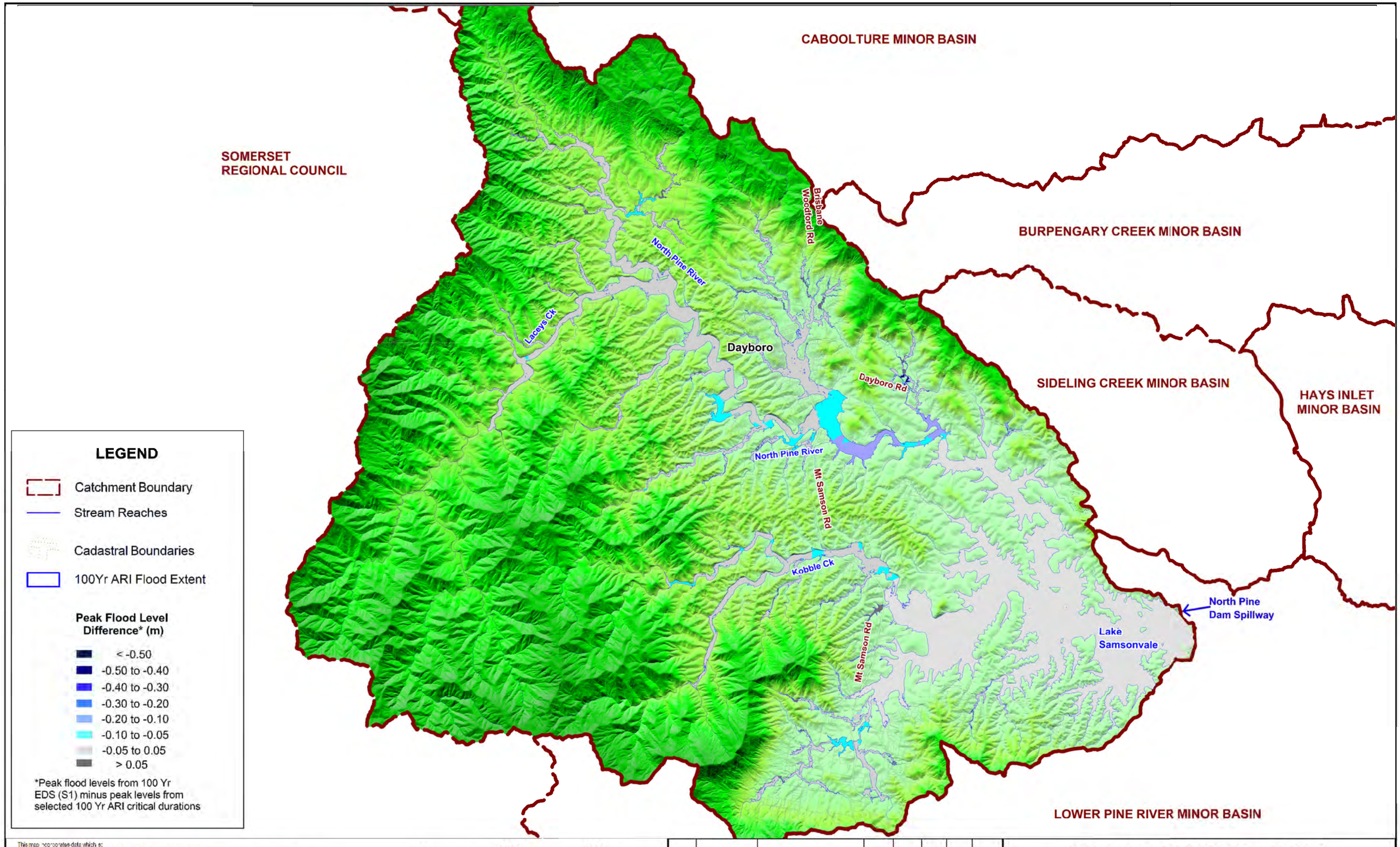
APPENDIX F: MODEL SENSITIVITY ANALYSIS MAPS



LEGEND

- Catchment Boundary
- Stream Reaches
- Cadastral Boundaries
- 100Yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- -0.50 to -0.40
- -0.40 to -0.30
- -0.30 to -0.20
- -0.20 to -0.10
- -0.10 to -0.05
- -0.05 to 0.05
- > 0.05

*Peak flood levels from 100 Yr EDS (S1) minus peak levels from selected 100 Yr ARI critical durations

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F1 FLOOD LEVEL DIFFERENCE BETWEEN EDS AND SELECTED CRITICAL STORM DURATIONS - 100 YR ARI (S1)

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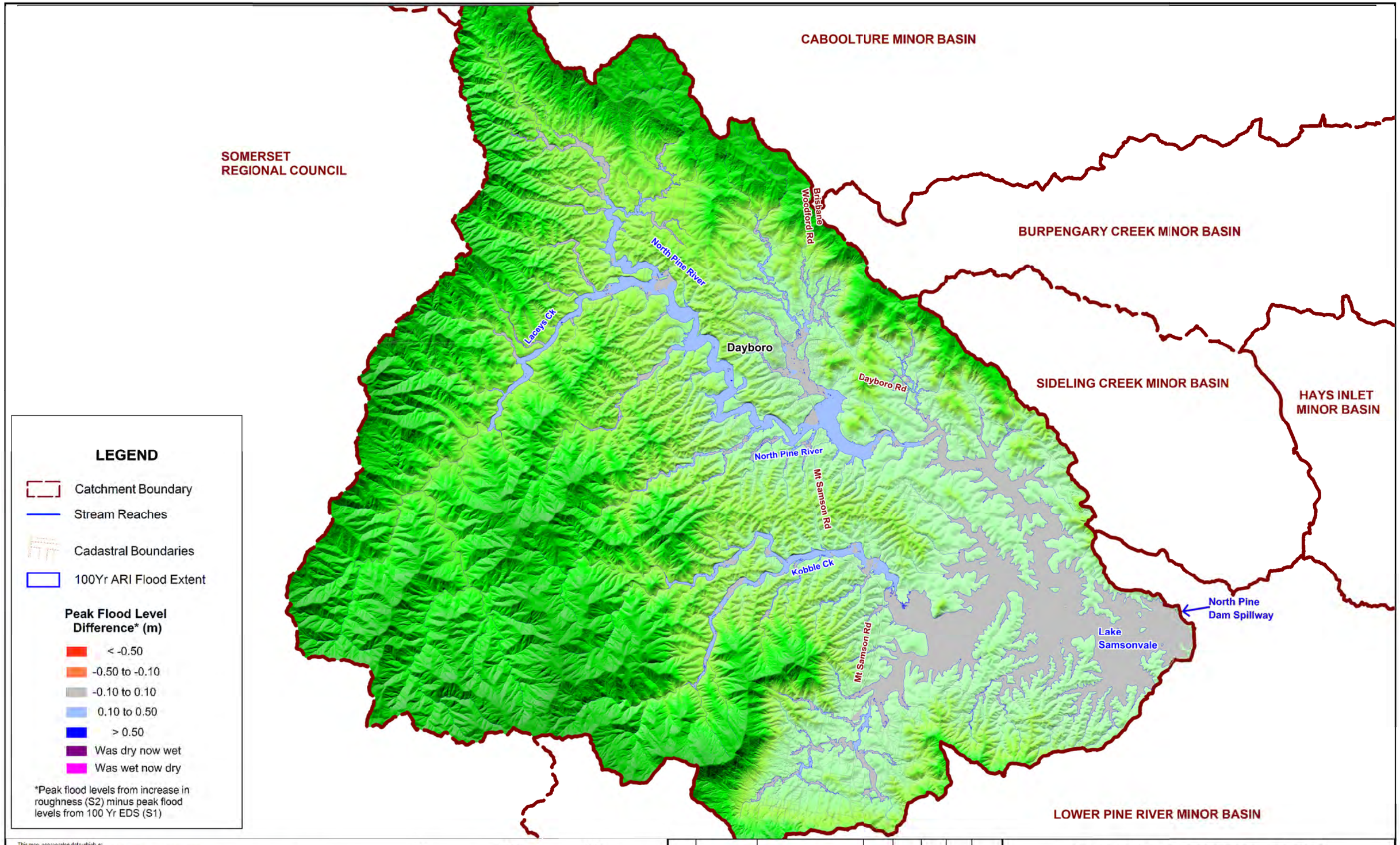

LEGEND

- Catchment Boundary
- Stream Reaches
- Cadastral Boundaries
- 100Yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- -0.50 to -0.10
- -0.10 to 0.10
- 0.10 to 0.50
- > 0.50
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in roughness (S2) minus peak flood levels from 100 Yr EDS (S1)

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F2 INCREASE IN ROUGHNESS FLOOD LEVEL IMPACT - 100 YEAR EDS (S2)

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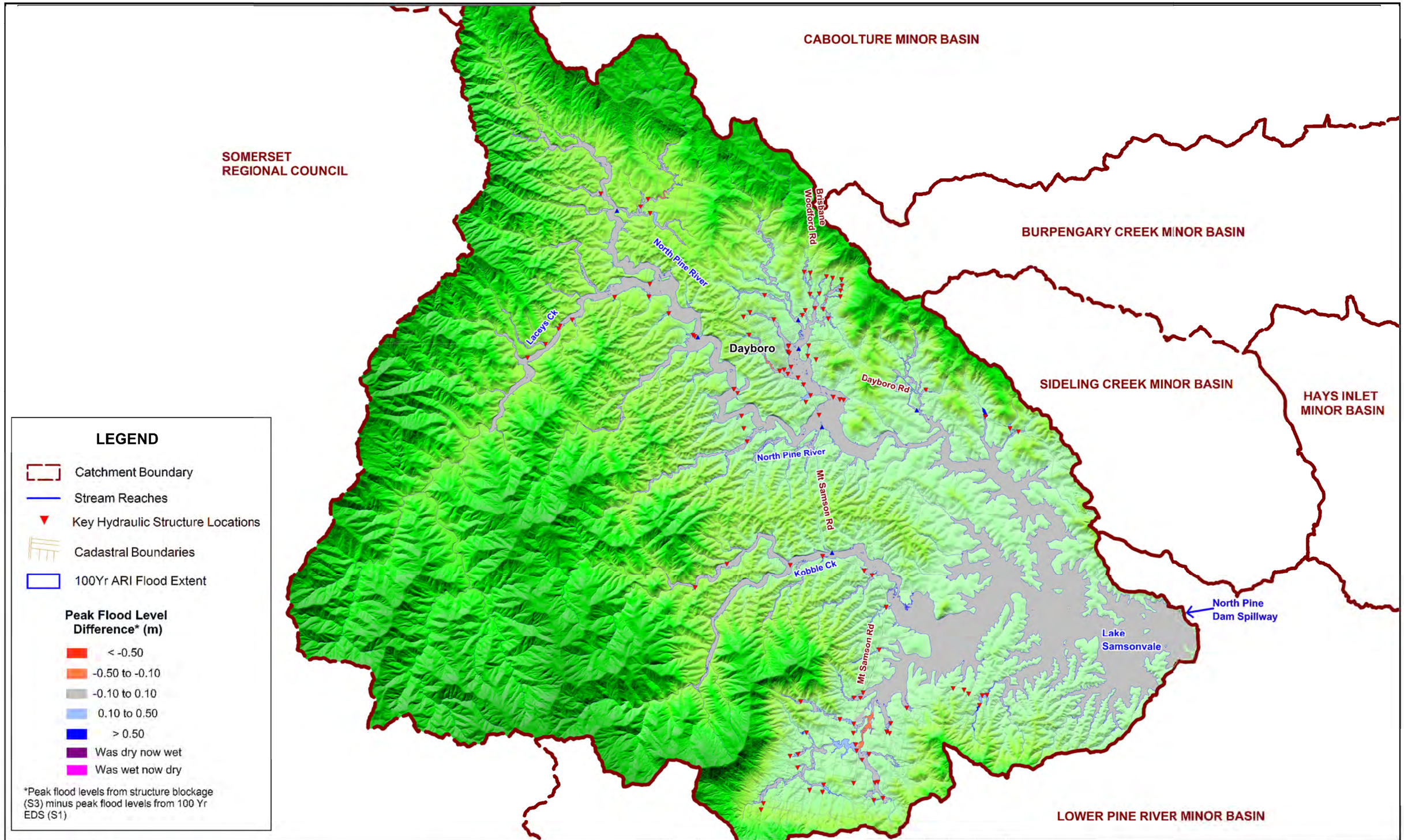

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F3 STRUCTURE BLOCKAGE FLOOD LEVEL IMPACT - 100 YEAR EDS (S3)

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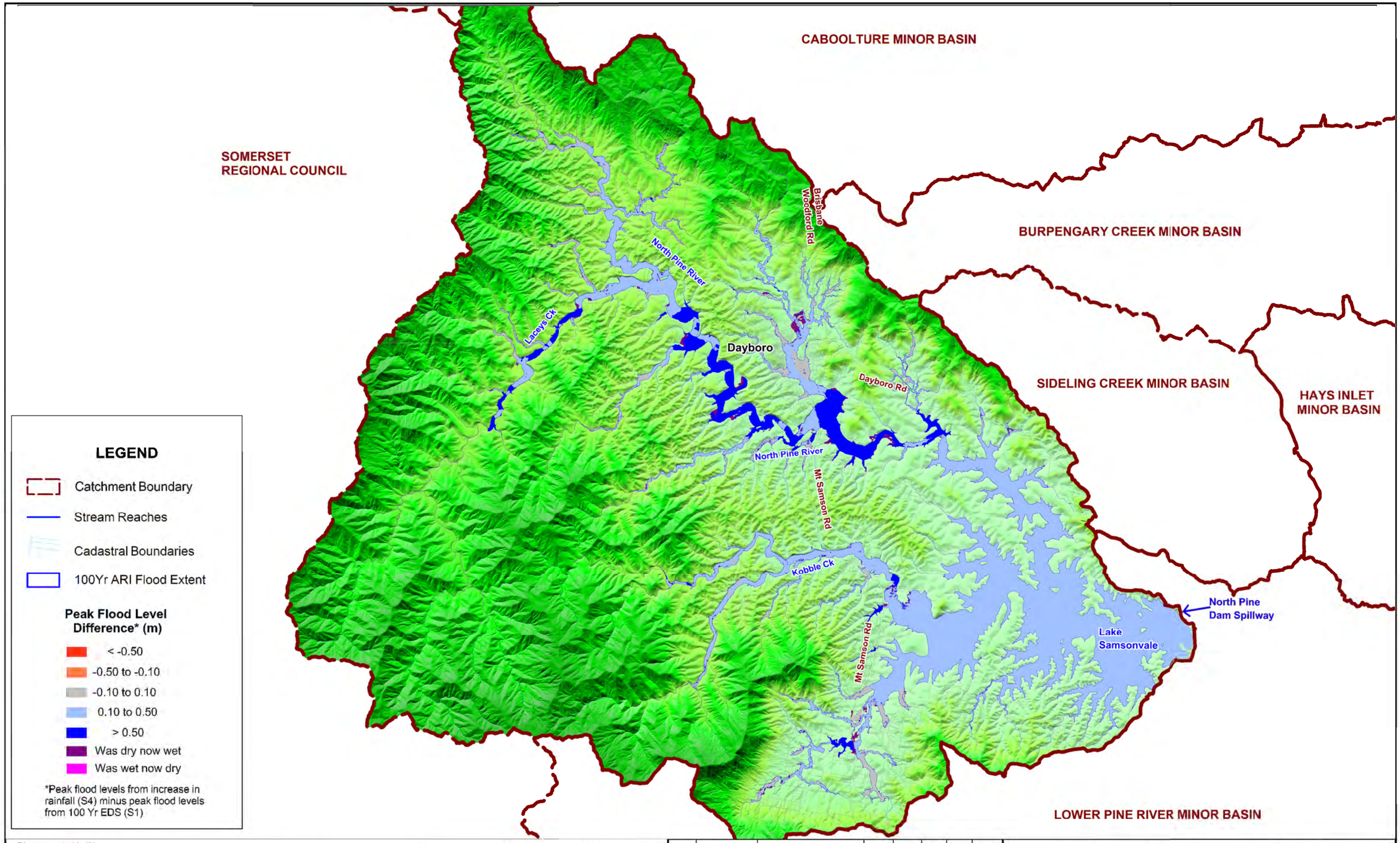

LEGEND

- Catchment Boundary
- Stream Reaches
- Cadastral Boundaries
- 100Yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- -0.50 to -0.10
- -0.10 to 0.10
- 0.10 to 0.50
- > 0.50
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in rainfall (S4) minus peak flood levels from 100 Yr EDS (S1)

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F4 INCREASE IN RAINFALL FLOOD LEVEL IMPACT - 100 EDS (S4)

Project No: 301001-01156	Figure:301001-01156-EN-DAL-0079	Rev: 0

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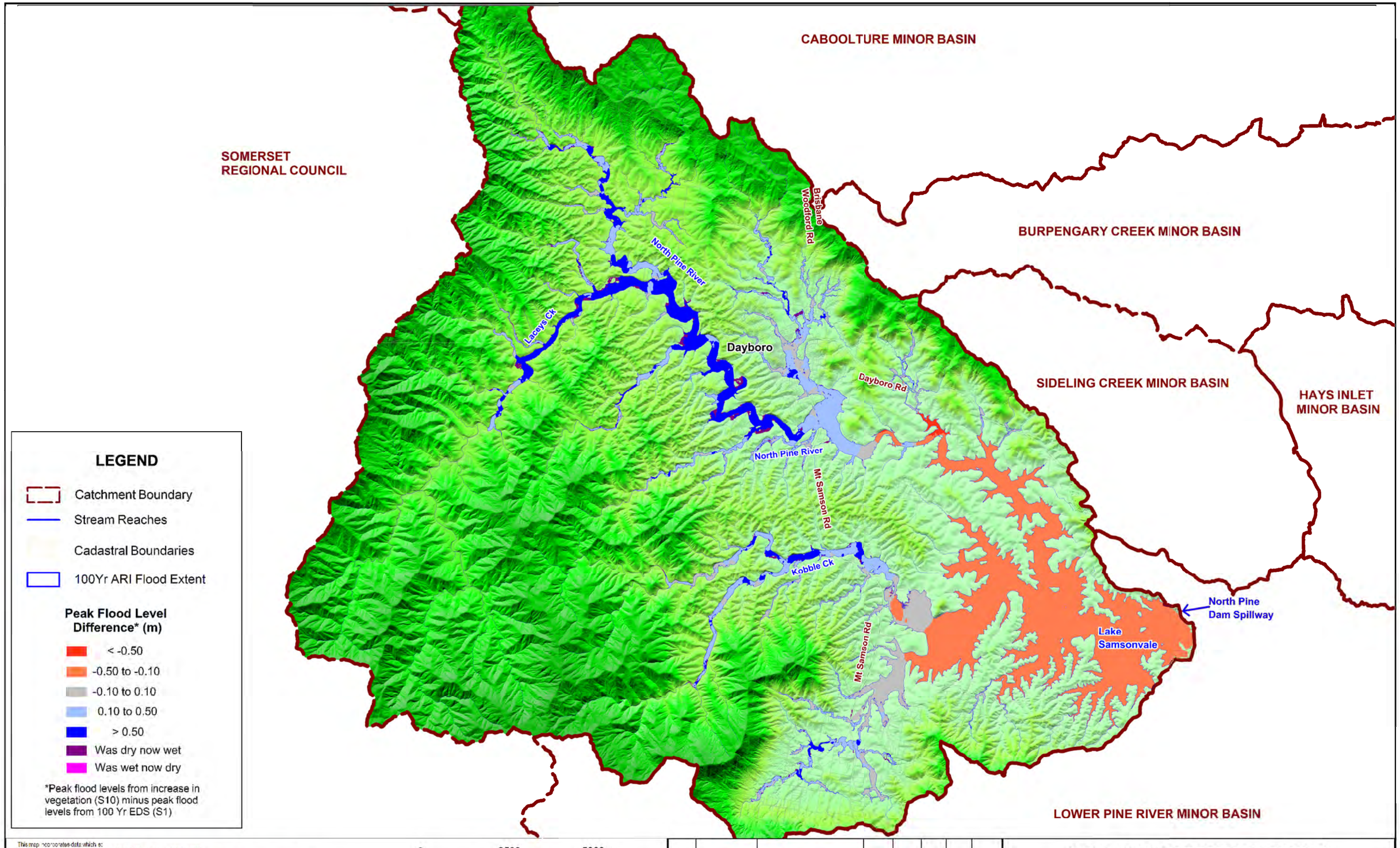

LEGEND

- Catchment Boundary
- Stream Reaches
- Cadastral Boundaries
- 100Yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- -0.50 to -0.10
- -0.10 to 0.10
- 0.10 to 0.50
- > 0.50
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in vegetation (S10) minus peak flood levels from 100 Yr EDS (S1)

0 2500 5000m

SCALE - 1:100,000 (at A3)

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F10 INCREASE IN VEGETATION FLOOD LEVEL IMPACT - 100 EDS (S10)

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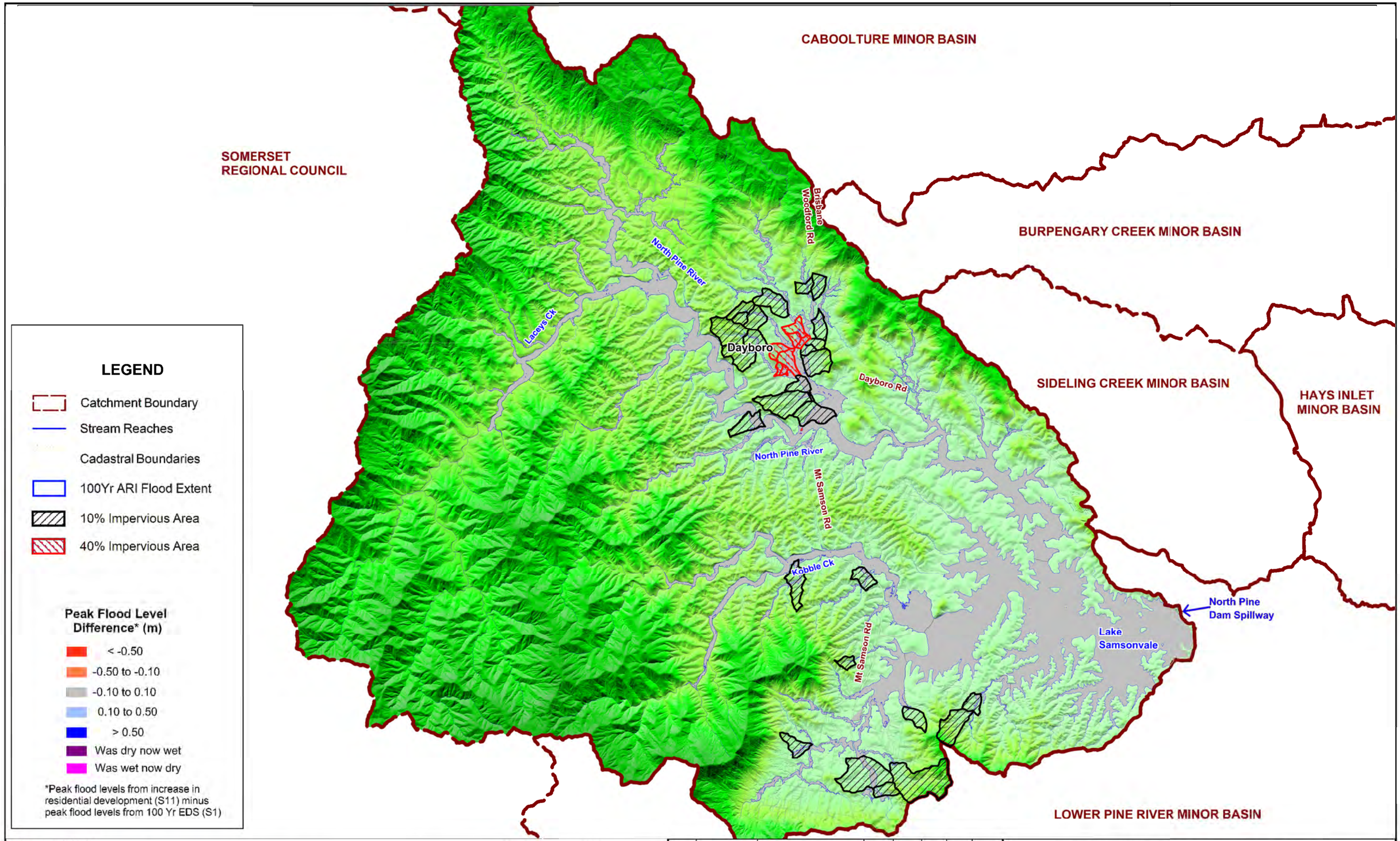

0 2500 5000m

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F11 INCREASE IN RESIDENTIAL DEVELOPMENT FLOOD LEVEL IMPACT - 100 EDS (S11)

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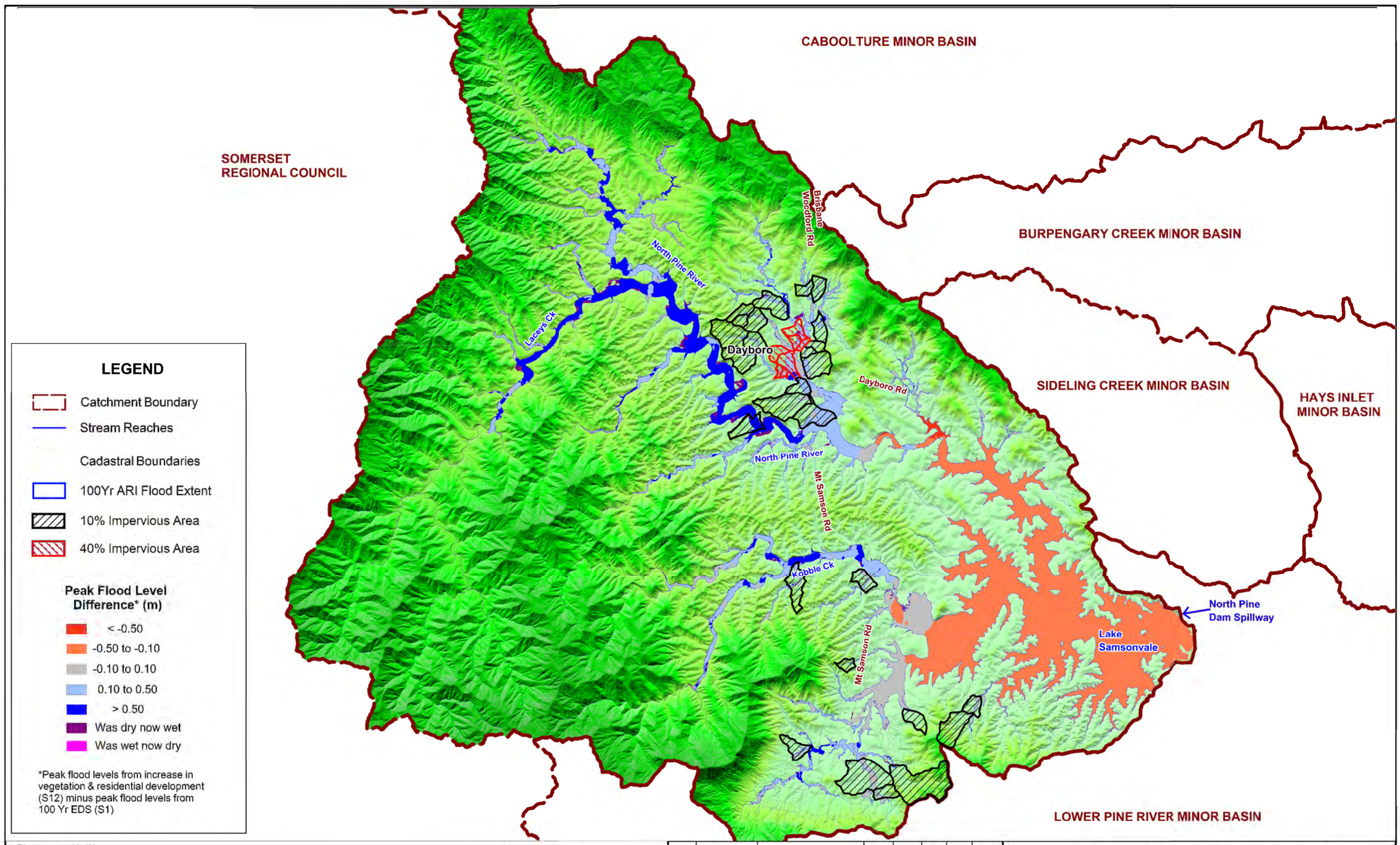

0 2500 5000m

SCALE - 1:100,000 (at A3)

Latitude / Longitude
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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
UPPER PINE RIVER
FIGURE F12 INCREASE IN VEGETATION & RESIDENTIAL DEVELOPMENT FLOOD LEVEL IMPACT - 100 EDS (S12)

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