



Complex nature of South Australian Pastoral Lands

Maconochie, JR¹; Humphrey, MJ¹

¹ Pastoral Land Management Branch, Department for Environment and Water, Government of South Australia.

Key words: desert; landscape; pastoral; conservation

An overview

South Australia (SA) is the driest state in the world's driest inhabited continent. The "SA Outback" constitutes more than 80% of the State's land area or approximately 741 000 km². About half of this is allocated to conservation areas and Aboriginal land use – the remainder consists of pastoral stations. There are 219 stations that make up the pastoral estate in South Australia.

Socioeconomic features

The South Australian pastoral lands have long held significance as both economic resources and cultural landscapes, shaping the history, environment, and economy of the region. Covering vast semi-arid and arid regions, these lands have been utilised primarily for grazing livestock, particularly sheep and cattle, since the early 19th century. Today the many land uses occurring in the region include pastoralism, mining and petroleum extraction, conservation, renewable energy and tourism.

The pastoral estate is made up of a number of community-based districts which were originally based on Soil Conservation Boards. These districts now form the Landscape SA groups of today which link local communities to the South Australian Arid Lands Landscape Board (SAAL). There are six groups in the in the SAAL region and a seventh group in the Murrylands and Riverland Landscape Region the southernmost pastoral zone (Figure 1).

The pastoral estate is comprised of pastoral leases. Each lease is a rolling 42 year term which is reviewed every 14 years (lease assessment) and then extended to the full term of 42 years. There are 219 individual pastoral stations which may comprise of one or many pastoral leases, and cover an area of approximately 422,000 km². The properties or stations are operated by 160 individuals or companies and the pastoral estate (leases) is administered by the Pastoral Board of South Australia.

South Australian Dog Fence

The dingo or wild dog is Australia's only native canid, and freely roams much of inland Australia. The South Australian Dog Fence, approximately 2250 km long, runs through the pastoral lands from the New South Wales border to the east, around the North Flinders, across the middle of the state between Lake

Torrens and Kati Thanda – Lake Eyre South and then south to the cliffs of the Nullarbor Plain above the Great Australian Bight. The fence was built in sections as the pastoral estate was expanded in South Australia from the late 1800's, initially as a rabbit proof fence and then later heightened to exclude the dingo and wild dogs. In 1947 the Dog Fence Act came into operation and established a formal dog-proof fence "for the purpose of preventing the entry of wild dogs into the pastoral and agricultural areas of the State". Today the fence creates a wild-dog free area to the south enabling grazing by both sheep and cattle, and the area north of the fence predominantly cattle and where wild dogs are still present.

Biophysical features

The geology and topography of the state consists of sandy deserts to the north and west, large inland salt lakes separated by ancient mountain ranges, saltbush and majestic tree woodlands, grassy tablelands, broad gibber plains and large free-flowing arid waterways which drain through vast lagoons and swamps into arid inland salt lakes.

The climate of the pastoral zone varies from the north to the south and east to west as South Australia is affected by weather patterns in the Pacific, Indian and Southern oceans. Both temperature and rainfall vary across the pastoral zone as a result of the latitudinal gradient affecting the weather patterns through-out the year with the north experiencing very hot summers and the east having freezing conditions in the winter.

Average annual temperatures have been gradually increasing in South Australia since the early 1970's with the highest rates of increase occurring in the north of the pastoral zone with mean annual temperatures having increased by 1.5 degrees Celsius (°C) over the past 50 years. The hot summers in the north and north-east can see temperatures exceeding 40 °C for a number of successive days. Climate scenarios are predicting potential average daily temperature increases of up to 2.2 °C by 2050.

Rainfall trends vary across the pastoral zone, with averages ranging from 150 mm in the east and south, up to 300 mm on the highest reaches of the Flinders ranges in the North Flinders region. Thunderstorms and tropical inflows in the north can result in short but intense rain events that may produce a year's rainfall in one event. The northern rangelands are dominated by summer rainfall, with cyclonic weather systems of northern Australia entering SA from the north-west or occasionally from south-west Queensland. The southern portion of the rangelands is dominated by winter rainfall with cold fronts coming up from the south-west. Regional variation show that the far north of the pastoral zone is experiencing an increase in summer rainfall and the winter rainfall of the southern areas decreasing over the last 30 years. In general, the extremes in summer temperatures that occur across the pastoral zone often result in evaporation rates far exceeding rainfall.

These climatic variations across the pastoral region are reflected in the many diverse landscapes and associated vegetation communities that form the seven landscape regions.

Regional Features

Marree – Innamincka region

The Marree Innamincka region is in the far north-east of the state extending over 200 000 km² or 20% of SA. This region contains free flowing arid rivers of the Diamantina and Cooper systems comprising the Goyder lagoon and the Coongie lakes near Innamincka. Both systems flow because of monsoonal rains in central and south-western Queensland and which, on extreme and rare rain events, will eventually empty into Kati Thanda - Lake Eyre. Sandy desert landscapes also dominate the region with the Simpson Desert, Strzelecki, and Tirari Deserts. Less extensive, the Sturt Stony Desert lies between the river channel country and is comprised of extensive flat clay dominated gibber (small, polished stones) plains with very sparse

vegetation, scattered dunes and productive sand mounds. Land use is primarily pastoral with oil and gas production in the eastern parts with private and state conservation parks forming part of the increasing tourism industry.

Marla – Oodnadatta region

The Marla Oodnadatta region is in the far north of the state covering an area of 132 400 km². The region comprises numerous landscapes, ranging from sweeping gibber plains with fertile sand lenses and dunes, tablelands with numerous drainage lines running east to Kati Thanda – Lake Eyre. There are weathered hills and plateaus forming “Breakaways” and extensive gibber plains with scattered gilgais containing perennial grasses and chenopod shrubland vegetation. Mulga woodlands scattered across the region on the sandier soils. A number of Conservation areas occur in the region and ancient mound springs of the Great Artesian Basin still occur in a number of areas. Land use is pastoralism with key resource mining, private conservation, and mining of precious stones of the Coober Pedy and Andamooka opal fields.

Kingoonya region

The Kingoonya region is in the centre of South Australia and covers 65 815 km². This region is bounded by the Dog fence to the north and west and large salt lakes to the south and east. The national railway network crosses the region both the north-south and east-west. Vegetation is comprised of mulga and myall woodlands with chenopod shrublands, mallee dune systems and treeless undulating tablelands of low chenopod shrublands. The primary land use is sheep pastoralism with several properties running cattle enterprises. Mining and conservation are also represented with several large mines, the largest of which is Olympic dam, and one of the earliest pastoral leases purchased for private conservation, Bon Bon Station, also occurring in the region.

Gawler Ranges region

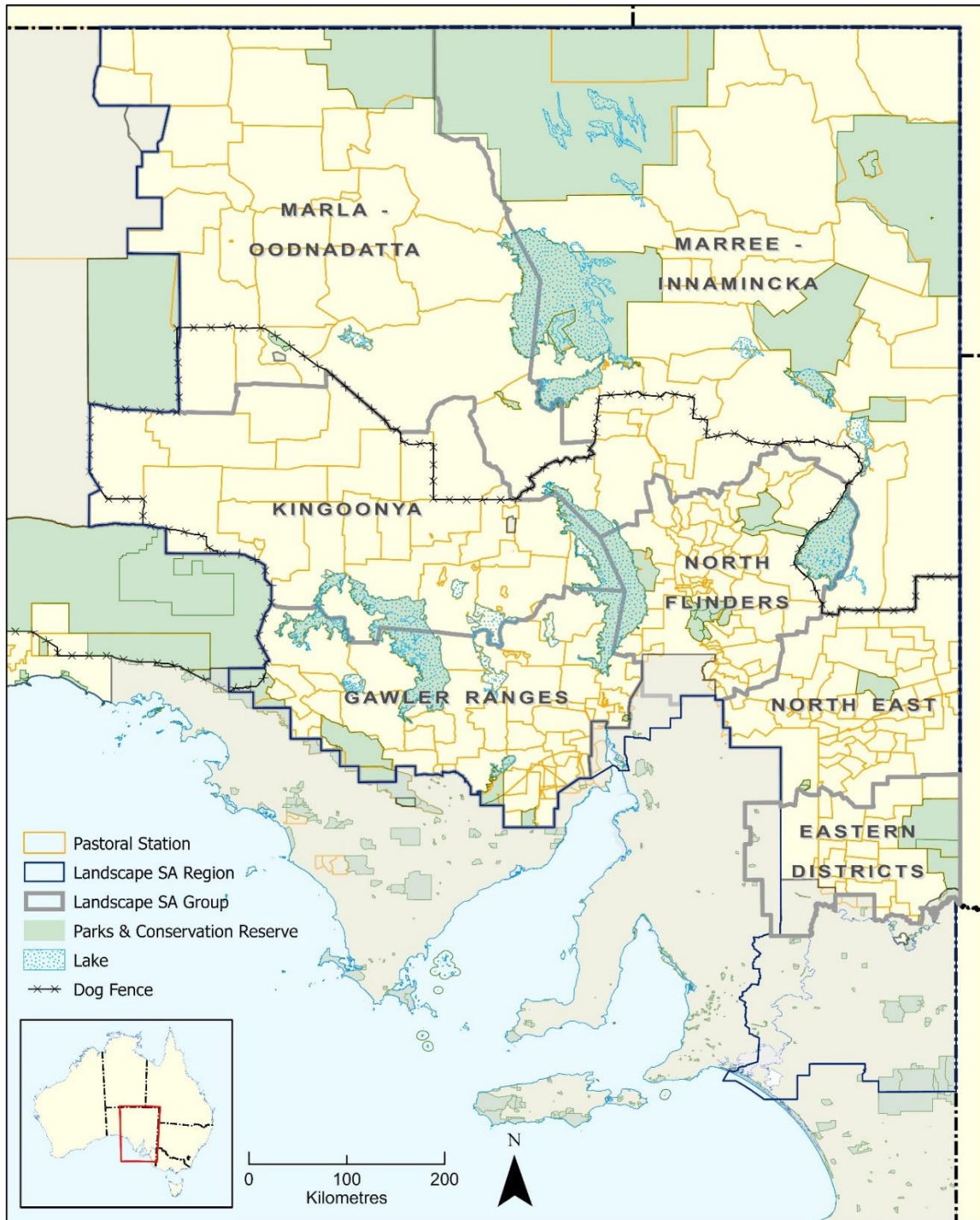
The Gawler Ranges region is 51 900 km² in size and is comprised of several large salt lakes, including Lake Everard and Lake Gairdner and the rounded rocky hills and broad valleys of the Gawler Ranges. These ranges form the principal component of the region and are dominated by chenopod shrublands and mixed woodlands of mulga, black oak, myall and wattle. The region also has a system of parallel dunes with plains and salt lakes. Mallee, myall, sugar wood and mulga woodlands with chenopod shrublands occur across the region. The primary land use of the region is pastoralism with the first pastoral leases established in the 1850's.

North Flinders region

The North Flinders region lies between Lake Torrens, Lake Frome and south of Kati Thanda - Lake Eyre being 33 500 km² in size and encompassing the Flinders and Gammon Ranges. The dog fence bounds the north and east of the region. This diverse landscape is comprised of plains, rugged ranges and outcrops. The complex nature of the ranges gives rise to the many landscapes of the region ranging from alluvial plains with mixed grasses and chenopods, undulating grassy gibber tablelands and plains to gentle rises and hills of annual grasses and chenopods. The ranges vary from shaley hills of mallee and pine, sandstone hills of mallee and mulga to high rugged ranges with cypress pine, spinifex and grasses and deep red gum gorges. Pastoralism began in the region in the early 1850's and continues today as the primary land use. Tourism and conservation have increased with many properties having accommodation facilities for visitors. Formal conservation in the region is supported through three national parks occurring in the region: Ikara – Flinders Ranges, Vulkathunha – Gammon Ranges, and Nilpena Ediacara National Park.

North East region

The North East pastoral region is 34 500 km² and is bounded by the Dog fence to the north and the New South Wales / South Australian border to the east. The main feature of the region is the Olary Spur, a series of ancient hills, geologically an extension of the Flinders Ranges. The region also comprises flat to undulating plains with chenopod shrublands and areas of low woodlands and shrublands. The Olary Spur consist of chenopod plains and open woodlands with numerous water courses and river red gum lined creeks. Mallee box open woodlands can be found on hills and ridges with mallee, sugar woods, and black oaks woodlands with chenopod shrublands with mallee on the sand plains and low dunes. To the north of the region chenopod shrublands and grasslands on open plains and rises and low hills are a major feature of the landscape. The major land use of the region is pastoral grazing of sheep for wool production and some cattle enterprises. Other land uses include mining and conservation with several conservation areas previously being operational pastoral enterprises.



Eastern District region

The Eastern District region is the smallest in SA at 22,240 km² and contains the most southern pastoral leases administered by the Board forming the northern half of the Murrumbidgee and Riverland Landscape Region. The pastoral properties of the region encompass both sheep and cattle production along with individual conservation leases and adjoining large conservation parks on the eastern boundary. The landscape is diverse ranging from alluvial and gentle plains with black oak and chenopod shrublands, sand plains and dune fields of extensive mallee occupying half of the district, through to chenopod shrublands and grasslands.

Further Information – Government of South Australia

Eastern District Soil Conservation Board District Plan, May 2002 Primary Industries and Resources SA
Gawler Ranges Soil Conservation District Plan – Revised 2004 Dept of Water, Land and Biodiversity Conservation
Kingoonya Soil Conservation Board District Plan – 2002 Primary Industries and Resources SA
Marla-Oodnadatta Soil Conservation Board District Plan – 2002 Dept of Water, Land and Biodiversity Conservation
Marree Soil Conservation Board District Plan – Revised 2004 Dept of Water, Land and Biodiversity Conservation
North East Pastoral Soil Conservation District Plan – 1997 Primary Industries and Resources SA
Northern Flinders Soil Conservation Board District Plan–Revised 2004 Dept of Water, Land and Biodiversity Conservation
South Australia’s environmental trend and condition report cards 2023 Department for Environment and Water
State of the Environment Summary Report 2023 Environment Protection Authority