



NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Bandon Land Unit include:

- *Eucalyptus incrassata* Open Low Mallee
- *Eucalyptus leptophylla/Eucalyptus socialis* Open Mallee
- *Eucalyptus gracilis/Eucalyptus oleosa* Very Open Mallee
- *Eucalyptus dumosa +/- Eucalyptus leptophylla* Mallee
- *Eucalyptus calycogona/Eucalyptus dumosa* Very Open Mallee.

CONSERVATION ASSETS

Due to the extremely low levels of remaining habitat within the Kunlara Land Unit and that most small remnants have not been surveyed, there are very few native wildlife records from the area. The Major Mitchell's Cockatoo has been recorded from a Heritage Agreement on the western end of the Land Unit. Ratings are abbreviated to Rare (R), Vulnerable (V) and Known (K).

Species of conservation significance:

Fauna

- Major Mitchell's Cockatoo (*Cacatua leadbeateri*), SA: V, MM: V.

KEY THREATENING PROCESSES

- Fragmentation and isolation of remnants.
- Feral animals.
- Grazing of remnants.
- Soil erosion—Erosion potential due to low remnancy levels across the area coupled with a high density of linear dunes to the eastern end of the Kunlara Land Unit. Laut et al., (1977) notes both undulating plains and dune have slight and moderate drift potential respectively.

- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, African Lovegrass, Athel Pine, Bathurst Burr, Bladder Champion, Boneseed, Branched Broomrape, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, False Caper, Field Garlic, Golden Dodder, Horehound, Innocent Weed, Noogoora Burr, Onion Weed, Prickly Pear, Salvation Jane, Silver Nightshade, Skeleton Weed, Soursob and Yellow Burr Weed.

CURRENT MANAGEMENT STRATEGIES

Erosion control

There are areas identified for erosion management within the Kunlara Land Unit by the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003). The main areas range from severe to moderate (severe is described as razorbacks, mobile drift, encroachment of erosion site onto neighbouring land, untrafficable by farm machinery, and/or mostly devoid of vegetative cover (MMLAP, 2003)) with various levels of vegetative cover and are mainly located:

- Mindarie and surrounds
- north and west of Halidon
- south and south-west of Wanbi.

The report also identifies which areas have been revegetated between 1998 and 2001. Revegetation has been targeted at the following areas:

- north-west of Mindarie
- north-east of Halidon.

RECOMMENDED MANAGEMENT STRATEGIES*

- Protect existing remnants
- buffer existing remnants
- maintain and improve the condition of remnants
- maintain and improve the condition of roadside vegetation
- control erosion.

*See Table 7 (page 51).

LOWER MURRAY

Area—922 km²

Mean annual rainfall—350 mm

Primary land uses—Irrigated pasture production for dairying

Remnancy—1.3%



Figure 36: Lower Murray locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

DESCRIPTION

The Lower Murray Land Unit has been described as ‘the Murray River floodplain, here incised some 40 metres below the surface of the surrounding calcreted plains. The higher proportion of the floodplain and some of the highest swamps have been drained and reclaimed for pasture and fodder cultivation. Dairy cattle and other livestock are either grazed on these pastures or fed on the fodder harvested from them. The steep cliffs beside the river create local perspective views. From the top of the cliffs, panoramic views are available, with the floodplain, swamps and channel creating foreground features’ (Laut et al., 1977).

Approximately half (44.5%) of this land type is located within the Murray Mallee LAP area covering an area of 922 km² along the River Murray corridor. The vast majority of the vegetation has been cleared or severely modified, leaving 1.3%, or 125.5 hectares remaining, of which none is formally protected in the reserve system. The area has been a site of intensive use since early settlement due to its proximity to the River and today it is primarily utilised for dairy pastures, recreation and urban development (Kahrimanis et al., 2001).

Despite the level of degradation, the corridor habitat is still extremely valuable habitat to numerous wildlife species including bats, birds, reptiles, mammals and insects. The declining Brushtail Possum is known from habitats close to the river, where hollow-bearing mature eucalypts provide nesting habitat (Kahrimanis et al., 2001). The Lower Murray Land Unit also provides an effective corridor for the movement of wildlife.



NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Lower Murray Land Unit include:

- *Eucalyptus camaldulensis* ssp. *camaldulensis* (River Red Gum) Woodland
- *Eucalyptus largiflorens* (River Box) Woodland
- *Enchylaena tomentosa* (Ruby Saltbush) Low Shrubland.

CONSERVATION ASSETS

The vegetation along the river corridor is highly degraded and modified, however it is known to provide habitat to a large range of wildlife species. Mature River Red Gums along the corridor often possess a range of hollows suitable for bird species (such those listed in Table 6) as well as the regionally significant Major Mitchell's Cockatoo, Brush-tailed Possum, Feather-tail Glider, Yellow-bellied Sheath-tailed Bat, and a range of other common species.

KEY THREATENING PROCESSES

- Grazing of remnant vegetation—Degradation of the understorey species by grazing has modified the composition and structure of many areas along the river corridor. Regeneration of native species is limited whilst the protective nature of species such as the Common Reed (*Phragmites australis*) is compromised, leaving the banks further exposed to erosion (Kahrmanis et al., 2001).
- Erosion potential along banks due to heavy utilisation by stock, recreational users and river wave action.
- Feral animals.
- Salinity in the form of local rising saline groundwater.

- Recreational activities continue to degrade the environs within the Lower Murray Land Unit. The area is extremely popular and subsequently recreational use is intensive. Some of the impacts include erosion of banks due to wave action caused by motor boats, over-collection of firewood, vehicle damage to banks and urban developments.
- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, African Lovegrass, Aleppo Pine, Athel Pine, Bathurst Burr, Blackberry, Boneseed, Branched Broomrape, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, Dandelion, False Caper, Horehound, Innocent Weed, Lincoln Weed, Noogoora Burr, Olive, Onion Weed, Prickly Pear, Salvation Jane, Silver Nightshade, Skeleton Weed, Soursob, Variegated Thistle, Willow and Yellow Burr Weed.

RECOMMENDED MANAGEMENT STRATEGIES*

- Protect existing remnants
- buffer existing remnants
- create wildlife corridors
- maintain and improve the condition of remnants
- maintain and improve the condition of roadside vegetation
- control erosion
- rehabilitate degraded areas
- retain wildlife habitat.

*See Table 7 (page 51).

MOORLANDS

Area—143.1km²

Mean annual rainfall—375 mm

Primary land uses—Cereal cropping and sheep grazing

Remnancy—3.7%



Figure 37: Moorlands locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

DESCRIPTION

The Moorlands Land Unit has been described as ‘an undulating plain on calcreted sands with outcrops of calcrete and isolated dunes. The cover is mainly grassland and locally open parkland. The land is used for grazing and cereal cultivation’ (Laut et al., 1977).

Three small sections of the Moorlands Land Unit, amounting to approximately 10% of the entire area fall within the Murray Mallee LAP area. The sections are all located on the south-western boundary of the region. Only 3.7% of the original native vegetation remains within this Land Unit, of which 63%, or 341 hectares, is protected under three small Heritage Agreements. The areas protected under Heritage Agreements constitute the largest remaining blocks on the Land Unit, with all other vegetation made up of tiny fragmented and isolated blocks. Due to their size and a lack of formal protection, most are likely to be degraded from grazing and weed invasion, however they may help serve as small stepping stones for birds and larger wildlife species attempting to move from one larger remnant patch to another.

NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Moorlands Land Unit include:

- *Eucalyptus gracilis* / *Eucalyptus oleosa*
Very Open Mallee
- *Melaleuca acuminatum* / *Melaleuca lanceolata*
+/- *Eucalyptus socialis* +/- *Eucalyptus leptophylla*
Tall Open Shrubland *Lomandra effusa* Open Tussock Grassland
- *Eucalyptus incrassata* Open Low Mallee.



CONSERVATION ASSETS

The three Heritage Agreements are considered to be the only conservation assets within the Land Unit. All other remnant vegetation is contained within small patches which are likely to be degraded and therefore of low habitat value. The Heritage Agreements are isolated from other blocks, however they are located on the south-eastern corner of the Ettrick High Value Habitat Area and may therefore be useful as stepping stones within that area.

There are no records of plant or animal species of conservation significance from the Moorlands Land Unit.

KEY THREATENING PROCESSES

- Fragmentation and isolation of remnants.
- Small remnants (less than one hectare).
- Grazing of remnants.
- Feral animals .
- Soil erosion—There are a small number of moderate erosion areas that have been identified in the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003).
- Weed invasion, the major weeds identified for the Land Unit are: African Boxthorn, African Lovegrass, Bathurst Burr, Bladder Campion, Boneseed, Branched Broomrape, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, False Caper, Horehound, Innocent Weed, Lincoln Weed, Onion Weed, Silver Nightshade, Skeleton Weed, Soldier Thistle, Soursob, Variegated Thistle and Yellow Burr Weed.

CURRENT MANAGEMENT STRATEGIES

Erosion control

There are areas identified for erosion management within the Moorlands Land Unit by the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003). Several small areas south of Wynarka and south of Geranium have been classified as having moderate erosion.

RECOMMENDED MANAGEMENT STRATEGIES*

- Protect existing remnants
- buffer existing remnants
- maintain and improve the condition of remnants
- maintain and enhance the condition of roadside and railway reserve vegetation
- control erosion
- manage feral animals
- protect Heritage Agreements and other reserves and remnants.

*See Table 7 (page 51)

MURTHO

Area—125 km²

Mean annual rainfall—250 mm

Primary land uses—Grazing with some cereal cropping

Remnancy—26.3%

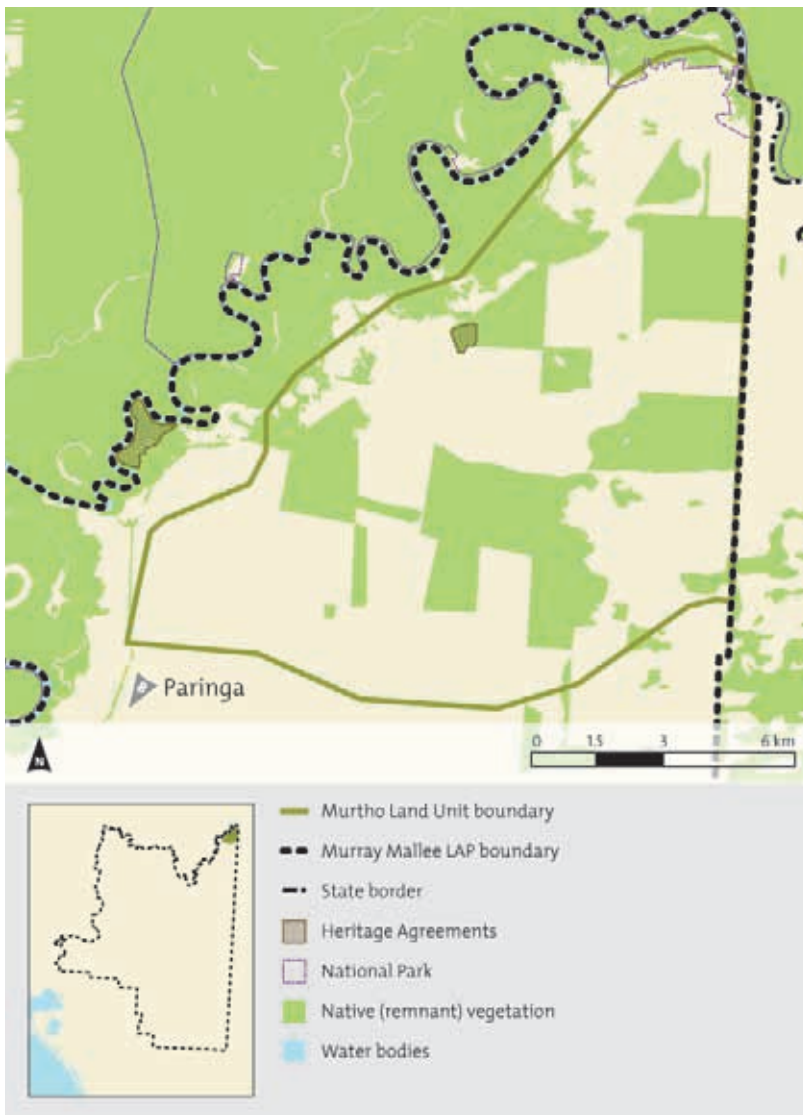


Figure 38: Murtho locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

DESCRIPTION

The Murtho Land Unit has been described as ‘a gently undulating calccrete plain with low discontinuous sand dunes and a grassland or open parkland cover, mainly grazed but with limited wheat cultivation’ (Laut et al., 1977).

The entire Murtho Land Unit within South Australia occurs within the Murray Mallee LAP area and is located in its far north-eastern end, bordering the River Murray and the SA–Victoria border. Despite the majority of the Land Unit being cleared of vegetation in the past, a reasonable proportion is still remaining (26.3%). Of this remaining vegetation, a very small proportion is formally protected under one Heritage Agreement (0.83%, or 27.45 hectares). The remnant blocks of vegetation, some of which are over 200 hectares in size, are especially significant due to their proximity to native vegetation along the river corridor. Collectively the blocks may serve as an effective corridor for the movement of wildlife between the river and large areas of mallee vegetation across the Victorian border. The larger unprotected blocks are likely to benefit from restoration or maintenance, through feral plant and animal control and/or fencing from grazing. Connection of remnants using wildlife corridors may encourage greater movement of wildlife species between patches. The smaller blocks are more susceptible to the degrading impacts of weed invasion from the edges (edge effects) and may need more regular treatment to keep infestations from spreading throughout the entire block.



NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Murtho Land Unit include:

- *Casuarina pauper* Low Woodland
- *Maireana sedifolia* or *M. pyramidata*
Very Open Shrubland
- *Eucalyptus largiflorens* Low Woodland
- *Stipa* sp. Open Tussock Grassland
- *Eucalyptus diversifolia*, *Olearia axillaris*
Open Mallee

CONSERVATION ASSETS

There is only one Heritage Agreement contained within the Murtho Land Unit, which represents a tiny proportion of the remaining vegetation. The area is however, connected onto larger remnants including the river corridor. Many of the other unprotected remnants are between 100–200 hectares in size and are most probably grazed by domestic stock. The majority of the degradation is likely to be concentrated around the edges.

There are no records of plants or animals of conservation significance recorded from the Murtho Land Unit, however the remnant blocks in excess of 200 hectares are predicted habitat for species such as Malleefowl, Chestnut Quail-thrush, Major Mitchell's Cockatoo, Regent Parrot and the Striped Honeyeater (Kahrimanis et al., 2001).

KEY THREATENING PROCESSES

- Fragmentation and isolation of remnants.
- Grazing of remnants.
- Feral animals.
- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, Bathurst Burr, Boneseed, Bridal Creeper, Caltrop, False Caper, Golden Dodder, Horehound, Innocent Weed, Noogoora Burr, Olive, Onion Weed, Prickly Pear, Salvation Jane, Skeleton Weed, Soursob and Yellow Burr Weed.

RECOMMENDED MANAGEMENT STRATEGIES*

- Protect existing remnants
- buffer existing remnants
- create wildlife corridors
- maintain and improve the condition of remnants
- maintain and enhance the condition of roadside and railway reserve vegetation
- manage feral animals
- protect Heritage Agreements and other reserves and remnants.

*See Table 7 (page 51).

PATA

Area—2052 km²

Mean annual rainfall—275 mm

Primary land uses—Cereal cropping and grazing

Remnancy—6.5%

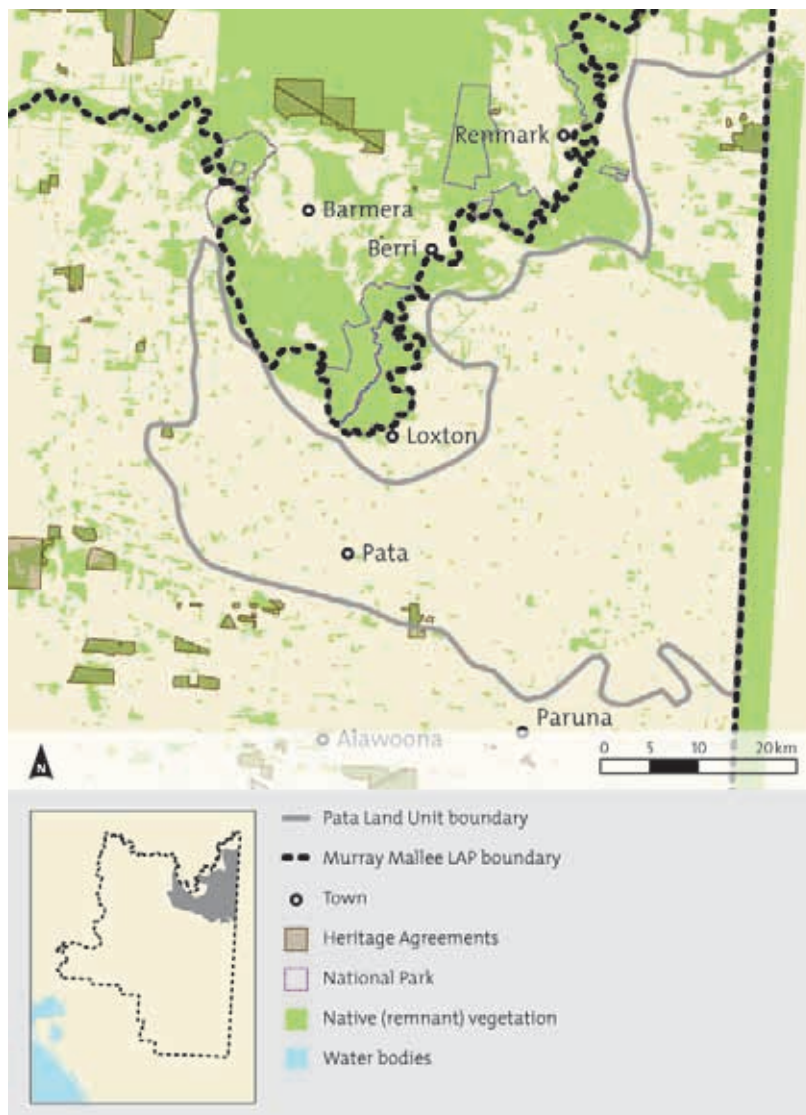


Figure 39: Pata locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

DESCRIPTION

The Pata Land Unit has been described as ‘a gently undulating plain on calcreted sands with easterly trending isolated dunes. Open parkland with pasture understorey and cereal crops. Middle ground panoramic views are dominated by field and pastures, with mallee remnants or bare dune crests as local features. Mallee verges create perspective views along some roads’ (Laut et al., 1977).

The entire Pata Land Unit occurs within the Murray Mallee LAP area, and is located in the north-eastern corner bordering the River Murray and the SA–Victoria state border. Clearance of native vegetation has been widespread throughout the Land Unit, with remaining vegetation calculated at 6.5%. Of this remaining vegetation, a very small proportion is protected under eight Heritage Agreements (9.6%, or 1293 hectares).

The southern and western portions of the Pata Land Unit separate the ‘Billiatt Complex’ from the River channel and much of the remaining vegetation across these areas is small, fragmented and isolated and due to a lack of formal protection, are most likely degraded from grazing and weed invasion. Many of these blocks, which may serve as stepping stones between areas of higher habitat value could benefit from restoration or maintenance, through feral plant and animal control and/or fencing from grazing. The smaller blocks are more susceptible to the degrading impacts of weed invasion from the edges (edge effects) and may need more regular treatment to keep infestations from spreading throughout the entire block.



The north-eastern sections of the Land Unit contain higher levels of native vegetation, although the vast majority of this is not formally protected. Due to their proximity to the river corridor, these areas may benefit from further protection and maintenance. Connection of remnants using wildlife corridors may encourage greater movement of wildlife species between patches.

NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Pata Land Unit include:

- *Eucalyptus cyanophylla* Open Mallee
- *Eucalyptus gracilis* / *Eucalyptus oleosa* Very Open Mallee
- *Casuarina pauper* Low Woodland
- *Eucalyptus leptophylla* / *Eucalyptus socialis* Open Mallee
- *Spinifex sericeus*, *Ozothamnus turbinatus*, *Isolepis nodosa* Tussock Grassland
- *Halosarcia* sp. Low Very Open Shrubland.

CONSERVATION ASSETS

The eight Heritage Agreements are considered to be the primary conservation assets within the Pata Land Unit. All other remnant vegetation is contained within unprotected blocks which are likely to be relatively degraded. The Heritage Agreements are isolated from other blocks, however they are four grouped mallee blocks located in the north-east of the Land Unit close to the Victorian border. These have the potential to maintain some level of quality habitat due to their proximity to similar and larger blocks over the border and to the River Murray.

There are no records of plants or animals of conservation significance from the Pata Land Unit, however the state and regionally Vulnerable Major Mitchell's Cockatoo has been recorded from small mallee patches on the east of the Land Unit close to the border and from the north-west close to the river.

Blue Mallee (*Eucalyptus cyanophylla*) is a species endemic to the South Australian Murraylands region. Much of the association has previously been cleared leaving small pockets scattered throughout the Land Unit. It mainly exists now along road reserves and small remnants on private land. Conservation of the remaining pockets of Blue Mallee is therefore extremely important. Small areas of this vegetation type also occur within the neighbouring Land Units of Holder and Renmark (Payne, pers. comm., 2006).

There are numerous important *Callitris gracilis* remnants of varying condition in this Land Unit that should be considered important for targeted conservation (Simon, pers. comm., 2006).

CONTINUED

PATA

KEY THREATENING PROCESSES

- Fragmentation and isolation of remnants.
- Small remnants—Many of the blocks within the central and north-western regions of the Land Unit are less than five hectares in size.
- Grazing of remnants.
- Feral animals.
- Soil erosion—There are a small number of moderate erosion areas that have been identified in the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003).
- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, Athel Pine, Bathurst Burr, Boneseed, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, Dandelion, False Caper, Golden Dodder, Horehound, Innocent Weed, Khaki Weed, Lincoln Weed, Noogoora Burr, Olive, Onion Weed, Perennial Ragweed, Prickly Pear, Salvation Jane, Silver Nightshade, Skeleton Weed, Soursob, Variegated Thistle and Yellow Burr Weed.

CURRENT MANAGEMENT STRATEGIES

Erosion control

There are areas identified for erosion management within the Pata Land Unit by the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003). Small areas east of Wunkar and south of Renmark have been identified as having severe erosion (severe is described as razorbacks, mobile drift, encroachment of erosion site onto neighbouring land, untrafficable by farm machinery, and/or mostly devoid of vegetative cover (MMLAP, 2003)).

RECOMMENDED MANAGEMENT STRATEGIES*

- Protect existing remnants
- buffer existing remnants
- maintain and improve the condition of remnants
- maintain and enhance the condition of roadside and railway reserve vegetation
- control erosion
- manage feral animals
- protect Heritage Agreements and other reserves and remnants.

*See Table 7 (page 51).



PINNAROO

Area—1311 km²

Mean annual rainfall—325 mm

Primary land uses—Cereal cropping and grazing

Remnancy—0.75%

DESCRIPTION

The Pinnaroo Land Unit has been described as ‘a gently undulating sandy plain with low parallel dunes and locally, small outcrops of calcrete. There is a grassland cover of cereals and pastures. Sparsely vegetated dune crests stand out in middle and background panoramas over fields and pastures. Remnants of the original vegetation are only found along some roads and the railway, providing local perspective views’ (Laut et al., 1977).

The entire Pinnaroo Land Unit within South Australia occurs within the southern portion of the Murray Mallee LAP area, between Ngarkat and Billiatt Conservation Parks. Approximately 0.75% of the native vegetation has been retained, with a portion of that occurring within two Heritage Agreements and the road reserve along the Mallee Highway. The vast majority of the vegetation has been removed to accommodate cereal cropping and pastoral activities and consequently this wide cleared area has resulted in a significant barrier to wildlife movement between the Ngarkat and Billiatt Conservation Parks’ High Value Habitat areas.

The remaining tiny remnants scattered across the Land Unit are isolated and likely to be highly degraded from weed invasion and grazing, but given the extreme level of clearance, are all very important. These areas may benefit from revegetation in the form of buffering, however they are highly unlikely to provide valuable habitat for viable populations of wildlife. They may however provide some benefit to common bird and possibly small reptile species.

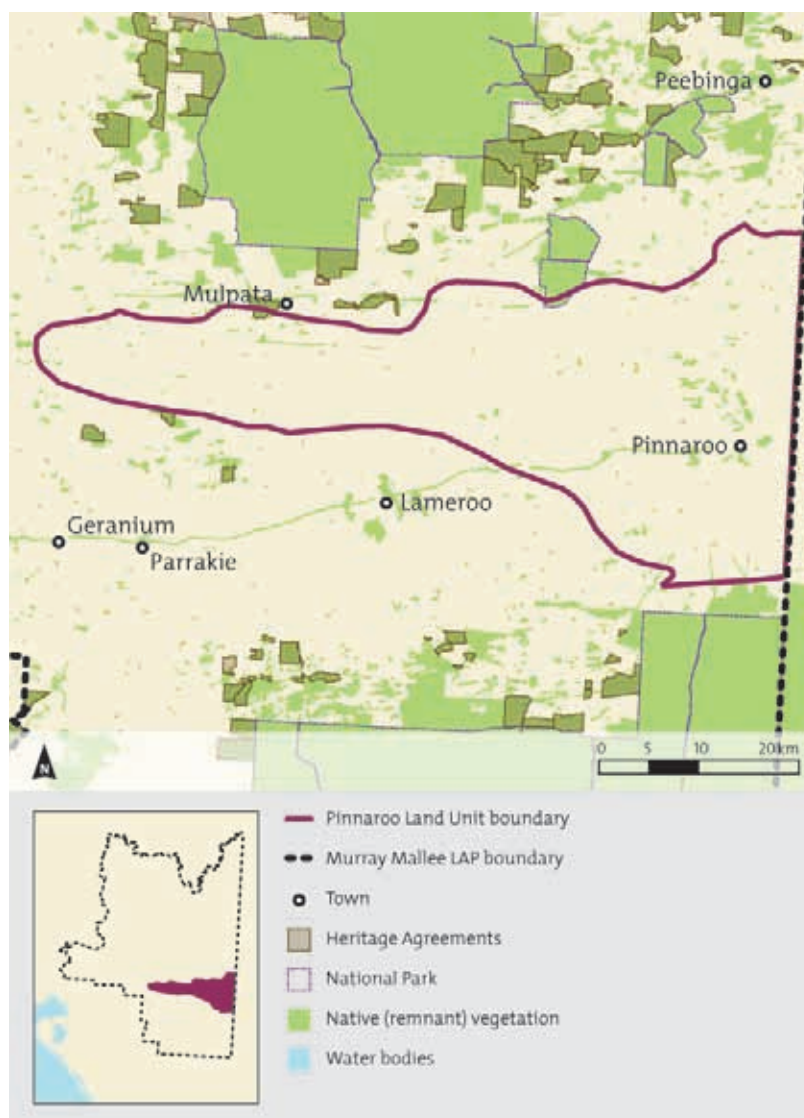


Figure 40: Pinnaroo locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

CONTINUED

PINNAROO

NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Pinnaroo Land Unit include:

- *Eucalyptus dumosa* +/- *Eucalyptus leptophylla* Mallee
- *Eucalyptus incrassata* Open Low Mallee
- *Melaleuca acuminatum*, *Melaleuca lanceolata* +/- *Eucalyptus socialis* +/- *Eucalyptus leptophylla* Tall Open Shrubland
- *Callitris verrucosa* Tall Open Shrubland.

CONSERVATION ASSETS

The two Heritage Agreements located on the boundary of the Pinnaroo Land Unit are considered to be its primary conservation assets. All other remnant vegetation is contained within unprotected blocks which are likely to be severely degraded due to isolation, grazing and weed invasion.

The vegetation contained within the road reserve along the Mallee Highway is one of the last remaining remnants within the Land Unit. The linear shape of a road reserve means that the degrading impacts of weed invasion from the edges (edge effects) results in the condition of the understorey vegetation being compromised. Ongoing weed control is therefore necessary to maintain the biological integrity of the habitat.

There are no records of plants or animals of conservation significance from the Pinnaroo Land Unit.

KEY THREATENING PROCESSES

- Low remnancy—There is very little scope for wildlife movement across the landscape due to the extremely low level of remaining habitat.
- Small remnants—Many of the blocks within the central and north-western regions of the Land Unit are less than one hectare in size.
- Isolation of remnants—The remaining blocks are isolated from all neighbouring blocks, which is likely to generate a significant barrier to the movement of wildlife, particularly small mammals and reptiles. Isolation can inhibit genetic mixing between animals which are unable to move freely between patches and cross-fertilisation between plants.
- Feral animals.
- Grazing of remnants.
- Soil erosion—There are a small number of moderate to severe erosion areas that have been identified in the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003).
- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, African Lovegrass, Bathurst Burr, Bladder Champion, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, False Caper, Horehound, Innocent Weed, Khaki Weed, Lincoln Weed, Noogoora Burr, Onion Weed, Prickly Pear, Salvation Jane, Silver Nightshade, Skeleton Weed, Soldier Thistle, Soursob and Yellow Burr Weed.



CURRENT MANAGEMENT STRATEGIES

Erosion control

The typical land types within the Pinnaroo Land Unit which are described as low parallel dunes and undulating sand plains are reported to have slight to moderate sand drift, particularly in the absence of native vegetation (Laut et al., 1977). There are areas identified for erosion management within the Pinnaroo Land Unit by the Murray Mallee Long Term Eroding Land Project (Derby et al., 2003).

Approximately 10–15 small areas south of Parilla have been identified as having moderate erosion and a number of small areas west of Marama are classified as severe (severe is described as razorbacks, mobile drift, encroachment of erosion site onto neighbouring land, untrafficable by farm machinery, and/or mostly devoid of vegetative cover (MMLAP, 2003)). These areas were mapped in 1991 and may have stabilised since then.

RECOMMENDED MANAGEMENT STRATEGIES*

- Buffer existing remnants
- maintain and improve the condition of remnants
- maintain and enhance the condition of roadside and railway reserve vegetation
- control erosion
- manage feral animals
- protect Heritage Agreements and other reserves and remnants.

*See Table 7 (page 51).

RENMARK

Area—612.4 km²

Mean annual rainfall—250 mm

Primary land uses—Horticulture, recreation, grazing

Remnancy—Approximately 56%



Figure 41: Renmark locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

DESCRIPTION

The Renmark Land Unit has been described as ‘the incised ancestral floodplain of the Murray River and adjacent irrigated plains. This association includes a variety of fluvial landforms including discontinuous levees, oxbows, back swamps, lakes and low terraces. Near-vertical cliffs border the old floodplain. Vegetative cover varies from disturbed woodlands and shrublands to orchards and vineyards. Land use includes irrigated horticulture, conservation and water-based recreation. This association has a variety of views’ (Laut et al., 1977).

Approximately one third (35%) of the Renmark Land Unit is located within the Murray Mallee LAP area covering of 612 km² along the River Murray Corridor. Approximately half of the vegetation has previously been cleared to make way for a variety of land uses including viticulture, citrus and stone fruit orchards, recreation, tourism and urban development (Kahrimanis et al., 2001). Despite the level of degradation, the corridor habitat, which includes floodplain areas, is still extremely valuable habitat to numerous wildlife species including bats, birds, reptiles, mammals and insects. The declining Brushtail Possum and the nationally Vulnerable Regent Parrot are known from habitats close to the river, where hollow-bearing mature eucalypts provide nesting habitat (Kahrimanis et al., 2001). The eucalypt woodlands along the river corridor have been very susceptible to the altered flows of the river and there is evidence to suggest that the deterioration in flooding patterns has impacted on the both River Red Gum and River Box populations.



In addition, rabbits and stock have heavily grazed and subsequently inhibited natural regeneration in many areas along the river corridor (Kahrimanis et al., 2001).

There are three Heritage Agreements contained within the Land Unit which together make up 202.5 hectares. This represents a very small proportion of the remaining vegetation within this Land Unit.

NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within the Renmark Land Unit include:

- *Eucalyptus camaldulensis* ssp. *camaldulensis* (River Red Gum) Woodland
- *Eucalyptus largiflorens* (River Box) Woodland
- *Eucalyptus cyanophylla* Open Mallee
- *Enchylaena tomentosa* (Ruby Saltbush) Low Shrubland.

CONSERVATION ASSETS

The vegetation along the river corridor is highly degraded and modified, however it is known to provide habitat to a large range of wildlife species. Mature River Red Gums along the corridor often possess a range of hollows suitable for bird species such as those listed in Table 6 (see page 29). Other species which are known to utilise this type of riverine and floodplain habitat include the nationally Vulnerable Regent Parrot, the State Vulnerable Bush Stone-curlew, Broad-shelled Tortoise and Southern Bell Frog, the State Threatened Feathertail Glider, the State Rare Striped Honeyeater and Bardick, the regionally significant Major Mitchell's Cockatoo, Brush-tailed Possum, Feather-tail Glider, Yellow-bellied Sheath-tailed Bat, and a range of other common species.

The State Rare Swamp Daisy (*Brachyscome basaltica* ssp. *gracilis*) is recorded from one of the Heritage Agreements located within the Land Unit.

Blue Mallee (*Eucalyptus cyanophylla*) is a species endemic to the South Australian Murraylands region. Much of the association has previously been cleared leaving small pockets scattered throughout the Land Unit. It mainly exists now along road reserves and small remnants on private land. Conservation of the remaining pockets of Blue Mallee is therefore extremely important. Small areas of this vegetation type also occur within the neighbouring Land Units of Holder and Pata (Payne pers. comm, 2006).

CONTINUED

RENMARK

KEY THREATENING PROCESSES

- Grazing of remnant vegetation—Degradation of the understorey species by grazing has modified the composition and structure of many areas along the river corridor. Regeneration of native species is limited or non-existent in areas of heavy grazing, whilst the protective nature of species such as the Common Reed (*Phragmites australis*) is compromised, leaving the banks further exposed to erosion (Kahrimanis et al., 2001).
- Erosion along the banks due to heavy utilisation by stock, recreational users and river wave action.
- Feral animals.
- Salinity in the form of local rising saline groundwater.
- Recreational activities continue to degrade the environs within the Renmark Land Unit. The area is extremely popular and subsequently recreational use is intensive. Some of the impacts include erosion of banks due to wave action caused by motor boats, house boat damage to banks, over-collection of firewood, vehicle damage to banks and urban developments.
- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, African Lovegrass, Athel Pine, Bathurst Burr, Blackberry, Boneseed, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, False Caper, Fountain Grass, Golden Dodder, Horehound, Innocent Weed, Khaki Weed, Lincoln Weed, Noogoora Burr, Olive, Onion Weed, Prickly Pear, Salvation Jane, Silver Nightshade, Skeleton Weed, Soursob, Variegated Thistle and Yellow Burr Weed.

RECOMMENDED MANAGEMENT STRATEGIES*

- Protect existing remnants
- buffer existing remnants
- create wildlife corridors
- maintain and improve the condition of remnants
- control erosion
- rehabilitate degraded areas
- retain wildlife habitat.

*See Table 7 (page 51).



THE BIG DESERT

Area—2461 km²

Mean annual rainfall—350–400 mm

Primary land uses—Conservation and grazing

Remnancy—73.6%

DESCRIPTION

The Big Desert Land Unit has been described as ‘an undulating plain on calcrete with a cover of aeolian sand sheets and dunes. Although the natural vegetation of mallee and heath has been disturbed by fire, very little has been cleared for grazing, and the area is mainly in conservation areas or remains as vacant crown land’ (Laut et al., 1977).

A large proportion of The Big Desert Land Unit occurs within the southern end of the Murray Mallee LAP area. In stark contrast to many of the other Land Units across the region, The Big Desert has 73.6% of its original vegetation remaining and approximately 93% (or 168 951.8 hectares) of that vegetation is protected within the reserve system. The protected areas are made up of Ngarkat and Scorpion Springs Conservation Parks and 39 Heritage Agreements. These areas constitute the largest remaining tracts of native vegetation within the Murray Mallee LAP area and are considered extremely important for the conservation of many populations of plants and animals. Together with numerous unprotected remnants, the area is identified as a High Value Habitat area and forms a stronghold for many populations of native plants and animals, some of which are of conservation significance.

There is also enormous potential for connection of the unprotected remnant blocks with revegetated wildlife corridors, and buffering. Restoration of remnants through weed and feral animal control is also recommended in The Big Desert Land Unit where wildlife concentration is higher than many other areas and frequent movement between remnants is likely to be considerable.

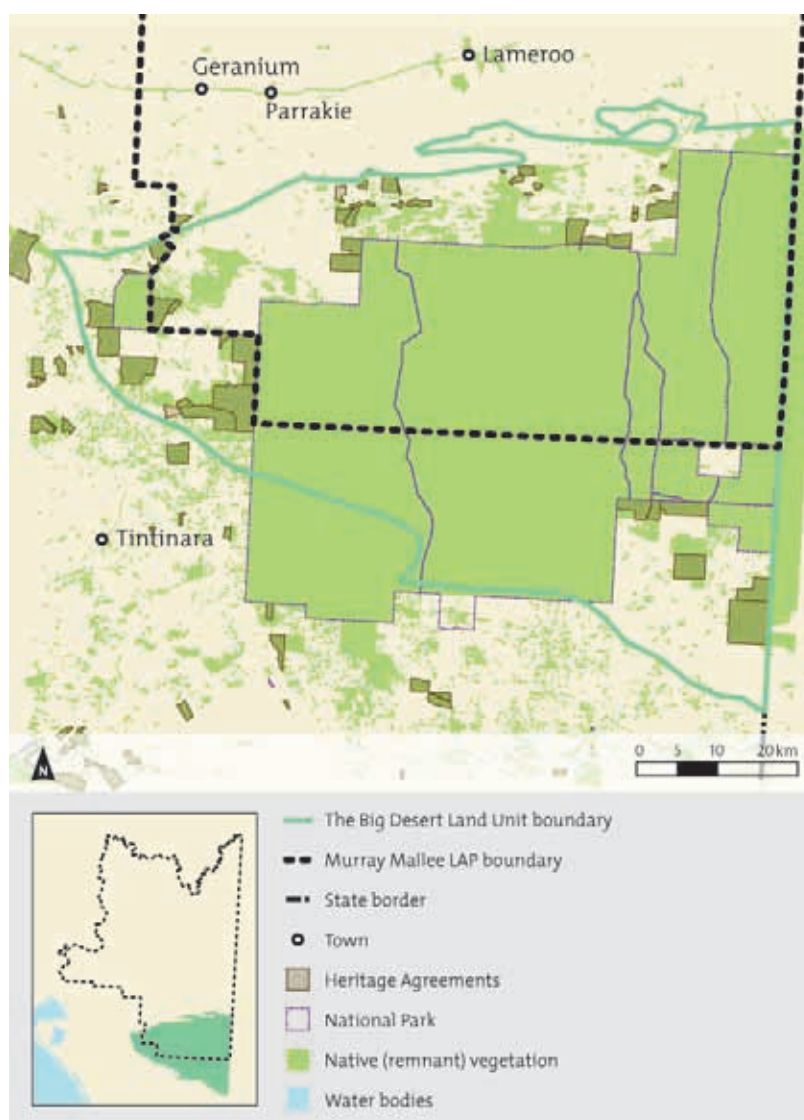


Figure 42: The Big Desert locality map. Map illustration: Ecocreative (based on GIS map supplied by Andy Saulys, DEH)

CONTINUED

THE BIG DESERT

NATIVE VEGETATION

The broadly defined dominant vegetation types occurring within The Big Desert Land Unit include:

- *Eucalyptus incrassata* Open Low Mallee
- *Banksia ornata* +/- *Allocasuarina pusilla* / *Leptospermum coriaceum* Tall Open Shrubland
- *Eucalyptus leptophylla* / *Eucalyptus socialis* Open Mallee
- *Callitris verrucosa* Tall Open Shrubland
- *Melaleuca acuminatum*, *Melaleuca lanceolata* +/- *Eucalyptus socialis* +/- *Eucalyptus leptophylla* Tall Open Shrubland
- *Allocasuarina luehmannii* (Buloke) Woodland
- *Eucalyptus arenacea* (Sand Stringybark) Open Woodland
- *Eucalyptus leucoxydon* ssp. *stephaniae* (Scrubby Bluegum) Low Woodland.

CONSERVATION ASSETS

The Big Desert Land Unit possesses a number of important features which contribute to its overall conservation significance. The levels of native vegetation retained within the area are high compared with that of many other Land Units across the Murray Mallee LAP area and a large proportion of that vegetation is afforded the protection of the Conservation Parks and 37 Heritage Agreements. Collectively, these areas provide excellent habitat for many native species populations including a high number of those listed as nationally, State and regionally threatened. Ratings are abbreviated to Rare (R), Vulnerable (V) and Known (K).

Species of conservation significance:

Flora

- Sundew (*Drosera whittakeri* ssp. *aberrans*), SA: R, MM: K
- Cleland's Beard-heath (*Leucopogon clelandii*), SA: R, MM: E
- Fringed Heath-myrtle (*Micromyrtus ciliata*), SA: R, MM: R
- Scaly Haeckeria (*Ozothamnus pholidotus*), SA: V, MM: E
- Lowan Phebalium (*Phebalium lowanense*), Aust: V, SA: V, MM: V
- Narrow-leaf Wax-flower (*Philotheca angustifolia* ssp. *angustifolia*), SA: R, MM: R.

Fauna

- Bardick (*Echiopsis curta*), SA: R, MM: R
- Blue-winged Parrot (*Neophema chrysostoma*), SA: V, MM: V
- Chestnut Quail-thrush (*Cinclosoma castanotus*), SA: R, MM: V
- Mallee Emu-wren (*Stipiturus mallee*), Aust: V, SA: V, MM: V
- Malleefowl (*Leipoa ocellata*), Aust: V, SA: V, MM: V
- Painted Button-quail (*Turnix varia*), Aust: V, SA: V, MM: V
- Red-lored Whistler (*Pachycephala rufogularis*), Aust: V, SA: V, MM: V
- Slender-billed Thornbill (*Acanthiza iredalei*), SA: V, MM: V
- Striated Grasswren (*Amytornis striatus*), SA: R, MM: V
- Striped Honeyeater (*Plectorhyncha lanceolata*), SA: R, MM: V
- Western Whipbird (*Psophodes nigrogularis leucogaster*), Aust: V, SA: V, MM: V
- Yellow-tailed Black-Cockatoo (*Calyptorhynchus funereus*), SA: V, MM: V.



Some additional species of significance identified in the *Biodiversity Plan for the SAMDB* as also inhabiting the area are:

- Western Pygmy-possum
- Southern Ningau
- Elegant Parrot
- Gilbert's Whistler
- Yellow-tailed Black-Cockatoo
- Striated Grasswren
- Common Dunnart
- Fat-tailed Dunnart
- Silky Mouse
- Mitchell's Hopping-mouse (Kahrimanis et al., 2001).

KEY THREATENING PROCESSES

- Grazing of remnants.
- Feral animals.
- Small remnants—Many of the blocks situated to the north of Ngarkat CP are very small).
- Soil erosion—Degradation of vegetation by vehicles can expose sandy soils to erosive forces, particularly wind.
- Inappropriate fire regimes.
- Weed invasion—The major weeds identified for the Land Unit are: African Boxthorn, African Lovegrass, Blackberry, Bridal Creeper, Caltrop, Cut-Leaf Mignonette, False Caper, Horehound, Innocent Weed, Onion Weed, Silver Nightshade, Skeleton Weed, Soldier Thistle, Soursob and Yellow Burr Weed.

CURRENT MANAGEMENT STRATEGIES

Revegetation

The Murray Mallee Long Term Eroding Land Project (MMLAP, 2003) has mapped a number of revegetation areas within the western end of the Land Unit up until 2001. The revegetation is likely to vary between blocks and windbreaks (Pfeiffer, pers. comm., 2005).

Feral animal control

A goat control program, which is proposed for the Ngarkat CP, will be postponed in the short term due to the recent fire in the park (Crawford, pers. comm., 2006). Fox baiting programs are conducted quarterly (February, May, August and November). Rabbits are baited with 1080 oats and warren destruction is achieved with explosives (Laver, pers. comm., 2005).

Weed control

Biological controls include Rust fungus (*Puccinia myrsiphylli*) released for Bridal Creeper, Crown Boring Weevil released for Salvation Jane (Laver, pers. comm., 2005) and Horehound Plume moth for Horehound (Clifford, pers. comm., 2006).

RECOMMENDED MANAGEMENT STRATEGIES*

- Maintain and improve the condition of remnants
- control erosion
- manage feral animals
- protect Heritage Agreements and other reserves and remnants.

*See Table 7 (page 51).

