

DECEMBER  
2009

# SUPPORTING MAP BOOK

## RIVERINA BIOREGION REGIONAL FOREST ASSESSMENT RIVER RED GUMS AND WOODLAND FORESTS

natural  
resources  
commission



## The supporting map book is to be read in conjunction with the final assessment report.

It has been designed to provide additional mapping detail for selected A4 document figures included in the final assessment report. It allows the reader to more readily distinguish features of interest throughout the study area.

Figure numbers in the map book correspond with those in the final assessment report and not all figures have been represented.

### Enquiries

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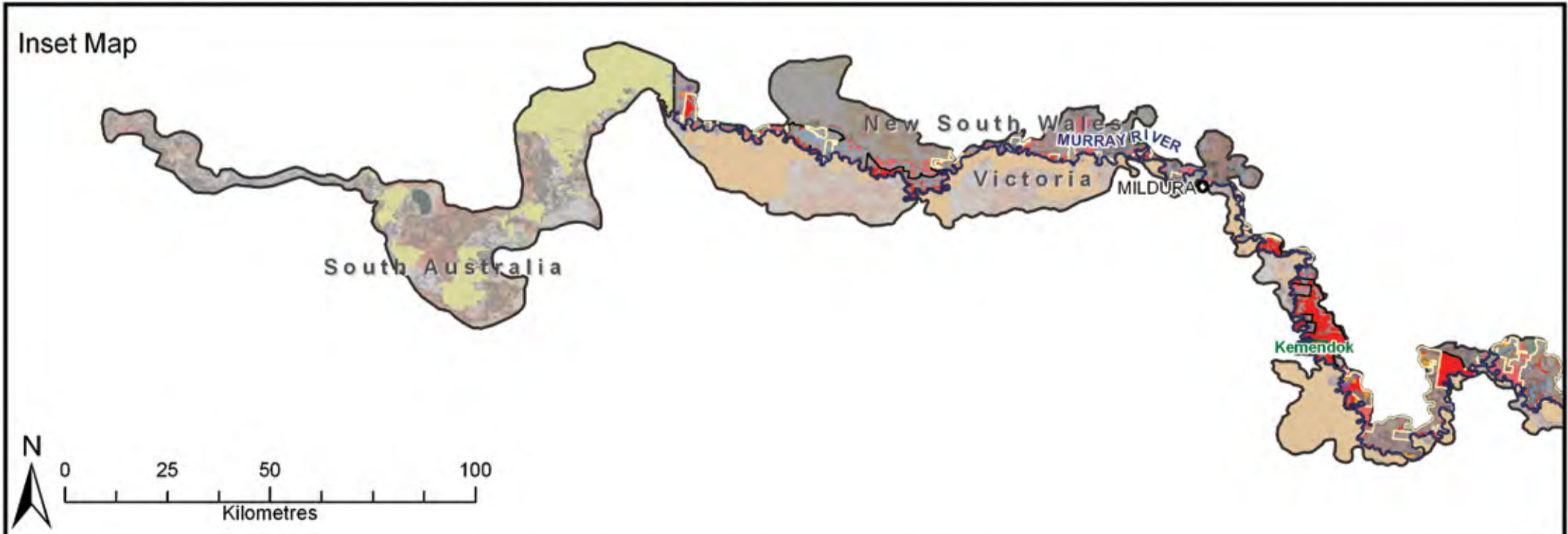
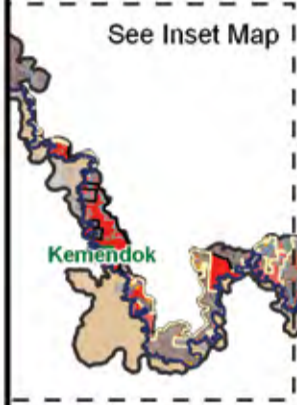
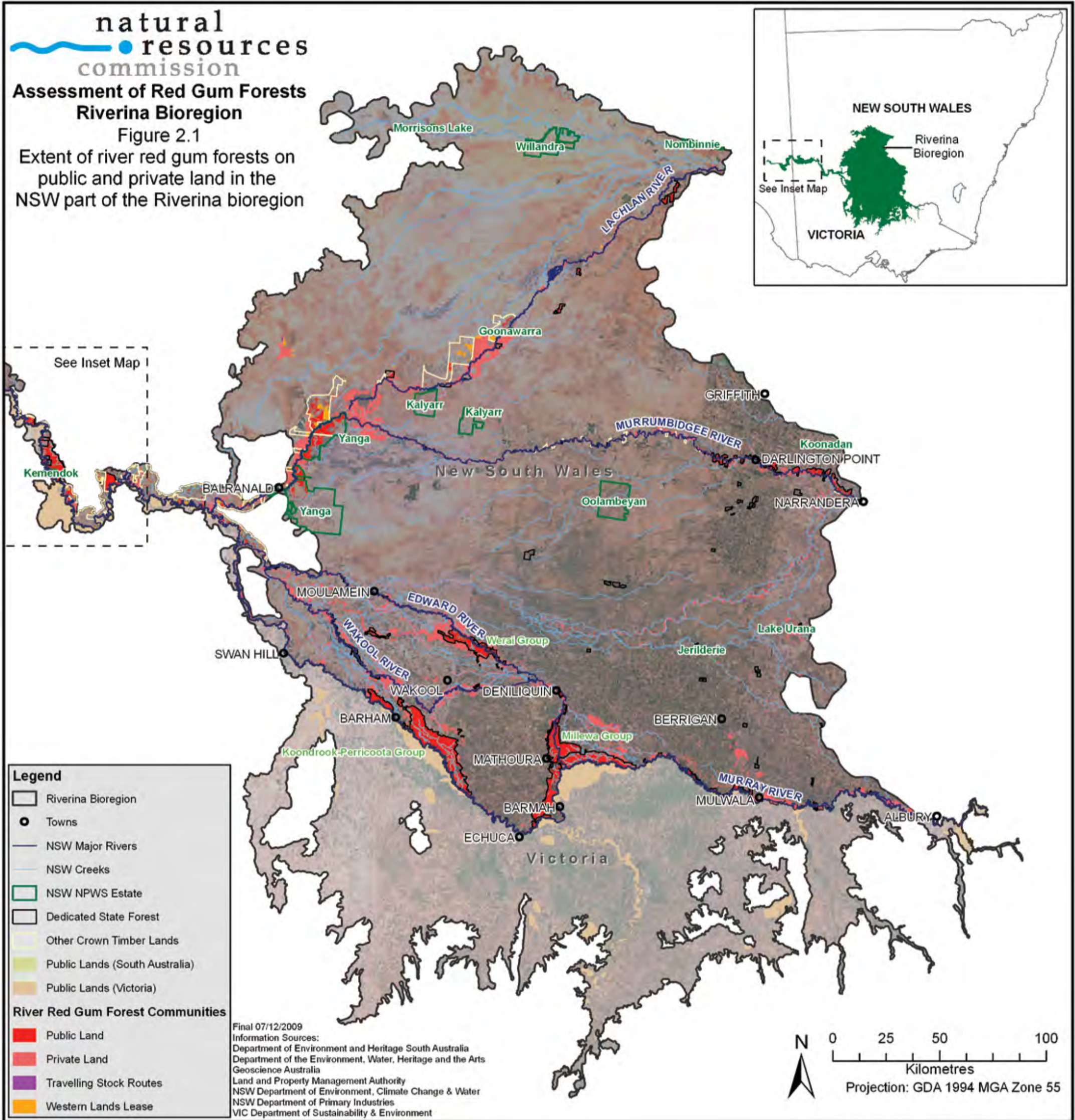
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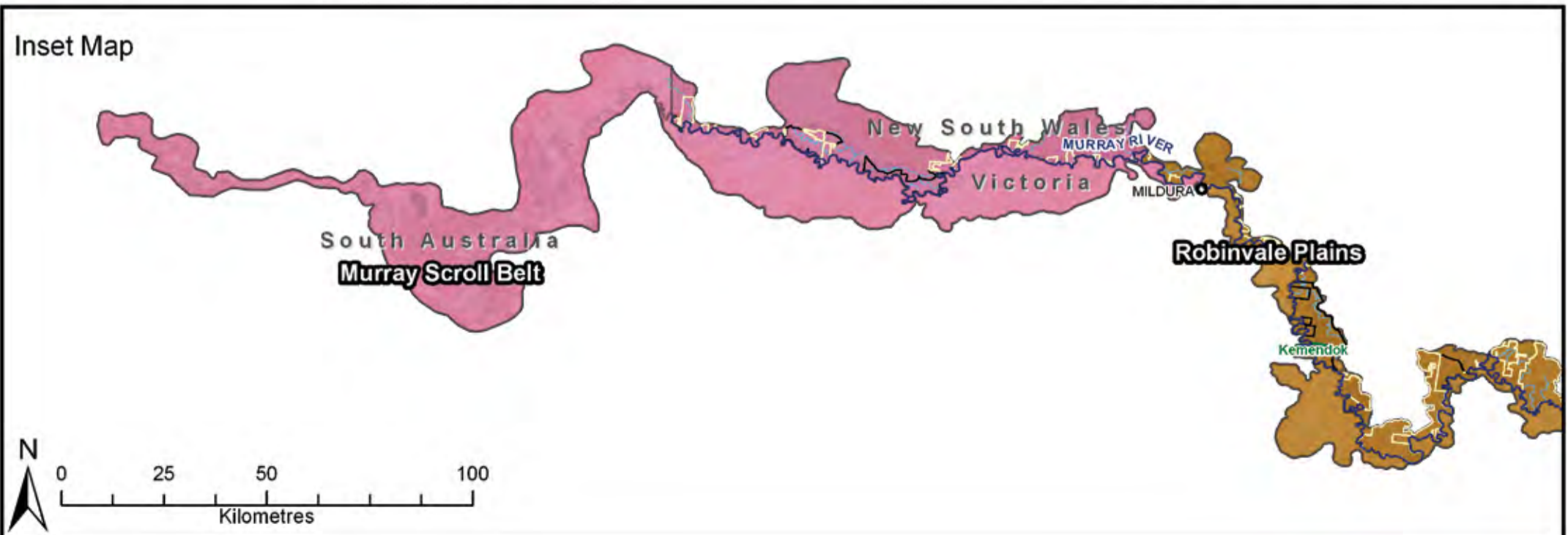
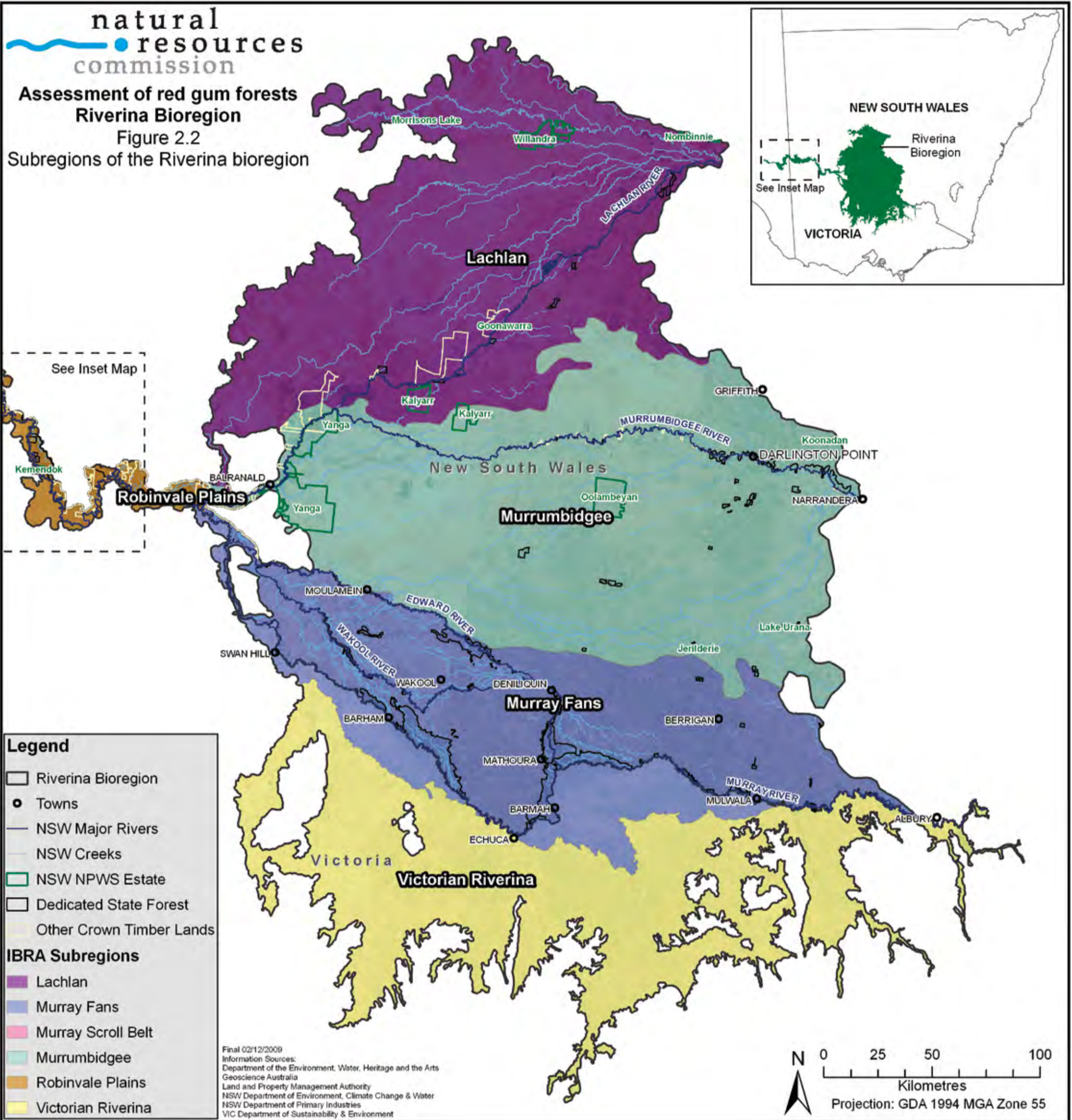
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.1

Extent of river red gum forests on public and private land in the NSW part of the Riverina bioregion



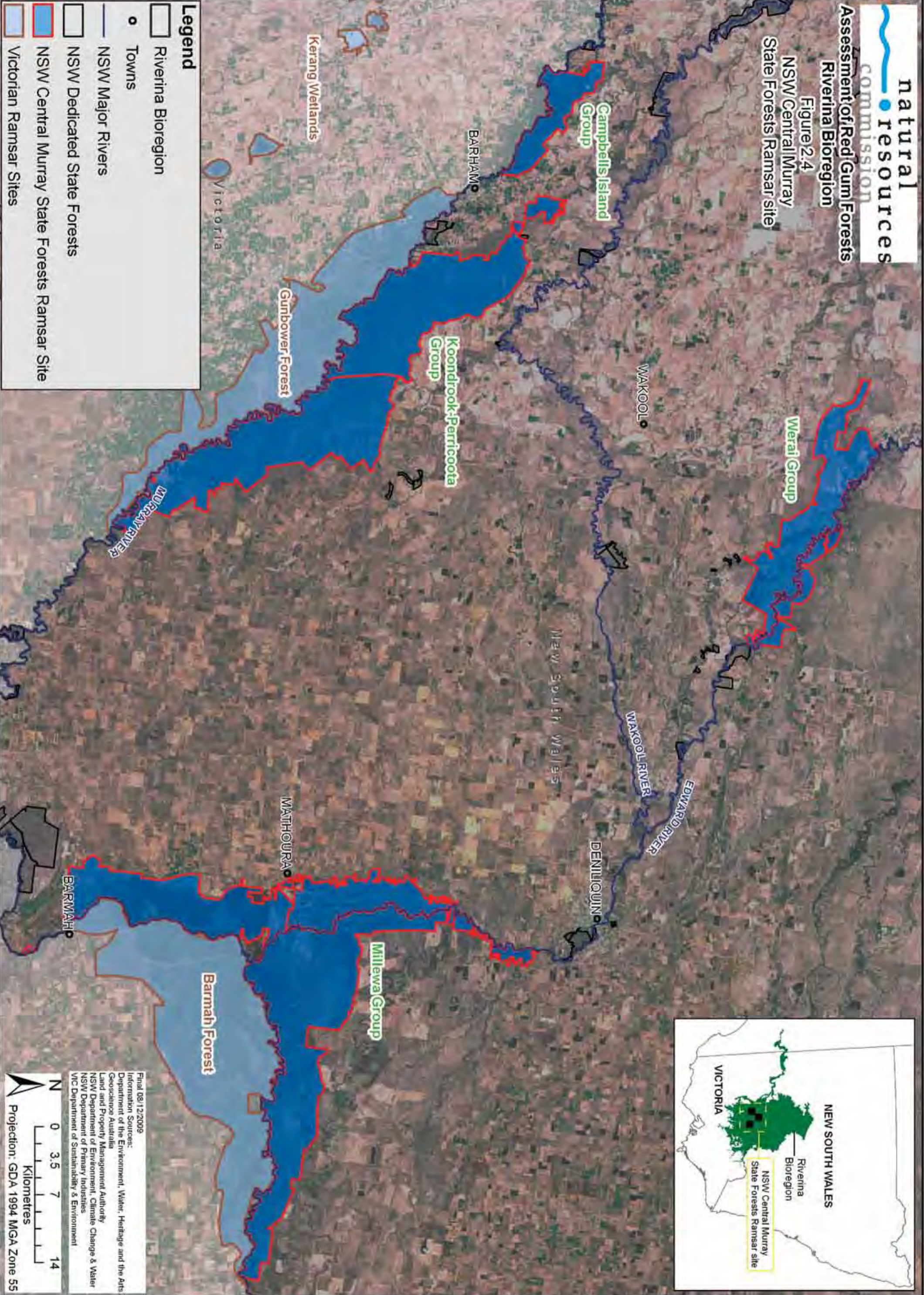






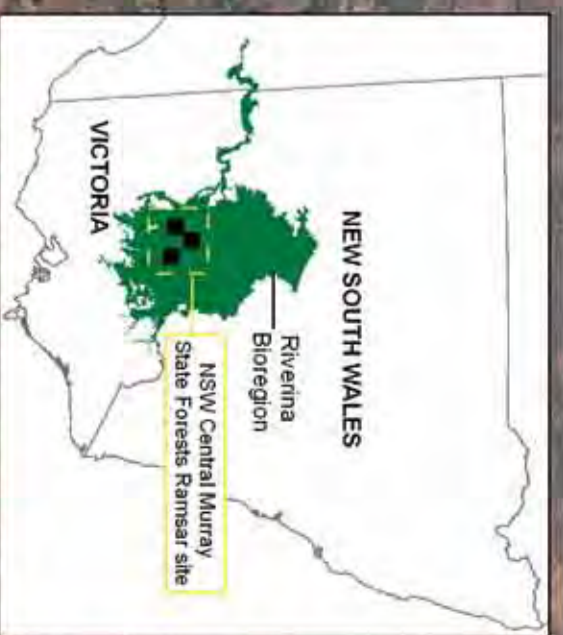
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.4  
NSW Central Murray  
State Forests Ramsar site

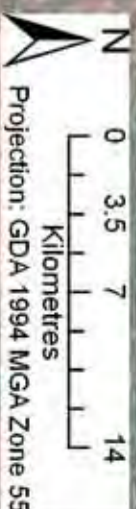


Legend

- Riverina Bioregion
- Towns
- NSW Major Rivers
- NSW Dedicated State Forests
- NSW Central Murray State Forests Ramsar Site
- Victorian Ramsar Sites

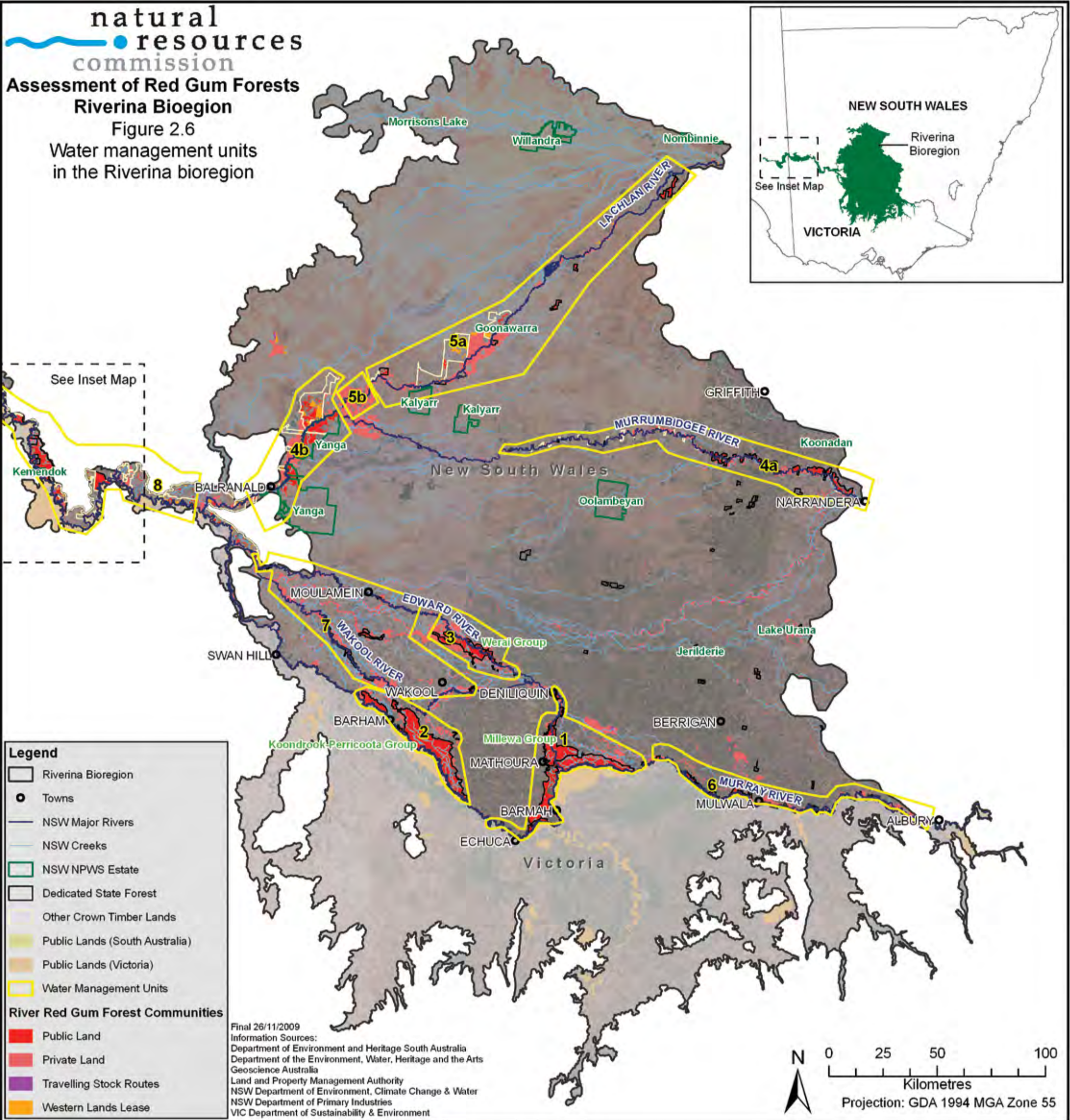


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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment





Assessment of Red Gum Forests  
Riverina Bioregion  
Figure 2.6  
Water management units  
in the Riverina bioregion



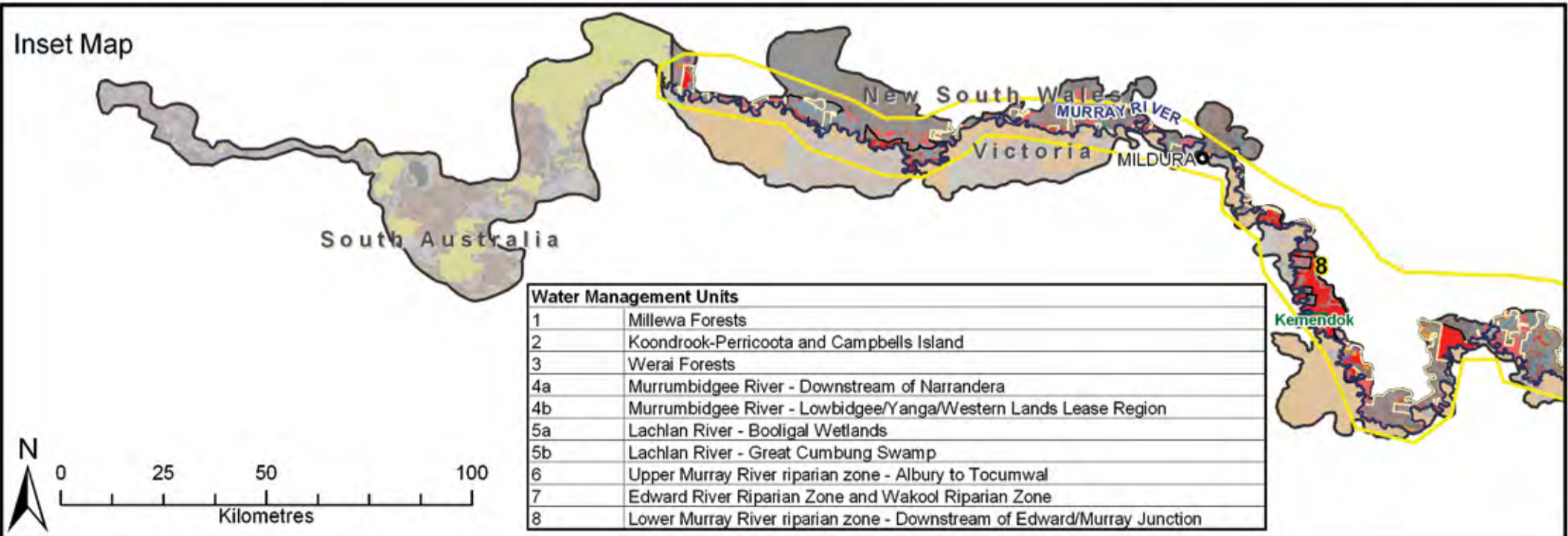
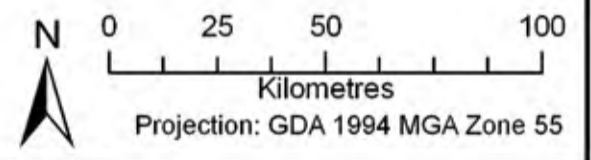
**Legend**

- Riverina Bioregion
- Towns
- NSW Major Rivers
- NSW Creeks
- NSW NPWS Estate
- Dedicated State Forest
- Other Crown Timber Lands
- Public Lands (South Australia)
- Public Lands (Victoria)
- Water Management Units

**River Red Gum Forest Communities**

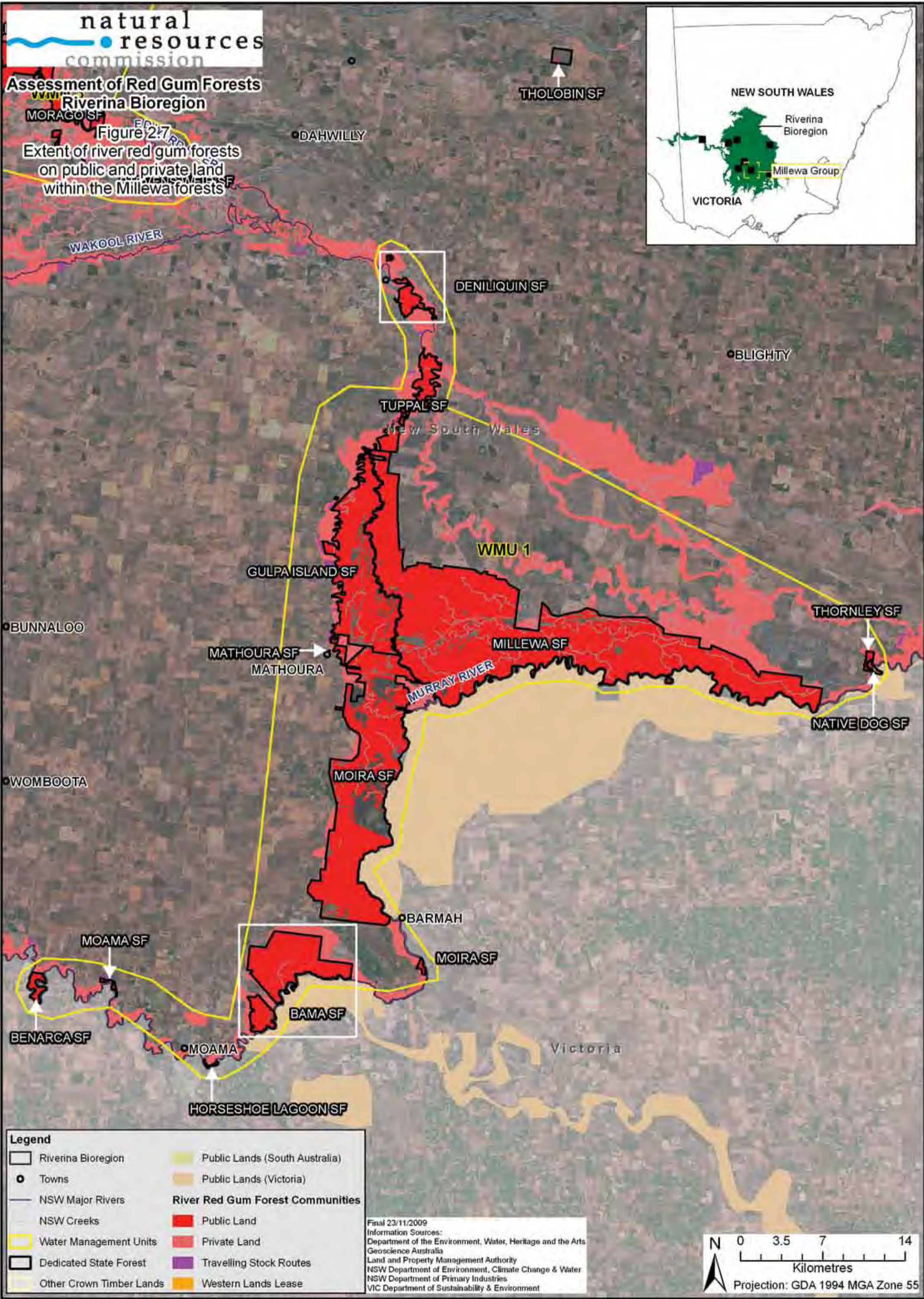
- Public Land
- Private Land
- Travelling Stock Routes
- Western Lands Lease

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Information Sources:  
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Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment



Water Management Units	
1	Millewa Forests
2	Koondrook-Perricoota and Campbells Island
3	Weral Forests
4a	Murrumbidgee River - Downstream of Narrandera
4b	Murrumbidgee River - Lowbidgee/Yanga/Western Lands Lease Region
5a	Lachlan River - Boodigal Wetlands
5b	Lachlan River - Great Cumbung Swamp
6	Upper Murray River riparian zone - Albury to Tocumwal
7	Edward River Riparian Zone and Wakool Riparian Zone
8	Lower Murray River riparian zone - Downstream of Edward/Murray Junction





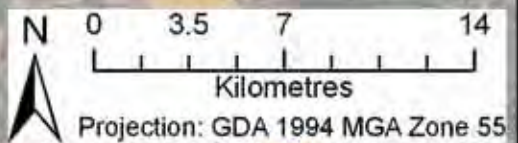
Assessment of Red Gum Forests  
 Riverina Bioregion  
 Figure 2.7  
 Extent of river red gum forests on public and private land within the Millewa forests



**Legend**

Riverina Bioregion	Public Lands (South Australia)
Towns	Public Lands (Victoria)
NSW Major Rivers	<b>River Red Gum Forest Communities</b>
NSW Creeks	Public Land
Water Management Units	Private Land
Dedicated State Forest	Travelling Stock Routes
Other Crown Timber Lands	Western Lands Lease

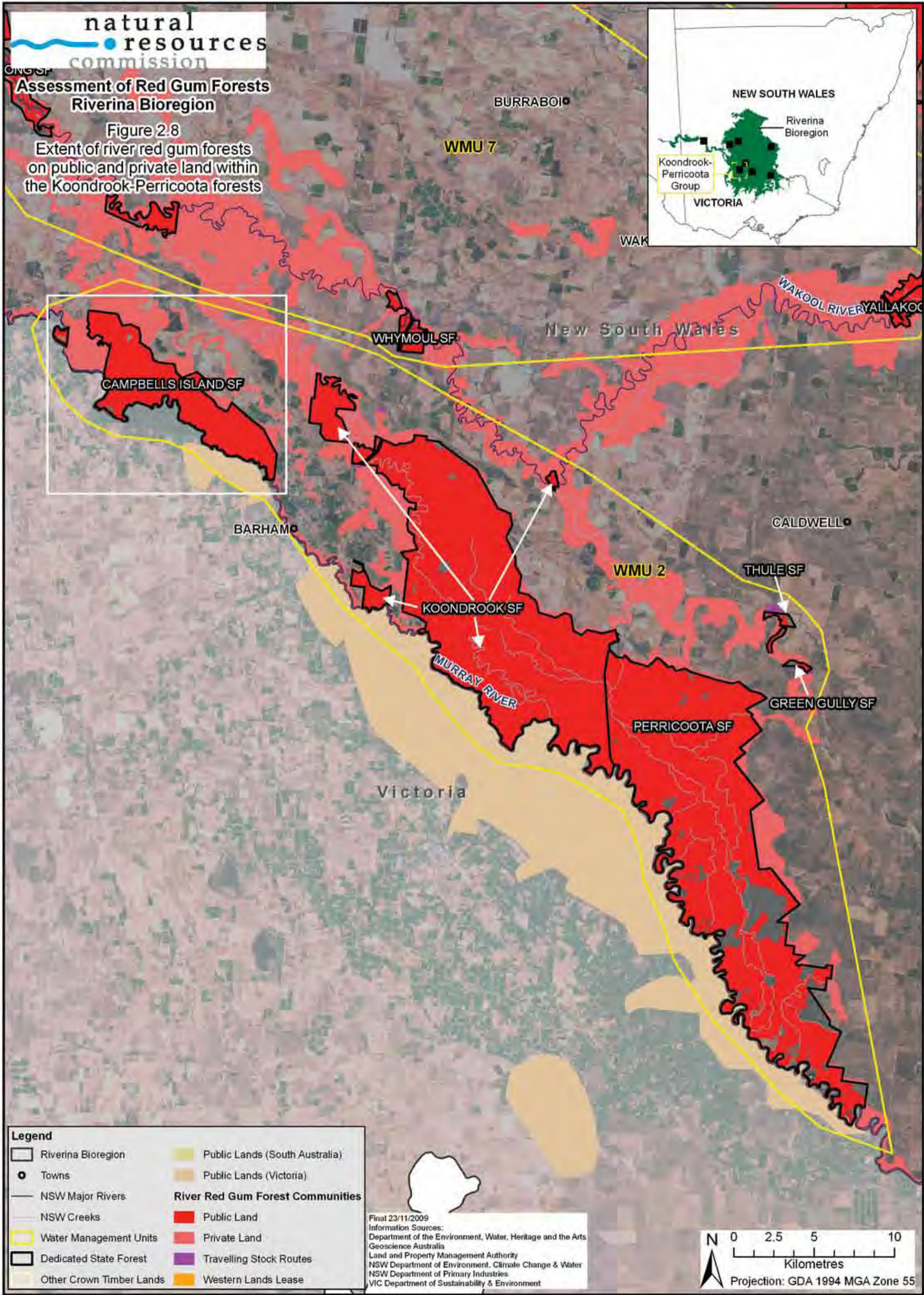
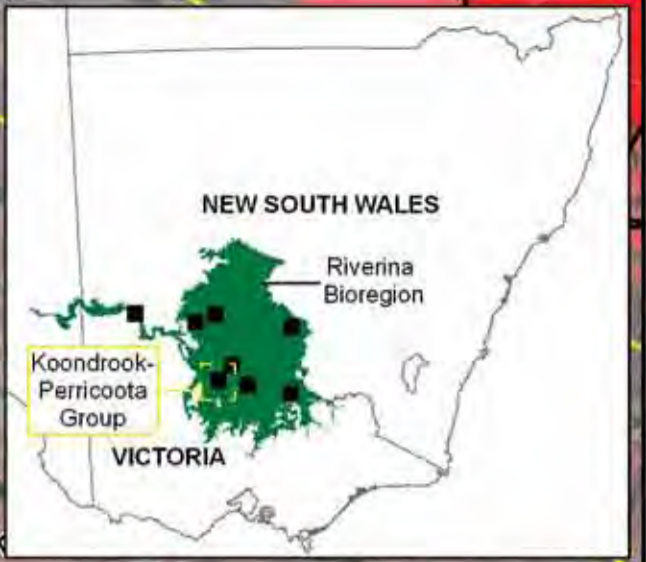
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 NSW Department of Primary Industries  
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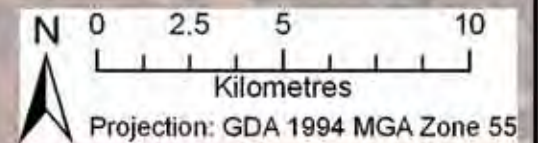
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.8  
Extent of river red gum forests  
on public and private land within  
the Koondrook-Perricoota forests



Legend	
	Riverina Bioregion
	Towns
	NSW Major Rivers
	NSW Creeks
	Water Management Units
	Dedicated State Forest
	Other Crown Timber Lands
	Public Lands (South Australia)
	Public Lands (Victoria)
River Red Gum Forest Communities	
	Public Land
	Private Land
	Travelling Stock Routes
	Western Lands Lease

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NSW Department of Primary Industries  
VIC Department of Sustainability & Environment

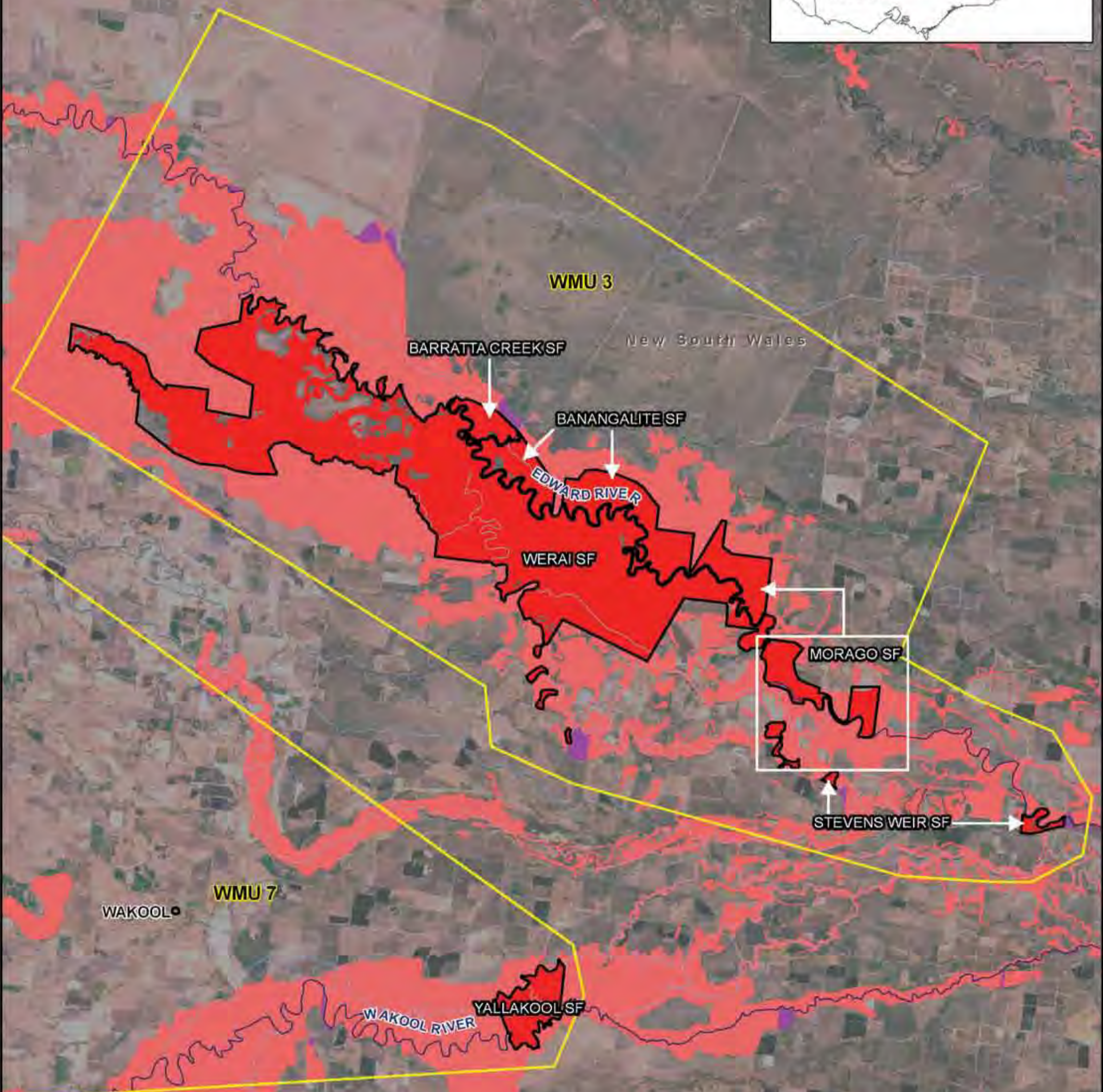




Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.9

Extent of river red gum forests on public and private land within the Werai forests INVERNESS



**Legend**

Riverina Bioregion	Public Lands (South Australia)
Towns	Public Lands (Victoria)
NSW Major Rivers	<b>River Red Gum Forest Communities</b>
NSW Creeks	Public Land
Water Management Units	Private Land
Dedicated State Forest	Travelling Stock Routes
Other Crown Timber Lands	Western Lands Lease

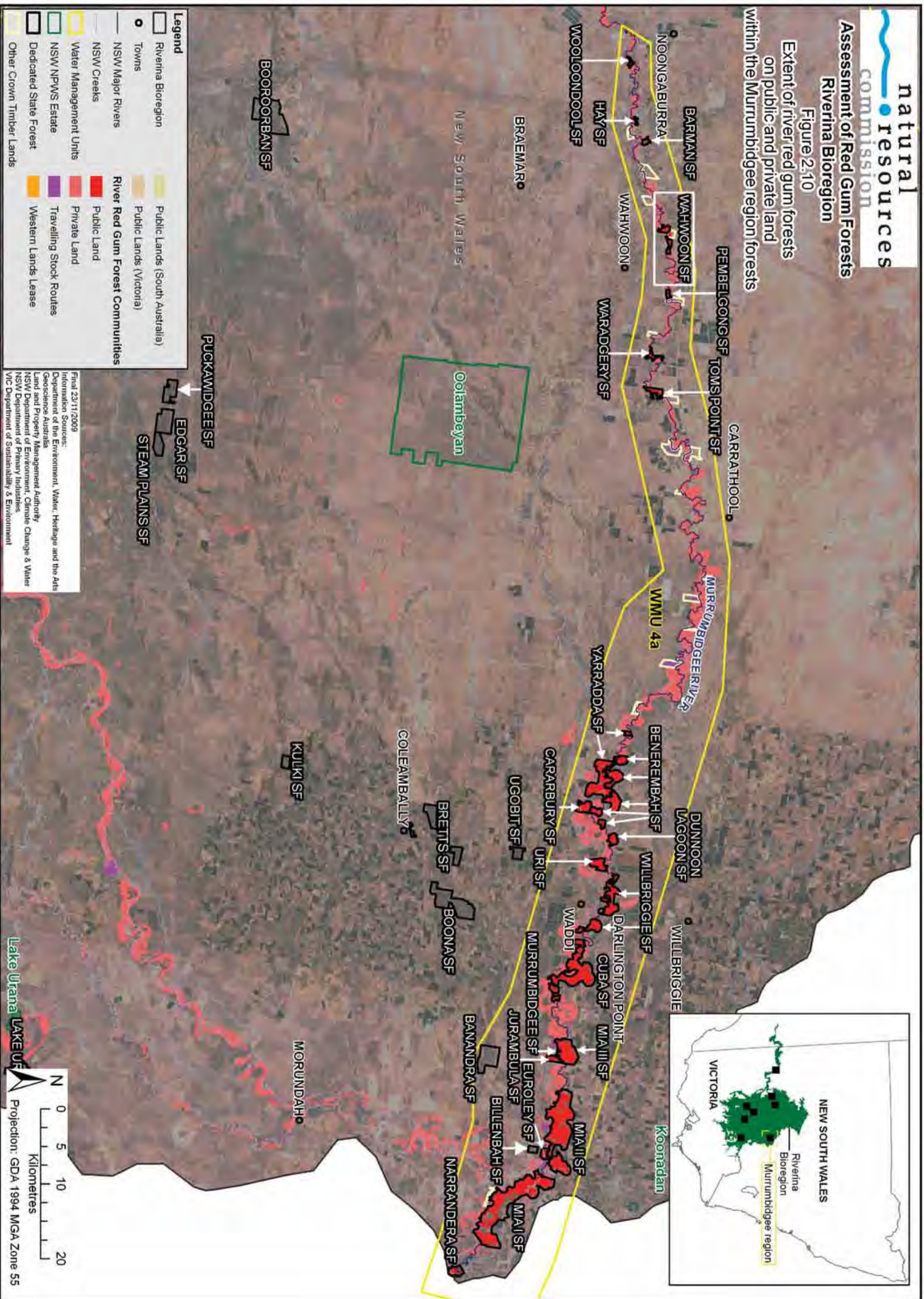
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 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment

N 0 2 4 8  
 Kilometres  
 Projection: GDA 1994 MGA Zone 55



Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.10  
Extent of river red gum forests  
on public and private land  
within the Murrumbidgee region forests



- Legend**
- Riverina Bioregion
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - Water Management Units
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Public Lands (South Australia)
  - Public Lands (Victoria)
  - River Red Gum Forest Communities
  - Public Land
  - Private Land
  - Travelling Stock Routes
  - Western Lands Lease

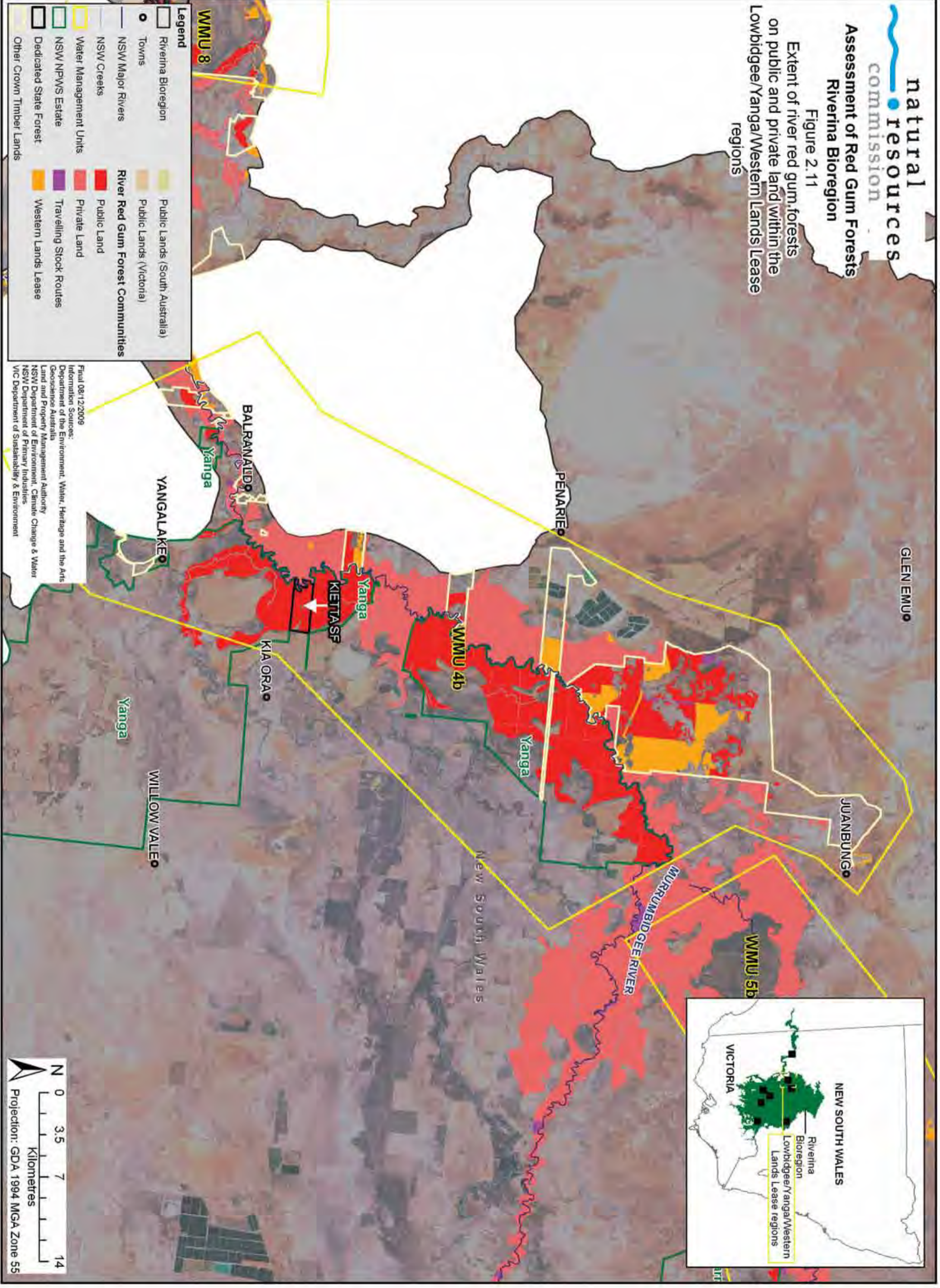
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Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment

Scale: 0 5 10 20 Kilometres  
Projection: GDA 1994 MGA Zone 55



Assessment of Red Gum Forests  
Riverina Bioregion

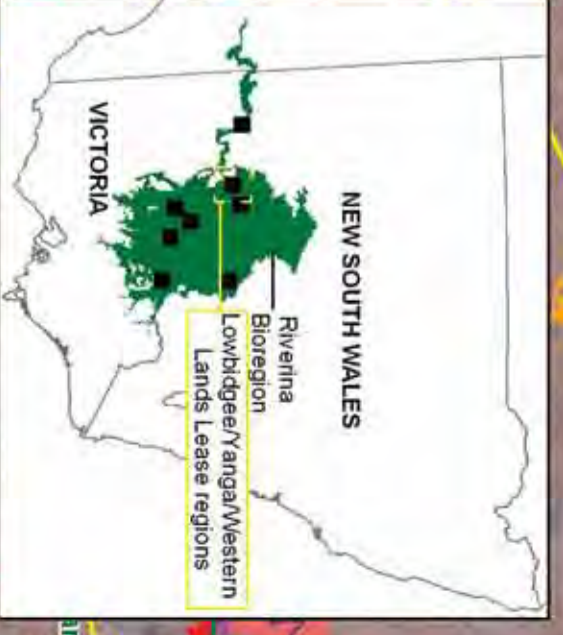
Figure 2.11  
Extent of river red gum forests  
on public and private land within the  
Lowbidgee/Yanga/Western Lands Lease  
regions



**Legend**

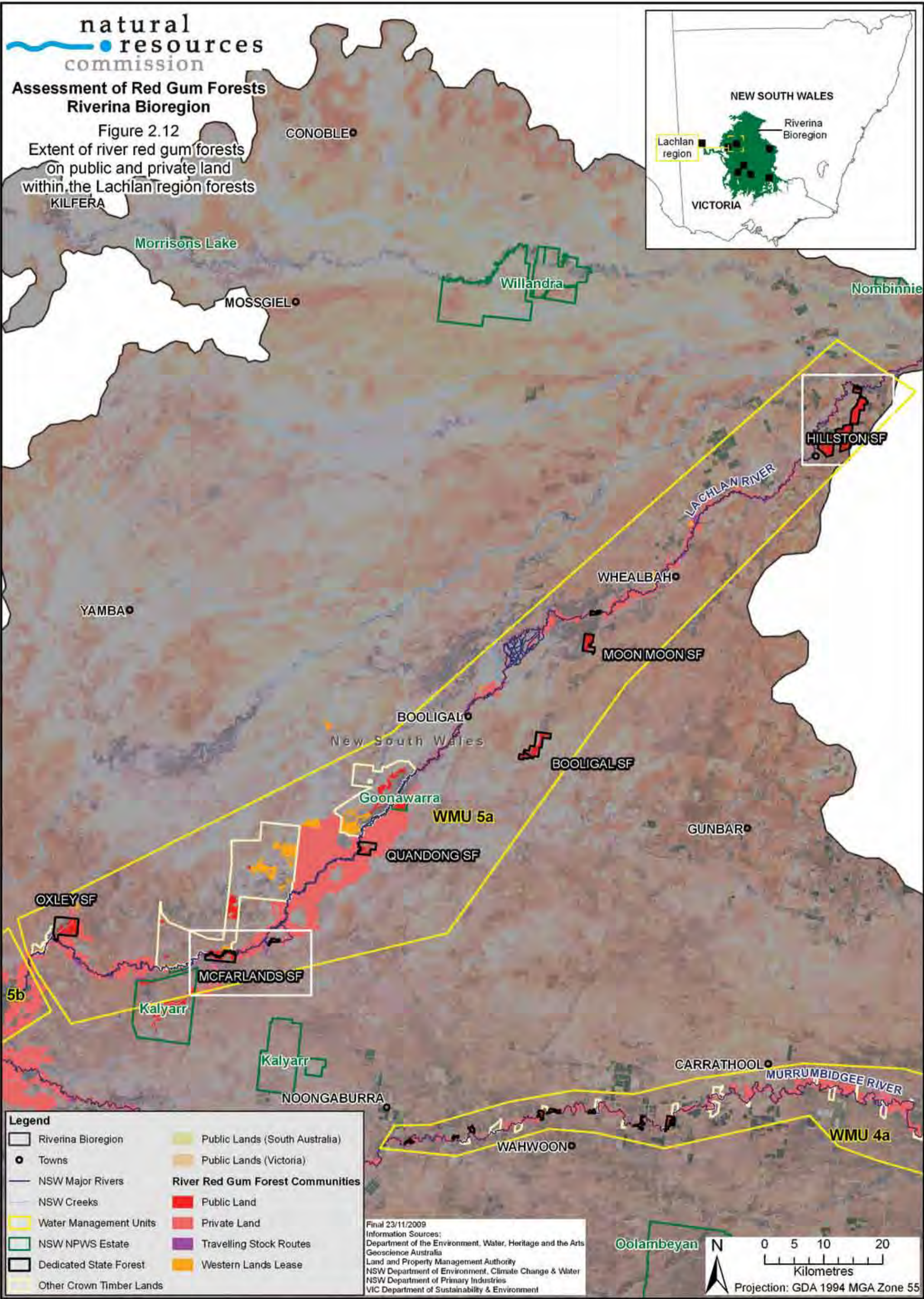
	Riverina Bioregion		Public Lands (South Australia)
	Towns		Public Lands (Victoria)
	NSW Major Rivers		River Red Gum Forest Communities
	NSW Creeks		Public Land
	Water Management Units		Private Land
	NSW NPWS Estate		Travelling Stock Routes
	Dedicated State Forest		Western Lands Lease
	Other Crown Timber Lands		

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Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment



N 0 3.5 7 14  
Kilometres  
Projection: GDA 1994 MGA Zone 55





Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.12  
Extent of river red gum forests  
on public and private land  
within the Lachlan region forests



**Legend**

Riverina Bioregion	Public Lands (South Australia)
Towns	Public Lands (Victoria)
NSW Major Rivers	<b>River Red Gum Forest Communities</b>
NSW Creeks	Public Land
Water Management Units	Private Land
NSW NPWS Estate	Travelling Stock Routes
Dedicated State Forest	Western Lands Lease
Other Crown Timber Lands	

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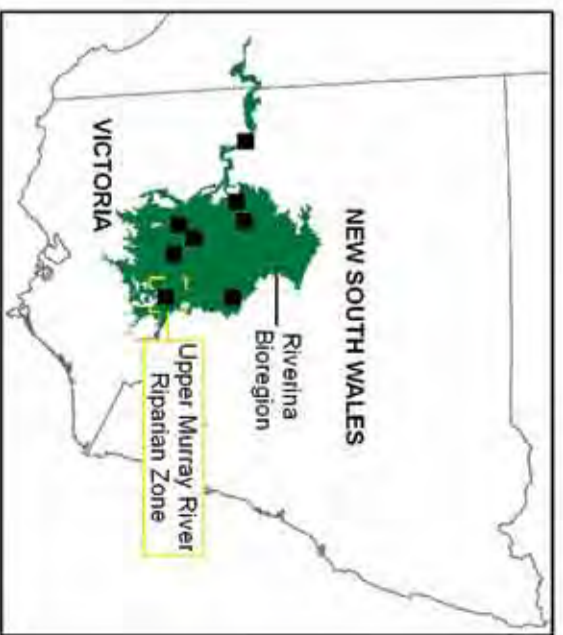
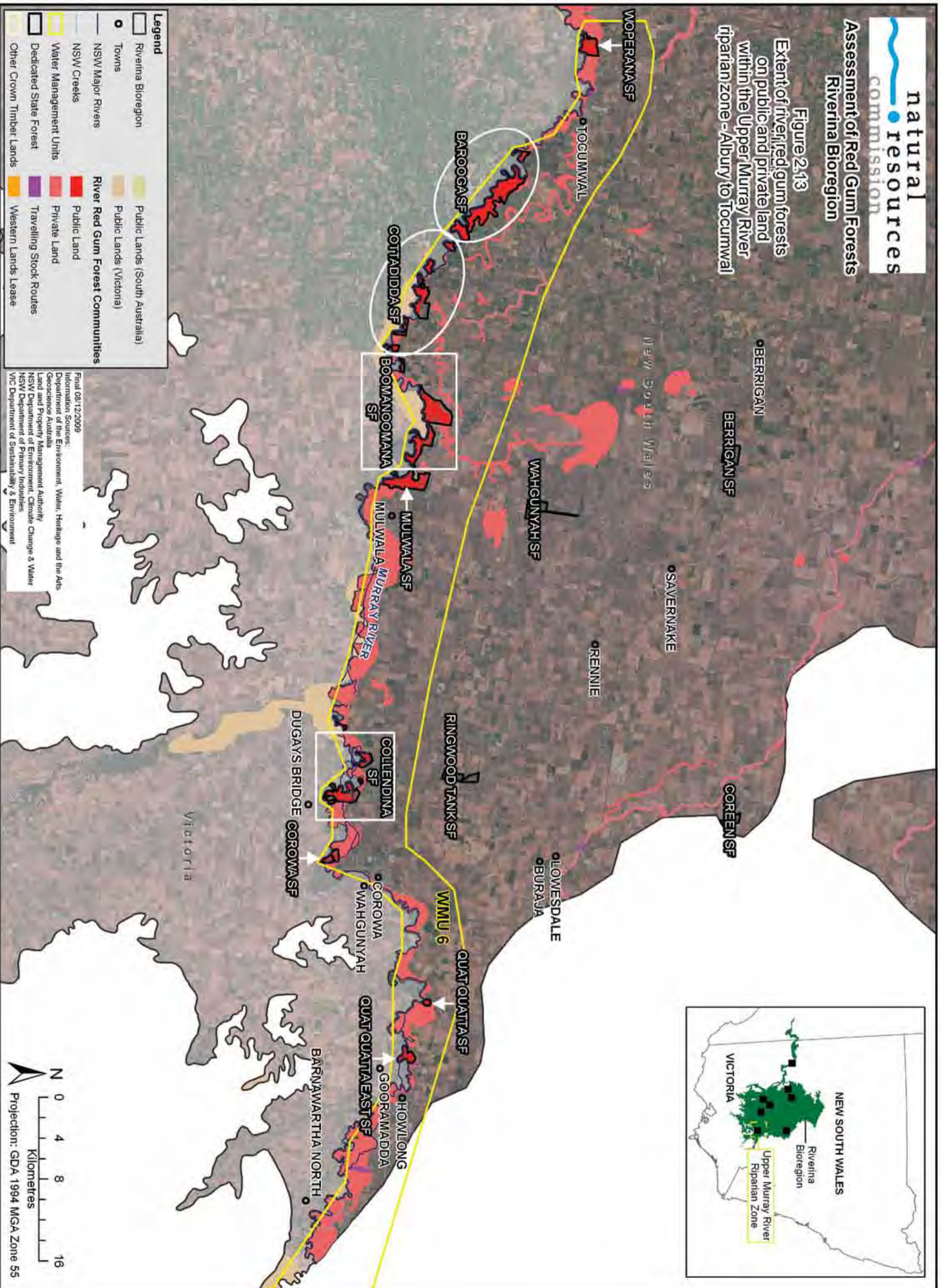
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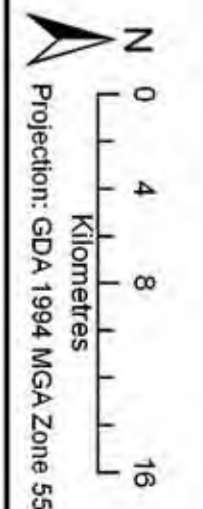
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.13

Extent of river/red gum forests  
on public and private land  
within the Upper Murray River  
riparian zone - Albury to Tocumwal



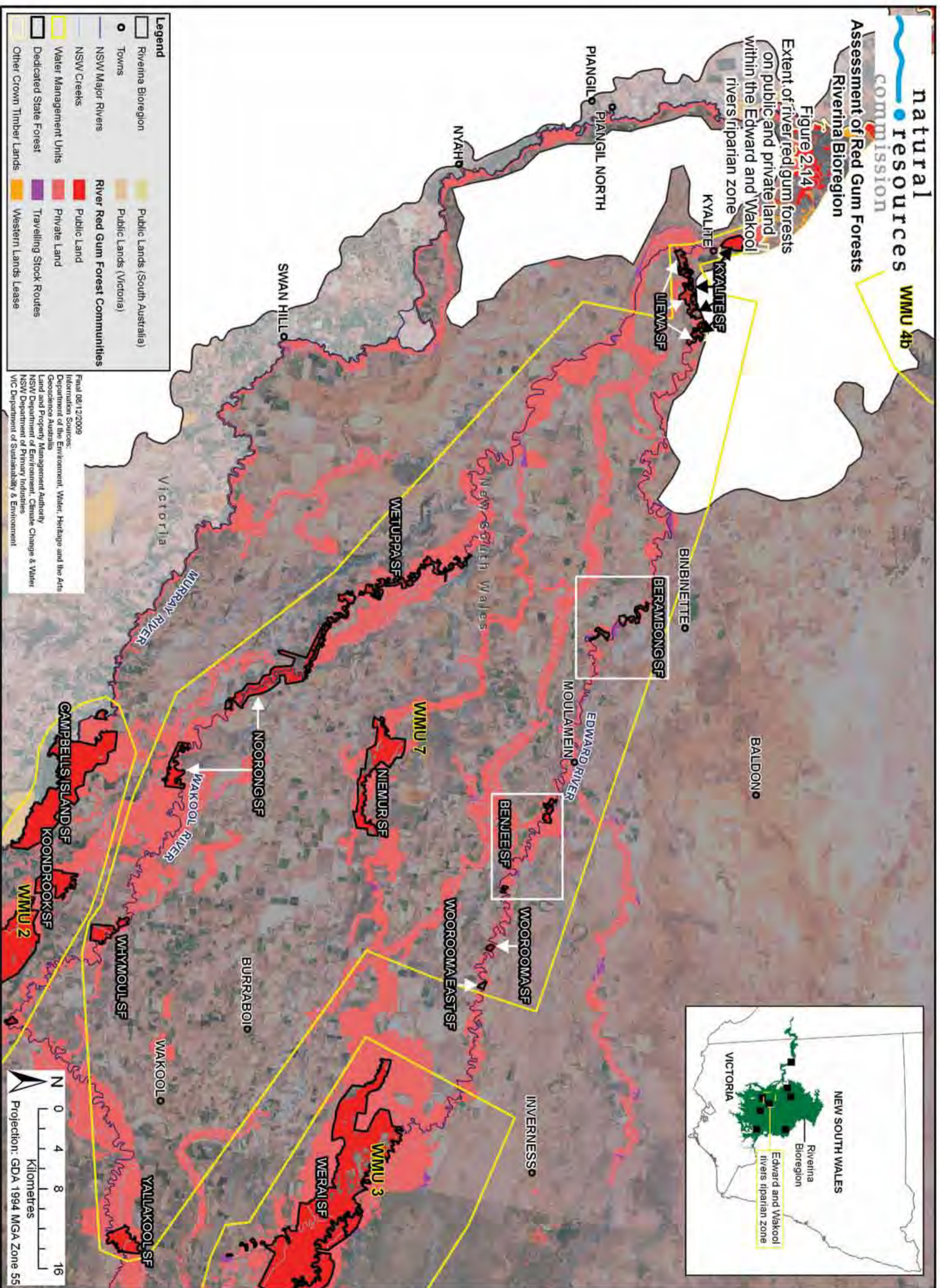
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NSW Department of Primary Industries  
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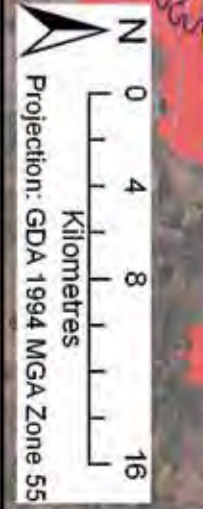
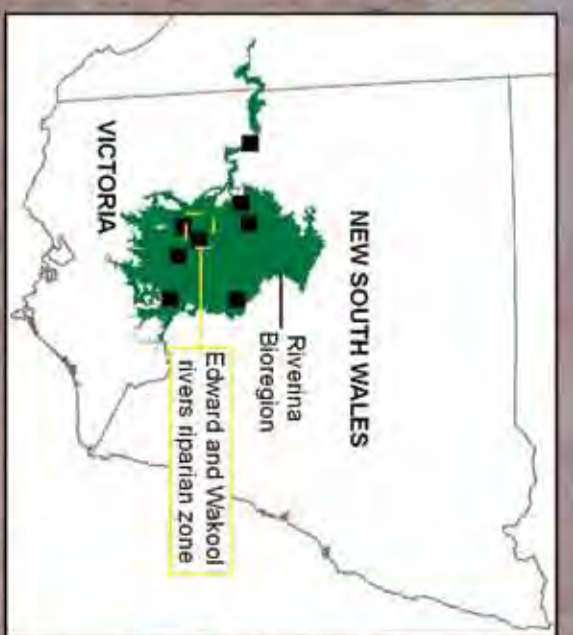
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 2.14  
Extent of river red gum forests on public and private land within the Edward and Wakkool rivers riparian zone



- Legend**
- Riverina Bioregion
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - Water Management Units
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Public Lands (South Australia)
  - Public Lands (Victoria)
  - River Red Gum Forest Communities
  - Public Land
  - Private Land
  - Travelling Stock Routes
  - Western Lands Lease

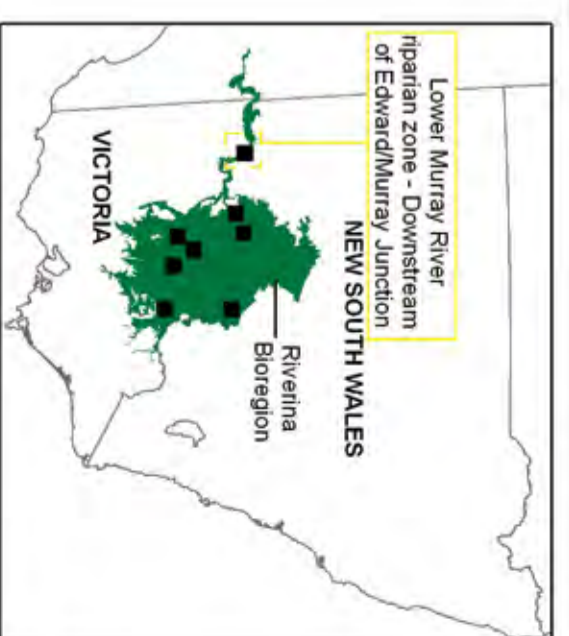
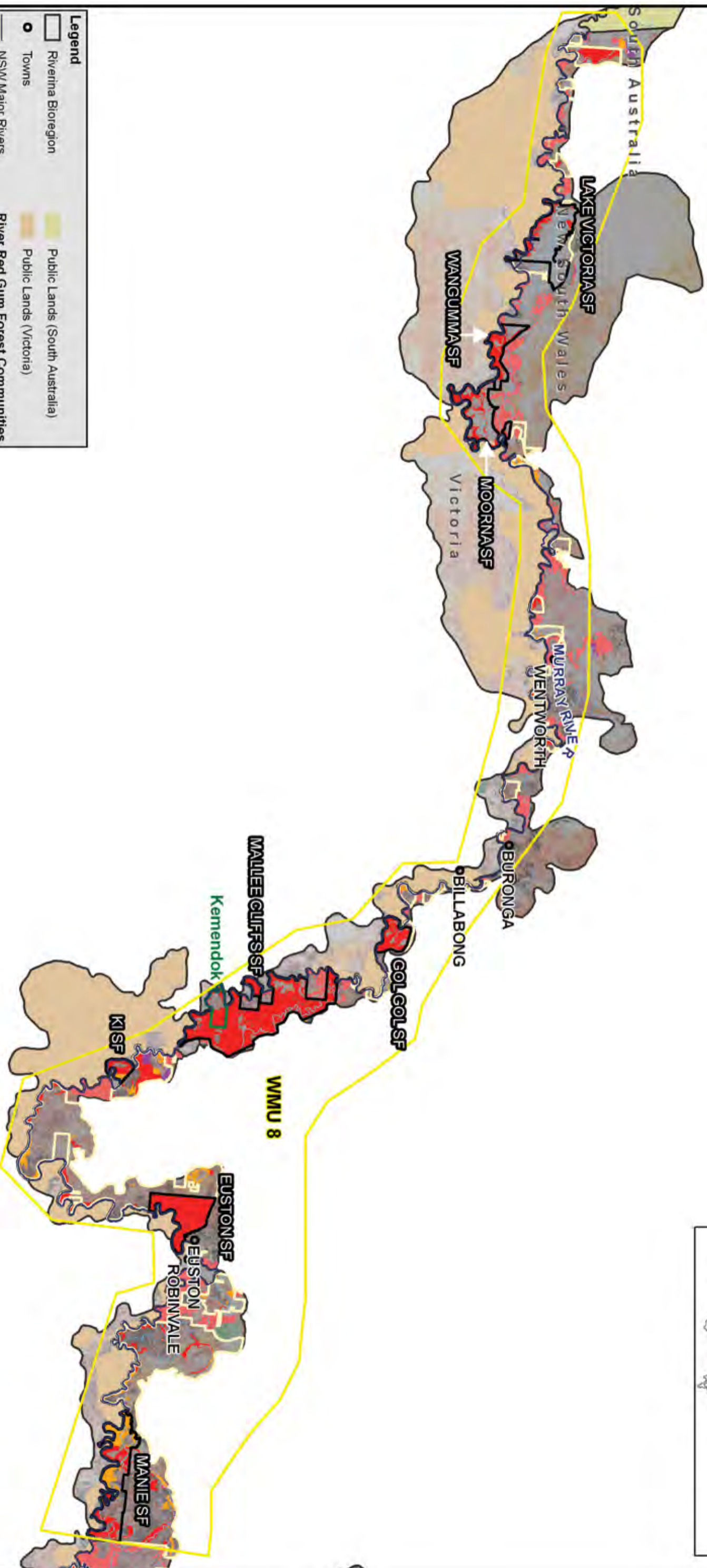
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Assessment of Red Gum Forests  
Riverina Bioregion

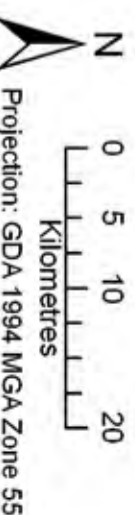
Figure 2.15  
Extent of river red gum forests  
on public and private land within the  
Lower Murray River riparian zone -  
downstream of Edward/Murray Junction



Legend

- |                          |                                  |
|--------------------------|----------------------------------|
| Riverina Bioregion       | Public Lands (South Australia)   |
| Towns                    | Public Lands (Victoria)          |
| NSW Major Rivers         | River Red Gum Forest Communities |
| NSW Creeks               | Private Land                     |
| Water Management Units   | Travelling Stock Routes          |
| NSW NPWS Estate          | Western Lands Lease              |
| Dedicated State Forest   |                                  |
| Other Crown Timber Lands |                                  |

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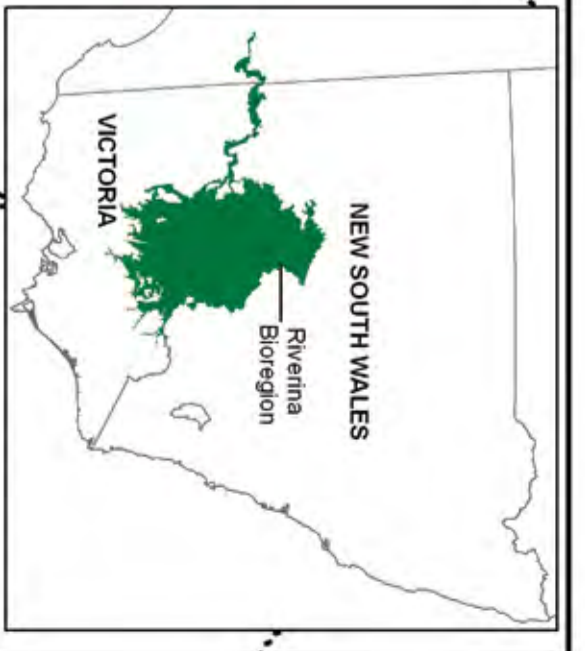
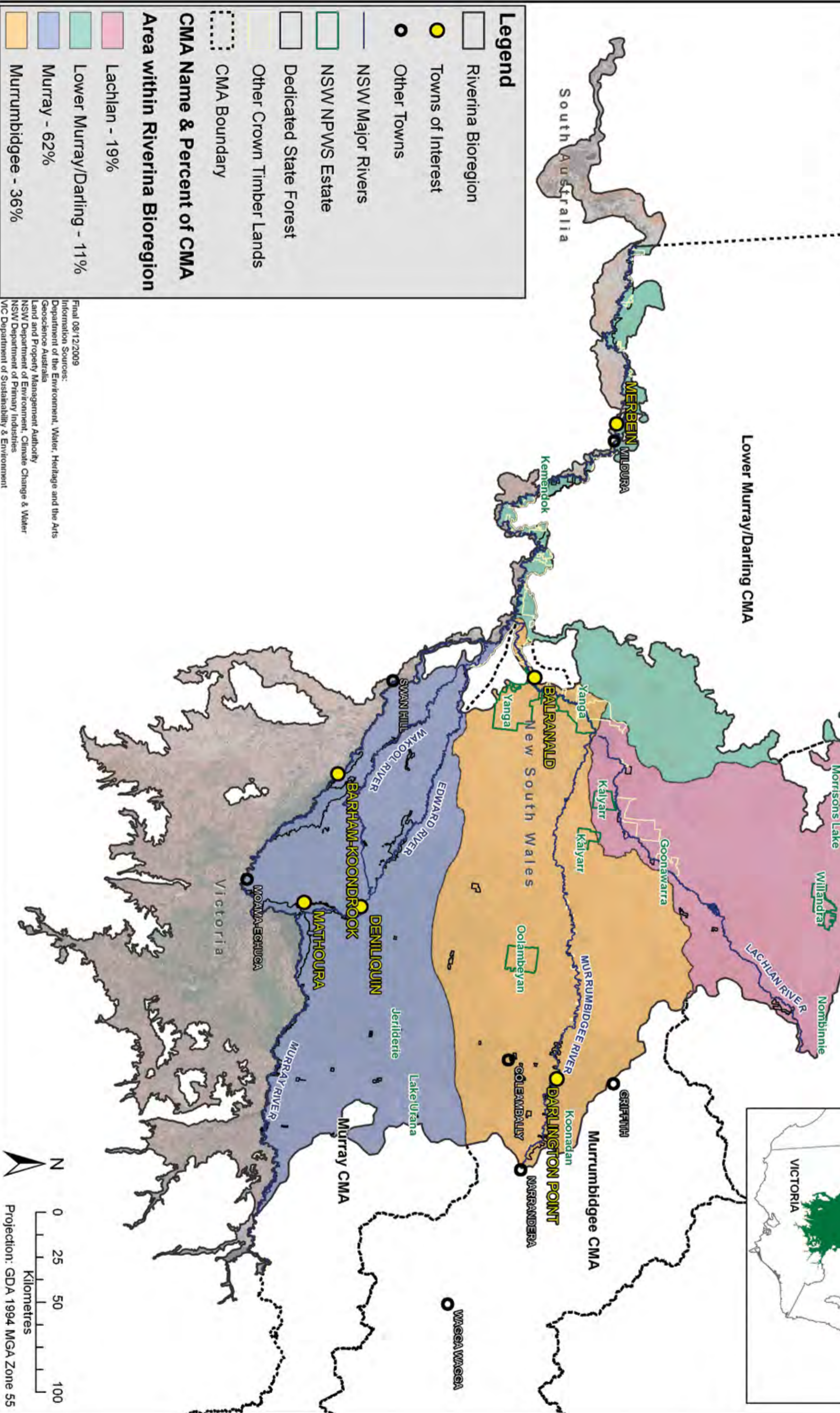




# Assessment of Red Gum Forests Riverina Bioregion

Figure 3.1

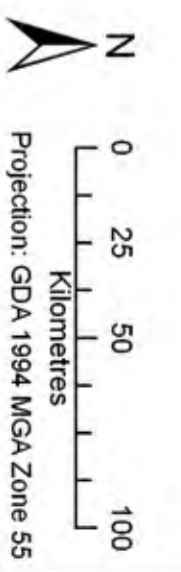
## Catchment Management Authorities in the NSW Riverina bioregion



### Legend

- Riverina Bioregion
  - Towns of Interest
  - Other Towns
  - NSW Major Rivers
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - CMA Boundary
- ### CMA Name & Percent of CMA Area within Riverina Bioregion
- Lachlan - 19%
  - Lower Murray/Darling - 11%
  - Murray - 62%
  - Murrumbidgee - 36%

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 Information Sources:  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment





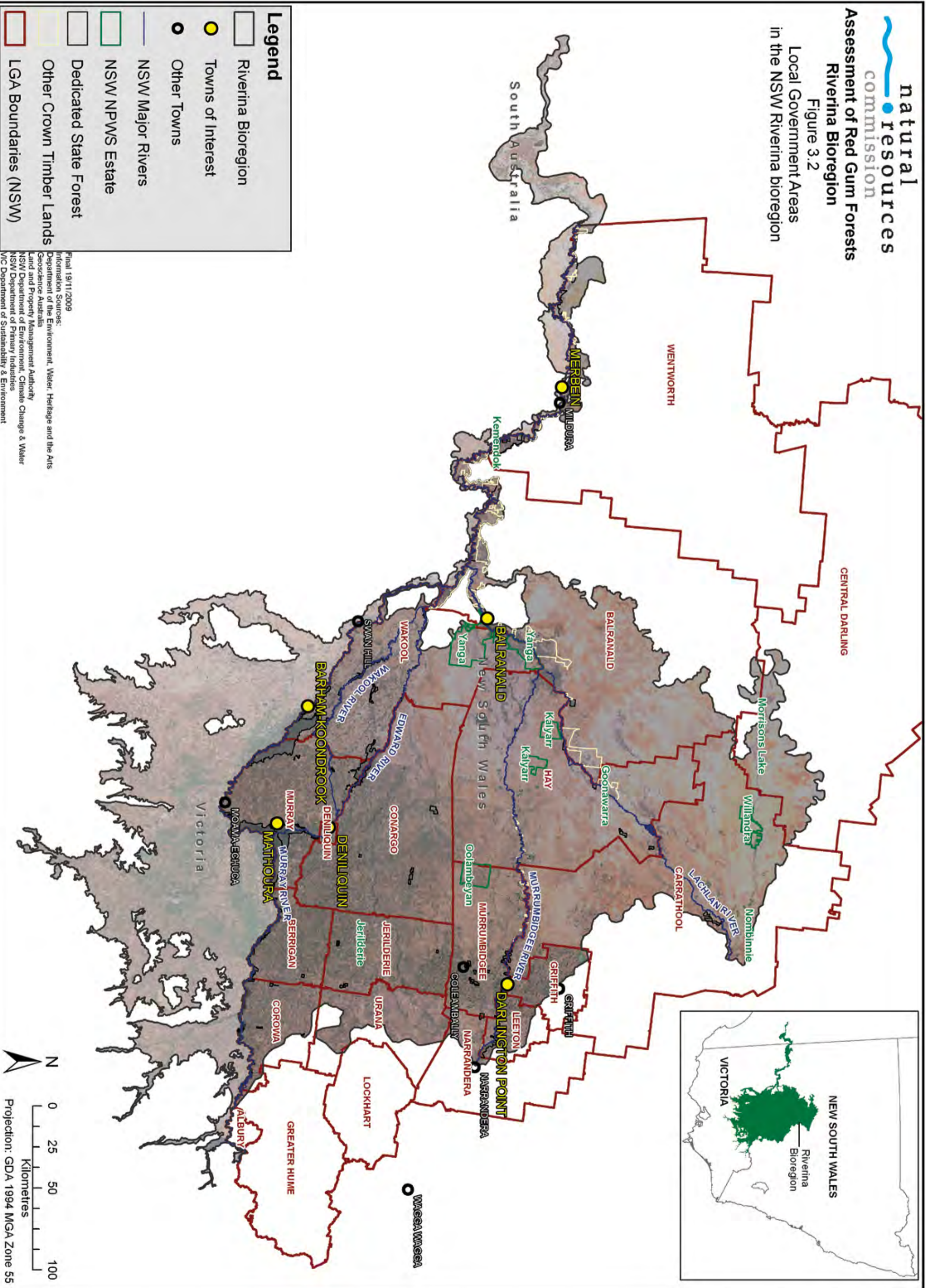
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 3.2  
Local Government Areas  
in the NSW Riverina bioregion

**Legend**

- Riverina Bioregion
- Towns of Interest
- Other Towns
- NSW Major Rivers
- NSW NPWS Estate
- Dedicated State Forest
- Other Crown Timber Lands
- LGA Boundaries (NSW)

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Information Sources:  
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Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
M/C Department of Sustainability & Environment

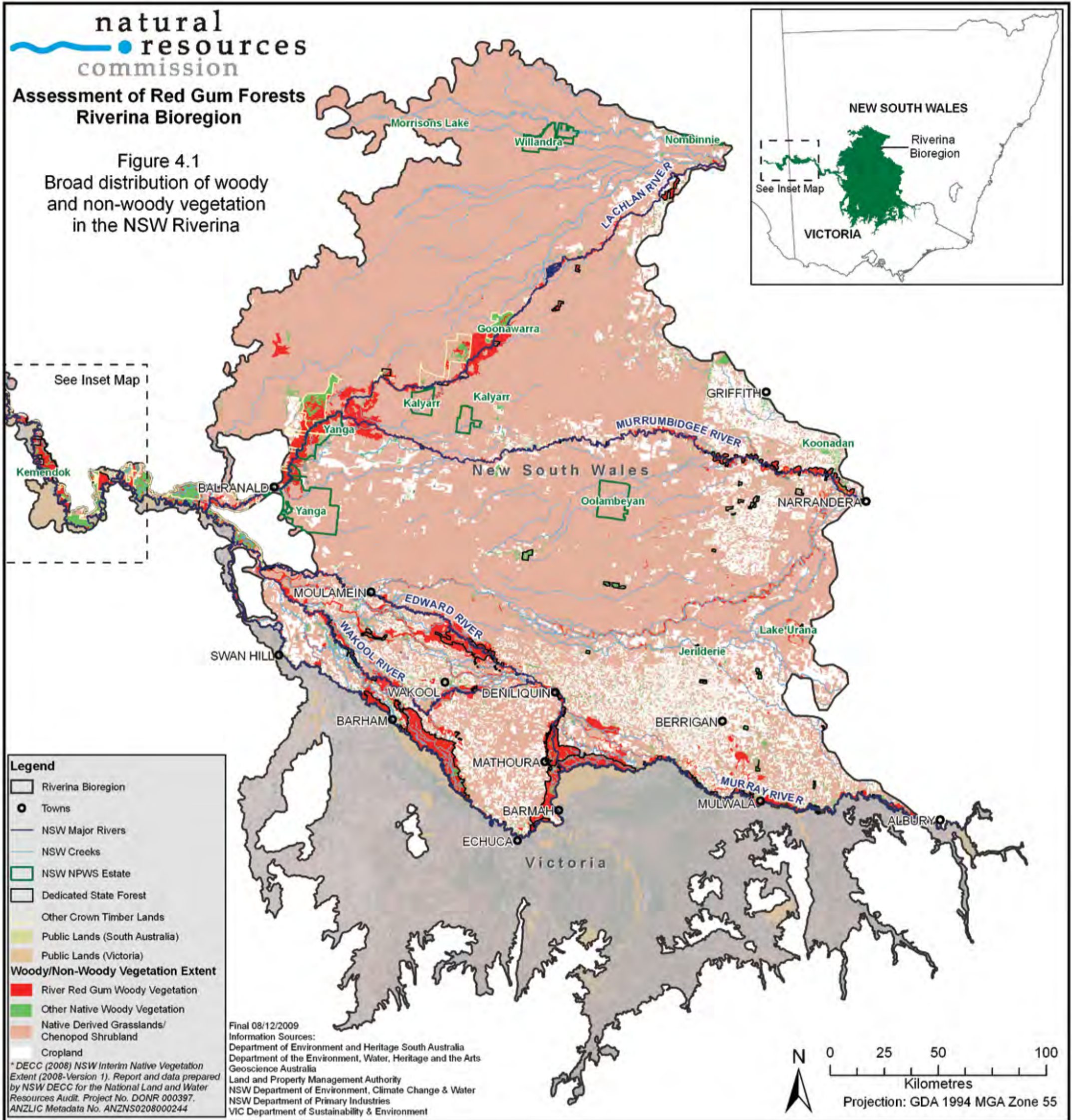


N  
0 25 50 100  
Kilometres  
Projection: GDA 1994 MGA Zone 55



Assessment of Red Gum Forests Riverina Bioregion

Figure 4.1  
Broad distribution of woody and non-woody vegetation in the NSW Riverina



**Legend**

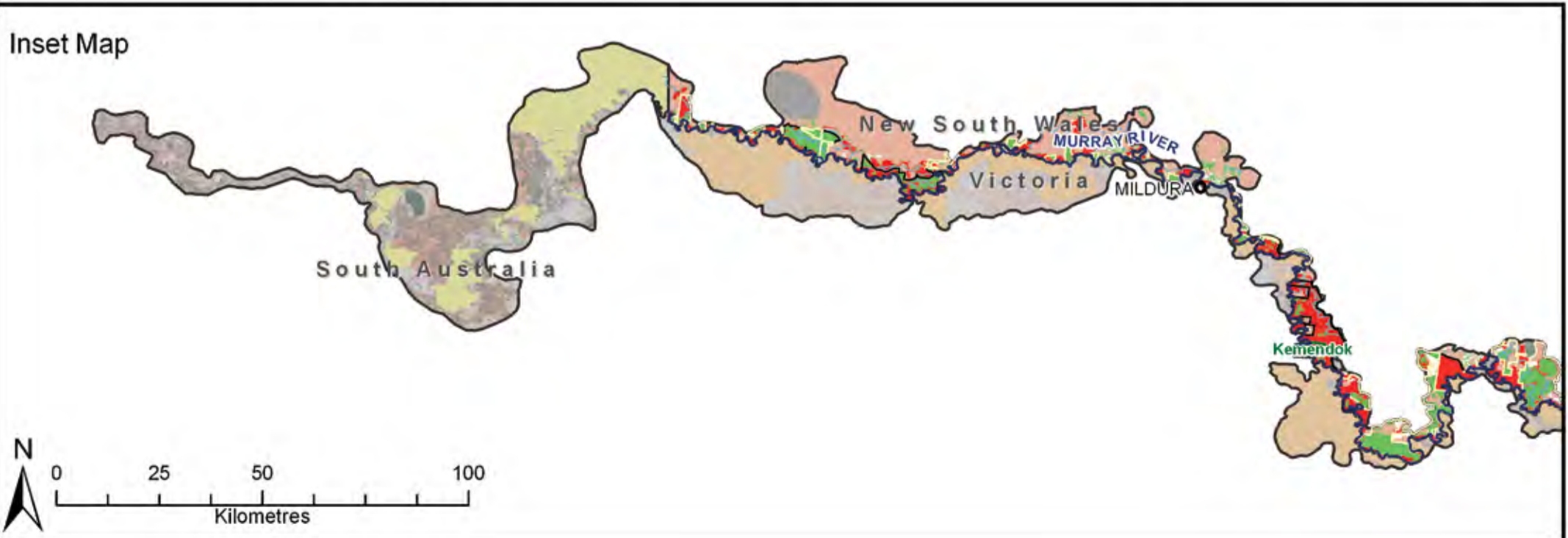
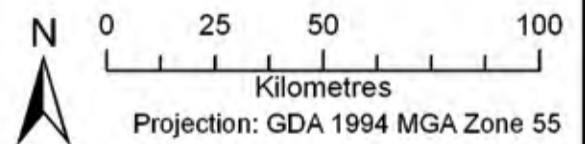
- Riverina Bioregion
- Towns
- NSW Major Rivers
- NSW Creeks
- NSW NPWS Estate
- Dedicated State Forest
- Other Crown Timber Lands
- Public Lands (South Australia)
- Public Lands (Victoria)

**Woody/Non-Woody Vegetation Extent**

- River Red Gum Woody Vegetation
- Other Native Woody Vegetation
- Native Derived Grasslands/Chenopod Shrubland
- Cropland

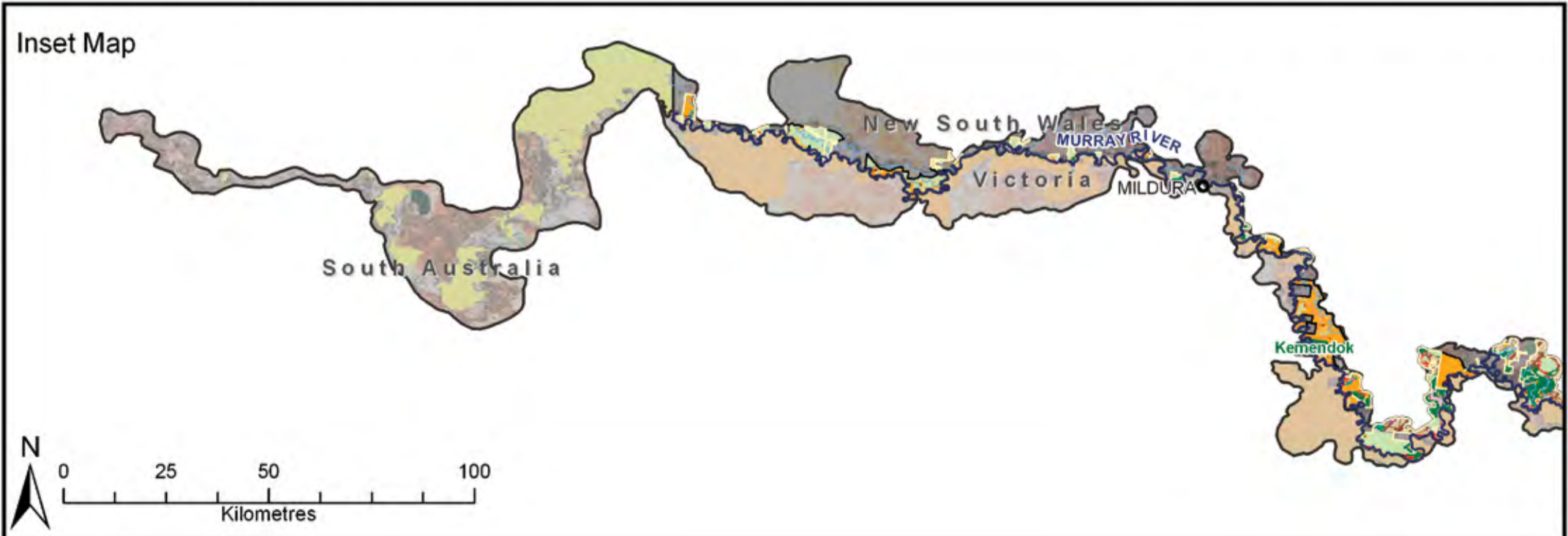
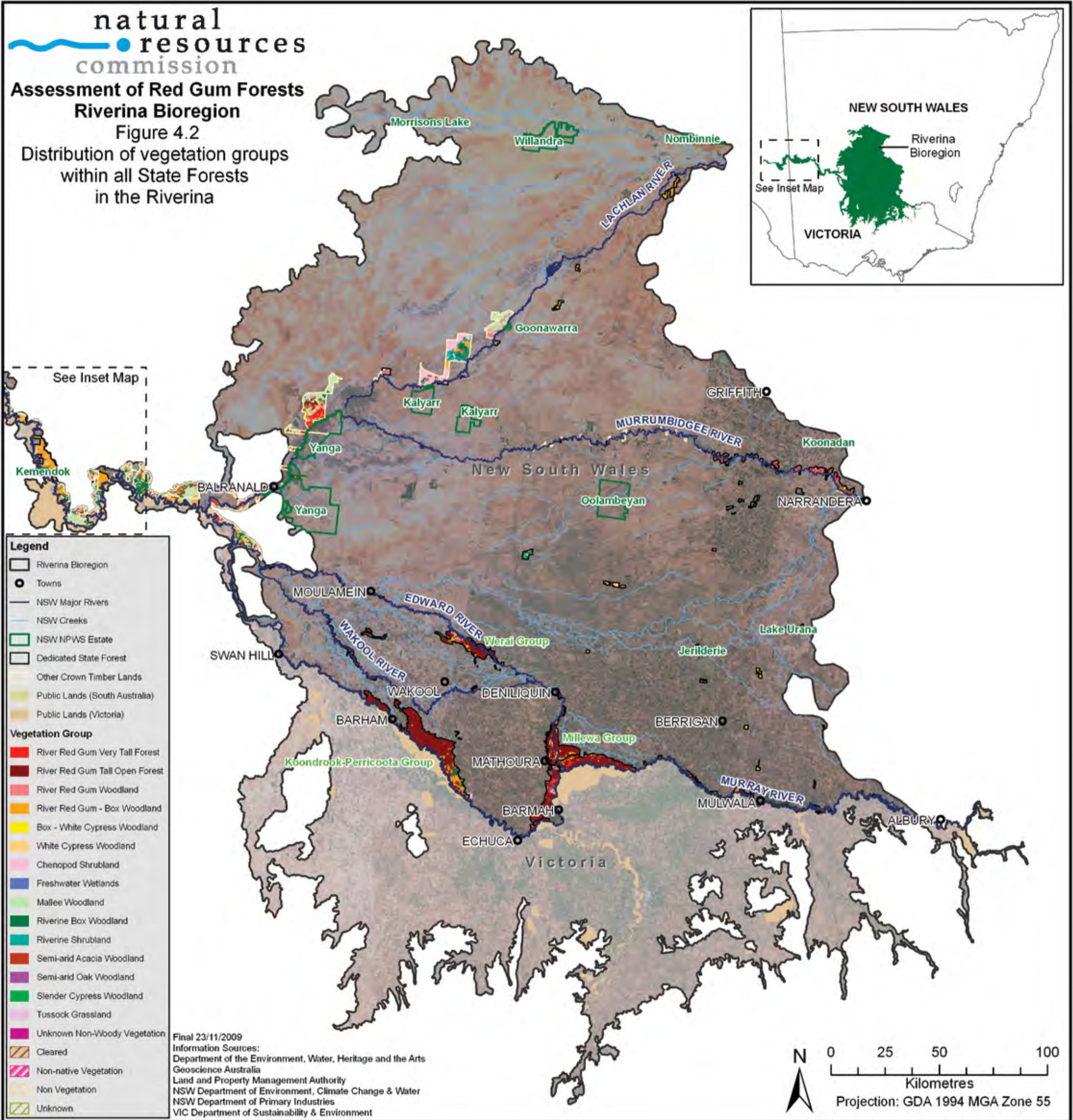
\* DECC (2008) NSW Interim Native Vegetation Extent (2008-Version 1). Report and data prepared by NSW DECC for the National Land and Water Resources Audit. Project No. DONR 000397. ANZLIC Metadata No. ANZNS0208000244

Final 08/12/2009  
 Information Sources:  
 Department of Environment and Heritage South Australia  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment

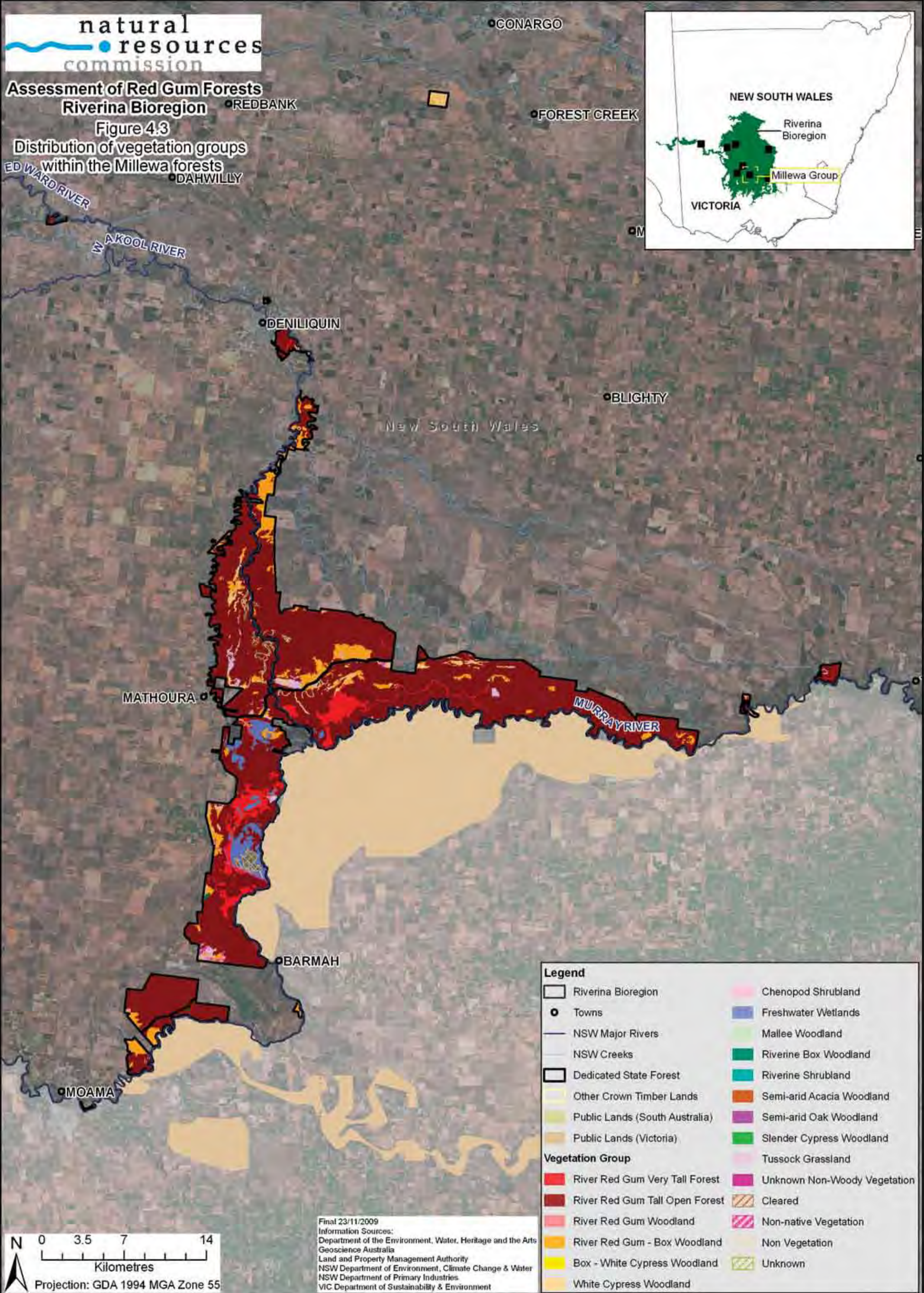




Assessment of Red Gum Forests  
Riverina Bioregion  
Figure 4.2  
Distribution of vegetation groups  
within all State Forests  
in the Riverina

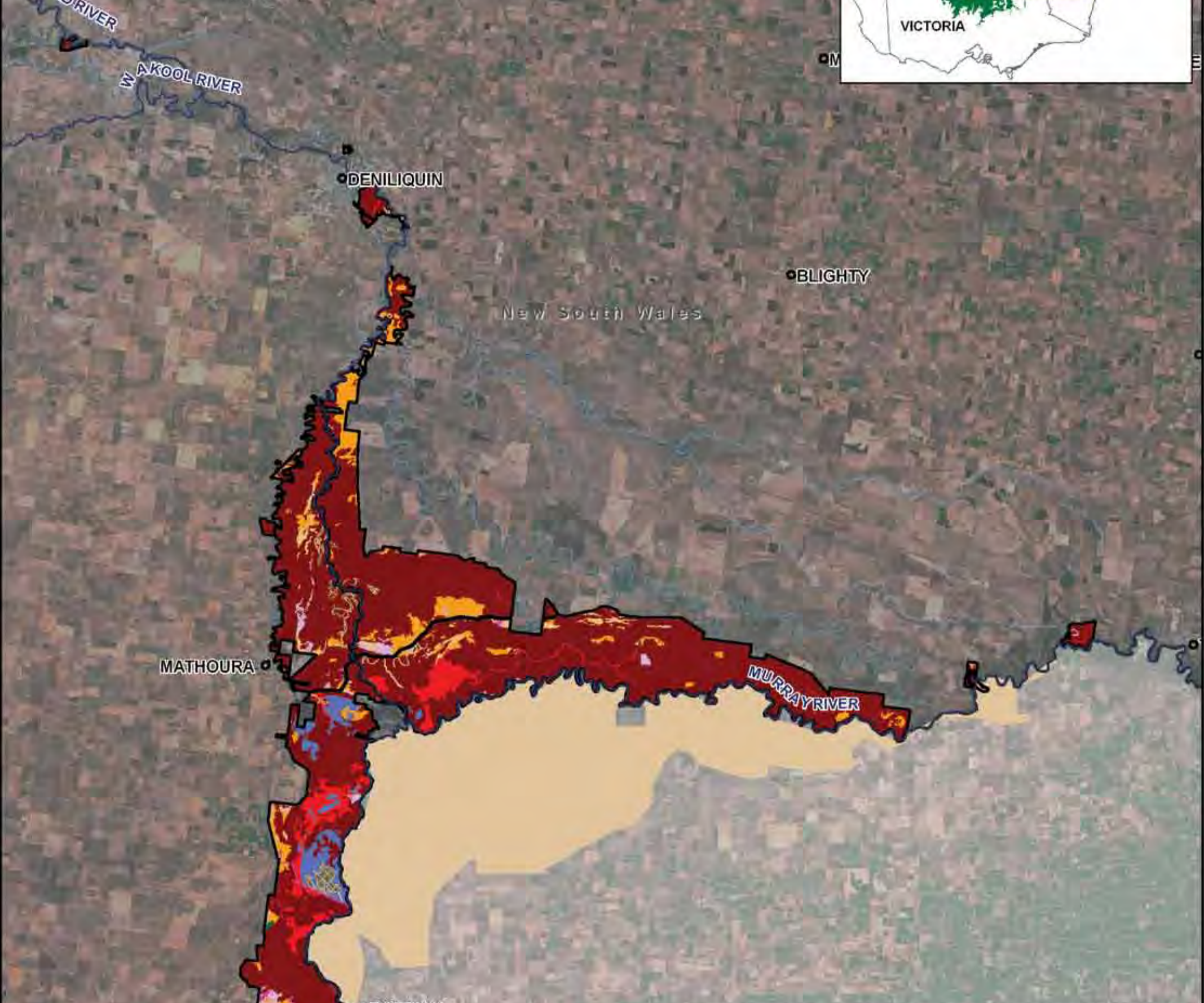






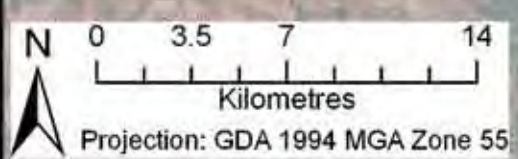
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.3  
Distribution of vegetation groups  
within the Millewa forests



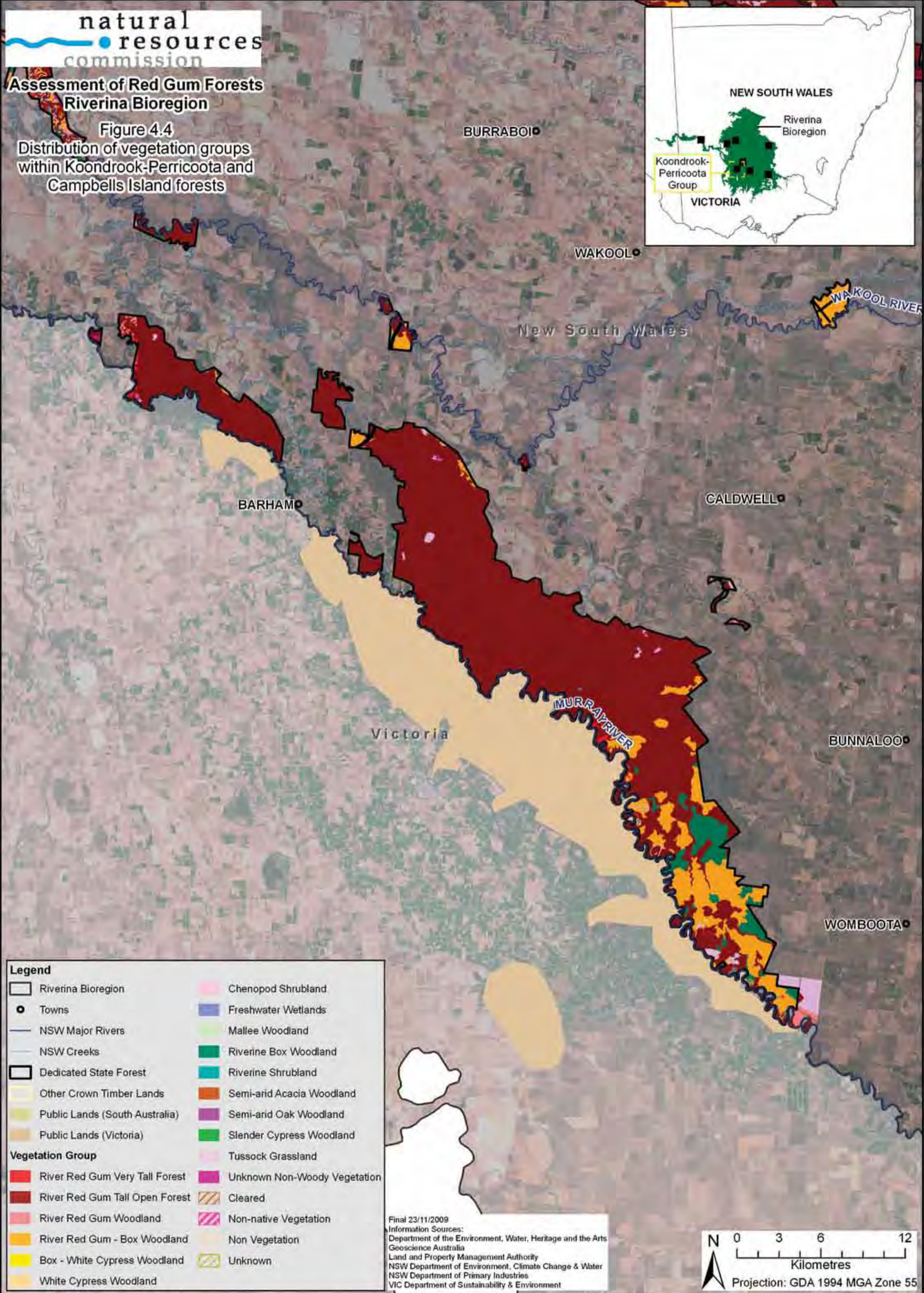
**Legend**

Riverina Bioregion	Chenopod Shrubland
Towns	Freshwater Wetlands
NSW Major Rivers	Mallee Woodland
NSW Creeks	Riverine Box Woodland
Dedicated State Forest	Riverine Shrubland
Other Crown Timber Lands	Semi-arid Acacia Woodland
Public Lands (South Australia)	Semi-arid Oak Woodland
Public Lands (Victoria)	Slender Cypress Woodland
River Red Gum Very Tall Forest	Tussock Grassland
River Red Gum Tall Open Forest	Unknown Non-Woody Vegetation
River Red Gum Woodland	Cleared
River Red Gum - Box Woodland	Non-native Vegetation
Box - White Cypress Woodland	Non-Vegetation
White Cypress Woodland	Unknown



Final 23/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment





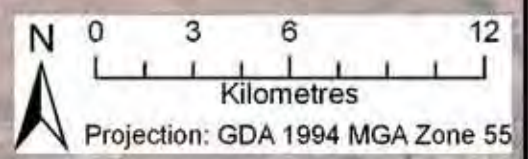
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.4  
Distribution of vegetation groups  
within Koondrook-Perricoota and  
Campbells Island forests



Legend	
Riverina Bioregion	Chenopod Shrubland
Towns	Freshwater Wetlands
NSW Major Rivers	Mallee Woodland
NSW Creeks	Riverine Box Woodland
Dedicated State Forest	Riverine Shrubland
Other Crown Timber Lands	Semi-arid Acacia Woodland
Public Lands (South Australia)	Semi-arid Oak Woodland
Public Lands (Victoria)	Slender Cypress Woodland
River Red Gum Very Tall Forest	Tussock Grassland
River Red Gum Tall Open Forest	Unknown Non-Woody Vegetation
River Red Gum Woodland	Cleared
River Red Gum - Box Woodland	Non-native Vegetation
Box - White Cypress Woodland	Non Vegetation
White Cypress Woodland	Unknown

Final 23/11/2009  
 Information Sources:  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment

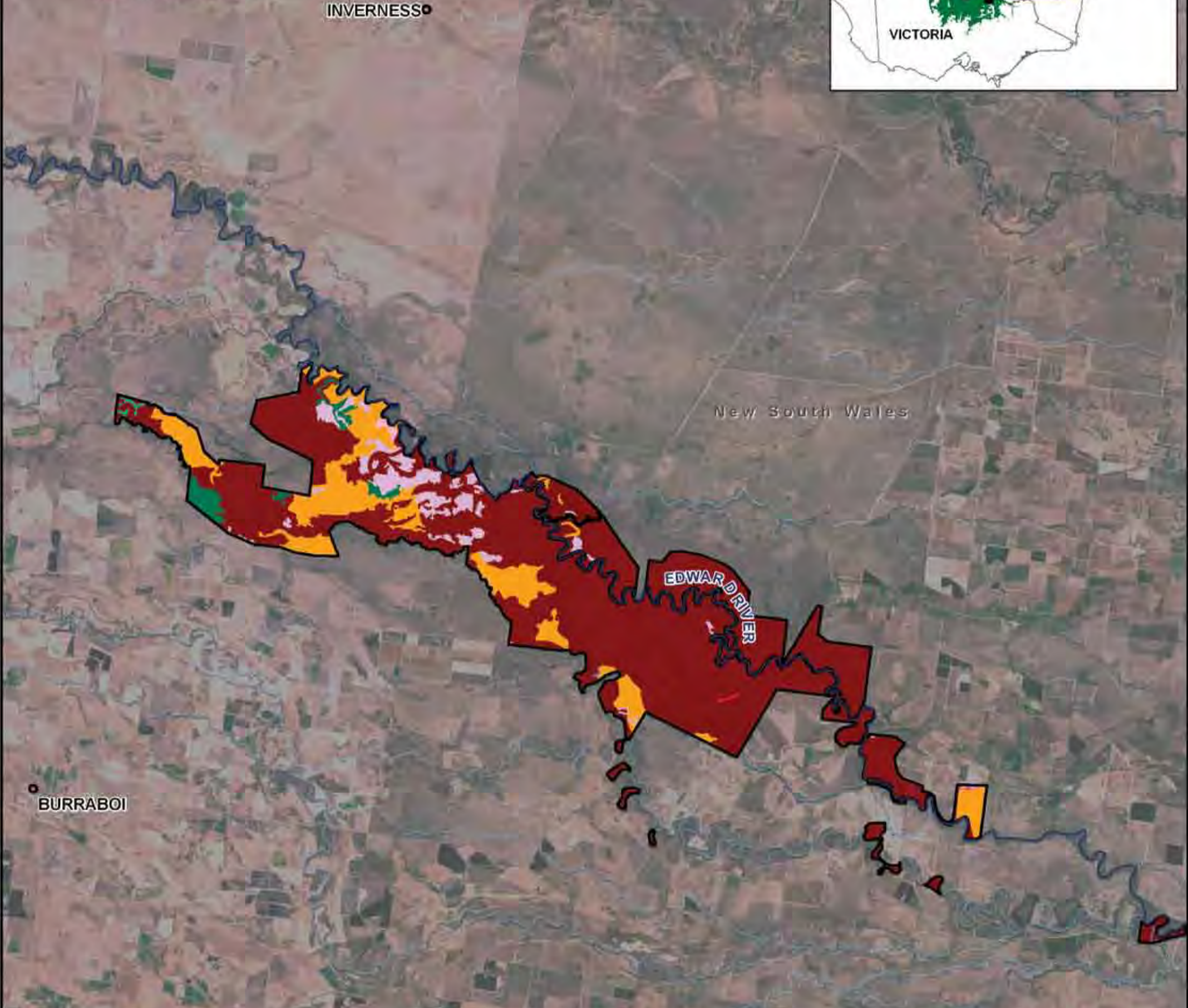




Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.5

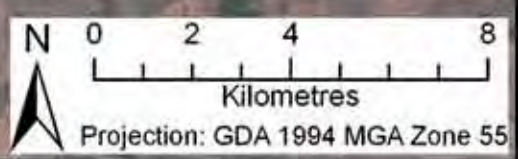
Distribution of vegetation groups  
within Werai forests



**Legend**

Riverina Bioregion	Chenopod Shrubland
Towns	Freshwater Wetlands
NSW Major Rivers	Mallee Woodland
NSW Creeks	Riverine Box Woodland
Dedicated State Forest	Riverine Shrubland
Other Crown Timber Lands	Semi-arid Acacia Woodland
Public Lands (South Australia)	Semi-arid Oak Woodland
Public Lands (Victoria)	Slender Cypress Woodland
<b>Vegetation Group</b>	Tussock Grassland
River Red Gum Very Tall Forest	Unknown Non-Woody Vegetation
River Red Gum Tall Open Forest	Cleared
River Red Gum Woodland	Non-native Vegetation
River Red Gum - Box Woodland	Non Vegetation
Box - White Cypress Woodland	Unknown
White Cypress Woodland	

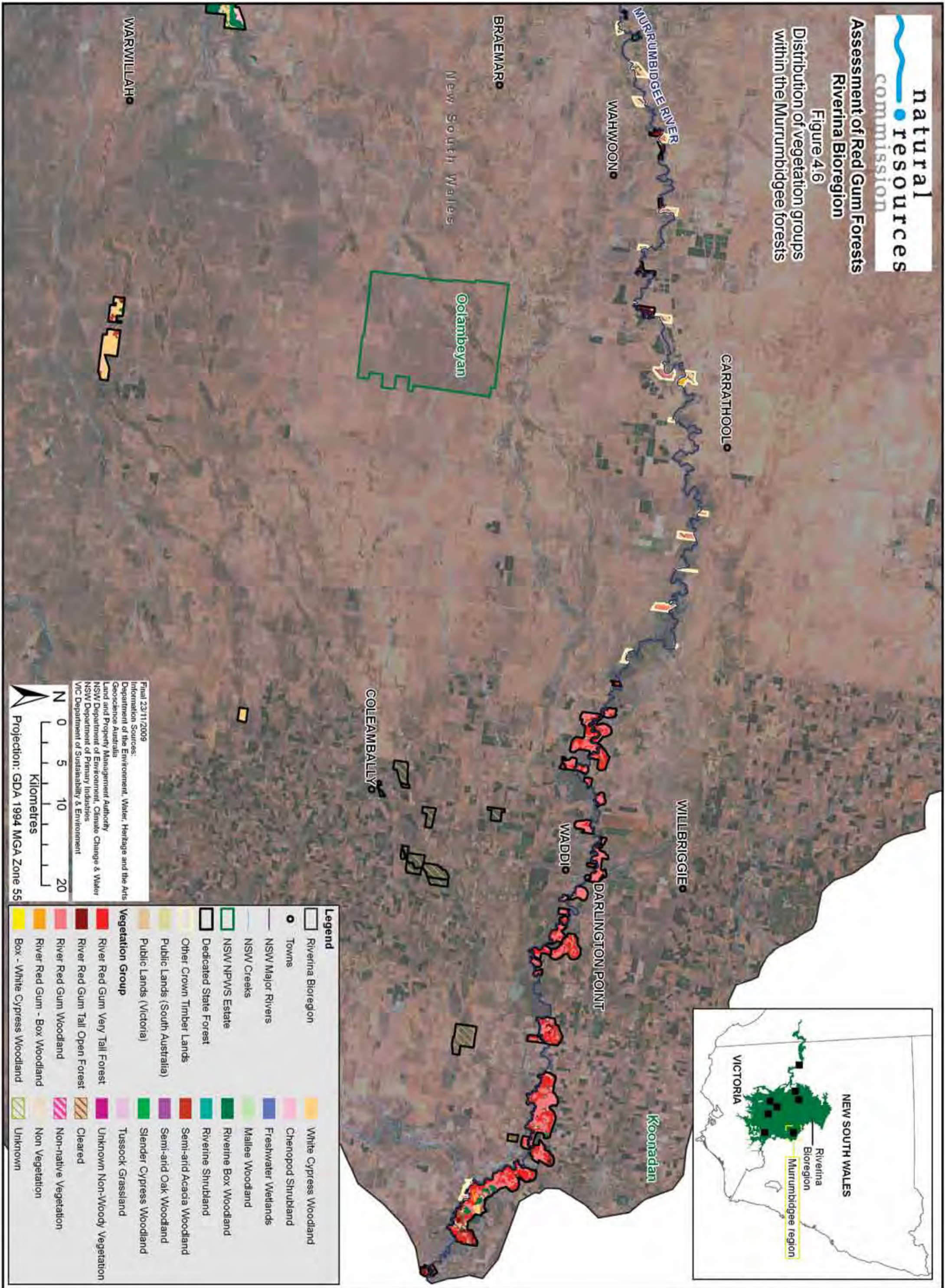
Final 23/11/2009  
 Information Sources:  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment





Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.6  
Distribution of vegetation groups  
within the Murrumbidgee forests



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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment

0 5 10 20  
Kilometres

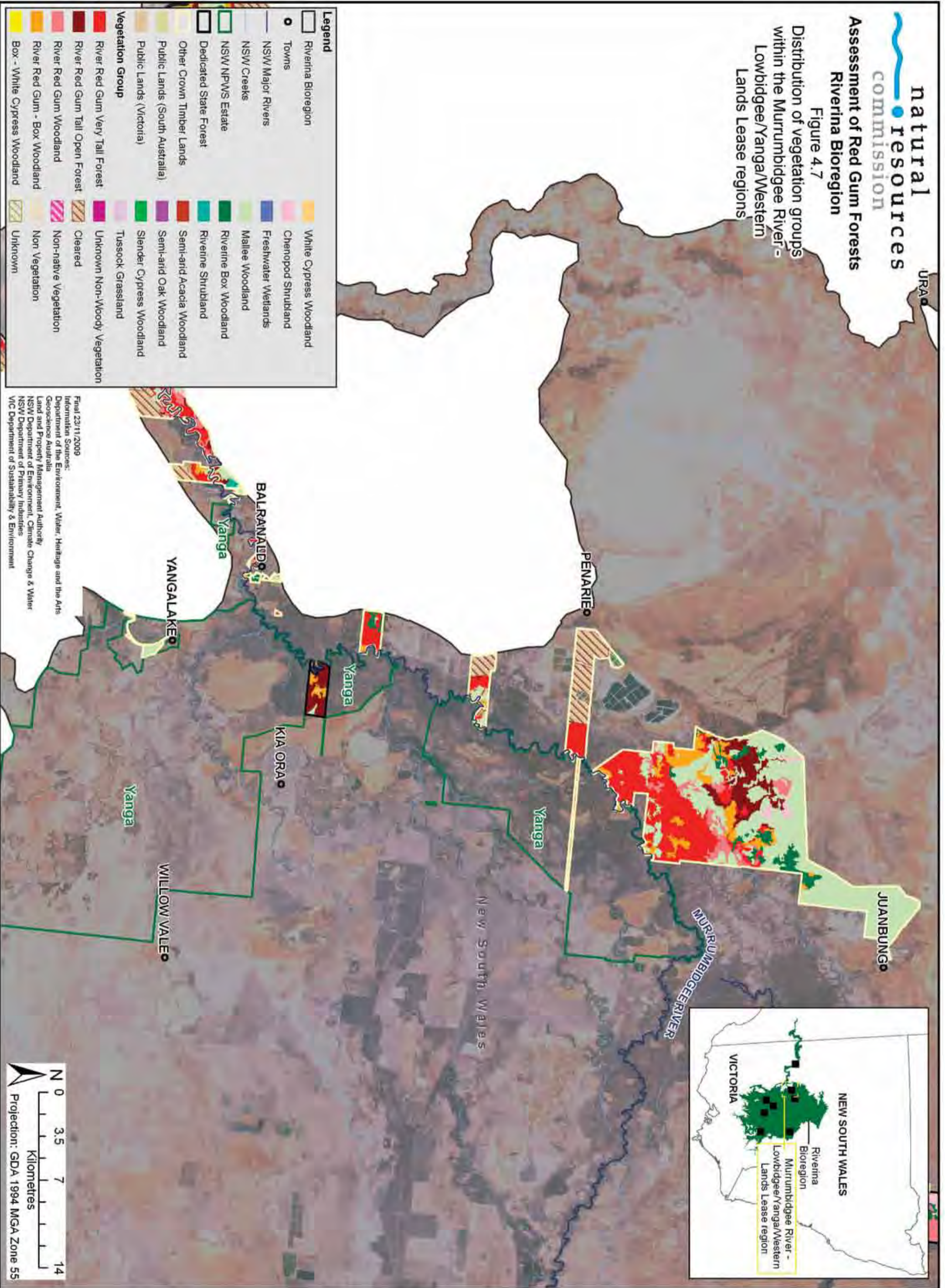
Projection: GDA 1994 MGA Zone 55

Legend			
	Riverina Bioregion		White Cypress Woodland
	Towns		Chenopod Shrubland
	NSW Major Rivers		Freshwater Wetlands
	NSW Creeks		Mallee Woodland
	NSW NPWS Estate		Riverine Box Woodland
	Dedicated State Forest		Riverine Shrubland
	Other Crown Timber Lands		Semi-arid Acacia Woodland
	Public Lands (South Australia)		Semi-arid Oak Woodland
	Public Lands (Victoria)		Slender Cypress Woodland
	Public Lands (Victoria)		Tussock Grassland
	River Red Gum Very Tall Forest		Unknown Non-Woody Vegetation
	River Red Gum Tall Open Forest		Cleared
	River Red Gum Woodland		Non-native Vegetation
	River Red Gum - Box Woodland		Non-vegetation
	Box - White Cypress Woodland		Unknown

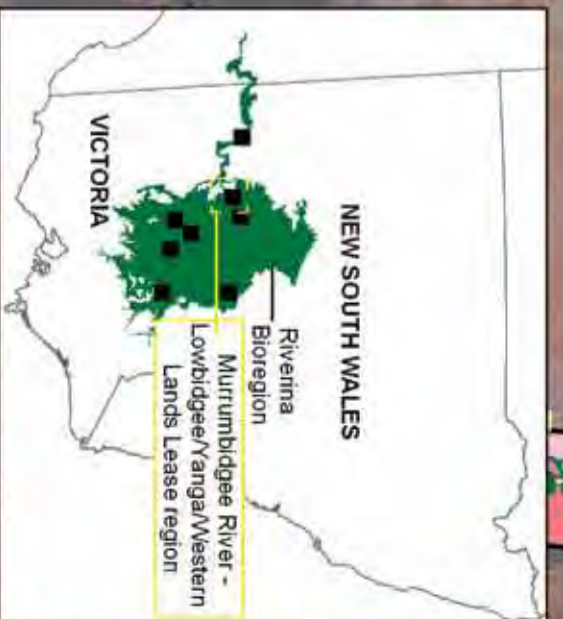


Assessment of Red Gum Forests  
Riverina Bioregion

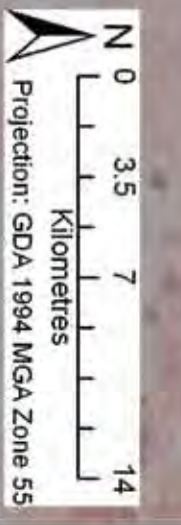
Figure 4.7  
Distribution of vegetation groups  
within the Murrumbidgee River -  
Lowbidgee/Yanga/Western  
Lands Lease regions



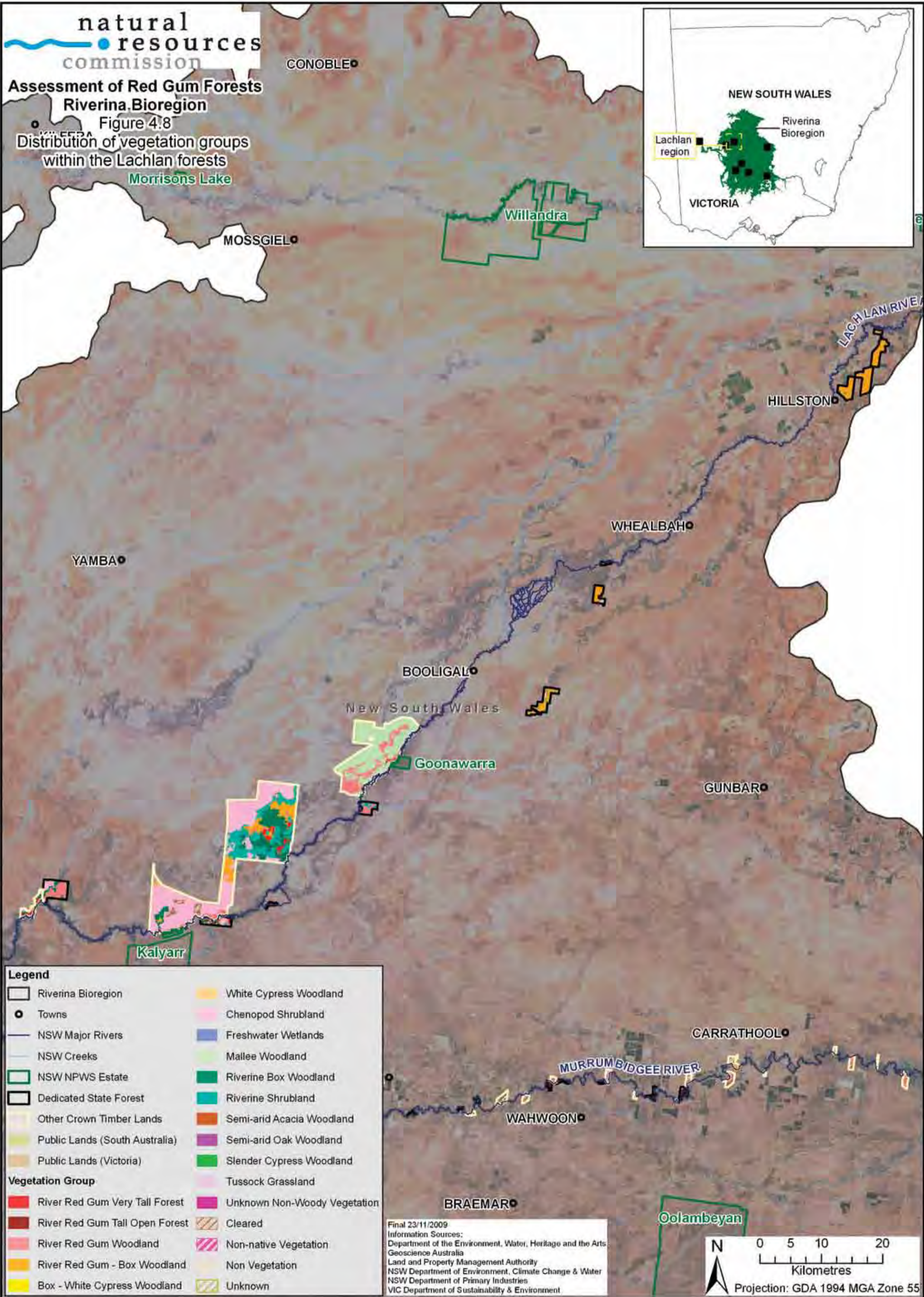
- Legend**
- Riverina Bioregion
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Public Lands (South Australia)
  - Public Lands (Victoria)
- Vegetation Group**
- River Red Gum Very Tall Forest
  - River Red Gum Tail Open Forest
  - River Red Gum Woodland
  - River Red Gum - Box Woodland
  - Box - White Cypress Woodland
  - White Cypress Woodland
  - Chenopod Shrubland
  - Freshwater Wetlands
  - Mallee Woodland
  - Riverine Box Woodland
  - Riverine Shrubland
  - Semi-arid Acacia Woodland
  - Semi-arid Oak Woodland
  - Slender Cypress Woodland
  - Tussock Grassland
  - Unknown Non-Woody Vegetation
  - Cleared
  - Non-native Vegetation
  - Non-Vegetation
  - Unknown



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Information Sources:  
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Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment







Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.8

Distribution of vegetation groups within the Lachlan forests



Morrison's Lake

Willandra

MOSSGIEL

LACHLAN RIVER

HILLSTON

YAMBA

WHEALBAH

BOOLIGAL

New South Wales

Goonawarra

GUNBAR

Kalyarr

**Legend**

	White Cypress Woodland
	Chenopod Shrubland
	Freshwater Wetlands
	Mallee Woodland
	Riverine Box Woodland
	Riverine Shrubland
	Semi-arid Acacia Woodland
	Semi-arid Oak Woodland
	Slender Cypress Woodland
	Tussock Grassland
	Unknown Non-Woody Vegetation
	Cleared
	Non-native Vegetation
	Non Vegetation
	Unknown

GARRATHOOL

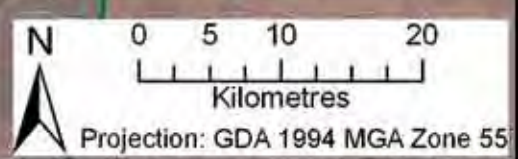
MURRUMBIDGEE RIVER

WAHWOON

BRAEMAR

Oolambeyan

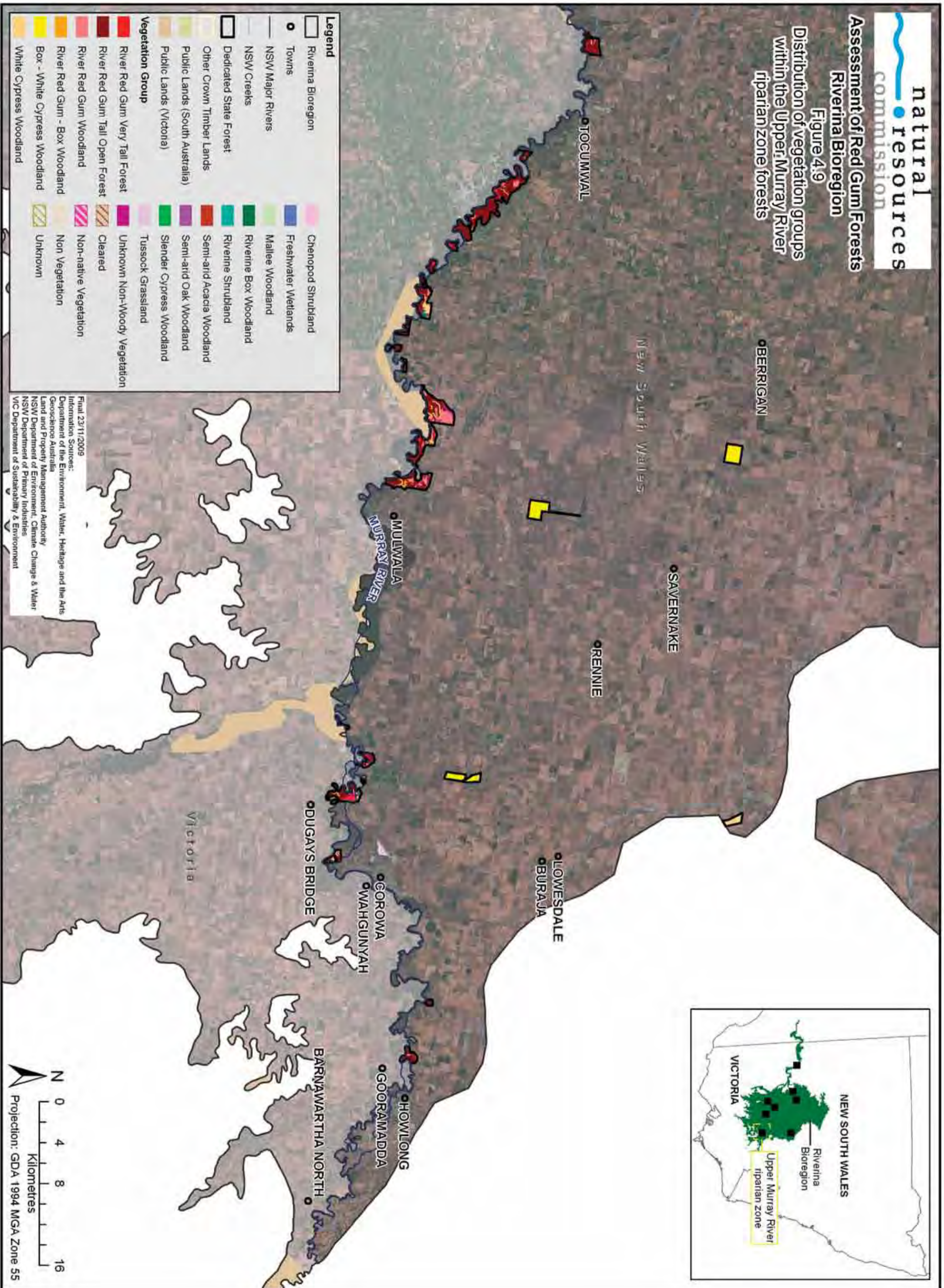
Final 23/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
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Assessment of Red Gum Forests  
Riverina Bioregion

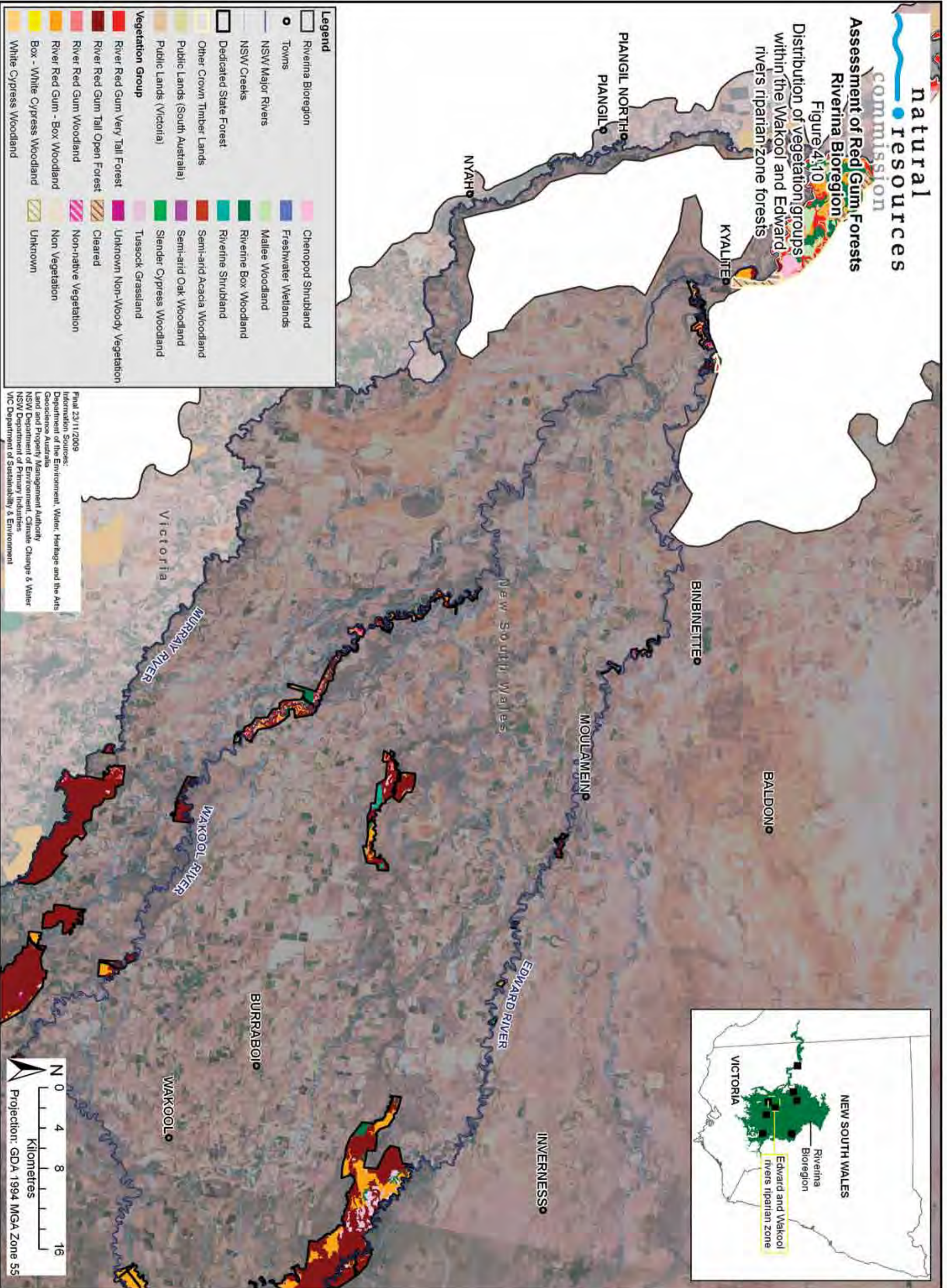
Figure 4.9  
Distribution of vegetation groups  
within the Upper Murray River  
riparian zone forests





Assessment of Red Gum Forests  
Riverina Bioregion

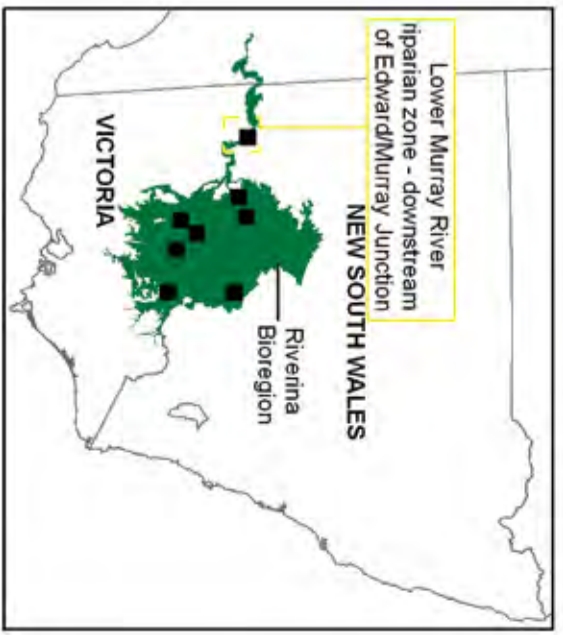
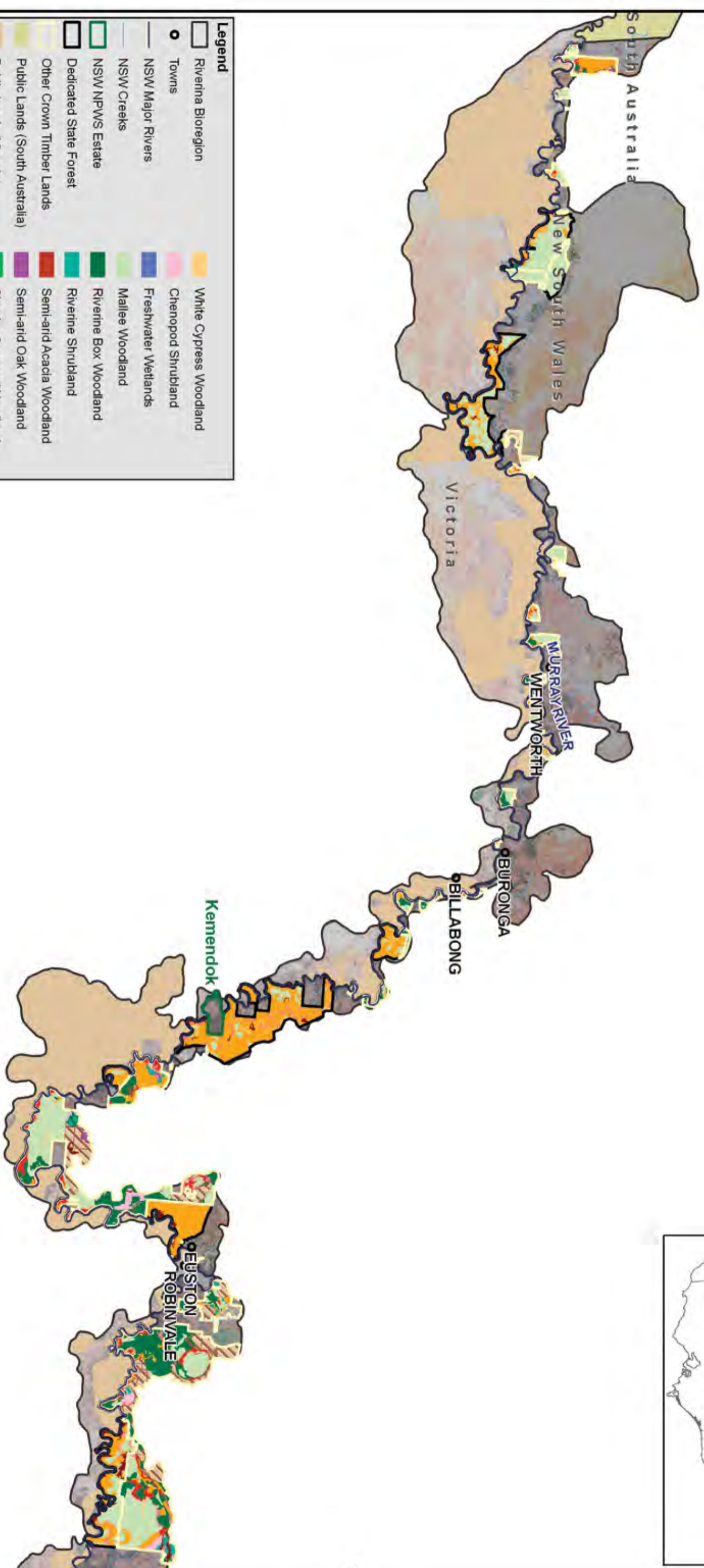
Figure 4.10  
Distribution of vegetation groups  
within the Wakool and Edward  
rivers riparian zone forests





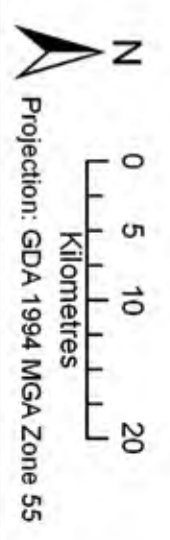
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.11  
Distribution of vegetation groups  
within the Lower Murray River  
riparian zone forests - downstream  
of Edward/Murray junction



Legend			
	Riverina Bioregion		White Cypress Woodland
	Towns		Chenopod Shrubland
	NSW Major Rivers		Freshwater Wetlands
	NSW Creeks		Mallee Woodland
	NSW NPWS Estate		Riverine Box Woodland
	Dedicated State Forest		Riverine Shrubland
	Other Crown Timber Lands		Semi-arid Acacia Woodland
	Public Lands (South Australia)		Semi-arid Oak Woodland
	Public Lands (Victoria)		Slender Cypress Woodland
Vegetation Group			Tussock Grassland
	River Red Gum Very Tall Forest		Unknown Non-Woody Vegetation
	River Red Gum Tall Open Forest		Cleared
	River Red Gum Woodland		Non-native Vegetation
	River Red Gum - Box Woodland		Non-Vegetation
	Box - White Cypress Woodland		Unknown

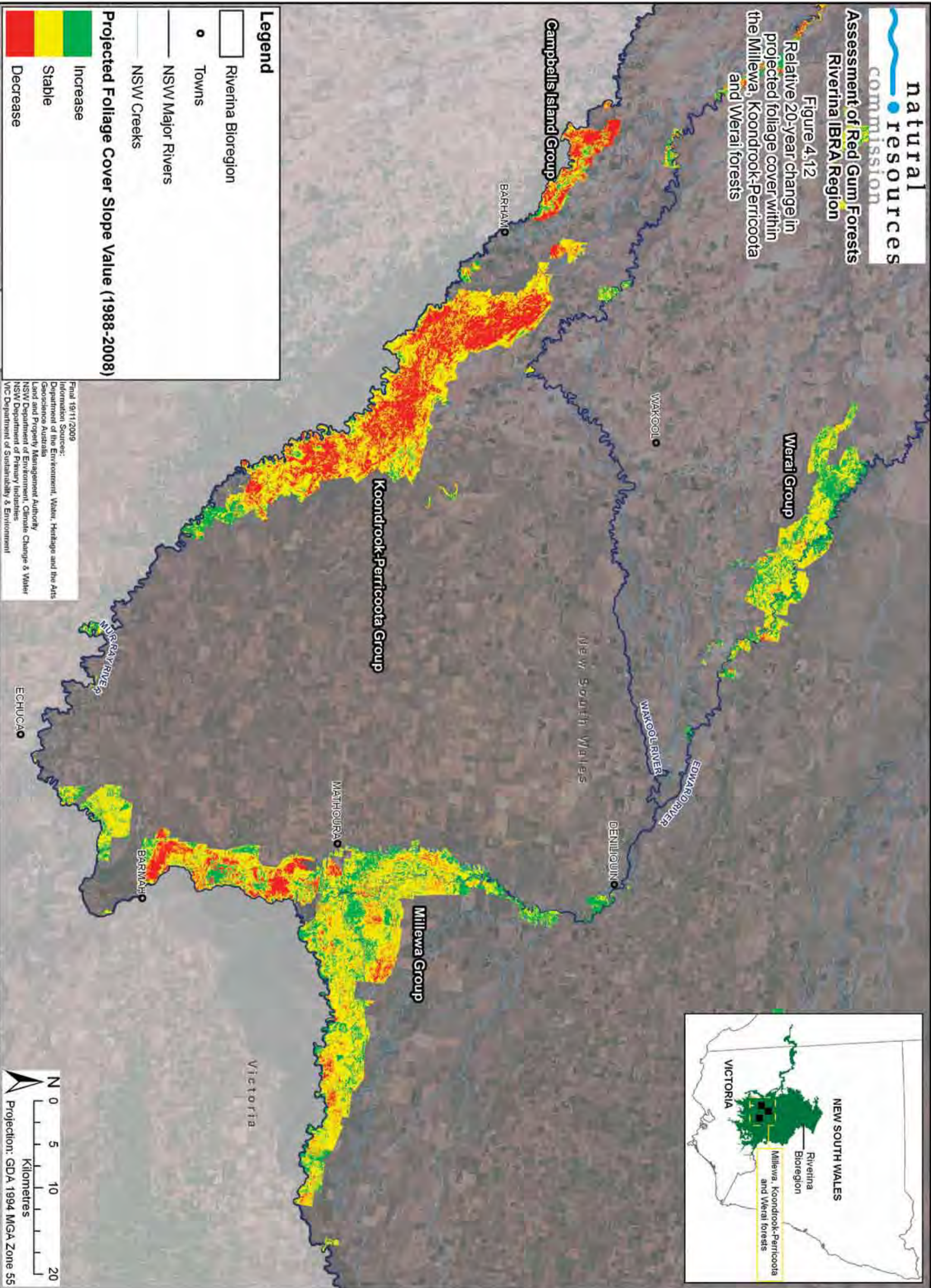
Final 23/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
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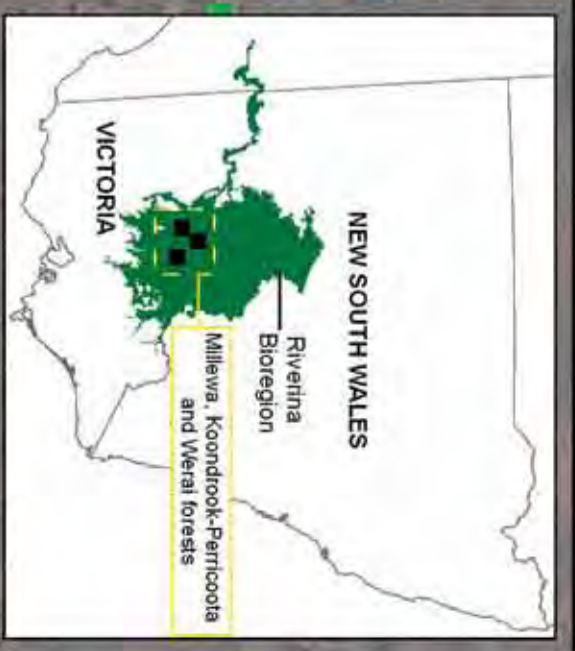
Assessment of Red Gum Forests  
Riverina IBRA Region

Figure 4.12  
Relative 20-year change in  
projected foliage cover within  
the Millewa, Koondrook-Perricoota  
and Werrai forests

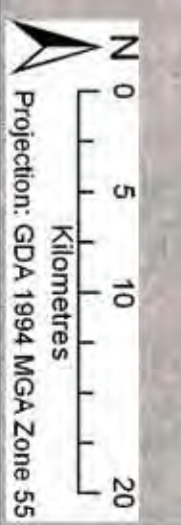


Legend

- Riverina Bioregion
  - Towns
  - NSW Major Rivers
  - NSW Creeks
- Projected Foliage Cover Slope Value (1988-2008)**
- Increase
  - Stable
  - Decrease

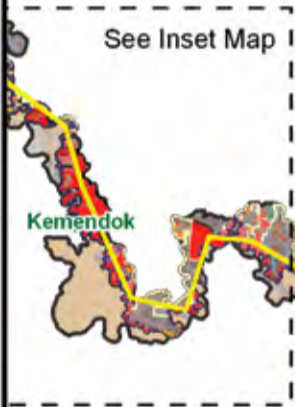
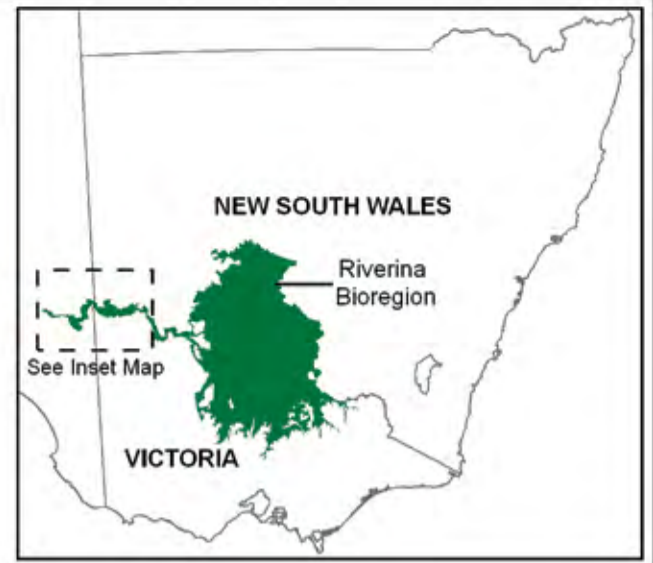


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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
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Assessment of Red Gum Forests  
Riverina Bioregion  
Figure 4.14  
Potential habitat corridors linking river red gum refugia



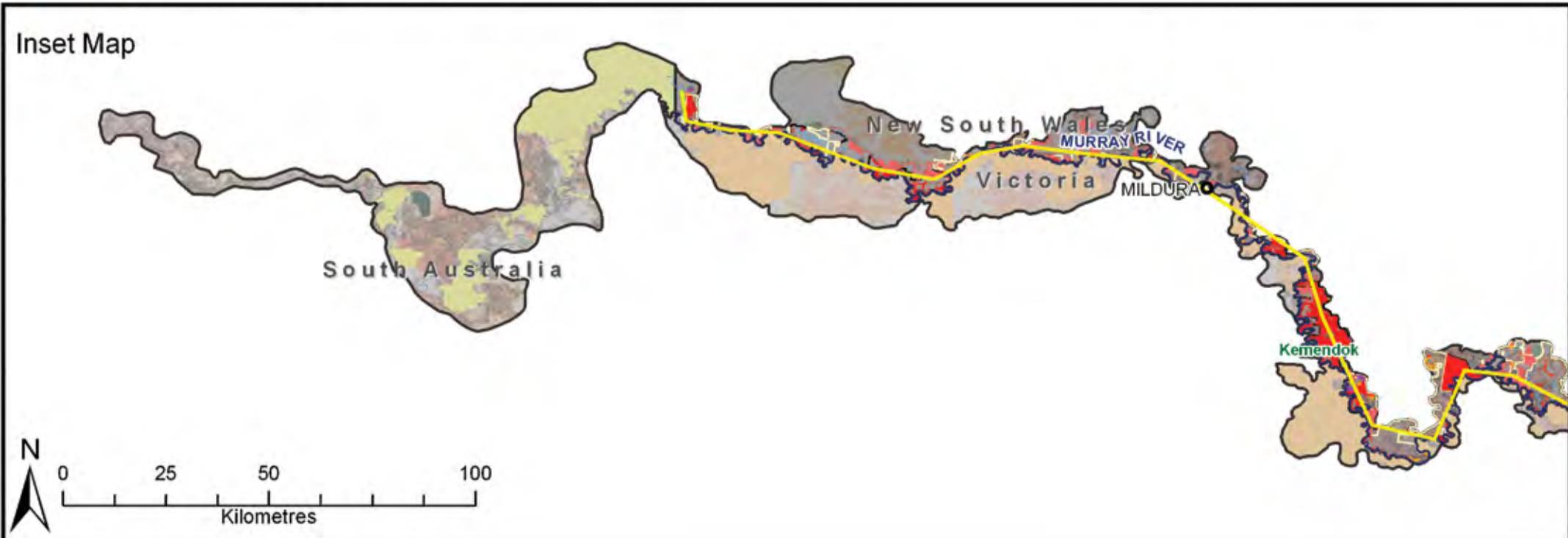
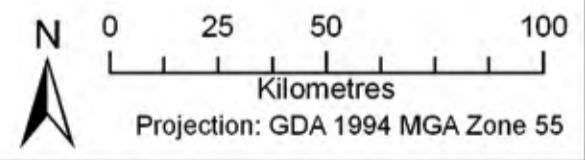
**Legend**

- Riverina Bioregion
- Towns
- NSW Major Rivers
- NSW Creeks
- NSW NPWS Estate
- Dedicated State Forest
- Other Crown Timber Lands
- Public Lands (South Australia)
- Public Lands (Victoria)
- Potential Corridors

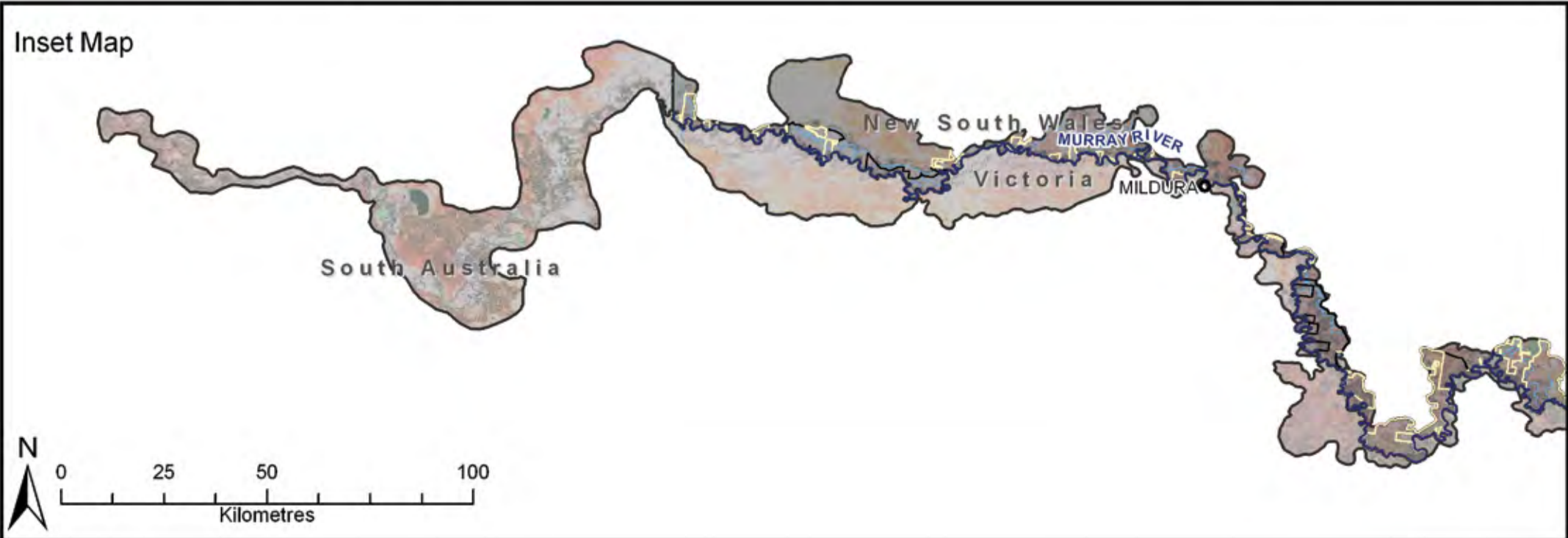
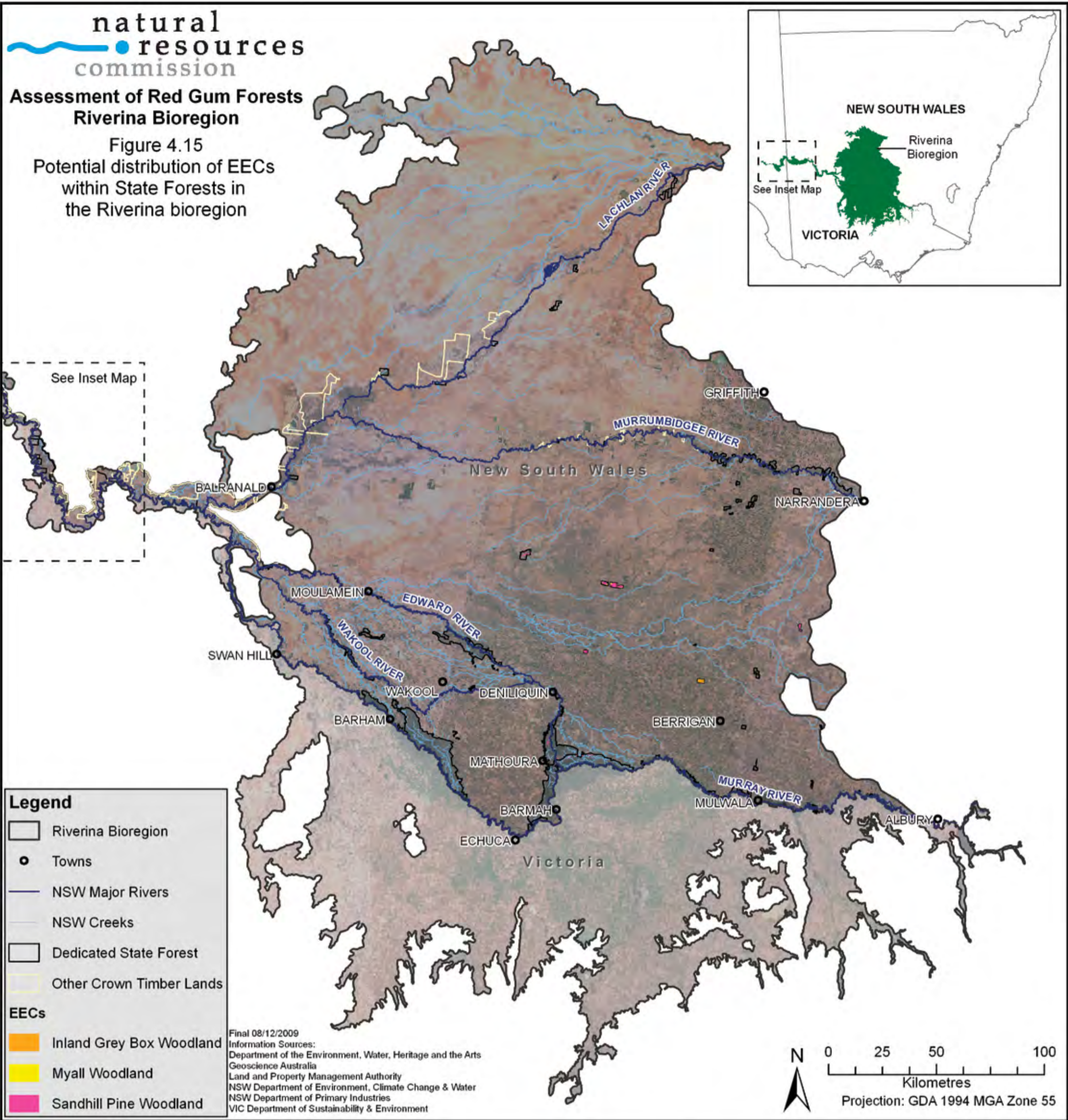
**River Red Gum Forest Communities**

- Public Land
- Private Land
- Travelling Stock Routes
- Western Lands Lease

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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
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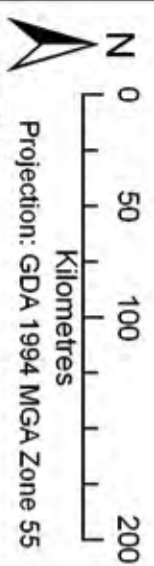




Assessment of Red Gum Forests  
Riverina Bioregion

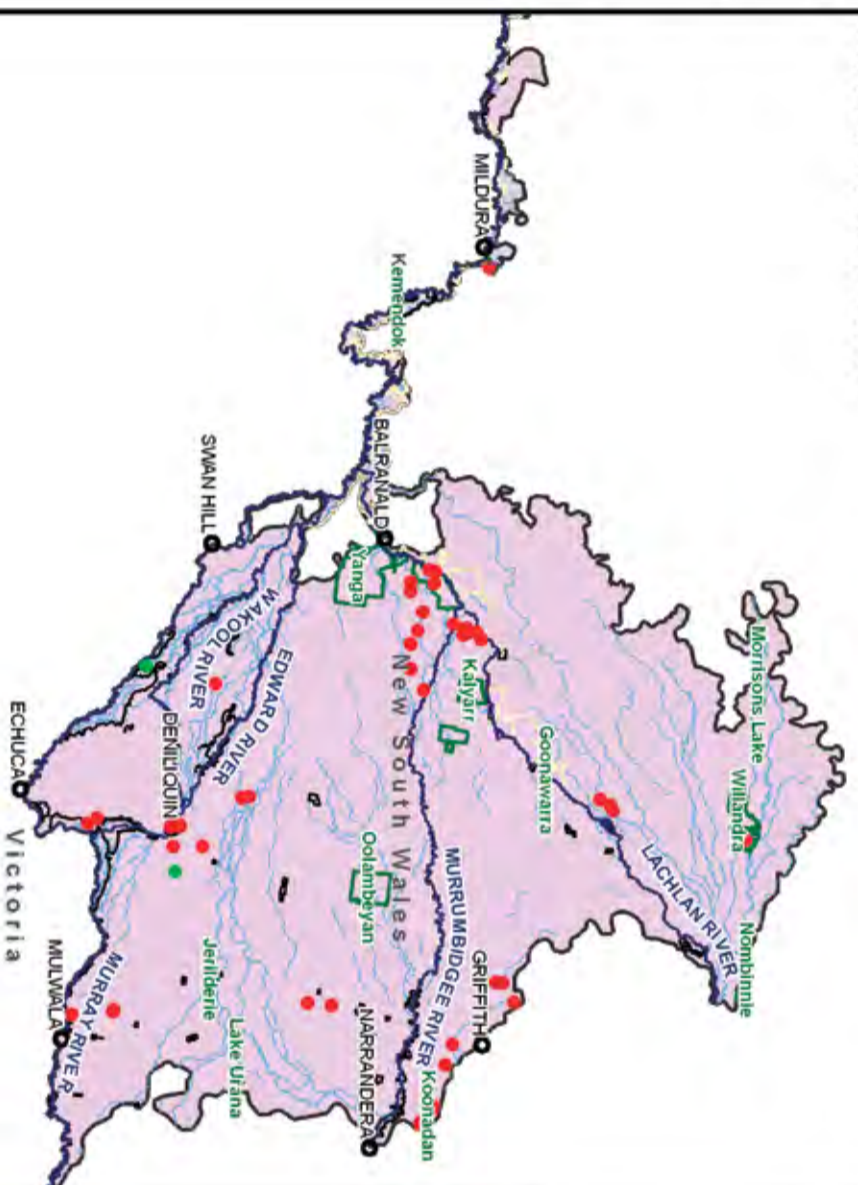
Figure 4.16  
Distribution of wetland-dependent  
bird species in the Riverina (I)

- Legend**
- NSW Riverina
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Species Records Post 1980
  - Species Records Pre 1980
  - Indicative Range within NSW

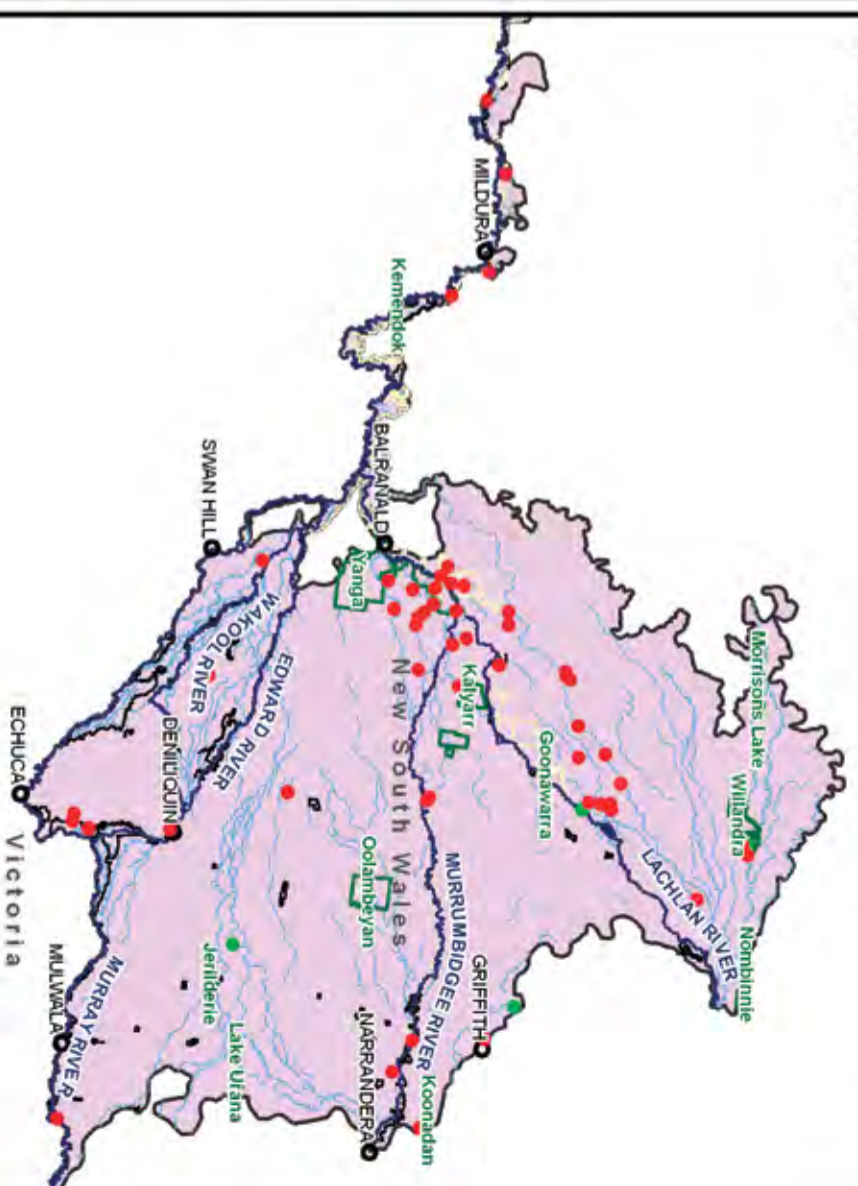


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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment

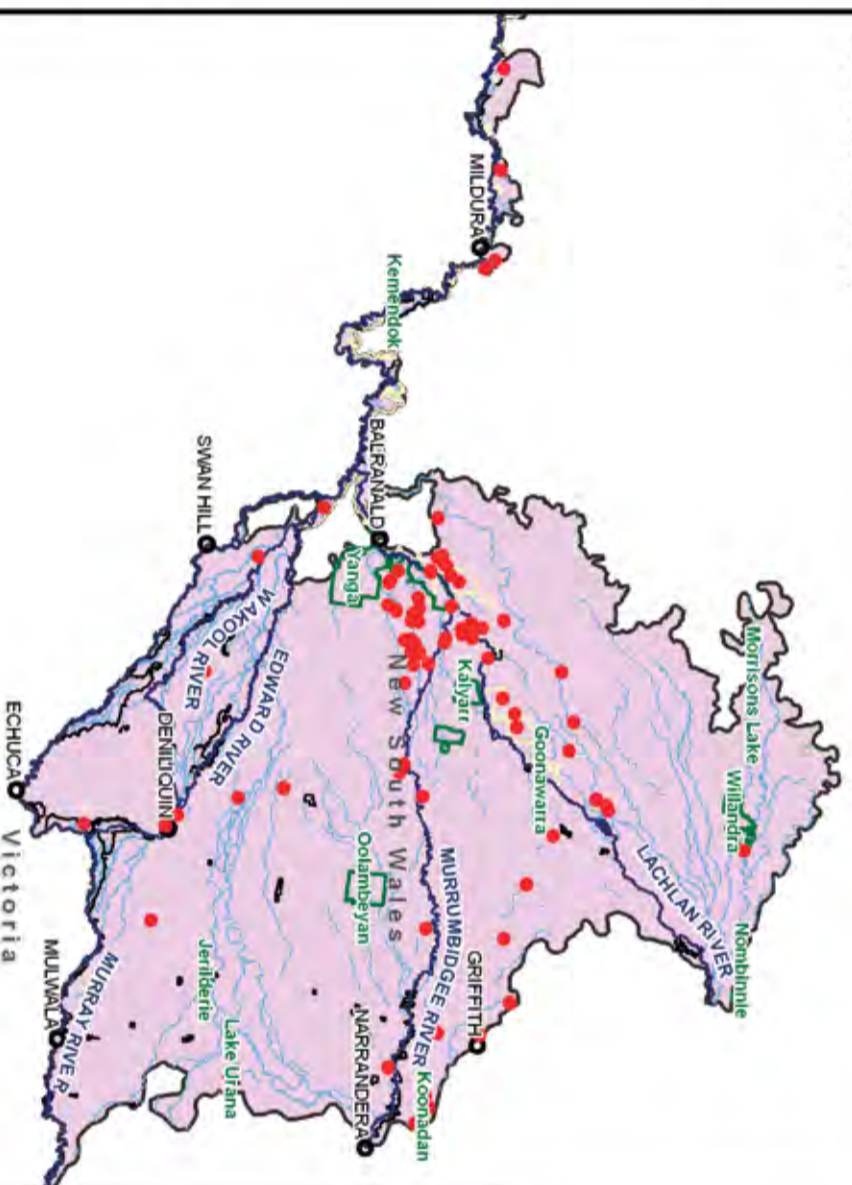
Australasian Bittern



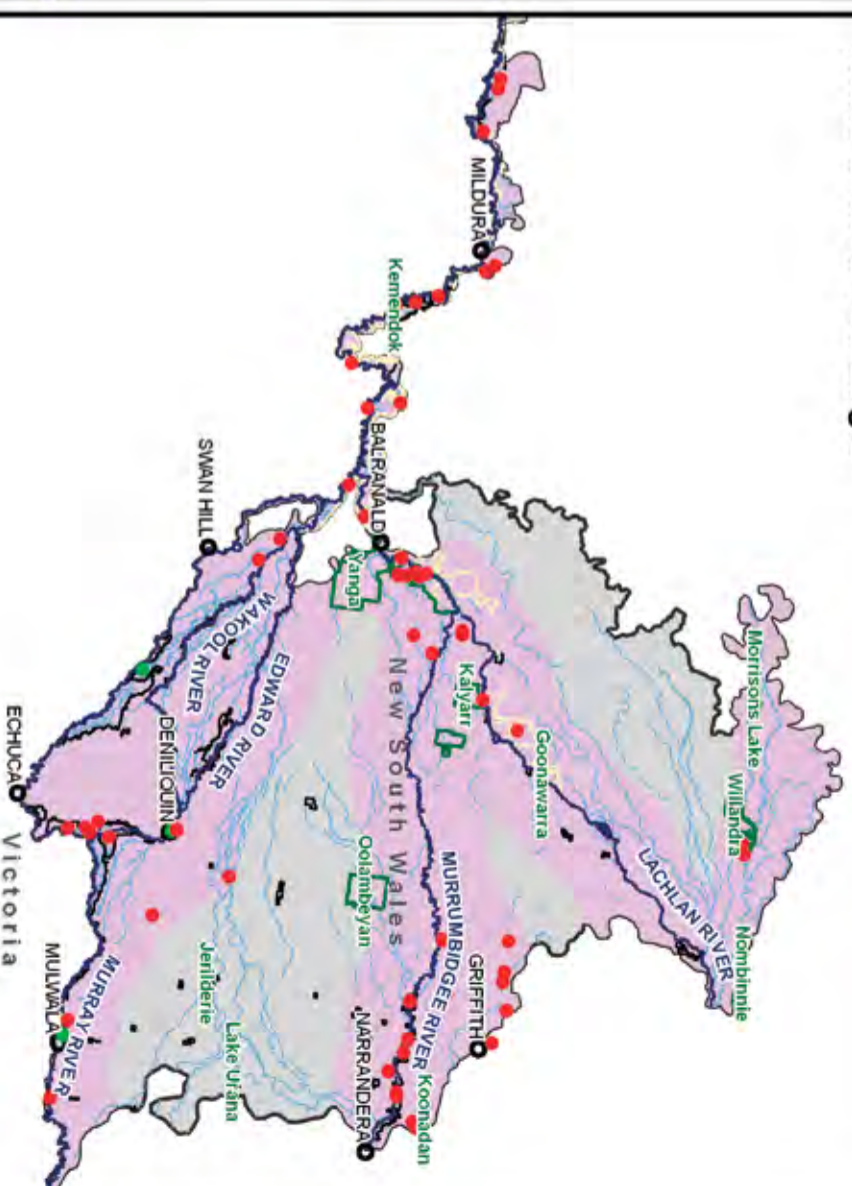
Blue-billed Duck



Freckled Duck



White-bellied Sea Eagle

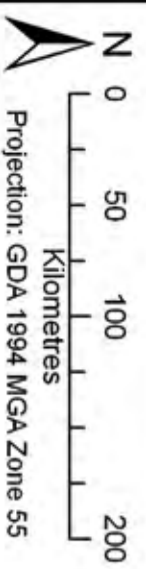




Assessment of Red Gum Forests  
Riverina Bioregion

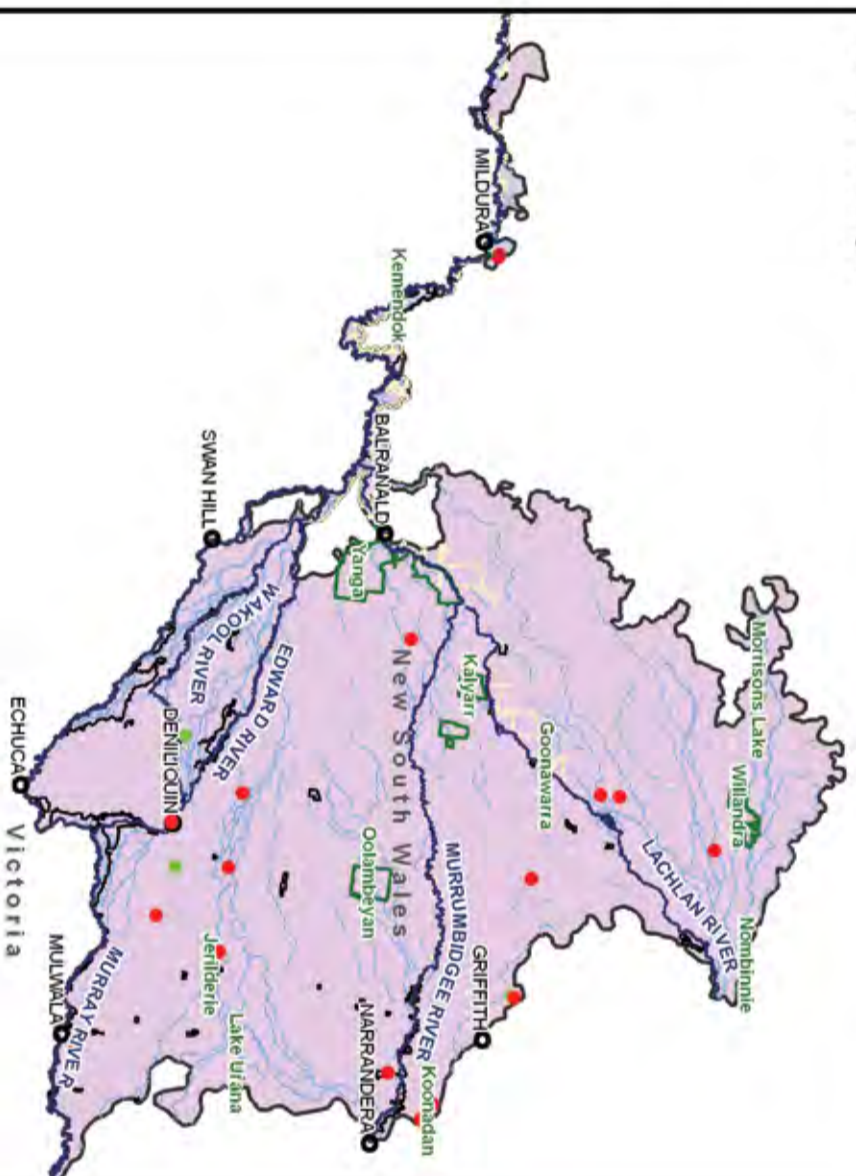
Figure 4.17  
Distribution of wetland-dependent  
bird species in the Riverina (II)

- Legend**
- NSW Riverina
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Species Records Post 1980
  - Species Records Pre 1980
  - Indicative Range within NSW

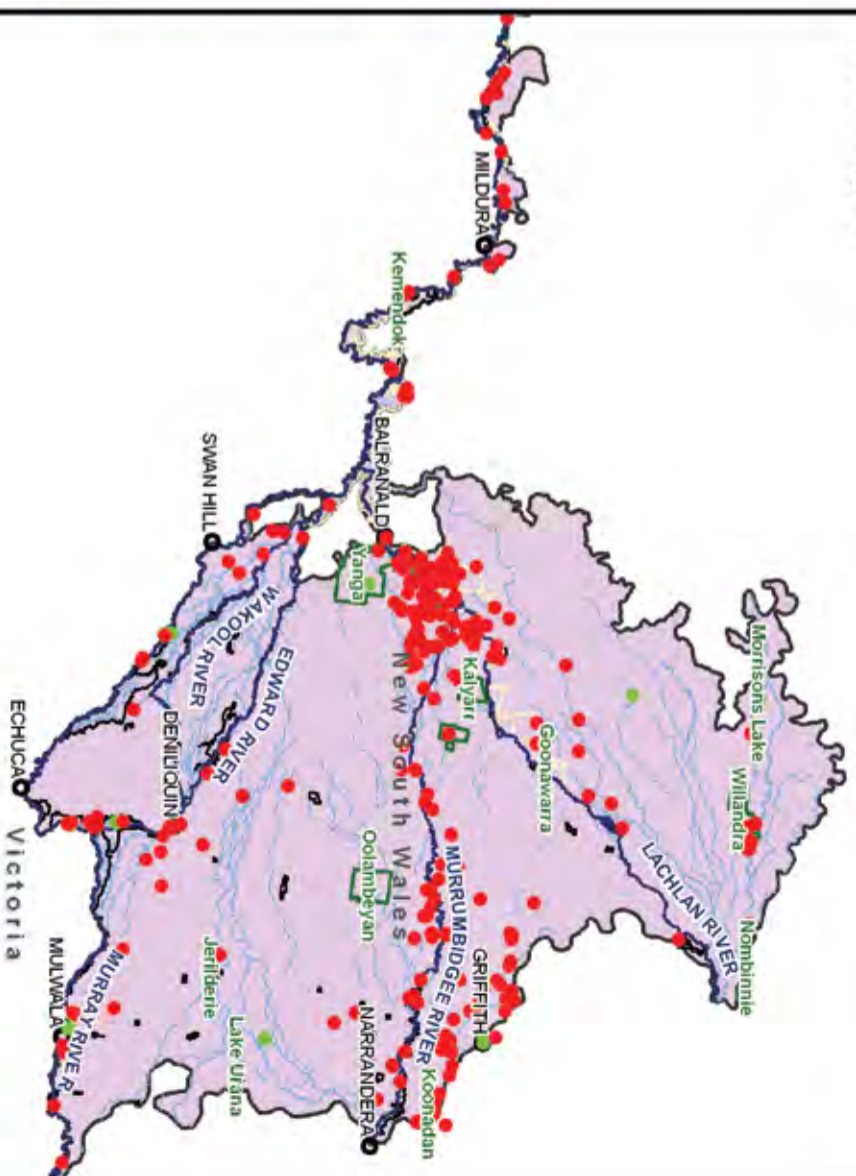


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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
VIC Department of Sustainability & Environment  
Projection: GDA 1994 MGA Zone 55

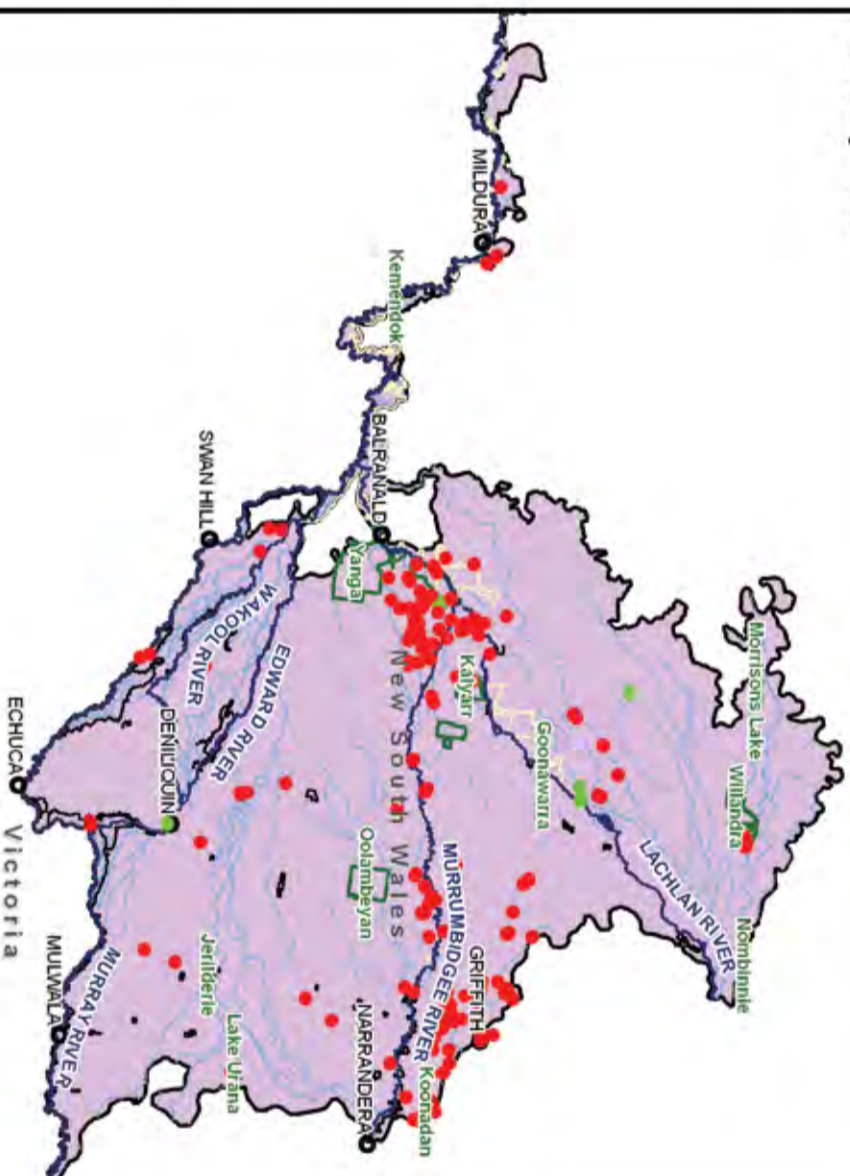
Painted Snipe



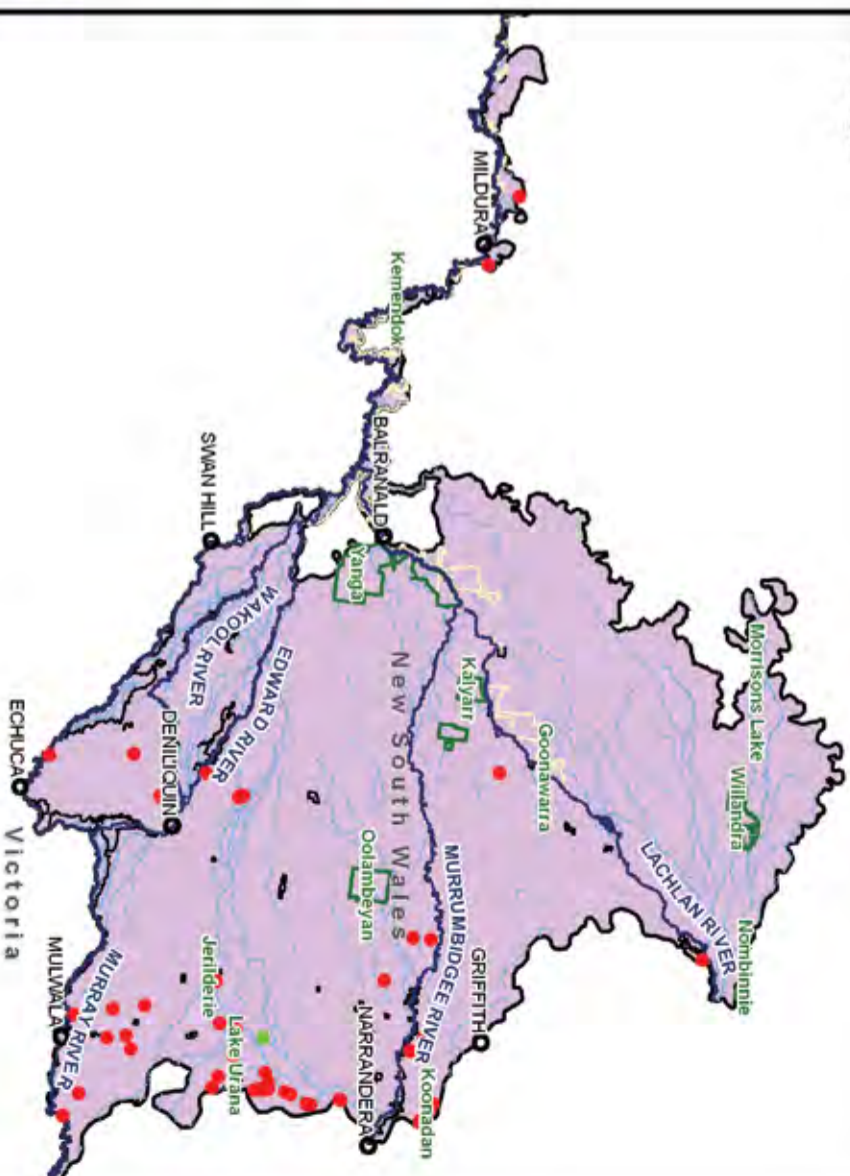
Great Egret



Glossy Ibis



Brolga

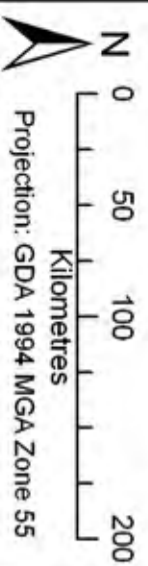




Assessment of Red Gum Forests  
Riverina Bioregion

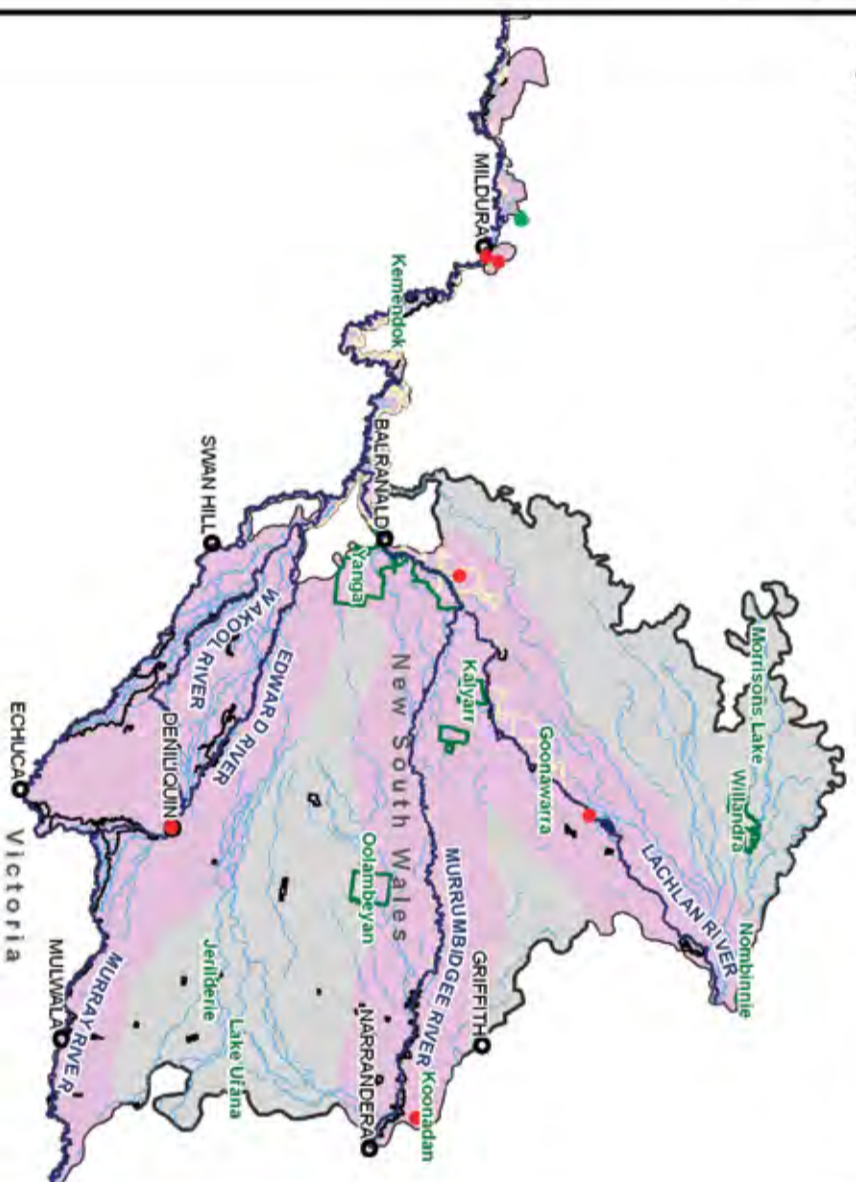
Figure 4.18  
Distribution of threatened  
raptors and large forest owls  
in the Riverina

- Legend**
- NSW Riverina
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Species Records Post 1980
  - Species Records Pre 1980
  - Indicative Range within NSW

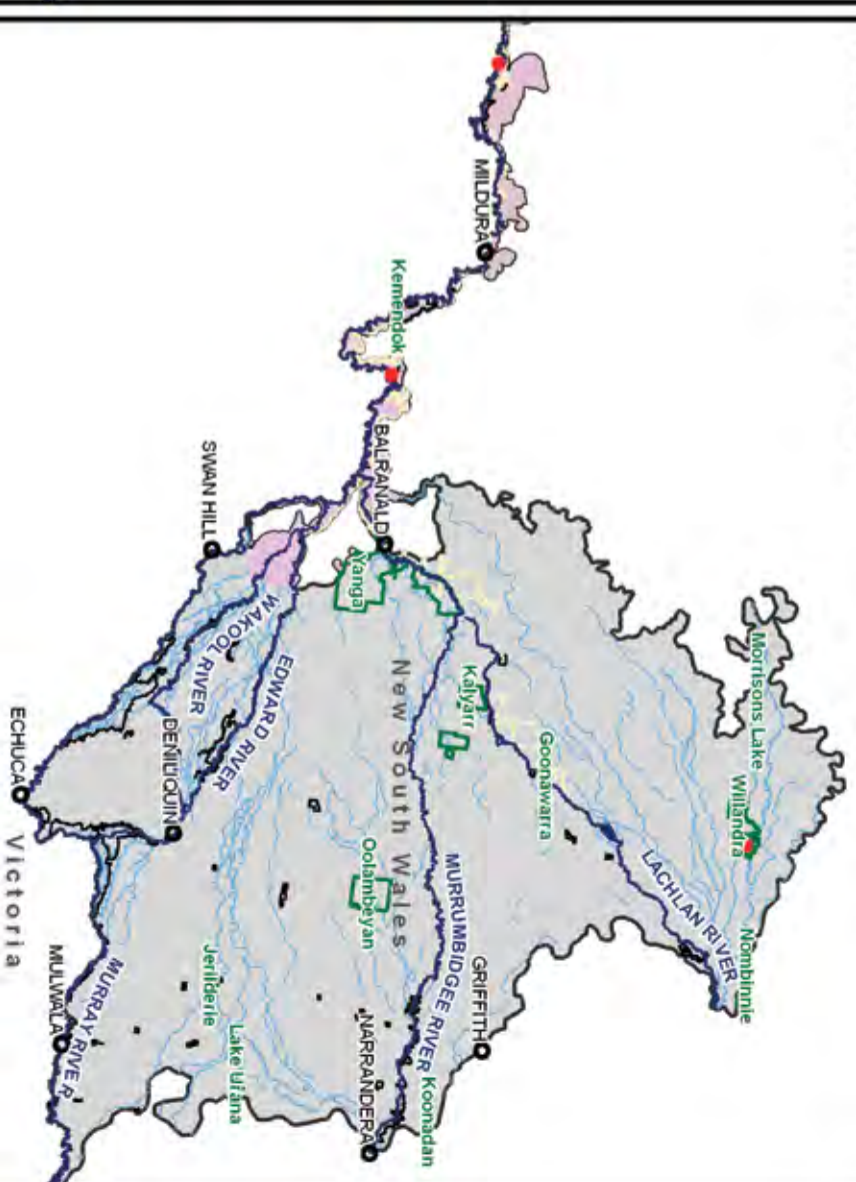


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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment  
Projection: GDA 1994 MGA Zone 55

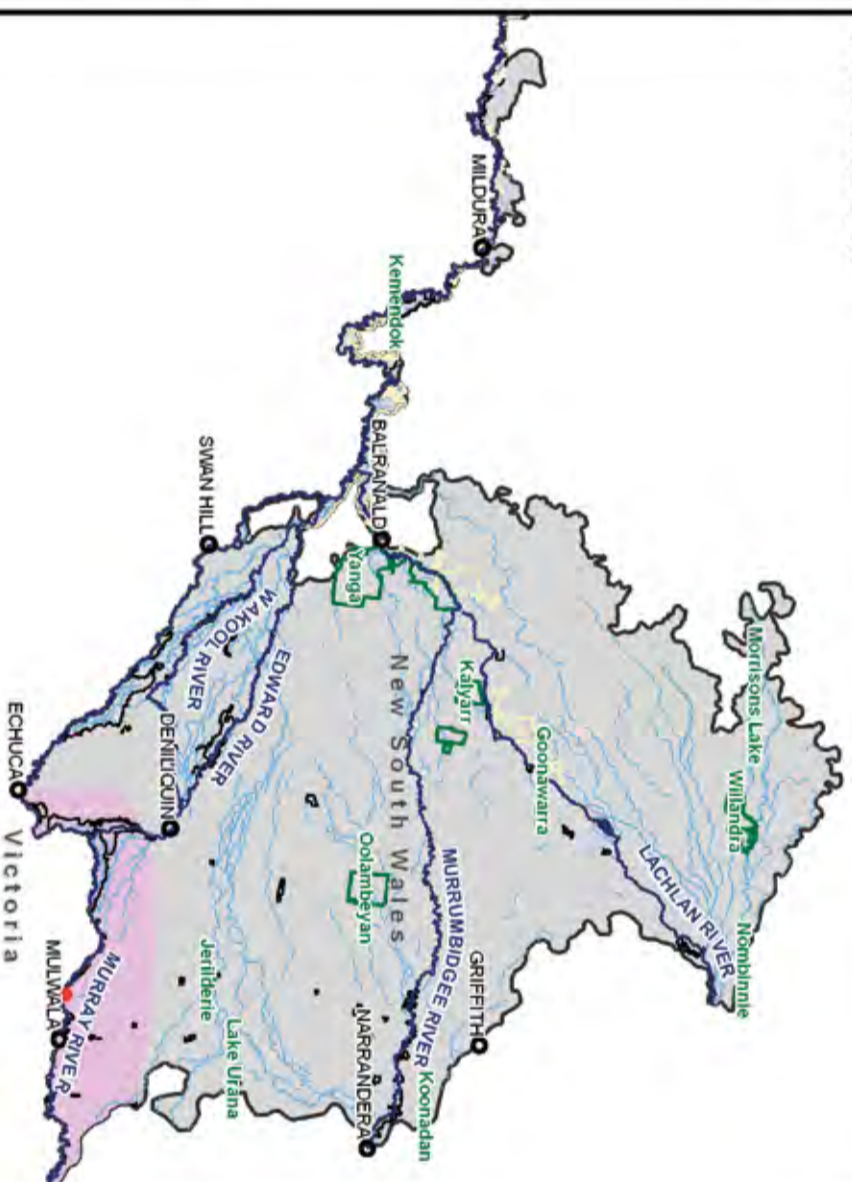
Square-tailed Kite Records



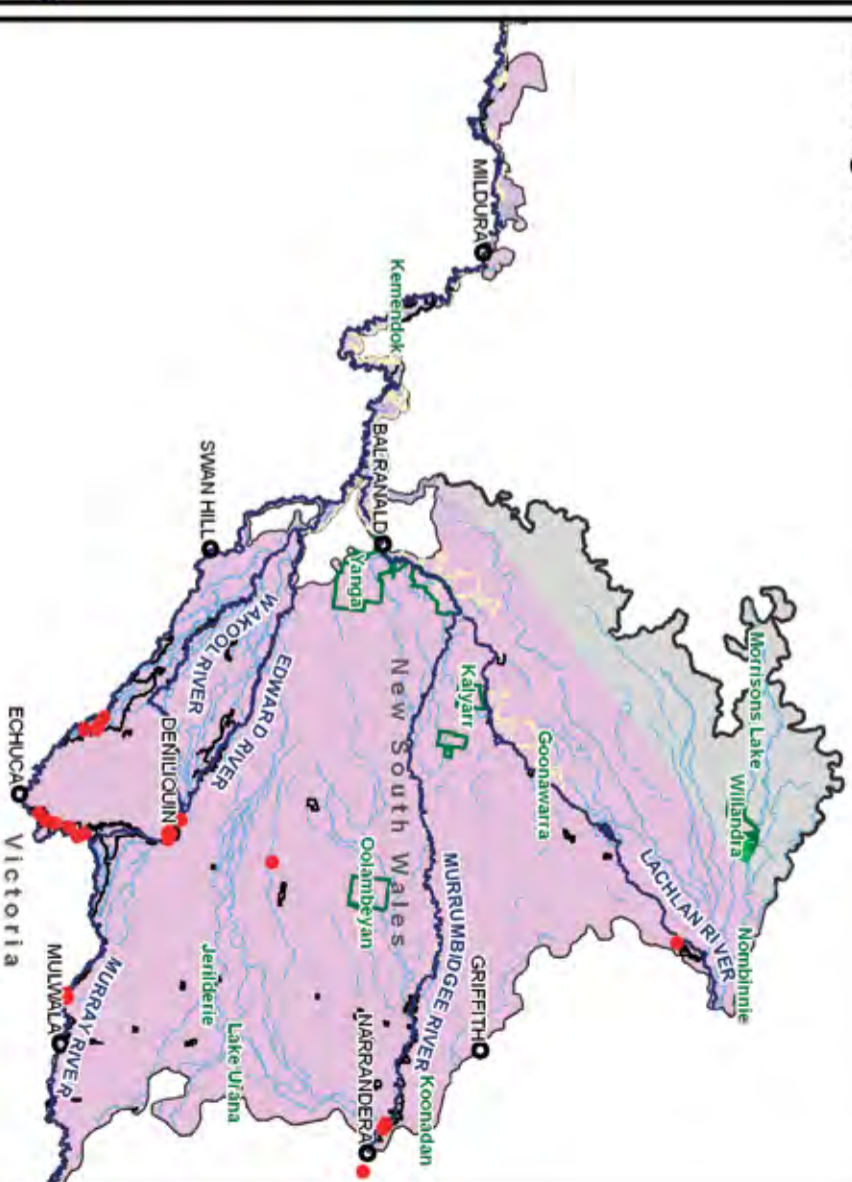
Black Breasted Buzzard



Powerful Owl



Barking Owl

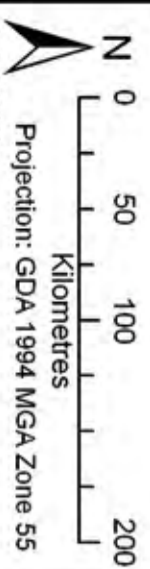




**Assessment of Red Gum Forests  
Riverina Bioregion**

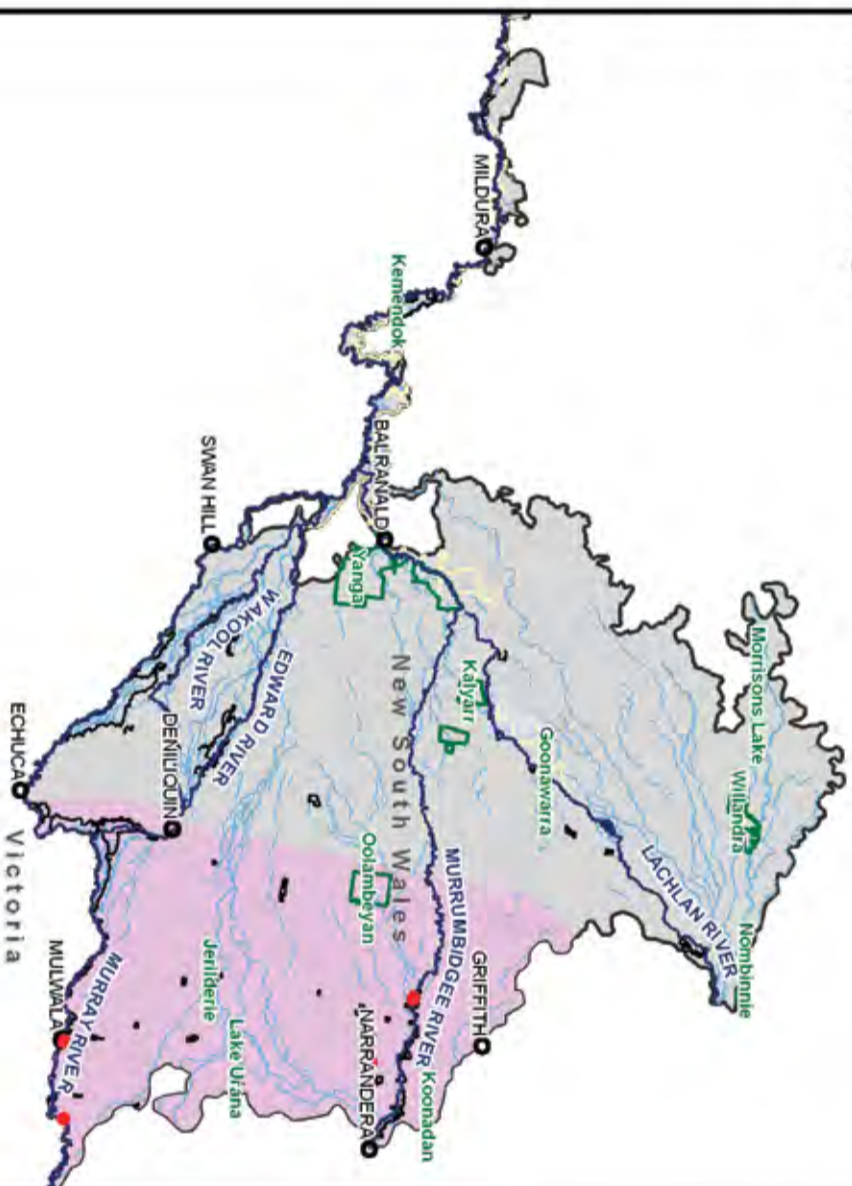
**Figure 4.19**  
Distribution of two threatened  
frogs and two restricted plants  
in the Riverina

- Legend**
- NSW Riverina
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Species Records Post 1980
  - Species Records Pre 1980
  - Indicative Range within NSW

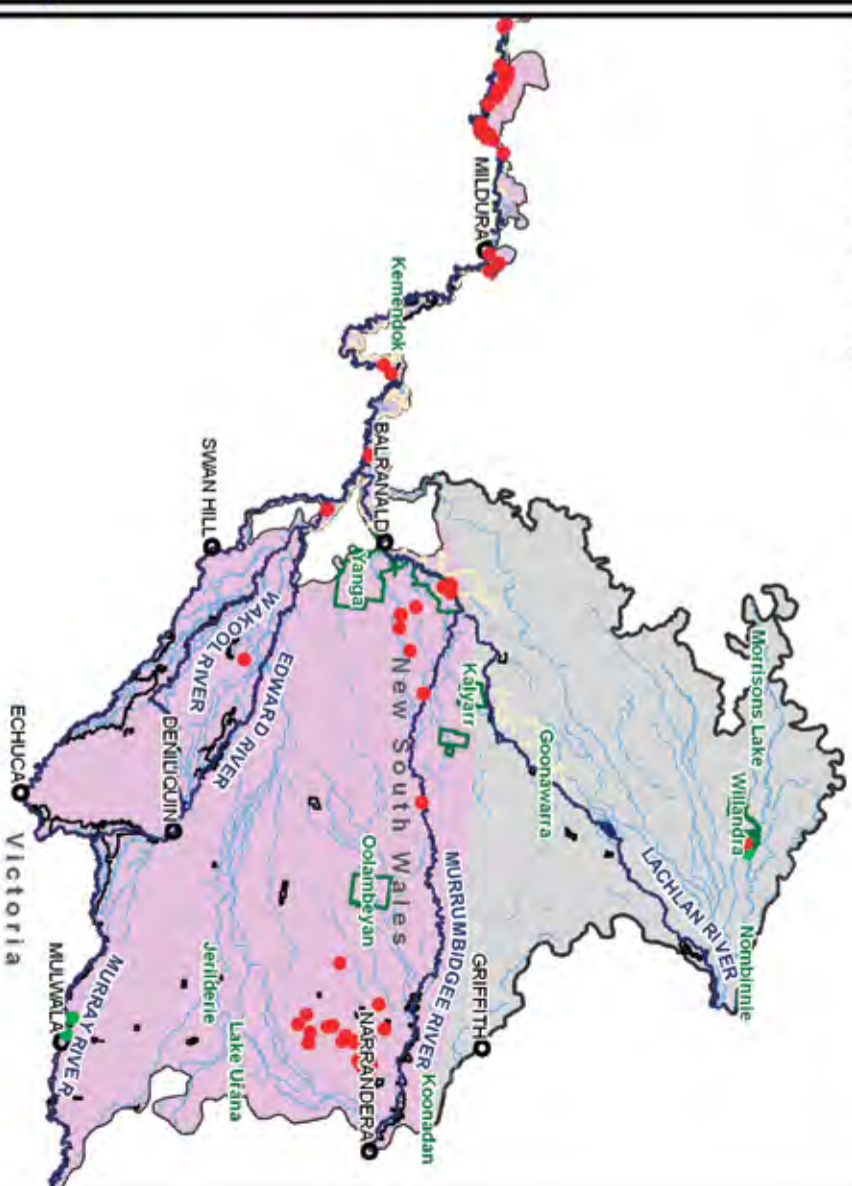


Final 19/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment  
Projection: GDA 1994 MGA Zone 55

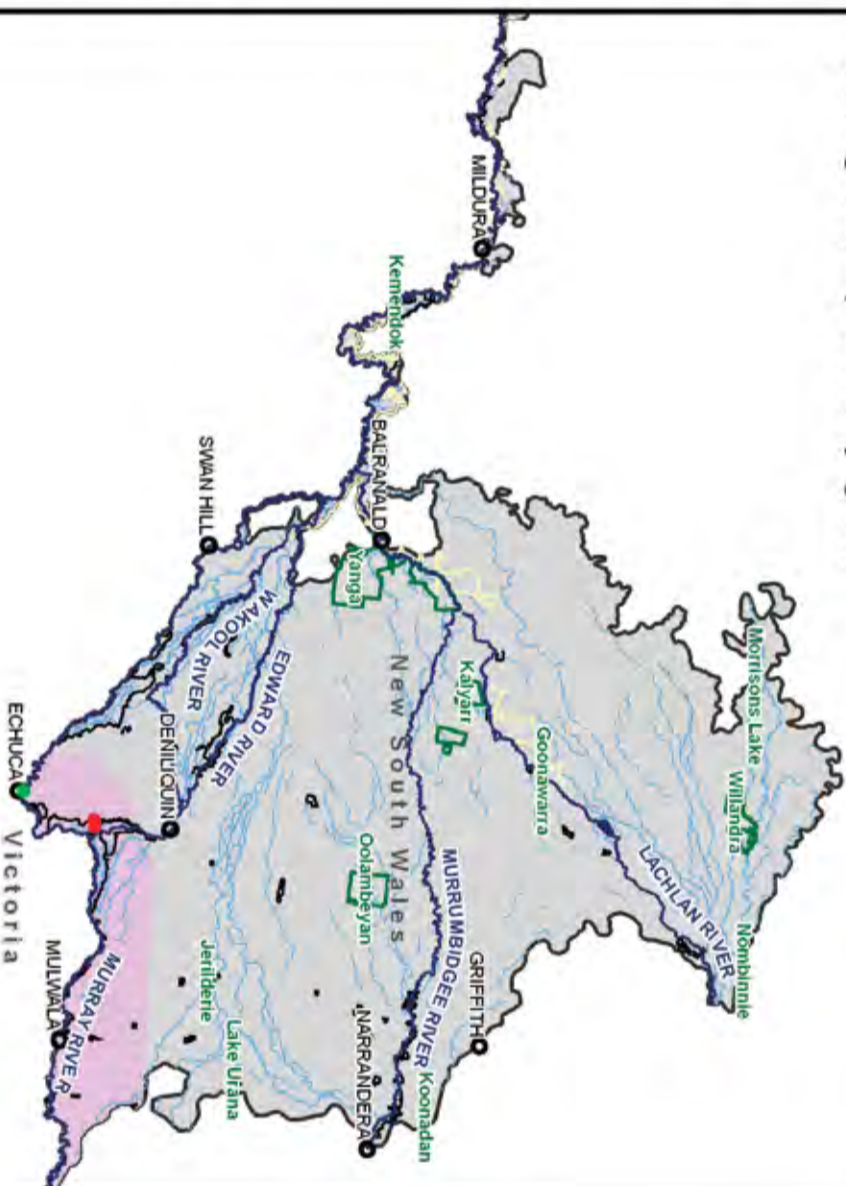
**Sloane's Froglet**



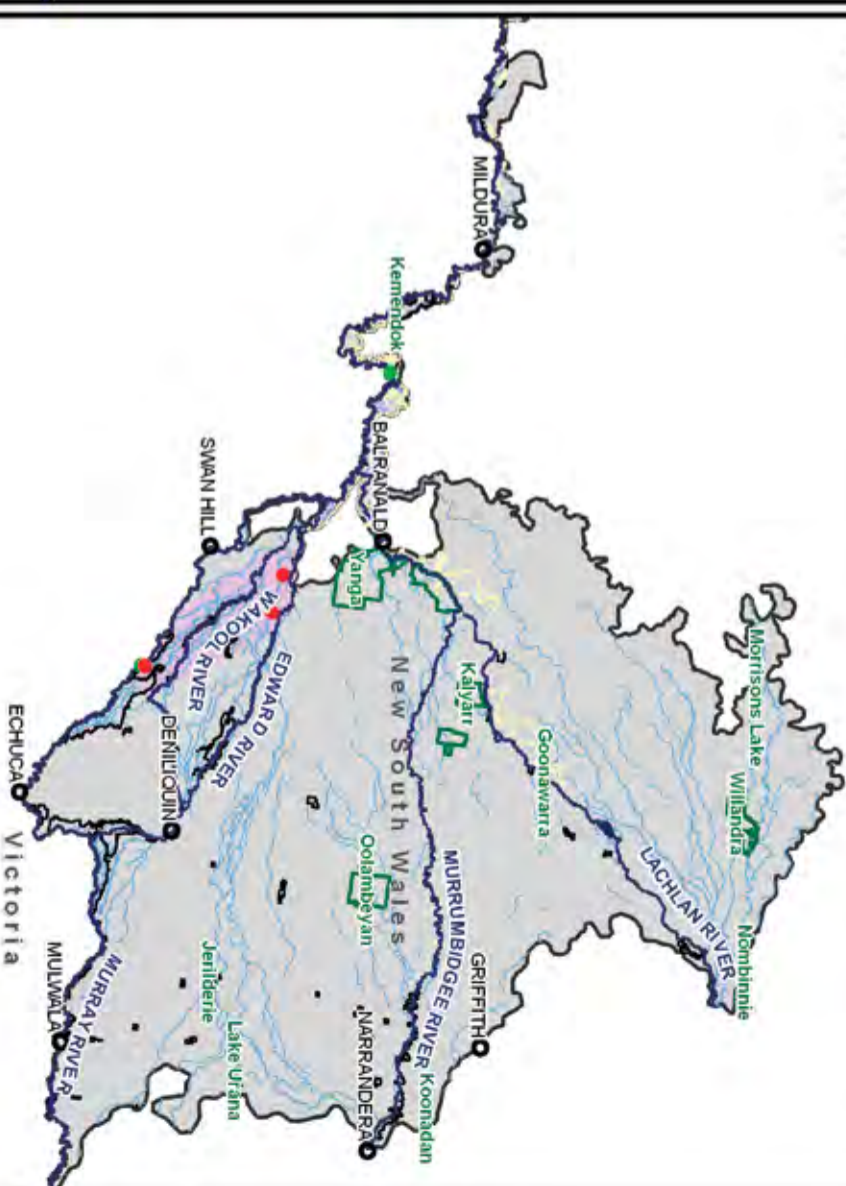
**Southern Bell Frog**



**Floating Swamp Wallaby-grass**



**Yellow Gum**



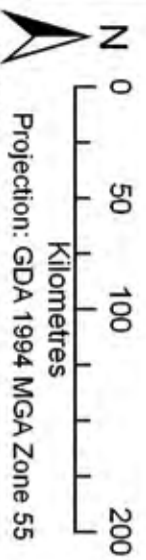


Assessment of Red Gum Forests  
Riverina Bioregion

Figure 4.20  
Distribution of threatened  
red gum-dependent birds  
in the Riverina

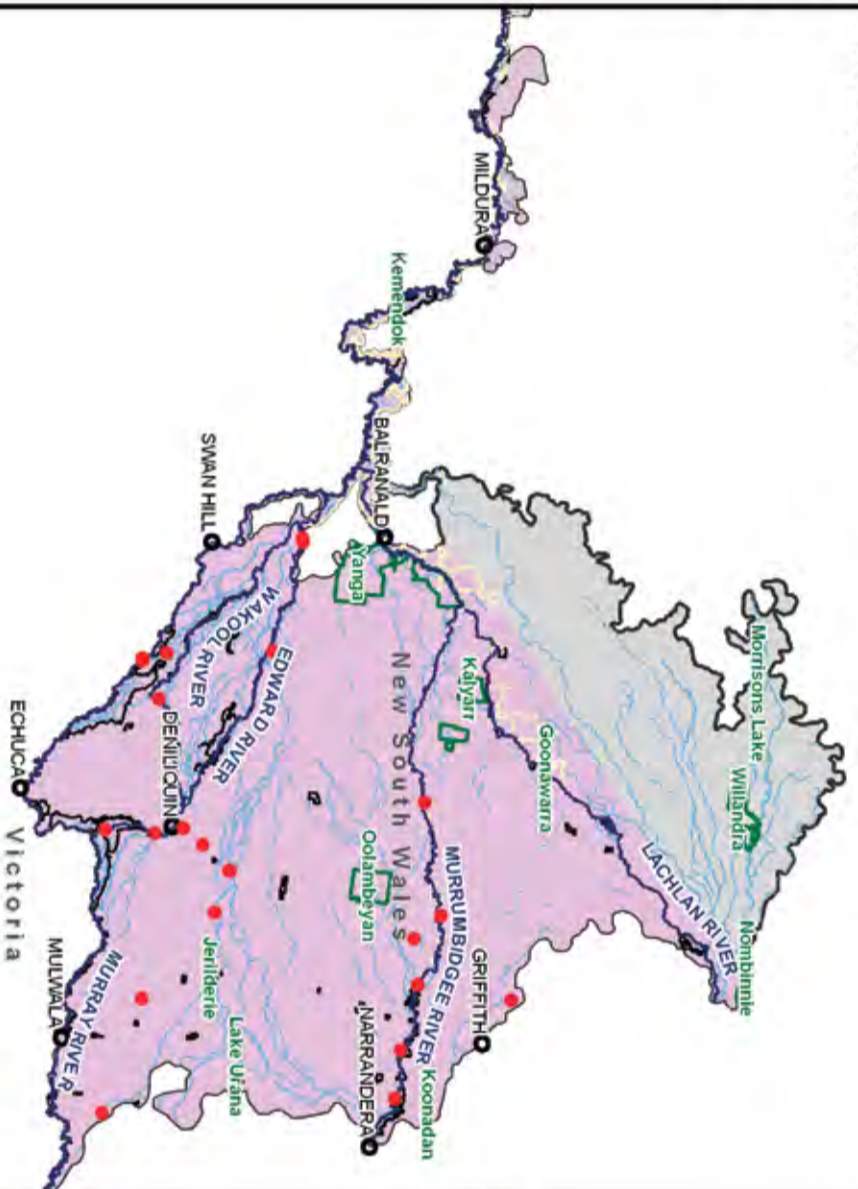
Legend

- NSW Riverina
- Towns
- NSW Major Rivers
- NSW Creeks
- NSW NPWS Estate
- Dedicated State Forest
- Other Crown Timber Lands
- Species Records Post 1980
- Species Records Pre 1980
- Indicative Range within NSW

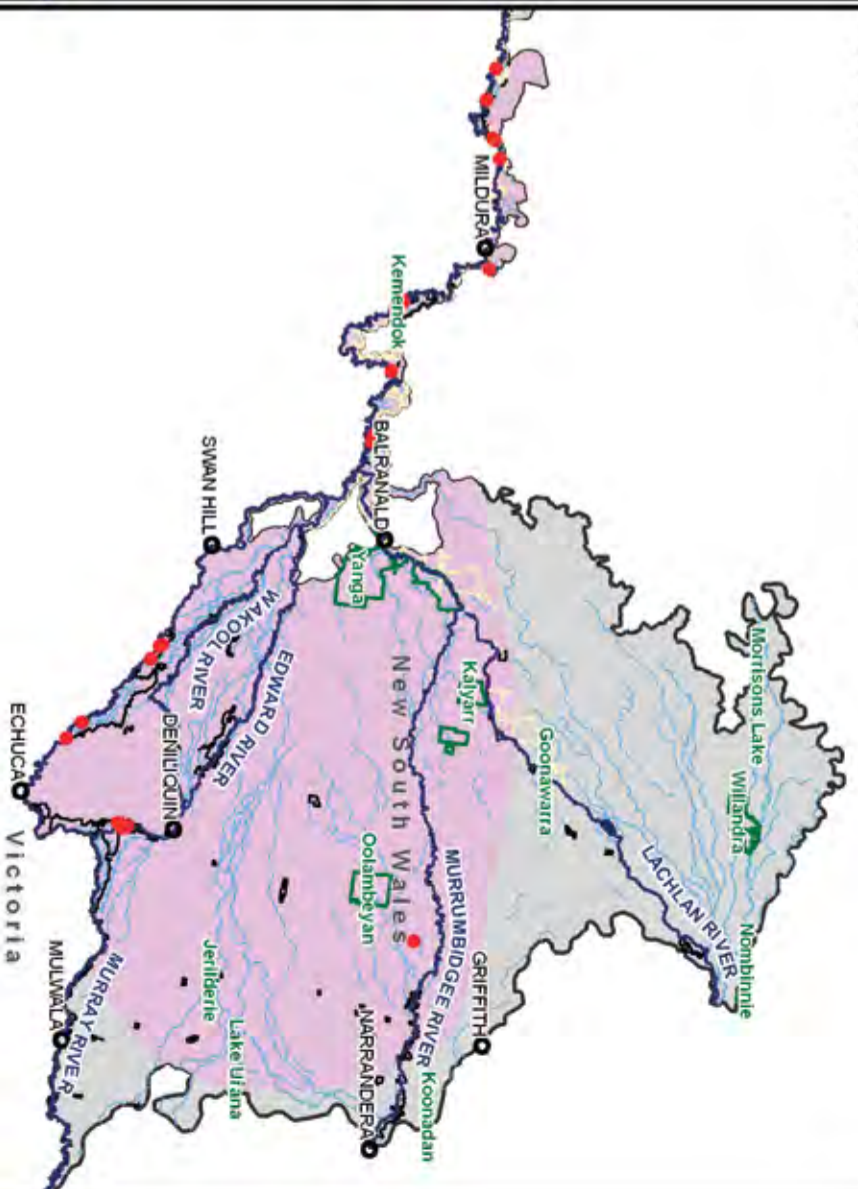


Final 25/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment  
Projection: GDA 1994 MGA Zone 55

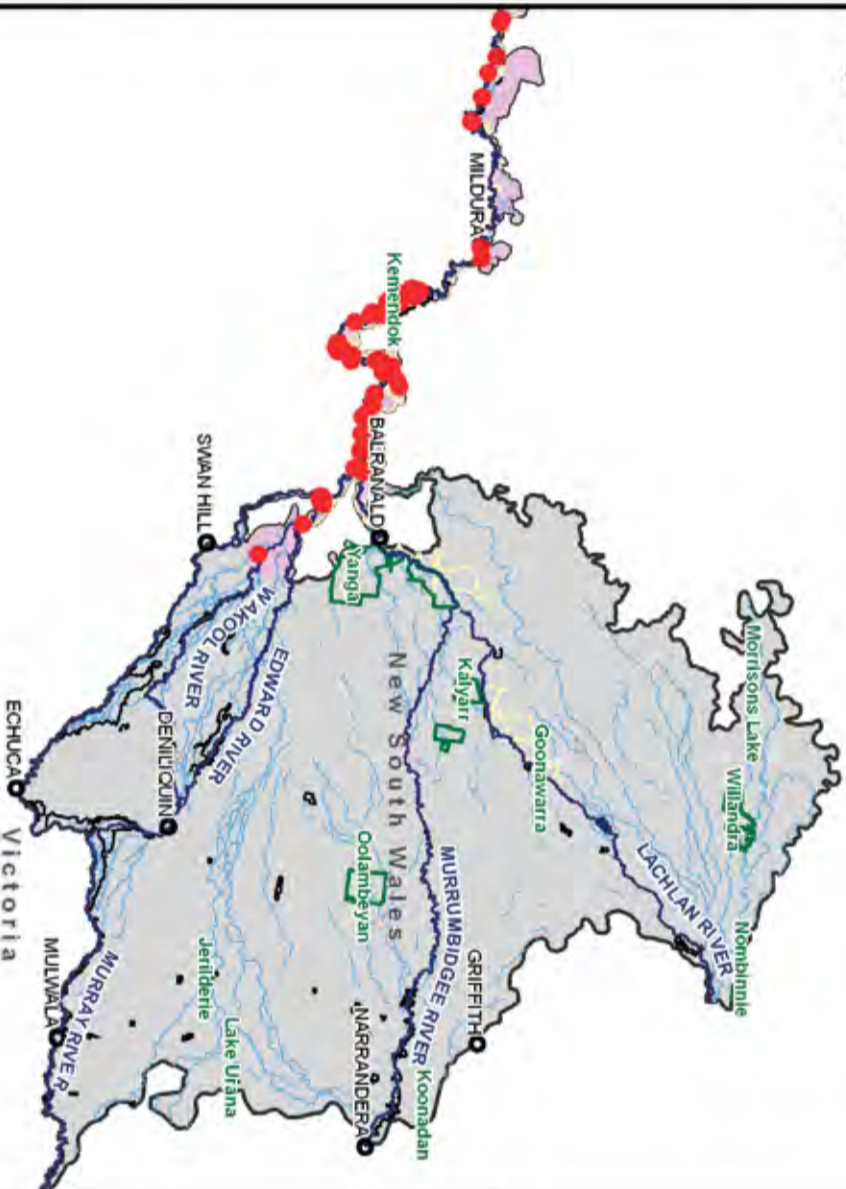
Bush Stone-curlew



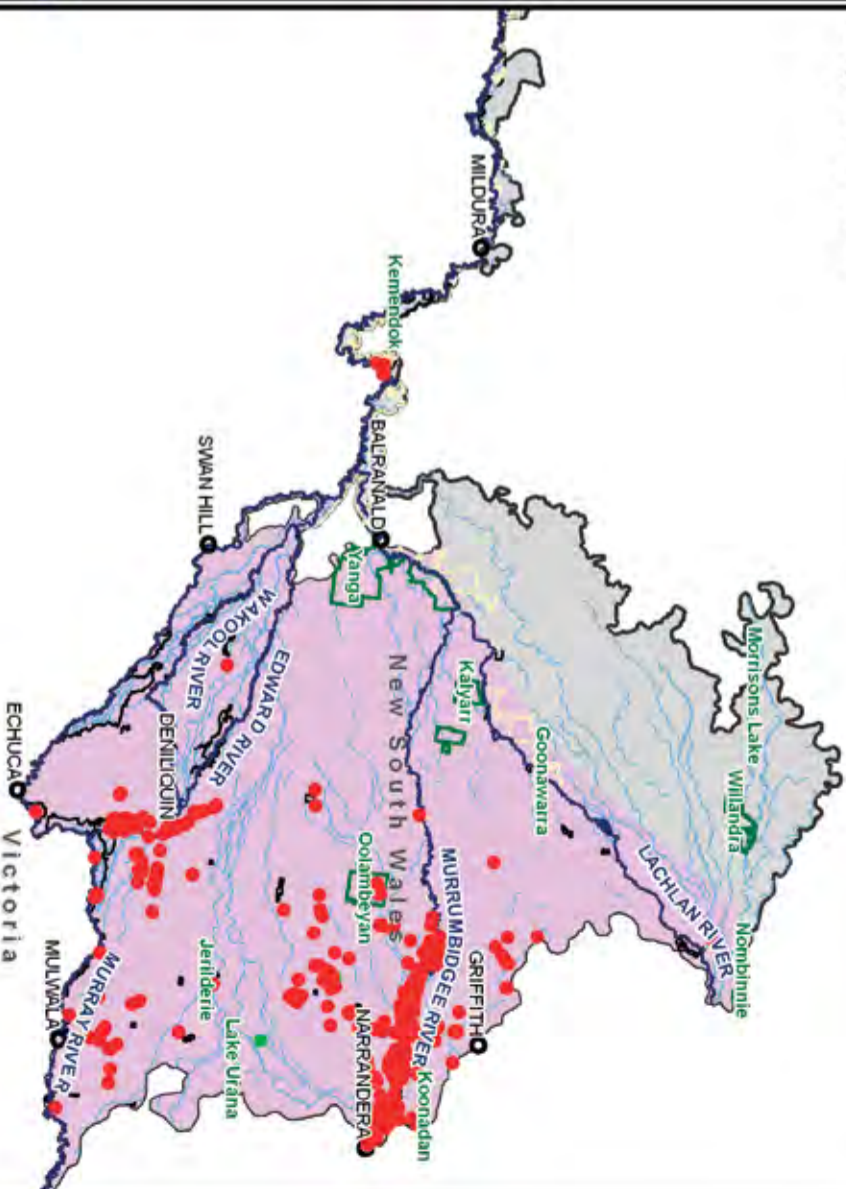
Gilbert's Whistler



Regent Parrot



Superb Parrot

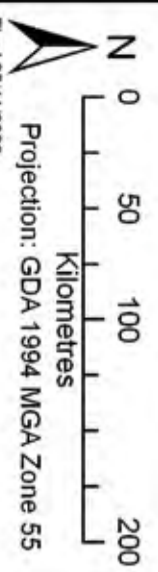




Assessment of Red Gum Forests  
Riverina Bioregion

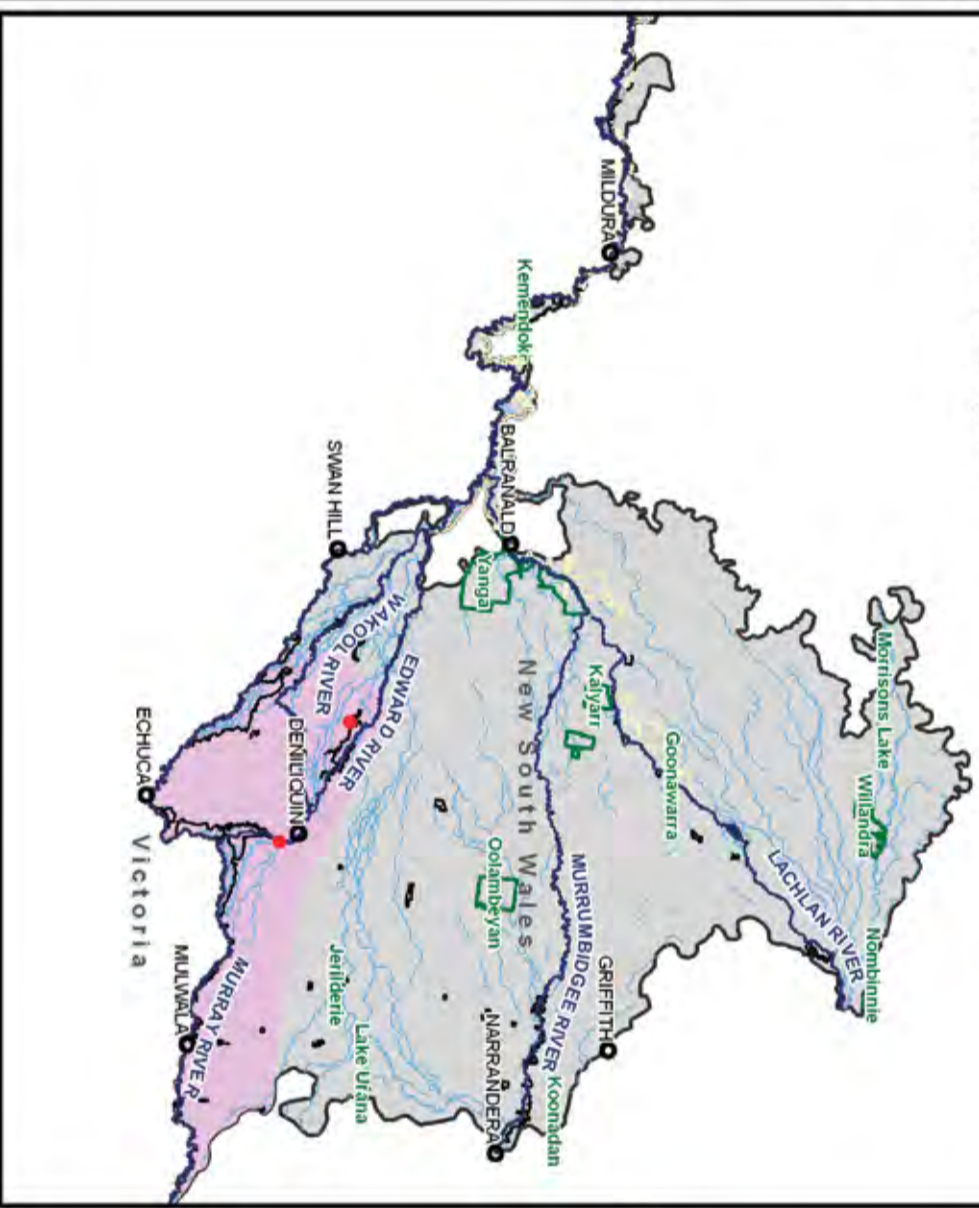
Figure 4.21  
Distribution of threatened  
mammals in the Riverina

- Legend**
- NSW Riverina
  - Towns
  - NSW Major Rivers
  - NSW Creeks
  - NSW NPWS Estate
  - Dedicated State Forest
  - Other Crown Timber Lands
  - Species Records Post 1980
  - Species Records Pre 1980
  - Indicative Range within NSW

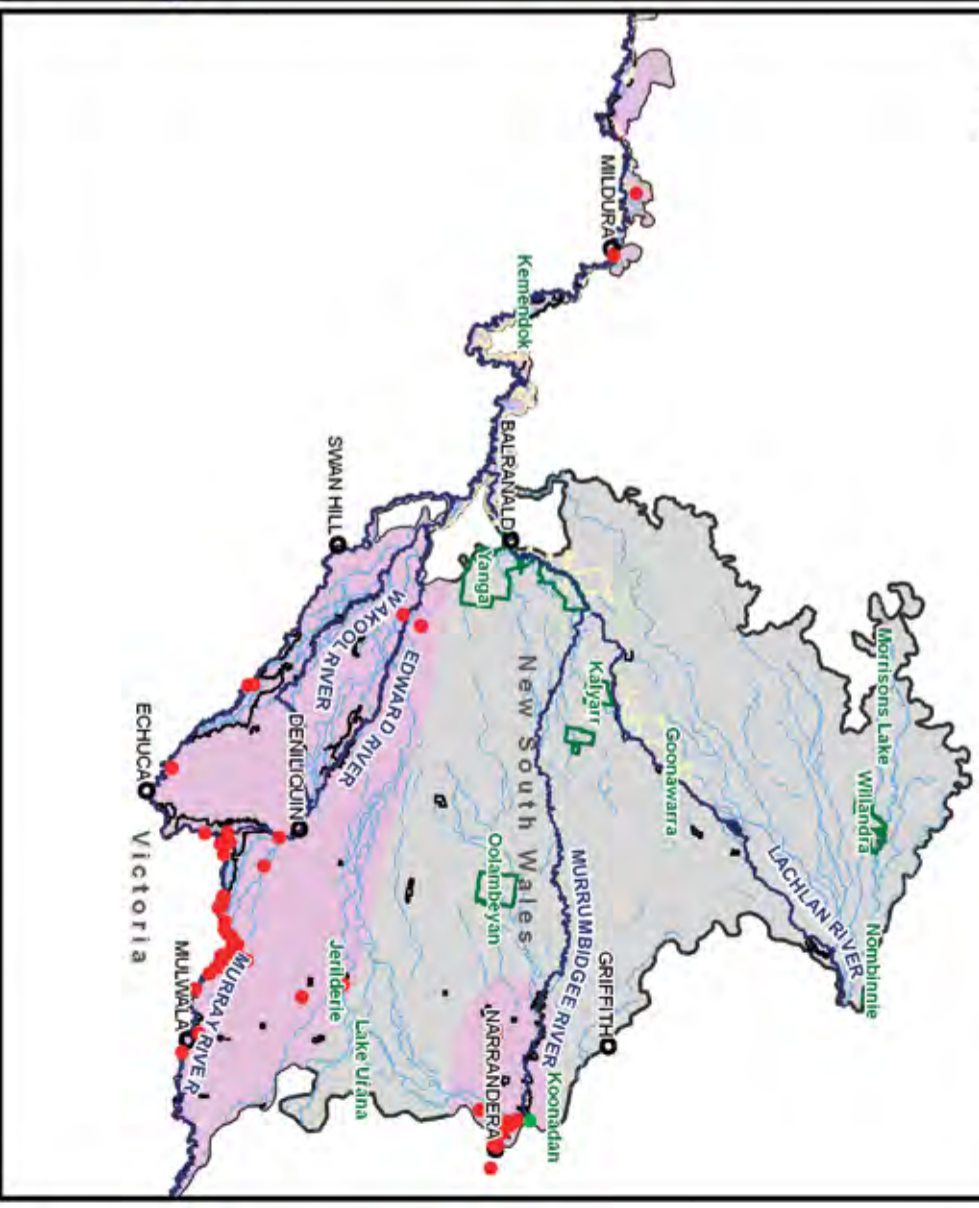


Final 25/11/2009  
Projection: GDA 1994 MGA Zone 55  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment

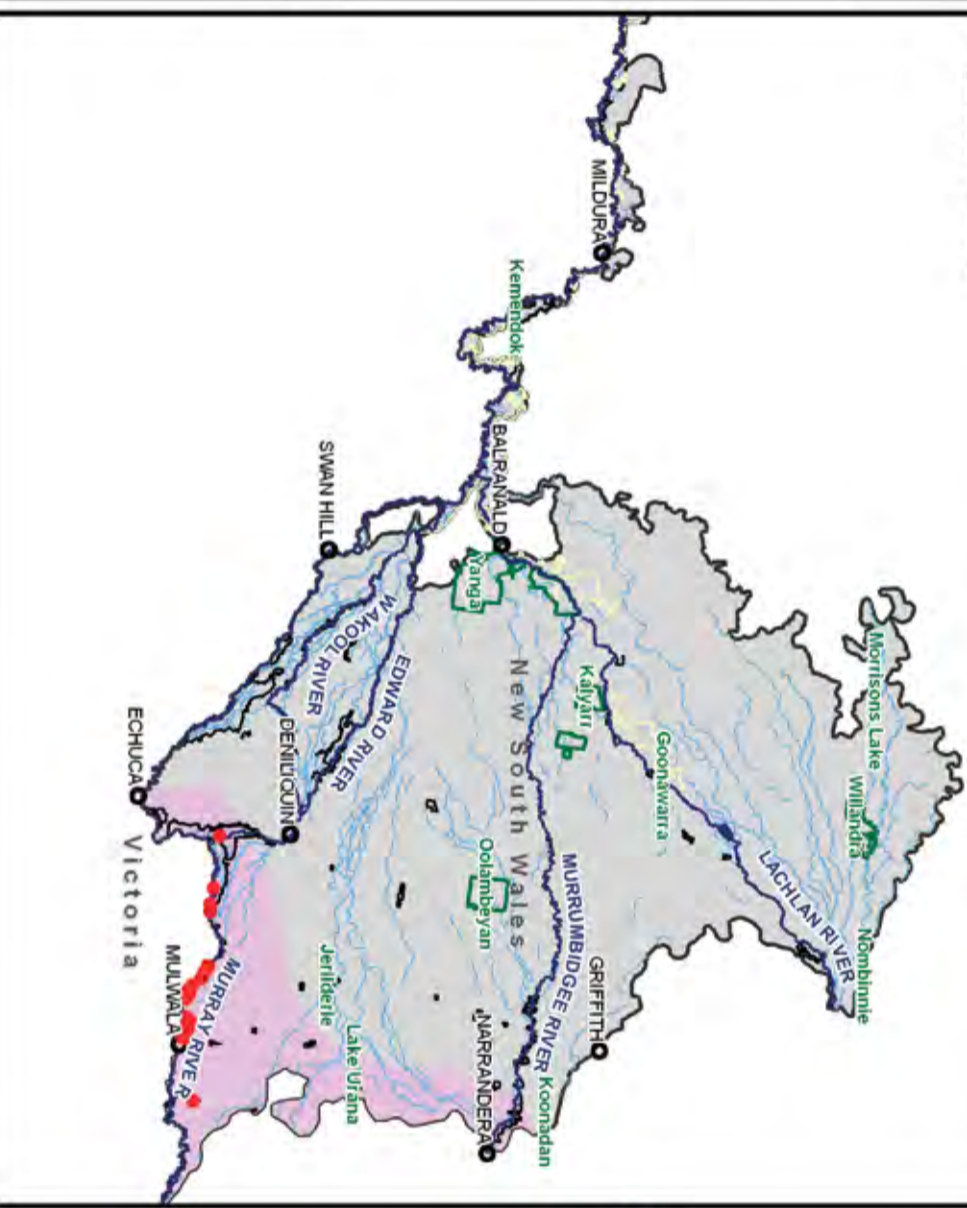
Brush-tailed Phascogale



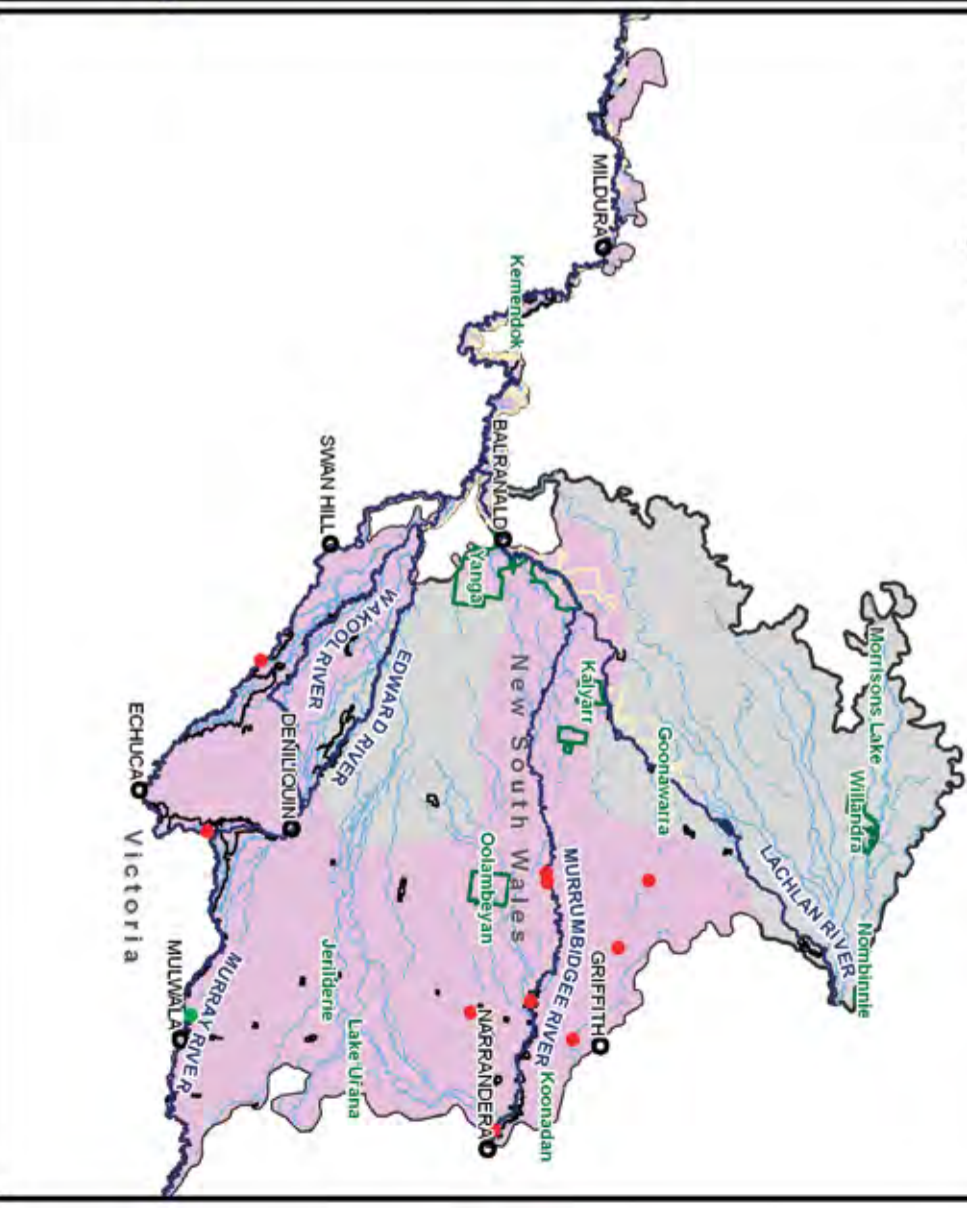
Koala



Squirrel Glider



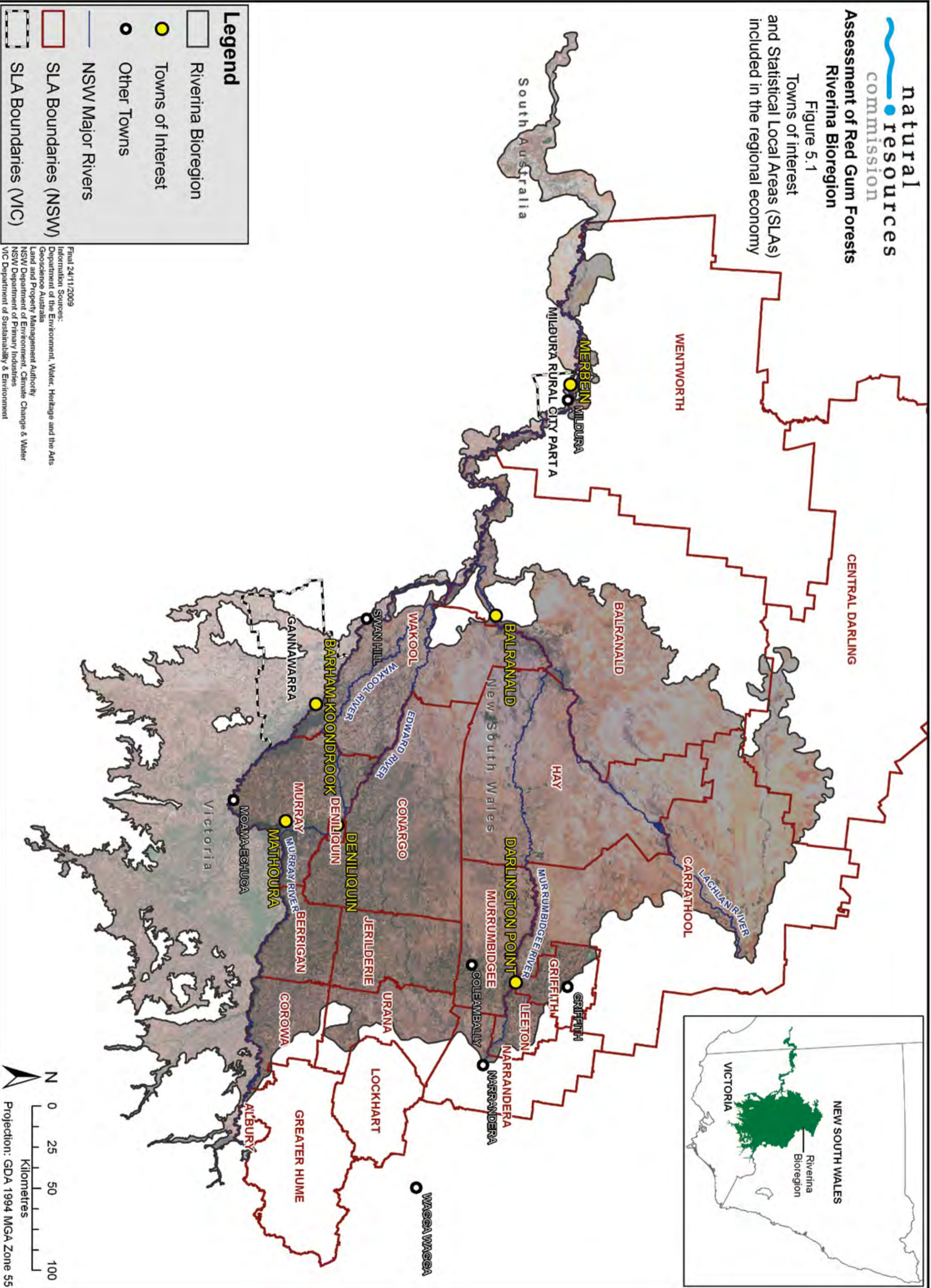
Southern Myotis





Assessment of Red Gum Forests  
Riverina Bioregion

Figure 5.1  
Towns of interest  
and Statistical Local Areas (SLAs)  
included in the regional economy



**Legend**

- Riverina Bioregion
- Towns of Interest
- Other Towns
- NSW Major Rivers
- SLA Boundaries (NSW)
- SLA Boundaries (VIC)

Final 24/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment

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Kilometres  
Projection: GDA 1994 MGA Zone 55







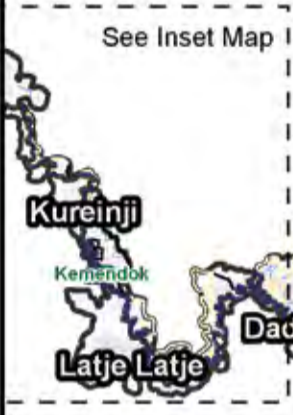
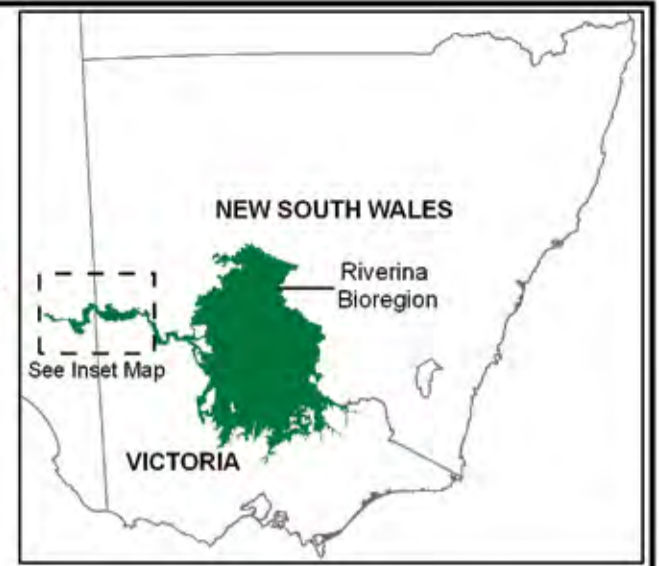
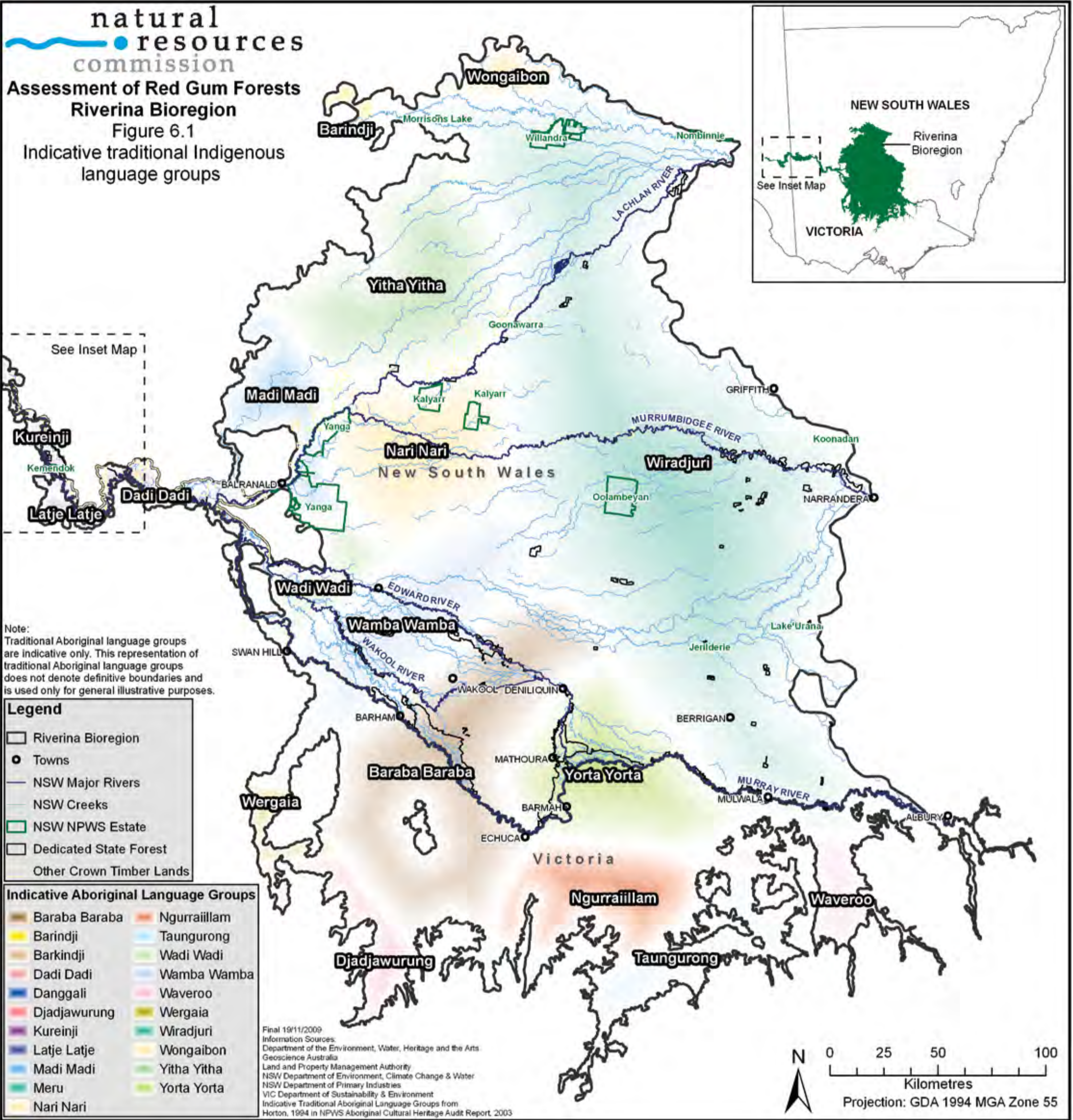




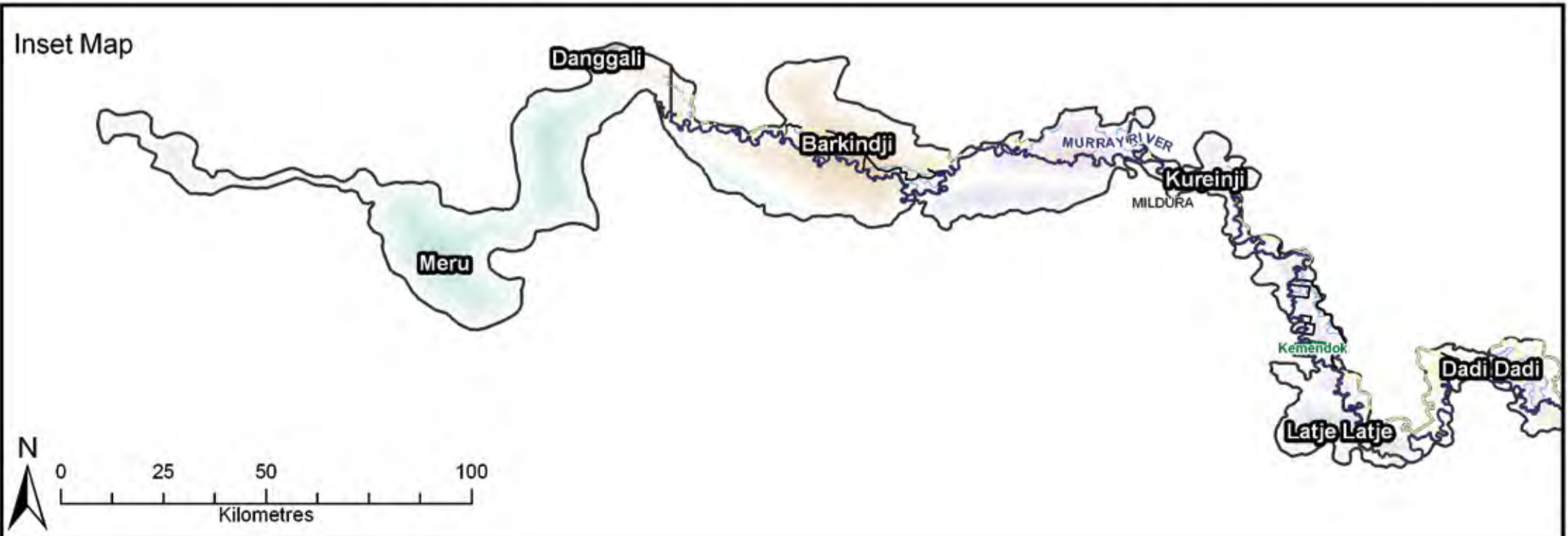
Assessment of Red Gum Forests  
Riverina Bioregion

Figure 6.1

Indicative traditional Indigenous language groups



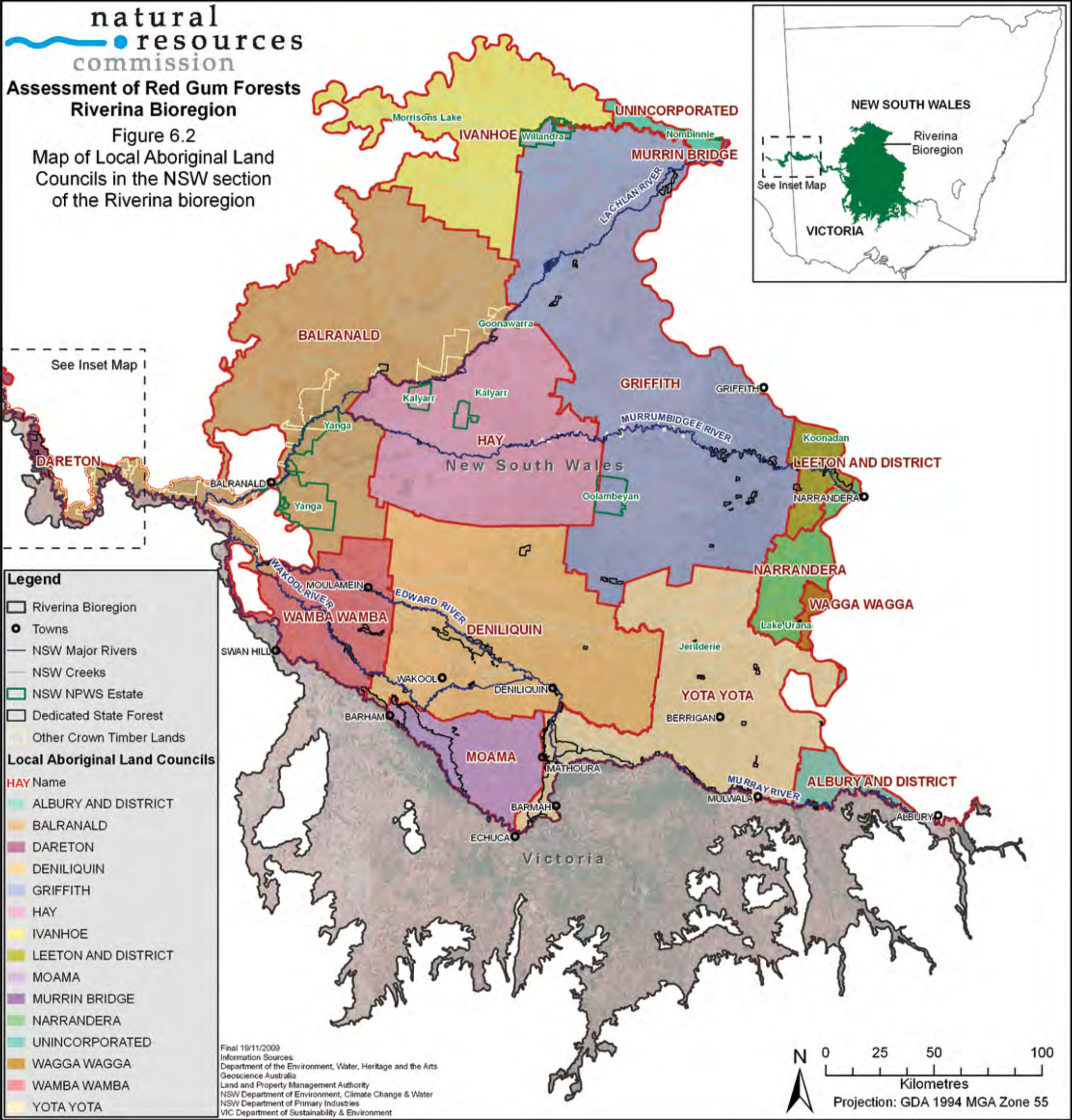
Note:  
Traditional Aboriginal language groups are indicative only. This representation of traditional Aboriginal language groups does not denote definitive boundaries and is used only for general illustrative purposes.





Assessment of Red Gum Forests  
Riverina Bioregion

Figure 6.2  
Map of Local Aboriginal Land Councils in the NSW section of the Riverina bioregion



See Inset Map

**Legend**

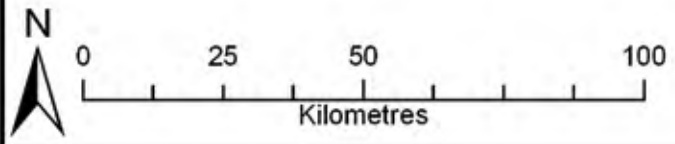
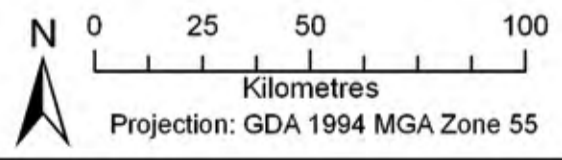
- Riverina Bioregion
- Towns
- NSW Major Rivers
- NSW Creeks
- ▭ NSW NPWS Estate
- ▭ Dedicated State Forest
- ▭ Other Crown Timber Lands

**Local Aboriginal Land Councils**

HAY Name

- ALBURY AND DISTRICT
- BALRANALD
- DARETON
- DENILIQVIN
- GRIFFITH
- HAY
- IVANHOE
- LEETON AND DISTRICT
- MOAMA
- MURRIN BRIDGE
- NARRANDERA
- UNINCORPORATED
- WAGGA WAGGA
- WAMBA WAMBA
- YOTA YOTA

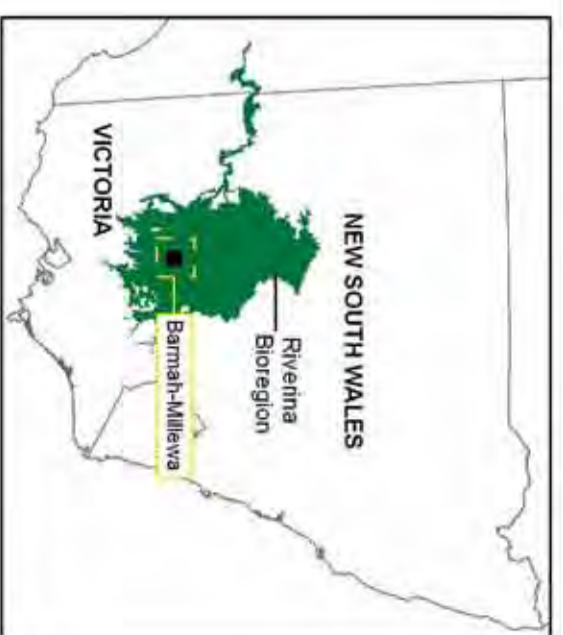
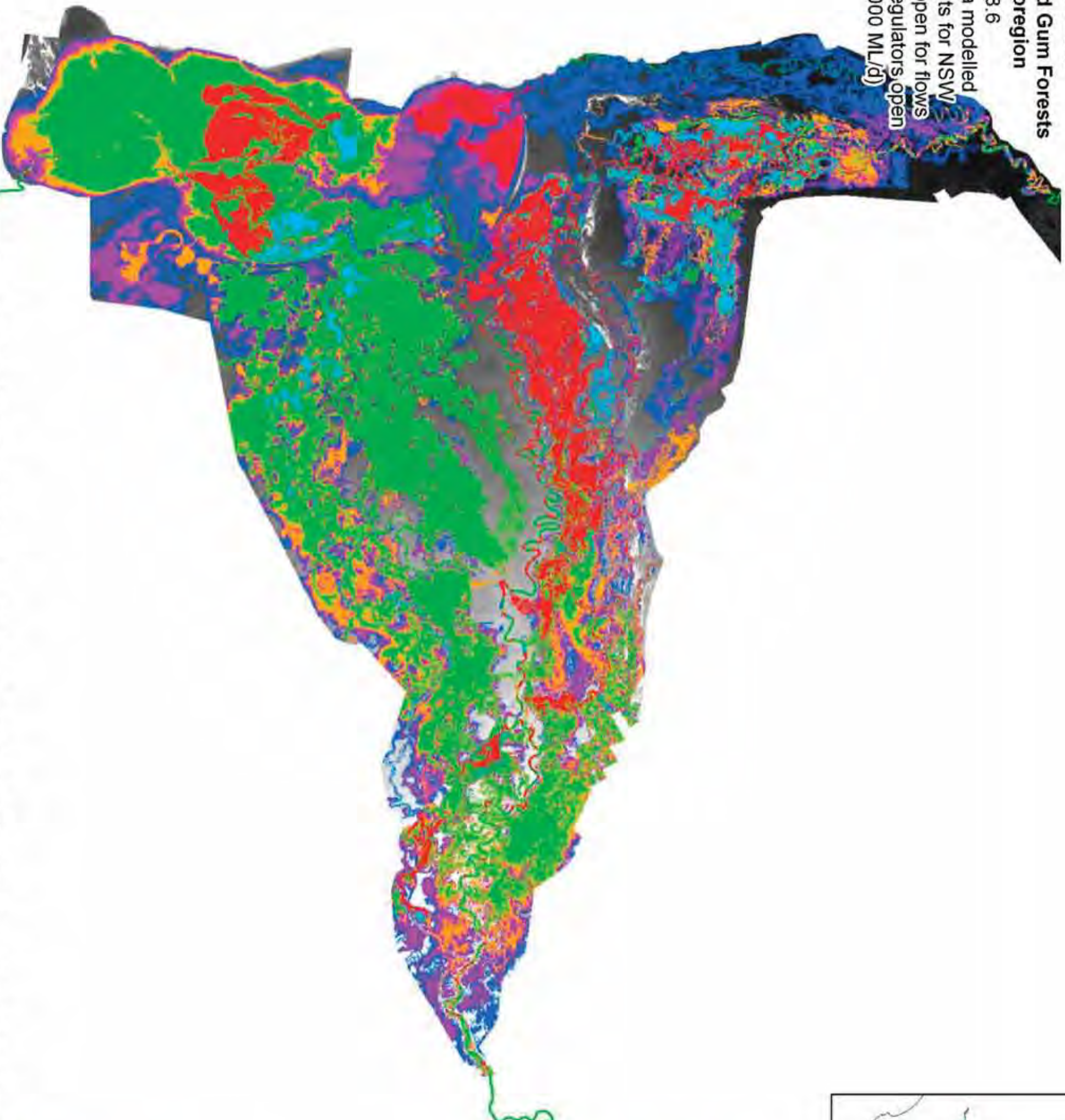
Final 19/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment



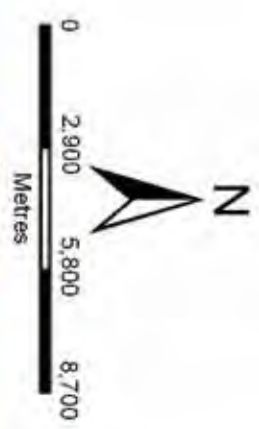


Assessment of Red Gum Forests  
 Riverina Bioregion

Figure 8.6  
 Barmah-Millewa modelled  
 inundation extents for NSW/  
 (NSW regulators open for flows  
 <25,000 ML/d, all regulators open  
 for flows >25,000 ML/d)



- Legend**
- 13,000 ML/d
  - 15,000 ML/d
  - 25,000 ML/d
  - 35,000 ML/d
  - 45,000 ML/d
  - 60,000 ML/d



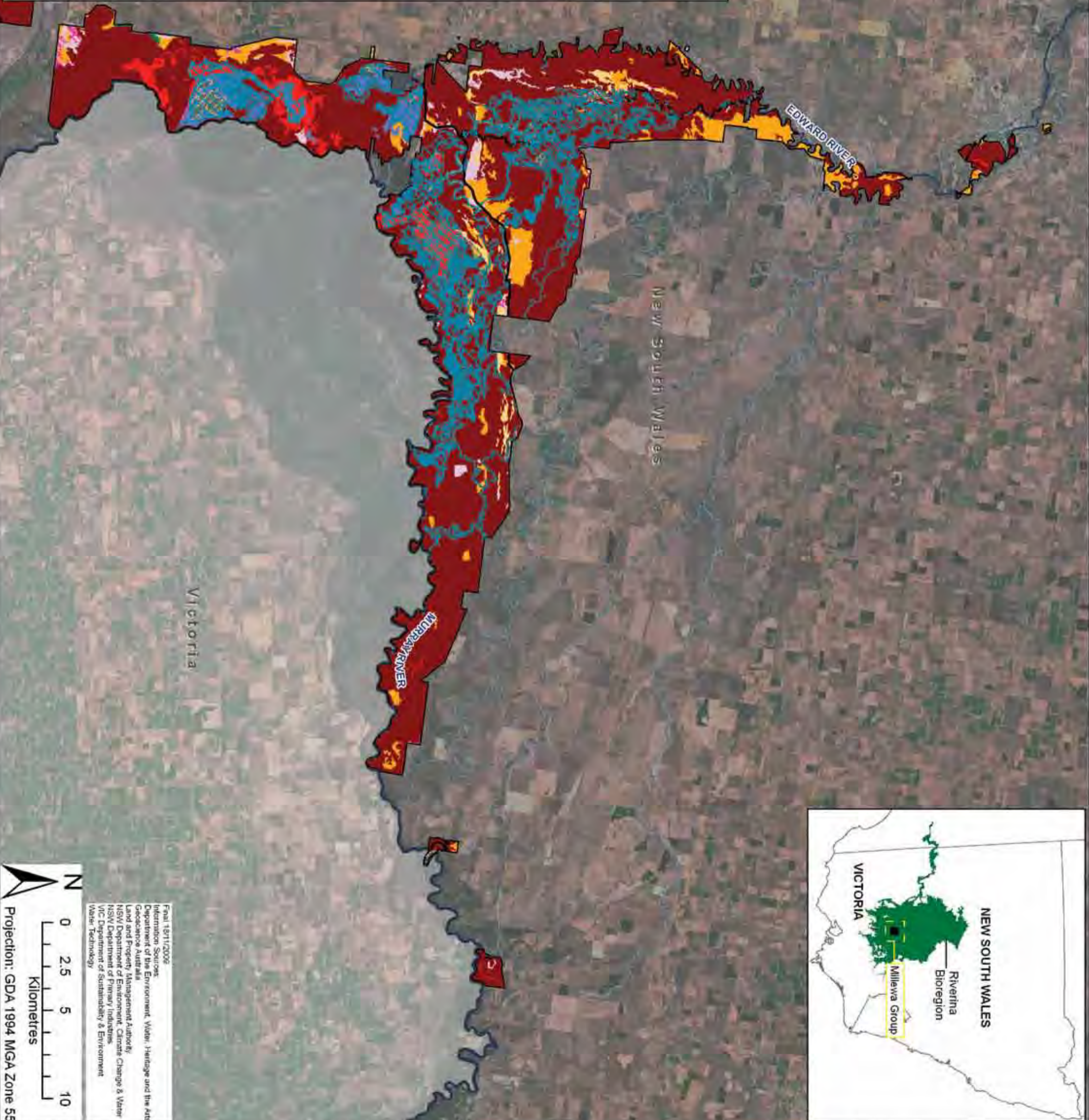
(NSW regulators open for flows < 25,000 ML/d, all regulators open for flows > 25,000 ML/d) (Water Tech 2009, Figure 7-2, p.37)



Assessment of Red Gum Forests  
Riverina Bioregion

Figure 8.7  
Millewa-modelled inundation extent  
of floodplain vegetation communities  
for 15,000 ML/d (at Yarrawonga weir),  
all regulators open

- Legend**
- Riverina Bioregion
  - NSW Major Rivers
  - NSW Creeks
  - Dedicated State Forest
  - Other Crown Timber Lands
  - 15,000 ML/d inundation extent (Water Tech, 2009)
- Vegetation Group**
- River Red Gum Very Tall Forest
  - River Red Gum Tall Open Forest
  - River Red Gum Woodland
  - River Red Gum - Box Woodland
  - Box - White Cypress Woodland
  - White Cypress Woodland
  - Chenopod Shrubland
  - Freshwater Wetlands
  - Mallee Woodland
  - Riverine Box Woodland
  - Riverine Shrubland
  - Semi-arid Acacia Woodland
  - Semi-arid Oak Woodland
  - Slender Cypress Woodland
  - Tussock Grassland
  - Unknown Non-Woody Vegetation
  - Cleared
  - Non-native Vegetation
  - Non Vegetation
  - Unknown



Final 18/11/2006  
 Information Sources:  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment  
 Water Technology

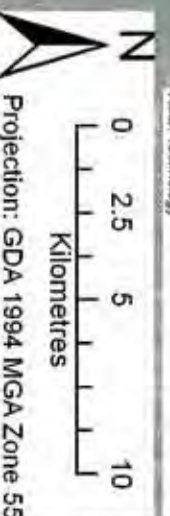
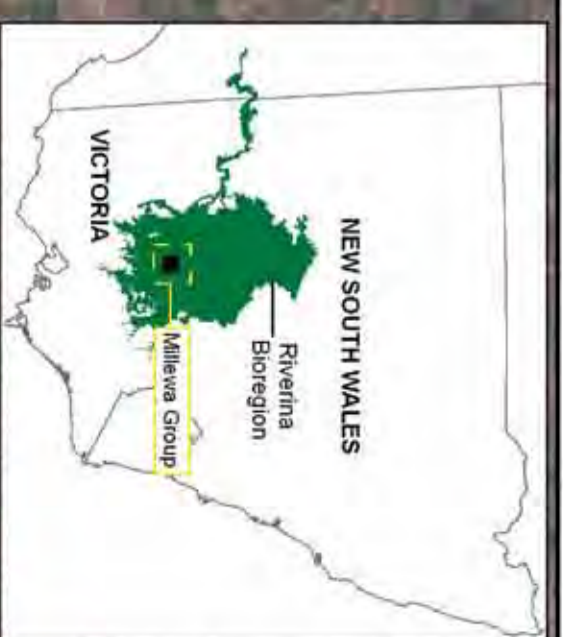
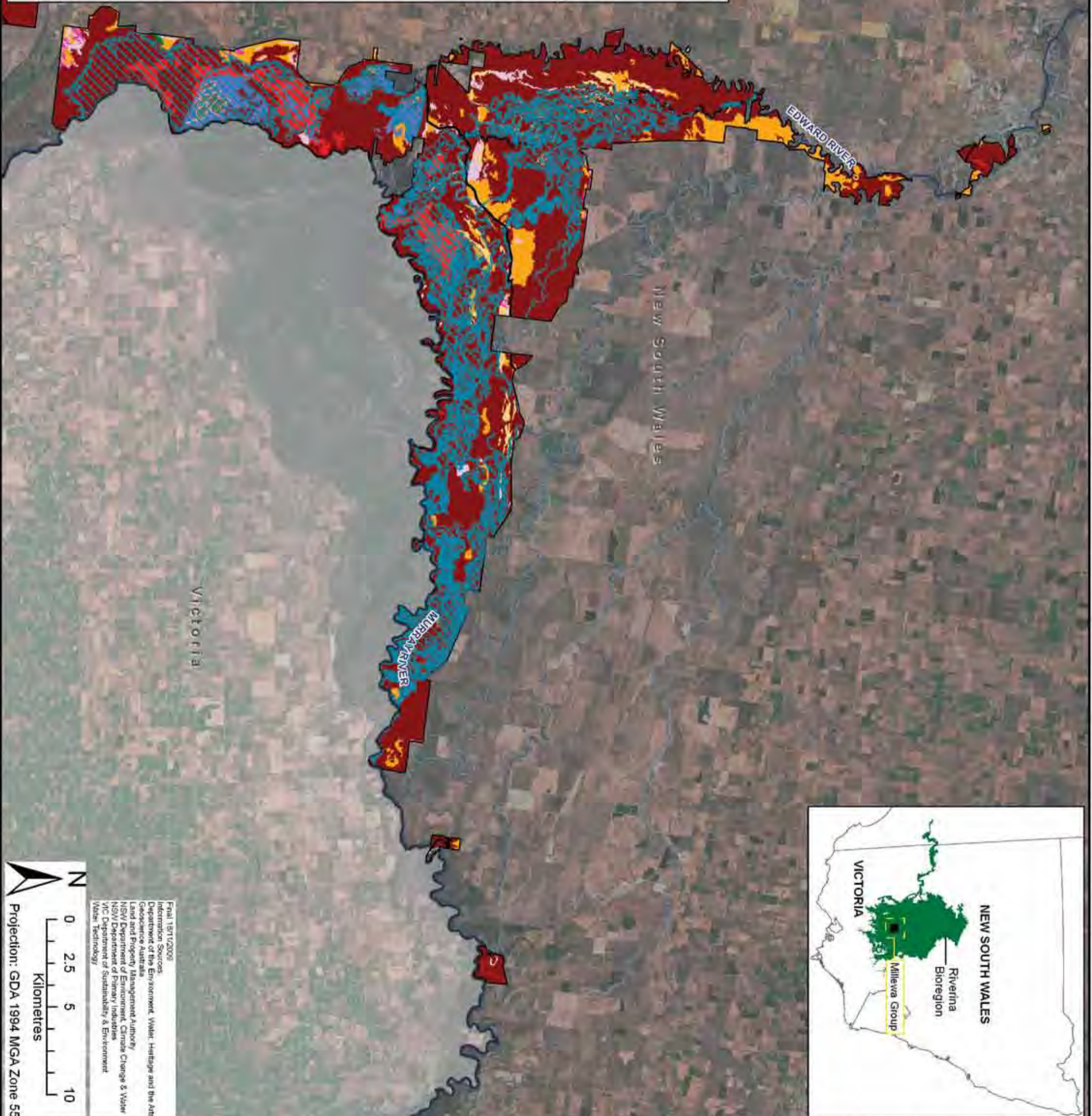


Assessment of Red Gum Forests  
Riverina Bioregion

Figure 8:8  
Millewa-modelled inundation extent  
of floodplain vegetation communities  
for 25,000 ML/d (at Yarrawonga weir),  
all regulators open

Legend

-  Riverina Bioregion
-  NSW Major Rivers
-  NSW Creeks
-  Dedicated State Forest
-  Other Crown Timber Lands
-  25,000 ML/d inundation extent (Water Tech, 2009)
- Vegetation Group**
  -  River Red Gum Very Tall Forest
  -  River Red Gum Tall Open Forest
  -  River Red Gum Woodland
  -  River Red Gum - Box Woodland
  -  Box - White Cypress Woodland
  -  White Cypress Woodland
  -  Chenopod Shrubland
  -  Freshwater Wetlands
  -  Mallee Woodland
  -  Riverine Box Woodland
  -  Riverine Shrubland
  -  Semi-arid Acacia Woodland
  -  Semi-arid Oak Woodland
  -  Slender Cypress Woodland
  -  Tussock Grassland
  -  Unknown Non-Woody Vegetation
  -  Cleared
  -  Non-native Vegetation
  -  Non Vegetation
  -  Unknown



Final 18/11/2009  
 Information Sources:  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment  
 Water Technology



Assessment of Red Gum Forests  
Riverina Bioregion

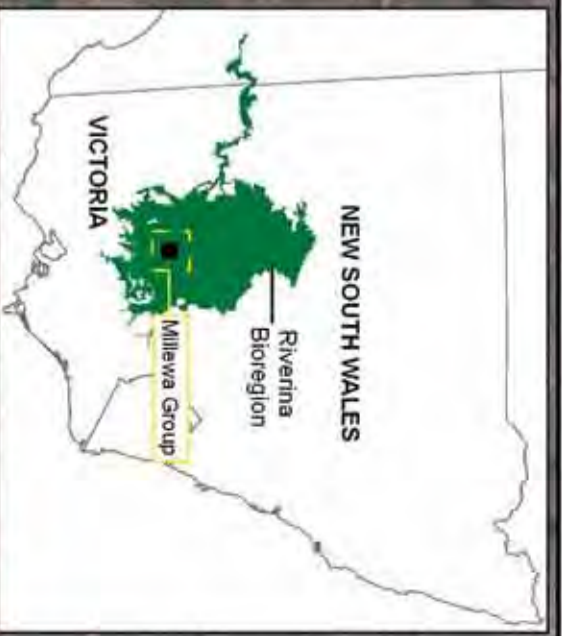
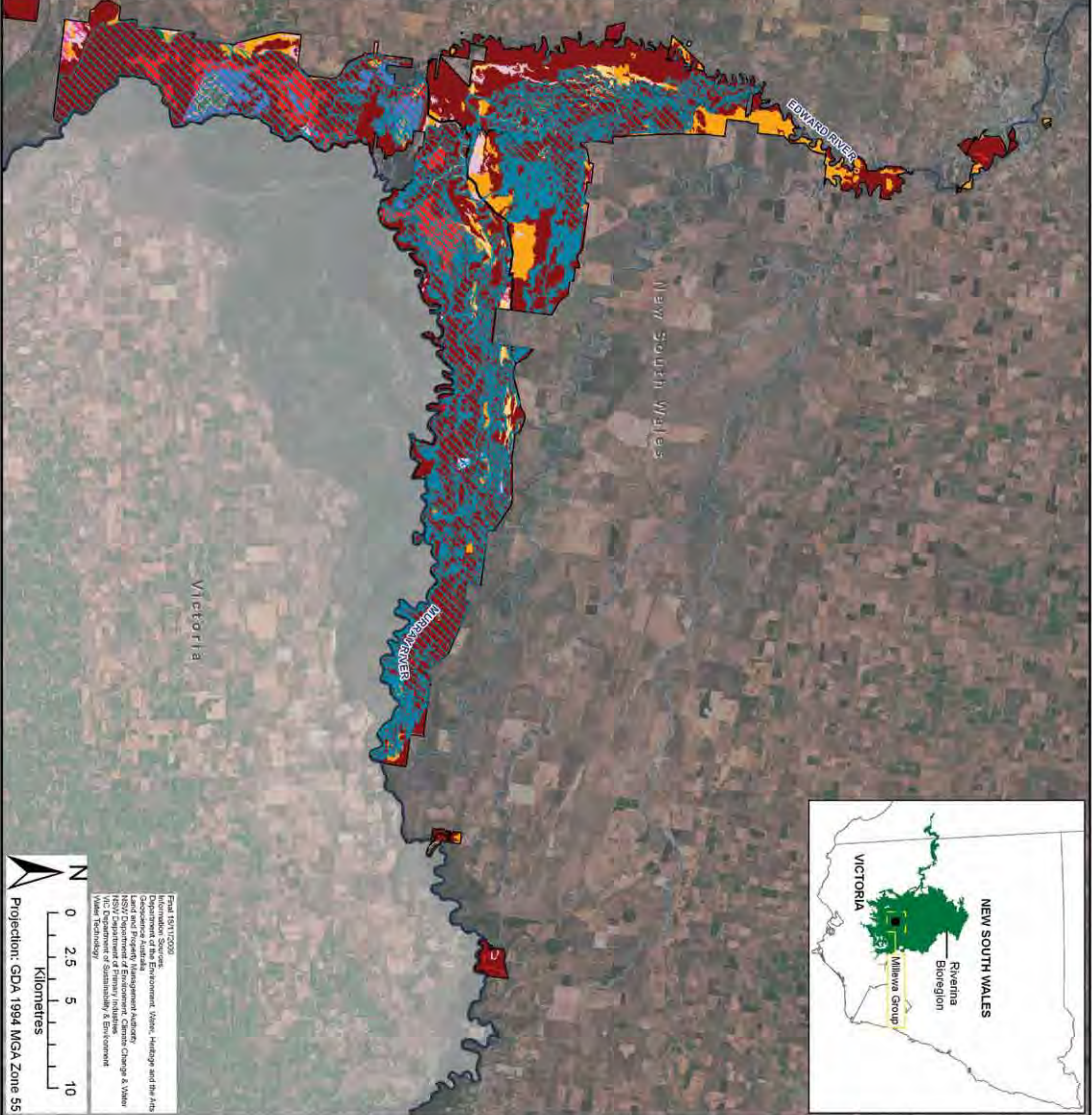
Figure 8.9  
Millewa-modelled inundation extent  
of floodplain vegetation communities  
for 45,000 ML/d (at Yarrowongga weir),  
all regulators open

**Legend**

- Riverina Bioregion
- NSW Major Rivers
- NSW Creeks
- Dedicated State Forest
- Other Crown Timber Lands
- 45,000 ML/d inundation extent (Water Tech, 2009)

**Vegetation Group**

- River Red Gum Very Tall Forest
- River Red Gum Tall Open Forest
- River Red Gum Woodland
- River Red Gum - Box Woodland
- Box - White Cypress Woodland
- White Cypress Woodland
- Chenopod Shrubland
- Freshwater Wetlands
- Mallee Woodland
- Riverine Box Woodland
- Riverine Shrubland
- Semi-arid Acacia Woodland
- Semi-arid Oak Woodland
- Slender Cypress Woodland
- Tussock Grassland
- Unknown Non-Woody Vegetation
- Cleared
- Non-native Vegetation
- Non Vegetation
- Unknown



Final 18/11/2009

Information Sources:  
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 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment  
 Water Technology

0 2.5 5 10  
Kilometres

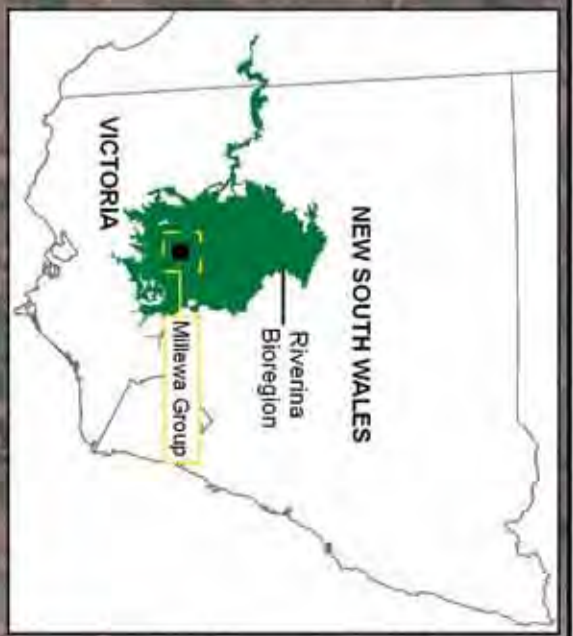
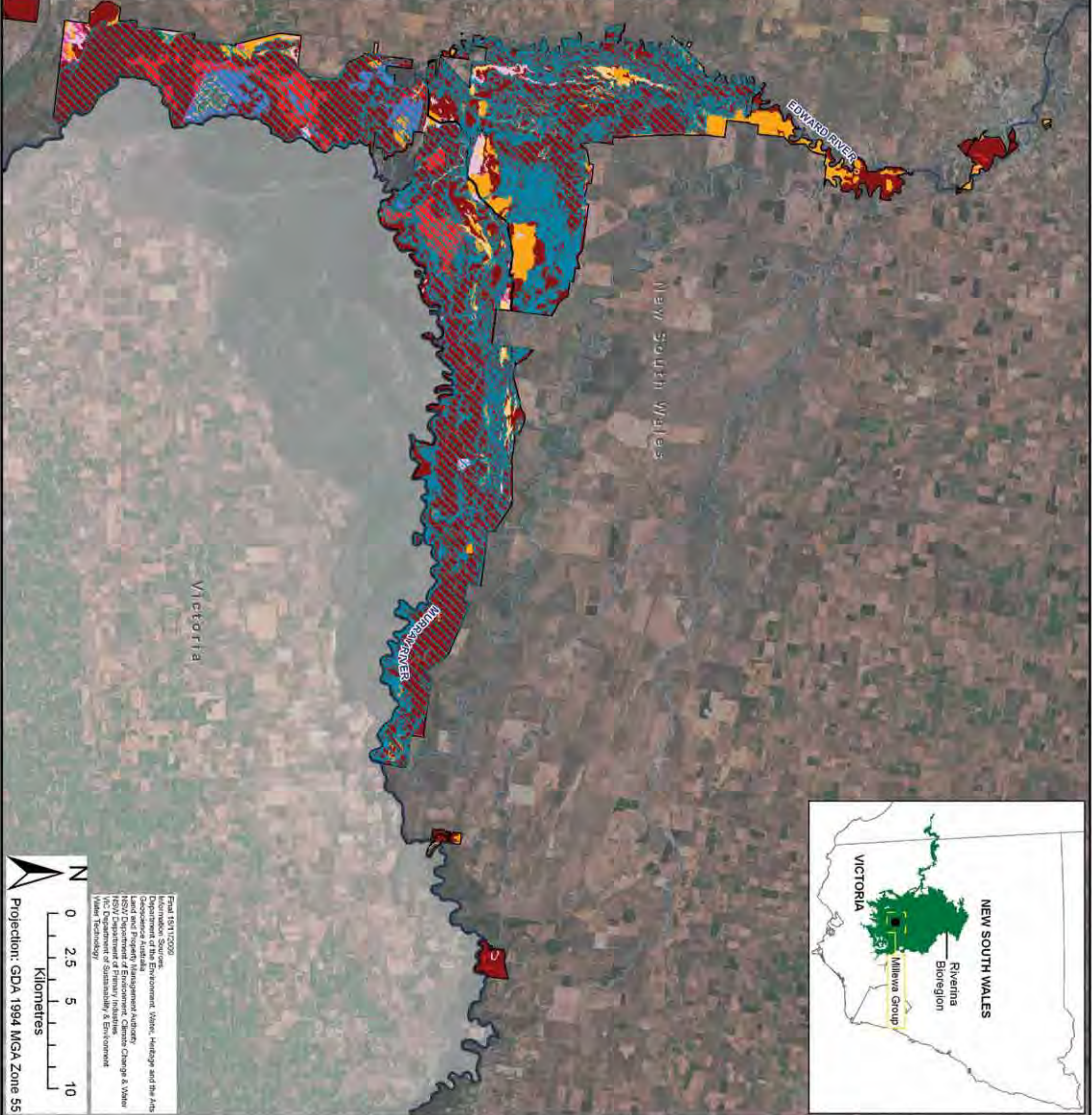
Projection: GDA 1994 MGA Zone 55



Assessment of Red Gum Forests  
Riverina Bioregion

Figure 8.10  
Millewa-modelled inundation extent  
of floodplain vegetation communities  
for 60,000 ML/d (at Yarrowongga weir),  
all regulators open

- Legend**
- Riverina Bioregion
  - NSW Major Rivers
  - NSW Creeks
  - Dedicated State Forest
  - Other Crown Timber Lands
  - 60,000 ML/d inundation extent (Water Tech, 2009)
- Vegetation Group**
- River Red Gum Very Tall Forest
  - River Red Gum Tall Open Forest
  - River Red Gum Woodland
  - River Red Gum - Box Woodland
  - Box - White Cypress Woodland
  - White Cypress Woodland
  - Chenopod Shrubland
  - Freshwater Wetlands
  - Mallee Woodland
  - Riverine Box Woodland
  - Riverine Shrubland
  - Semi-arid Acacia Woodland
  - Semi-arid Oak Woodland
  - Slender Cypress Woodland
  - Tussock Grassland
  - Unknown Non-Woody Vegetation
  - Cleared
  - Non-native Vegetation
  - Non Vegetation
  - Unknown



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Information Sources:  
 Department of the Environment, Water, Heritage and the Arts  
 Geoscience Australia  
 Land and Property Management Authority  
 NSW Department of Environment, Climate Change & Water  
 NSW Department of Primary Industries  
 VIC Department of Sustainability & Environment  
 Water Technology

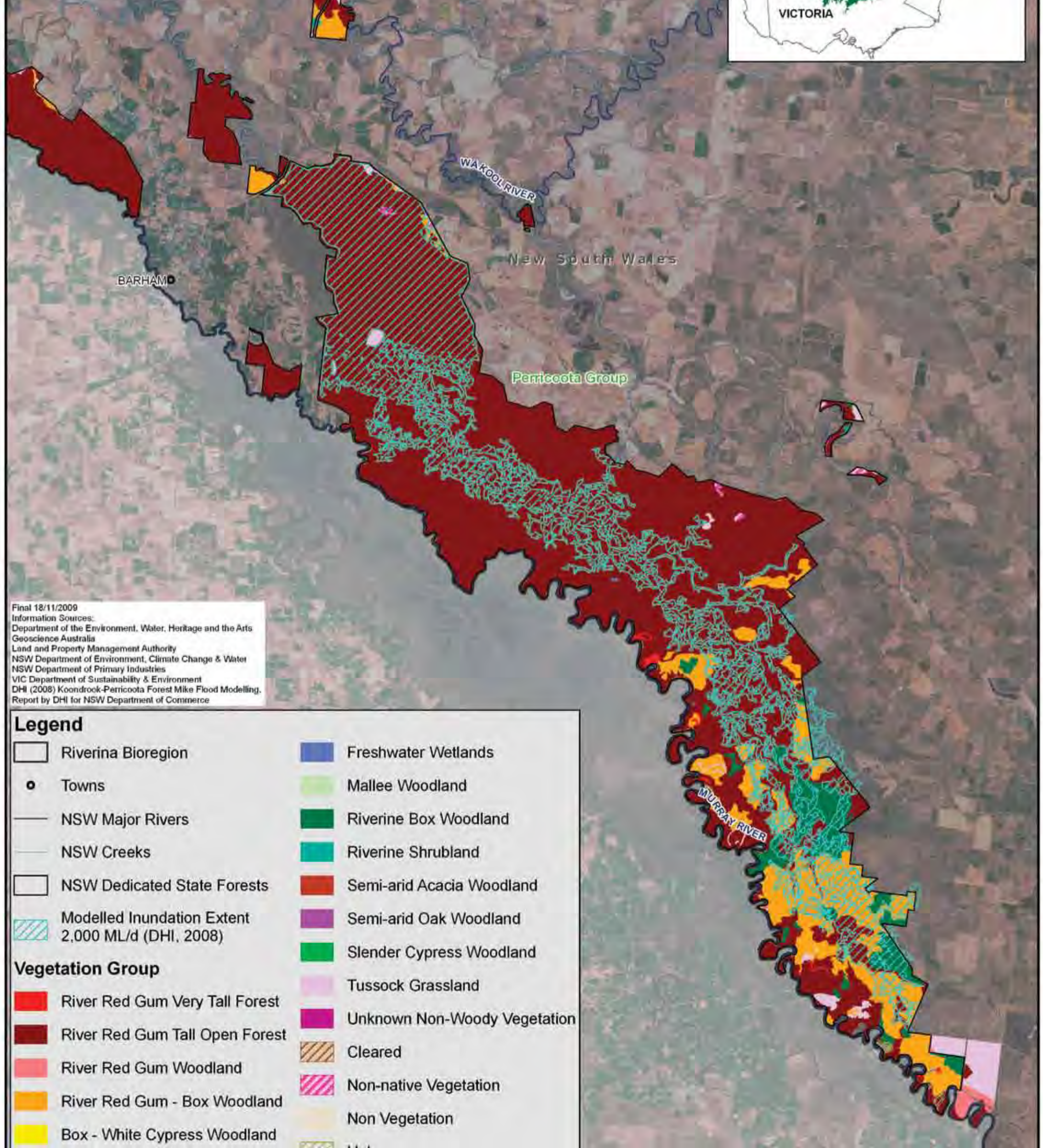
0 2.5 5 10  
Kilometres

Projection: GDA 1994 MGA Zone 55



Assessment of Red Gum Forests  
Riverina Bioregion

Figure 8.11  
Modelled maximum inundation  
extents for Koondrook-Perricoota -  
2,000 ML/d



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Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment  
DHI (2008) Koondrook-Perricoota Forest Mike Flood Modelling.  
Report by DHI for NSW Department of Commerce

**Legend**

- Riverina Bioregion
- Towns
- NSW Major Rivers
- NSW Creeks
- NSW Dedicated State Forests
- Modelled Inundation Extent 2,000 ML/d (DHI, 2008)
- Freshwater Wetlands
- Mallee Woodland
- Riverine Box Woodland
- Riverine Shrubland
- Semi-arid Acacia Woodland
- Semi-arid Oak Woodland
- Slender Cypress Woodland
- Tussock Grassland
- Unknown Non-Woody Vegetation

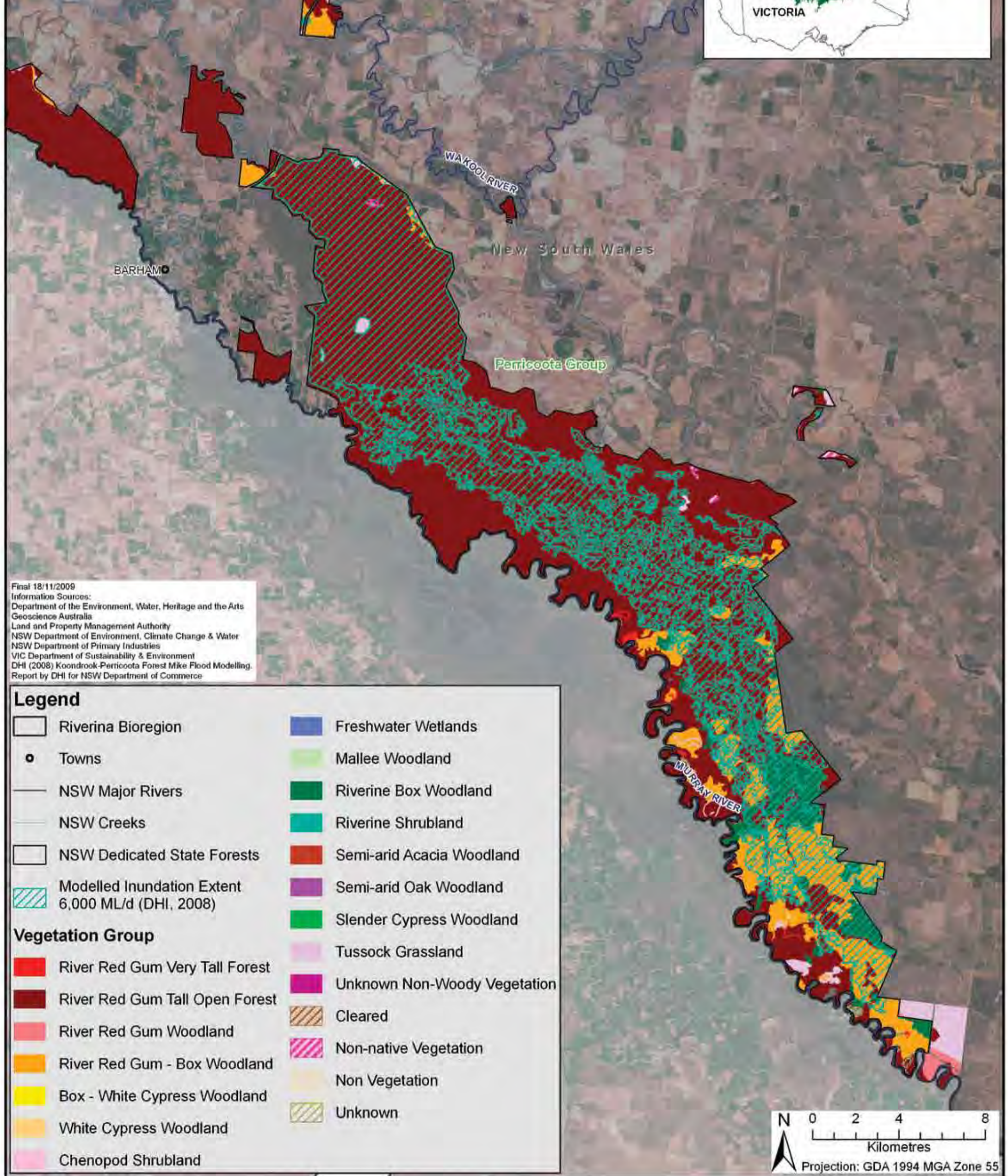
**Vegetation Group**

- River Red Gum Very Tall Forest
- River Red Gum Tall Open Forest
- River Red Gum Woodland
- River Red Gum - Box Woodland
- Box - White Cypress Woodland
- White Cypress Woodland
- Chenopod Shrubland
- Cleared
- Non-native Vegetation
- Non Vegetation
- Unknown



Assessment of Red Gum Forests  
Riverina Bioregion

Figure 8.12  
Modelled maximum inundation  
extents for Koondrook-Perricoota -  
6,000 ML/d



Final 18/11/2009  
Information Sources:  
Department of the Environment, Water, Heritage and the Arts  
Geoscience Australia  
Land and Property Management Authority  
NSW Department of Environment, Climate Change & Water  
NSW Department of Primary Industries  
VIC Department of Sustainability & Environment  
DHI (2008) Koondrook-Perricoota Forest Mike Flood Modelling.  
Report by DHI for NSW Department of Commerce

**Legend**

Riverina Bioregion	Freshwater Wetlands
Towns	Mallee Woodland
NSW Major Rivers	Riverine Box Woodland
NSW Creeks	Riverine Shrubland
NSW Dedicated State Forests	Semi-arid Acacia Woodland
Modelled Inundation Extent 6,000 ML/d (DHI, 2008)	Semi-arid Oak Woodland
	Slender Cypress Woodland
<b>Vegetation Group</b>	Tussock Grassland
River Red Gum Very Tall Forest	Unknown Non-Woody Vegetation
River Red Gum Tall Open Forest	Cleared
River Red Gum Woodland	Non-native Vegetation
River Red Gum - Box Woodland	Non Vegetation
Box - White Cypress Woodland	Unknown
White Cypress Woodland	
Chenopod Shrubland	



# natural resources commission

## Assessment of Red Gum Forests Riverina Bioregion

Figure 8.13  
Conceptual diagram illustrating hydrological links between Werai forests and Millewa forests

### Riverina

Semi-arid. 400mm average annual rainfall. Local rainfall and runoff makes very small contribution to hydrology of the forests.

### Kooncrook Forests

In-stream flooding via Burrumberry Creek and other small inflows. Water exits forests via Cow, Barbers, Calf and Thule Creeks. No broad area flooding for > 10 years, due to high banks on Murray River, irrigation diversions and below average rainfall.

### Werai Forests

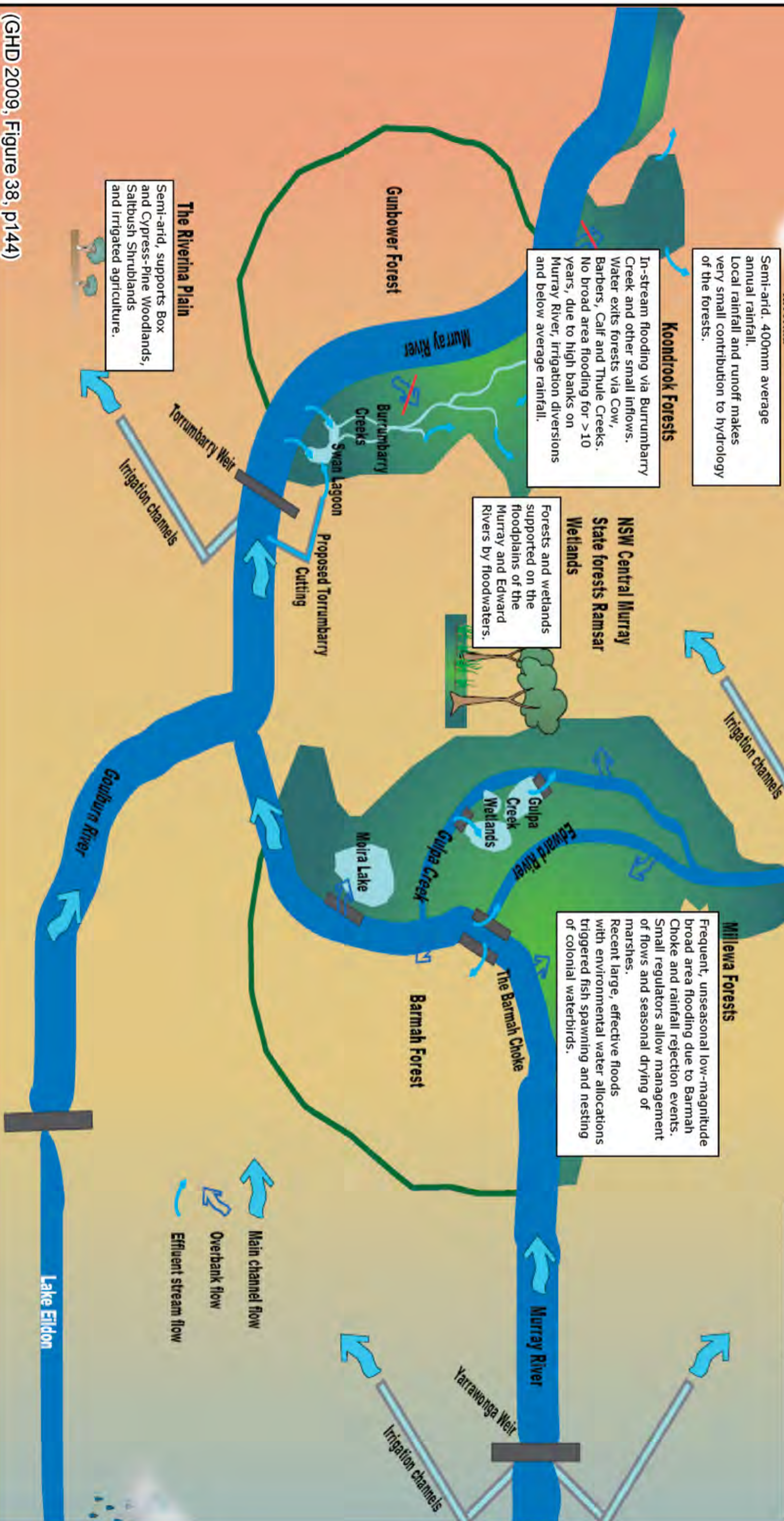
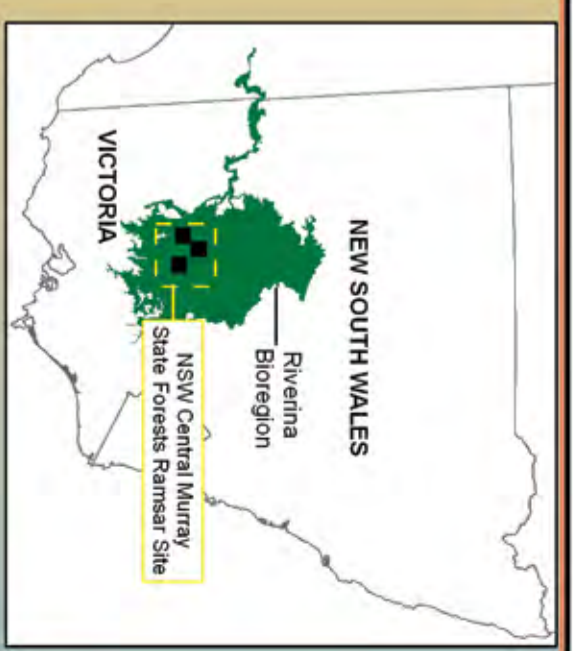
In-stream flooding via Tummulderry Creek and other small inflows. Flooding of Drainage Depression Marshes in flood runners. Limited broad area flooding for > 10 years

### NSW Central Murray State forests Ramsar Wetlands

Forests and wetlands supported on the floodplains of the Murray and Edward Rivers by floodwaters.

### Millewa Forests

Frequent, unseasonal low-magnitude broad area flooding due to Barmah Choke and rainfall rejection events. Small regulators allow management of flows and seasonal drying of marshes. Recent large, effective floods with environmental water allocations triggered fish spawning and nesting of colonial waterbirds.



**The Riverina Plain**  
Semi-arid, supports Box and Cypress-Pine Woodlands, Saltbush Shrublands and irrigated agriculture.







