

## 5 Overview of North East Victoria

### 5.1 North East Regional Catchment Strategy

The NE Regional Catchment Strategy (RCS) was developed as an overarching document to identify assets that are threatened in the region and to coordinate catchment management. The RCS identified 6 asset classes in the North East region - land, people, built infrastructure, inland water, biodiversity, and climate and atmosphere (Table 4).

**Table 4** - Definition of the assets of the region as outlined within the North East RCS.

| Asset                  | Asset Component  |
|------------------------|--|
| Land                   | Agricultural Land, other private land, public land and landscape         |
| People                 | Indigenous heritage, historical sites, knowledge, capacity, demographics |
| Built infrastructure   | Transport, services, commercial buildings and houses                     |
| Inland water           | Rivers & streams, wetland ecosystems, groundwater                        |
| Biodiversity           | Terrestrial ecosystems, Flora, Fauna                                     |
| Climate and atmosphere | Air, Atmosphere  |

Source: NECMA 2004

No asset was ranked as being a higher priority than another within the RCS. These assets have been considered throughout this plan and drive the implementation and actions of this plan.

### 5.2 Overview of the North East Region

The NECMA region covers approximately 1.9 million hectares in North East Victoria (NECMA 2004) (Figure 7). The Murray River and New South Wales border bound it in the north and east, the Victorian Alps in the south and the Warby Ranges in the west.

#### 5.2.1 The Land

The landscape varies greatly across the region, from the mountainous areas of the Great Dividing Range in the east and south, to the riverine plains in the north west. The highest peak in Victoria, Mt Bogong (1,986m above sea level), occurs in North East Victoria. Public land accounts for approximately 61% or 1.2 million hectares of the catchment area within the NECMA (NECMA 2004) (Figure 8). There are approximately 700,000ha of State Forests, and 400,000ha of National Parks and State Parks, including Mount Buffalo National Park, Chiltern Mt Pilot National Park, and a large part of the Alpine National Park (NECMA 2004).

Public land is largely maintained under native vegetation. Forestry is the dominant land use of State Forests, with most forestry operations being conducted in softwood plantations and native forests in the Alpine and Towong Shires (Figure 7). Alpine areas in national parks host a number of ski field and resorts that attract large tourist numbers to the region.

Presently, 35% of the region has been cleared of its original vegetation (NECMA 2000). Only 6% of remnant vegetation is found on private land. The dominant use of the 670,000ha of private land is pasture production for grazing of livestock (beef and sheep) and dairying. Broad acre cereal cropping is a common land-use west of the Hume Highway where soils and rainfall are suitable. Horticulture is practised throughout the region and includes grapes, berries, tobacco, olives, nuts, and apple production.

Dryland agriculture is the main driver of the North East region's economy. This is estimated at \$230 million per annum (Ada, 2001). Forest industries in both softwood plantations and native forests also make a significant contribution, estimated at \$131 million per annum (NECMA 2004).

Figure 7 – Map of land use within the North East (limited to what is mapped, scale means smaller areas of use not shown).

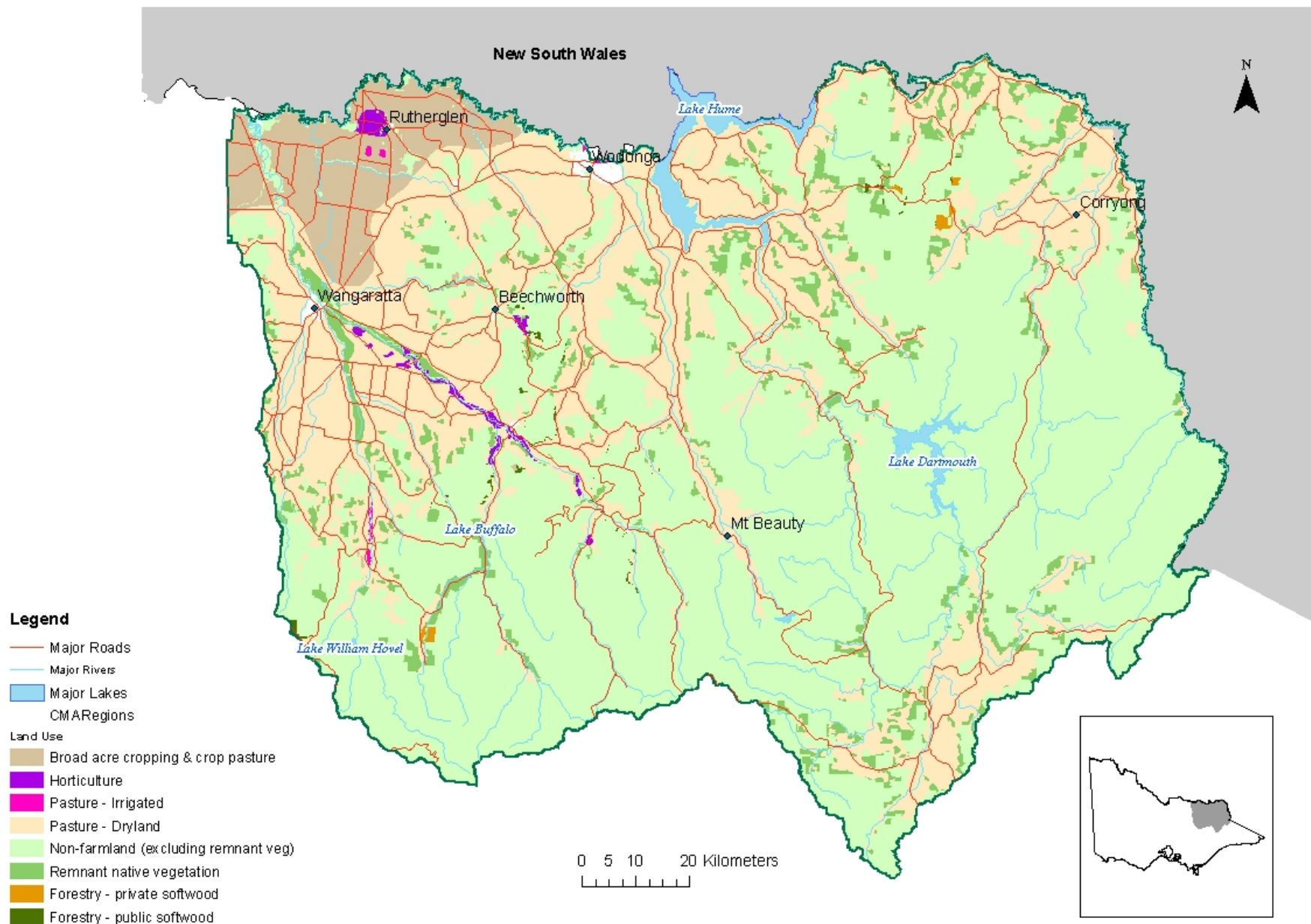
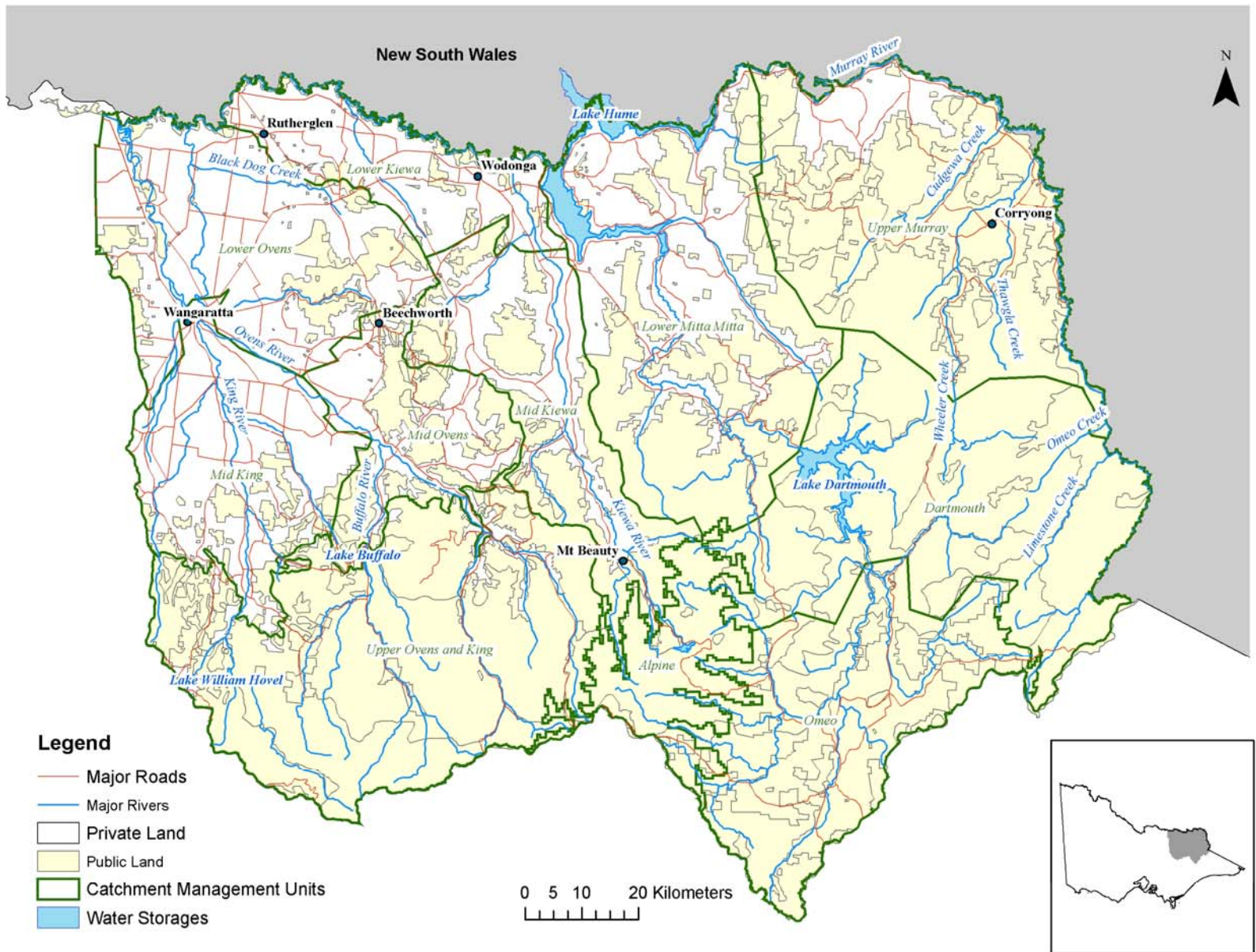


Figure 8 – Map of catchment management units and public/private land.



Most agricultural enterprises are restricted to non-irrigated lands, although some irrigation of pastures and horticultural crops does occur (Figure 7). In 2001 it was estimated that 4,700ha of horticulture and 5,500ha of pastures were irrigated (Ada 2001). Licences for an additional 4,000 ha of irrigation for pasture has been allocated but is not currently used.

The Gross Value of agricultural production on irrigated land is estimated at \$75 million per annum (Ada 2001). The contribution of the tourism and hospitality industry to the region's economy has not been quantified, although in the Alpine Shire alone it amounted to some \$51.7 million (1998). Of this figure \$23 million was realised from ski resorts (NECMA 2004). The total number of visitors to the region is estimated at 3.5 million in 2002 (NECMA 2004).

The 670,000 hectares of private land in the region has been divided into eleven different catchment management units (CMUs) (Figure 8) on the basis of the soil, landform and climatic limitations to agricultural enterprises. The agricultural capability of each CMU has been ranked as high, moderate and low (Table 5). Of the total area of the region 5.9% is classified high agricultural capability, 54.8% moderate and 39.3% low.

**Table 5** - The percentage of high, medium and low of agricultural land found within each CMU in the North East.

| Catchment Management Unit | High agricultural capability % | Moderate agricultural capability % | Low agricultural capability % |
|---------------------------|--------------------------------|------------------------------------|-------------------------------|
| Alpine                    | 0                              | 0.6                                | 99.4                          |
| Dartmouth                 | 0                              | 50.8                               | 49.2                          |
| Lower Kiewa               | 1.2                            | 59.3                               | 39.6                          |
| Lower Mitta Mitta         | 7.4                            | 70.2                               | 22.4                          |
| Lower Ovens               | 4.0                            | 25.4                               | 70.6                          |
| Mid Kiewa                 | 9.4                            | 78.6                               | 12.0                          |
| Mid King                  | 15.2                           | 52.2                               | 32.6                          |
| Mid Ovens                 | 10.9                           | 67.0                               | 22.0                          |
| Omeo                      | 0.2                            | 27.3                               | 72.5                          |
| Upper Murray              | 0                              | 80.9                               | 19.1                          |
| Upper Ovens and King      | 7.5                            | 53.9                               | 38.6                          |
| Total                     | 5.9                            | 54.8                               | 39.3                          |

Source: NECMA 2004

Land use and land management within the region is changing. The number of small and lifestyle landholders with small holdings and off-farm income is increasing throughout the region, especially around regional centres. There are 5,688 (60% of all landholders) who own small lifestyle farms that vary in size between 5 and 100ha (Table 6). These people derive most of their income from non-farm sources. A further 1,537 landholders (16% of all landholders) own more than 400ha (Hollier et al 2004).

**Table 6** - Property size (ha) within the North East by Shire.

| Farm Size/Shire | 5-50ha | 51-100ha | 101-200ha | 201-400ha | 400+ha | total |
|-----------------|--------|----------|-----------|-----------|--------|-------|
| Towong          | 552    | 338      | 373       | 187       | 61     | 1511  |
| Indigo          | 1310   | 466      | 317       | 89        | 7      | 2189  |
| Alpine          | 763    | 202      | 135       | 28        | 7      | 1135  |
| Wangaratta      | 1361   | 306      | 519       | 577       | 1461   | 4224  |
| Wodonga         | 286    | 104      | 61        | 25        | 1      | 477   |
| Totals          | 4272   | 1416     | 1405      | 906       | 1537   | 9536  |
| Percentage      | 45     | 15       | 15        | 10        | 16     | 100   |

Source: Hollier et al 2004

Research has predicted a high rate (47%) of land ownership change over the next decade, through both sales and family succession (Curtis 2002). These predictions have the potential implications



for the community's capacity to adopt changes or implement actions to address salinity and other natural resources management issues.

The triple bottom line value of the land assets were identified within the RCS (Table 7).

**Table 7** – Triple bottom line (environmental, economic and social) value of land assets within the North East.

| Land Type          | Environmental  | Economic  | Social   |
|--------------------|--|---|--|
| Agricultural Land  | Provides biodiversity <ul style="list-style-type: none"> <li>Ecosystem Services</li> </ul>   | Food, fibre and timber production <ul style="list-style-type: none"> <li>Export \$ for the region creates economic activity in the service sector, quality food source, secure production and personal income</li> </ul>                                      | Sustains growth of North East communities. <ul style="list-style-type: none"> <li>Provides growth in the service sector</li> </ul>   |
| Other Private Land | Provides opportunities for biodiversity conservation <ul style="list-style-type: none"> <li>Protection of sensitive areas</li> <li>Buffer for threatened ecosystems</li> <li>ecosystem service</li> </ul>        | Economic activity <ul style="list-style-type: none"> <li>Population adds to local economy</li> <li>Local industry</li> <li>Tourism</li> </ul>   | Lifestyle <ul style="list-style-type: none"> <li>Community well-being</li> <li>Amenity</li> </ul>  |
| Public Land        | Provides biodiversity conservation <ul style="list-style-type: none"> <li>Ecosystem services</li> <li>Genetic bank</li> <li>Habitat for flora and fauna</li> <li>Wilderness</li> <li>Recharge control</li> </ul> | Generates economic activity <ul style="list-style-type: none"> <li>Tourism service industries</li> <li>Hunting licences</li> <li>Employment</li> <li>Firewood</li> <li>Mining</li> <li>Agriculture use</li> <li>Grazing</li> <li>Timber production</li> </ul> | Recreation <ul style="list-style-type: none"> <li>Ski Fields</li> <li>Hunting</li> <li>Rail Trails</li> <li>Amenity</li> <li>Aesthetic value</li> <li>Spiritual value</li> <li>Personal well-being</li> <li>Cultural icon</li> </ul>   |
| Landscape          |  | Generates economic activity <ul style="list-style-type: none"> <li>Tourism</li> <li>Contribution to land value</li> </ul>   | Social well-being <ul style="list-style-type: none"> <li>Health</li> <li>Spiritual</li> <li>Feeling of Stewardship</li> <li>Sense of identity</li> </ul> Aesthetic appeal <ul style="list-style-type: none"> <li>Interesting/Unique land forms</li> <li>Variety of landscapes in NE</li> </ul> |

Source: NECMA 2004

### 5.2.2 The People

Prior to European settlement, the region was inhabited by a number of aboriginal tribes. The first European descriptions of the area were made by the explorers Hamilton Hume and William Hovell. They crossed the river they called the Hume (now the Murray River) where the City of Albury is now located and entered North East Victoria in November 1824. The explorers travelled along the hills near to where the town of Beechworth is now located and through to the Ovens Valley. Hovell wrote *“there are fine hills and grass land...as pretty a spot as valuable as any I have seen since leaving home”*, while Hume wrote *“the honeysuckle and grass trees are growing here well – we find the land to be good”* (Anon 2002).

The many settlers that followed soon after Hume and Hovell also found the land to be good, first for agriculture and then for prospecting after gold was discovered at Beechworth in 1852 (Anon 2004). By 1840 most of the plains and valleys had been claimed, with settlers clearing the woodlands first and then the forests.

The population grew dramatically after gold was discovered, first in Beechworth and later in other areas including Chiltern and Rutherglen. Once the easier gold had been mined out, settlers turned to agriculture for their livelihood. Settlement of the area resulted in major changes to the landscape. Native vegetation was removed for agriculture, the mining industry, as well as for timber and firewood use by the growing population.

Today the population of the region is approximately 94,383 (DSE 2003) and growing rapidly. Wodonga alone grew by more than 1% each year for five years from 1996 (NECMA 2004). Significant employment in the region occurs in Manufacturing (15.7%), Retail Trade (14.3%), Health and Community Service (11.4%) and Agriculture, Forestry and Fishing (8.4%) (DSE 2003).

The region's population is predominantly found in the two major cities of Wodonga and Wangaratta, and larger towns such as Corryong, Mt Beauty, Beechworth, Rutherglen, and Myrtleford. Local government municipalities comprise Wodonga, Indigo, Wangaratta, Alpine, Towong, and parts of Moira and East Gippsland.

The triple bottom line value of the people assets were identified within the NORTH EAST RCS (Table 8).

**Table 8 – Triple bottom line value of people assets within the North East.**

| <b>People Assets</b>   | <b>Environmental</b> | <b>Economic</b>   | <b>Social</b>   |
|------------------------|----------------------|---|---|
| Indigenous heritage    |                      | Generates economic activity <ul style="list-style-type: none"> <li>• Tourism</li> <li>• Employment</li> </ul>   | Cultural identity and spiritual value <ul style="list-style-type: none"> <li>• Stewardship</li> <li>• Belonging</li> <li>• Knowledge</li> <li>• Educational value</li> <li>• Diversity</li> <li>• Aid to reconciliation</li> </ul>  |
| Historical Sites       |                      | Generates economic activity <ul style="list-style-type: none"> <li>• Tourism</li> <li>• Employment</li> </ul>   | Cultural Identity and spiritual <ul style="list-style-type: none"> <li>• Recreation and amenity</li> <li>• Connection to the past</li> <li>• Education and research</li> </ul>  |
| Knowledge and capacity |                      | Sustainable growth and use of resources <ul style="list-style-type: none"> <li>• Tourism</li> <li>• Employment</li> <li>• Future economic activity through succession and retention of local knowledge</li> </ul> | Increases in productivity and sustainability of the NE region <ul style="list-style-type: none"> <li>• Communication networks</li> <li>• Coordination</li> <li>• Common goals</li> <li>• Support</li> <li>• Community involvement</li> <li>• Increases awareness</li> </ul> |
| Demographic Assets     |                      | Generate economic activity <ul style="list-style-type: none"> <li>• Agricultural production, forestry</li> <li>• Industrial and commercial industry</li> <li>• Service</li> </ul>                                 | Sustainable population size diversity of age, culture, gender and employment<br>Feeling of belonging in small communities   |

Source: NECMA 2004

### 5.2.3 Built Infrastructure

Approximately 6,200km of sealed road are found within the region. Major roads include a section of the Hume Freeway, the Great Alpine Road and Murray Valley Highway. The Melbourne to Sydney railway line also runs through the region, as does the gas pipe line. Other infrastructure that supports the communities within the North East includes telephone lines, underground utilities,

water treatment plants, electricity lines, waste water treatment, and bridges. The triple bottom line value of the built infrastructure assets were identified within the RCS (Table 9).

**Table 9 - Triple bottom line value of built infrastructure within the North East.**

| <b>Build Infrastructure Assets</b> | <b>Environmental</b>  | <b>Economic</b>  | <b>Social</b>  |
|------------------------------------|---|--|--|
| Transport                          | Biodiversity preservation and conservation <ul style="list-style-type: none"> <li>• Biodiversity conservation (roadsides)</li> <li>• Habitat corridors</li> </ul> | Economic activity <ul style="list-style-type: none"> <li>• Tourism \$ into the region</li> <li>• Market access</li> <li>• Supports economic activity</li> <li>• Employment</li> </ul>  | Lifestyle <ul style="list-style-type: none"> <li>• Community growth</li> <li>• Community links</li> <li>• Aesthetics</li> <li>• Recreation</li> <li>• Fire protection and emergency services use</li> <li>• Breaks</li> <li>• Access</li> <li>• Historical sites</li> <li>• Bridges</li> </ul>                             |
| Services                           | Biodiversity (eg: Wonga Wetlands)   | Economic activity <ul style="list-style-type: none"> <li>• Tourism</li> <li>• Agriculture production</li> <li>• Water reuse</li> <li>• Employment</li> <li>• Local industry</li> </ul> | Lifestyle <ul style="list-style-type: none"> <li>• Standard of living</li> <li>• Security</li> <li>• Enables population growth</li> <li>• Communication</li> <li>• Health</li> <li>• Education</li> <li>• Welfare and government services</li> <li>• Emergency services</li> <li>• Entertainment and recreation</li> </ul> |

Source: NECMA 2004

#### 5.2.4 Inland Waters

The North East is an important water-producing region. Thirty-eight percent of the flow in the Murray River originates from its three catchments (NECMA 2004). Almost 80% of the North East region has been classified as Declared Water Supply Catchments under the provisions of the Catchment and Land Protection Act, 1994. A number of major rivers and storages are found in the region including the Murray River and Lake Hume (Table 10).

**Table 10 - Major waterways and water storages within the North East.**

| <b>Catchment</b> | <b>Rivers and Creeks</b>                                     | <b>Water Storages</b>   |
|------------------|--|---|
| Upper Murray     | Mitta Mitta River<br>Murray River                            | Lake Hume<br>Lake Dartmouth                                     |
| Kiewa            | Kiewa River<br>Indigo Creek                                  | Rocky Valley Dam<br>Pretty Valley Dam<br>Lake Guy<br>Clover Dam |
| Ovens            | Oven River<br>King River<br>Buffalo River<br>Black Dog Creek | Lake Buffalo<br>William Hovell                                  |

Source: NECMA 2004

The Mitta Mitta River from Glen Valley to the tail-waters of Lake Dartmouth, and the 52km of river corridor on the Ovens River from Killawarra to Lake Mulwala are classified as Heritage Rivers under the Heritage Rivers Act 1992 (NECMA 2004).

There are approximately 19,588ha of wetland on public land and 5,166ha on private land. Eight of these are considered to be nationally significant (Davies Plain, Mount Buffalo Peatlands, Lake Hume, Ryans Lagoon, Black Swamp, Lake Dartmouth, Mitta Mitta River and Ovens River. The most significant wetland is Black Swamp. This is located on the floodplain between the Murray and

Ovens River. Black Swamp is considered high value for its ecological, educational, scientific, cultural and scenic features. It is also home to the Great Egret listed by Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA) (Environment Australia 2001).

Access to groundwater in the region is controlled by licensing arrangements administered by Goulburn-Murray Water. The total authorised volume for groundwater extraction in the NE is 14,147 megalitres (GMW 2005). There is currently a moratorium on new groundwater extraction licenses within four Groundwater Management Areas (GMA) being Barnawartha, Murmungee, and Mullindolingong (1&2) (Figure 9). Goulburn Murray Water is yet to confirm when investigations into sustainable extraction volumes for these areas are to commence. There is one (1) irrigation license and 9 other licenses in the Barnawartha GMA with an authorised volume of 595 megalitres. There are 161 irrigation licenses and 99 other licences in the Murmungee GMA with an authorised volume of 12,018 megalitres. While Mullindolingong (1&2) has 18 irrigation licenses and 42 other licenses with an authorised volume of 1534 megalitres. There are other many other extractions for stock and domestic supply across the region.

The triple bottom line value of the inland water assets where identified within the RCS (Table 11).

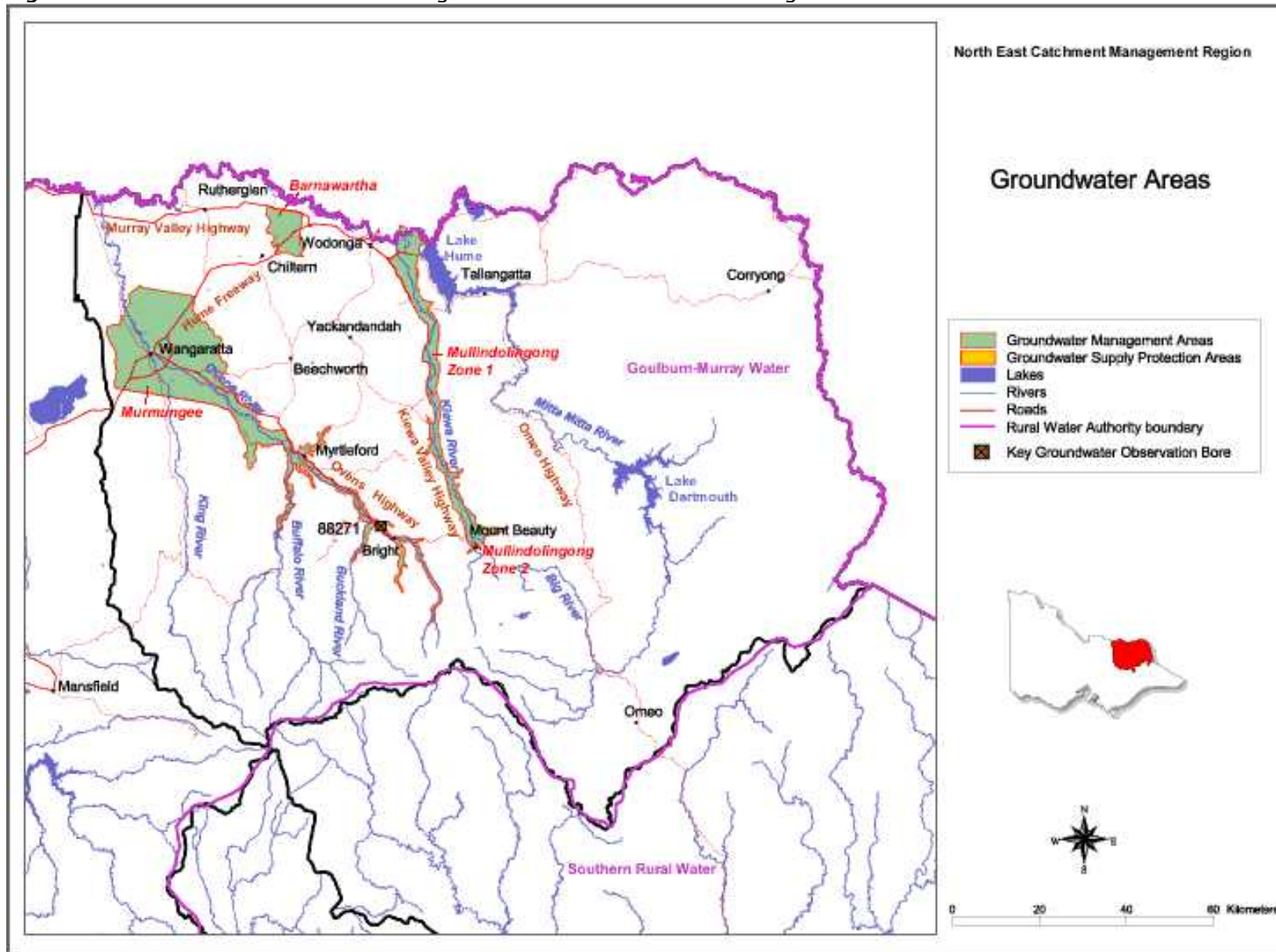
**Table 11** – Triple bottom line values of inland water assets within the North East.

| <b>Water Assets</b> | <b>Environmental</b>   | <b>Economic</b>  | <b>Social</b>  |
|---------------------|--|--|--|
| Rivers and Streams  | Provides biodiversity <ul style="list-style-type: none"> <li>• Ecosystem Function</li> <li>• Pristine habitat</li> <li>• Flora and fauna</li> <li>• Hydro power offsets</li> <li>• Greenhouse gas emissions</li> </ul> | High quality consumptive water for use in the North East and downstream catchments <ul style="list-style-type: none"> <li>• Irrigated agriculture</li> <li>• Drinking water</li> <li>• Industrial water use</li> <li>• Hydro power</li> <li>• Employment</li> <li>• Tourism</li> </ul> | Lifestyle and aesthetic value to North East communities <ul style="list-style-type: none"> <li>• Amenity</li> <li>• Heritage values</li> <li>• Recreation</li> <li>• Attracts new residents</li> </ul> |
| Wetland             | Ecosystem Function <ul style="list-style-type: none"> <li>• Biodiversity</li> <li>• Habitat especially for birds</li> <li>• Groundwater recharge</li> <li>• Maintains water quality and treats stormwater</li> </ul>   | High quality consumptive water storage for use in the NE and downstream catchments<br><br>Flood mitigation   | Places to visit and explore <ul style="list-style-type: none"> <li>• Educational and research</li> <li>• Recreation</li> <li>• Amenity and aesthetics</li> <li>• Heritage</li> </ul>                   |
| Groundwater         | Ecosystem functions <ul style="list-style-type: none"> <li>• Biodiversity</li> <li>• Contribution to stream flows</li> <li>• Salinity control</li> </ul>   | Secure consumptive water use <ul style="list-style-type: none"> <li>• Irrigation</li> <li>• Stock and domestic</li> <li>• Urban water supply</li> </ul>  | Allows for stable community development <ul style="list-style-type: none"> <li>• Supply reliability</li> <li>• Consistent quality</li> </ul>   |

Source: NECMA 2004



Figure 9 - Location of Groundwater Management Areas in the North East Region.



### 5.2.5 Biodiversity

The variety of landscapes and climatic characteristics of the north east region is reflected in the diversity of flora and fauna. Six national bioregions are recognised: Highlands-Northern Fall, Northern Inland Slopes, Victorian Alps, Victorian Riverina, Central Victorian Uplands, and Highlands- Southern Fall (NECMA 2000).

There are at least 30 ecological vegetation classes in the region (NECMA 2000). Twenty-one percent of these are classified as endangered, and a further 5% are classified as vulnerable. Native grasslands and grassy woodlands have less than 30% of their pre-1750 species. Of the 2,264 species of plants found throughout the region, 149 are considered to be rare or threatened. Some 520 fauna & fish species are known to occur in the region. At least 92 are considered rare or threatened, including the Regent Honeyeater, Long Footed Potoroo, Swift Parrot, and Brush-tailed Phascogale (NECMA 2000). The triple bottom line value of the biodiversity assets are identified within the RCS (Table 12).

**Table 12** - Triple bottom line value of biodiversity assets within the North East.

| Biodiversity Asset | Environmental   | Economic   | Social  |
|--------------------|---|--|---|
| Flora              | Habitat <ul style="list-style-type: none"> <li>• Rare and endangered species</li> <li>• Genetic pool</li> <li>• Reduces recharge</li> <li>• Reduces erosion</li> </ul>                    | Economic opportunities <ul style="list-style-type: none"> <li>• Honey production</li> <li>• Timber and firewood</li> <li>• Niche marketing (bush tucker)</li> <li>• Agricultural production (native grasses)</li> <li>• Tourism</li> <li>• Seed orchards</li> <li>• Native flowers</li> <li>• Potential pharmaceutical products</li> </ul> | Aesthetics <ul style="list-style-type: none"> <li>• Cultural values</li> </ul>  |
| Fauna              | Improved habitat <ul style="list-style-type: none"> <li>• Soil health</li> <li>• Aquatic health</li> <li>• Ecosystem services</li> <li>• Pollination</li> <li>• Seed dispersal</li> </ul> | Economic opportunities <ul style="list-style-type: none"> <li>• Honey production</li> <li>• Niche marketing (bush tucker)</li> <li>• Agricultural production (kangaroos)</li> <li>• Tourism (hunting, fishing)</li> <li>• Ecosystem services (predation of agricultural pests)</li> </ul>  | Community lifestyle <ul style="list-style-type: none"> <li>• Aesthetics</li> <li>• Cultural values</li> <li>• Recreation</li> <li>• Historical significance</li> <li>• Brumbies</li> <li>• Dingoes</li> </ul> |

Source: NECMA 2004

### 5.2.6 The Climate

The climate in North Eastern Victoria is highly variable depending on location and elevation (Table 13). Overall the region experiences hot, dry summers and cool, wet winters. Annual rainfall ranges from 500mm on the plains to more than 2,000mm in mountain areas. Most rain (60%) falls between May and September, and large rainfall events lead to flooding in the lower parts of the catchments in some years. Snowfalls above 1000m occur in winter months. Temperatures also vary widely according to topography; frosts are common throughout the catchment in the cooler months.

**Table 13** – Average maximum and minimum temperatures of the North East.

| Location   | January max. (°C) | January min. (°C) | July max.(°C) | July min.(°C) |
|------------|-------------------|-------------------|---------------|---------------|
| Wodonga    | 31.8              | 15.2              | 12.6          | 3.1           |
| Mt Buffalo | 19.5              | 10.8              | 3.7           | -0.7          |
| Wangaratta | 31.0              | 15.0              | 12.7          | 3.1           |

Source: BOM 2005

Consistent with other areas of south-eastern Australia, in recent years North East Victoria has been exceptionally dry and warm. These conditions culminated in severe drought and extensive bush fires throughout much of the region over the summer of 2002/2003. During this time approximately 1.1 million hectares of land was burnt in the North East (760,453ha) and Gippsland Regions (Victorian Government 2003). The triple bottom line value of the air and climate asset are identified within the RCS (Table 14).

**Table 14** – Triple bottom line value of air and climate asset.

| Air and Climate Asset | Environment   | Economic   | Social   |
|-----------------------|---|--|--|
| Air and Climate       | Habitat <ul style="list-style-type: none"> <li>• Clean air</li> <li>• Plant production</li> <li>• Diverse ecosystems</li> </ul> | Economic opportunities <ul style="list-style-type: none"> <li>• Tourism (skiing, bushwalking)</li> <li>• Plant production</li> </ul> | Community lifestyle <ul style="list-style-type: none"> <li>• Health</li> <li>• Mental well-being</li> <li>• Astronomy (clear skies)</li> </ul> |

Source: NECMA 2004

### 5.3 Threats to Assets

The RCS also identified 19 threats to the assets in the region. The two threats that are focused on within this plan are soil and water salinity. It is also important to consider the interaction that soil and water salinity has with other threats which is presented in Section 6.5 of this plan.

The 19 threats to assets in the region are:

- Pest plants and pathogens
- Pest animals
- Fire
- Soil acidity
- Soil salinity
- Other soil health
- Flooding
- Drought
- Disasters
- Climate change and air quality decline
- Algal blooms
- Water salinity
- Other water quality
- Changes (positive and negative) in water resource
- Direct removal of native vegetation
- Habitat decline
- Changing market conditions
- Insufficient public investment
- Loss of knowledge, expertise and leadership

The relationship between these threats can be complex. Some threats can further contribute to the occurrence of other threats such as direct removal of native vegetation on soil salinity. While some threats can limit the options or effectiveness of management options of other threats such as pest animals (rabbits) on tree planting for salinity. Threats should not be considered as a single entity.