



8. Land Capability

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8.1 Climate

Alice Springs climate is one of extremes; unlike the Top End of the Northern Territory which has a tropical climate, the arid centre has a semi-arid climate. In summer (December-February), average temperatures range between 20°C and 35°C. In winter (June-August), the average temperature range is 3°C to 20°C. Spring and autumn have warm days and cool evenings. Rainfall varies dramatically from year to year, but the annual average is around 286mm.

8.2 Flora, Fauna and Threatened Species

The study area is located within the MacDonnell Ranges Bioregion of the Interim Biogeographic Regionalisation.

The MacDonnell Ranges Bioregion is one of the most important refugial areas in arid Australia, supporting many endemic plant taxa and isolated occurrences of plants more typically associated with higher rainfall areas (often referred to as relictual plants). It also supports resident populations of some plant and animal species that are significant at the Northern Territory and national level.

Many ecosystems and species are highly localised, typically to the most fire-protected, topographically complex sites (such as gorges and escarpments), and/or to places with unusually persistent moisture availability.

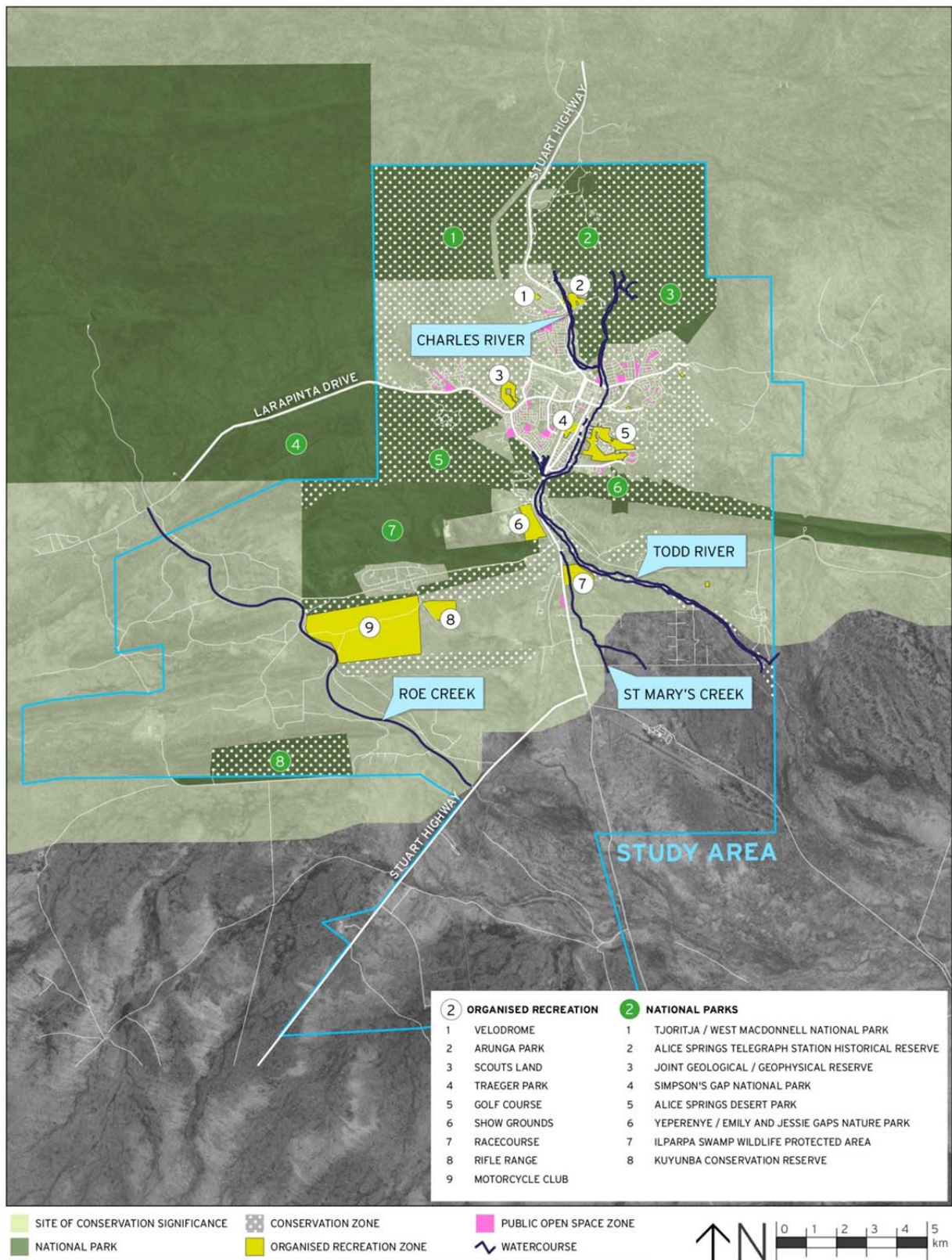
In Central Australia's Sites of Conservation Significance 43 nationally-listed and 72 Territory-listed threatened species are found.

8.3 Conservation Zones

Figure 8.1 shows the Sites of Conservation Significance for the region. The Northern Territory DLPE has identified 67 of the most important sites for biodiversity conservation within the Territory. Each site has been assessed as being of National or International Significance based on its biodiversity. The recognition of these sites imposes no additional regulatory or legislative requirements or control on management and use of the land, over and above any particular existing requirements of the area.

The MacDonnell Ranges are considered internationally significant and are classified as a Site of Conservation Significance at a Territory level. About 11% of the Ranges is managed as conservation reserves and is used for conservation and tourism, while other parts are used for residential purposes. The Township of Alice Springs occupies part of the MacDonnell Ranges.

Figure 8.1 Areas of Conservation Significance



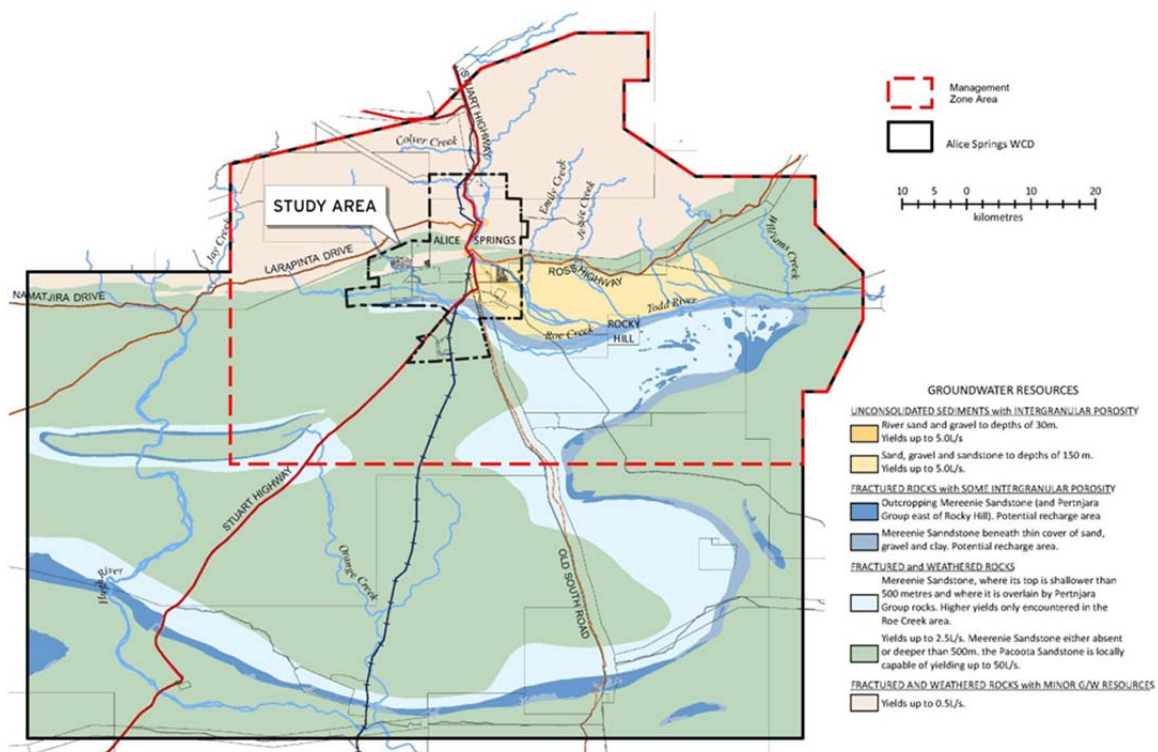
There are also eight formally conserved areas within Alice Springs, including West MacDonnell National Park, Alice Springs Telegraph National Historical Reserve, Joint Geological Geophysical Reserve, Simpsons Gap National Park, Alice Springs Desert Park, Emily and Jessie Gaps Nature Park, Ilparpa Swamp Wildlife Protected Area and Kuyunba Conservation Reserve. Formal conservation areas such as reserves and national parks within the Territory are declared under the Territory Parks and Wildlife Act (the Act). Declaration under the Act specifies appropriate land use within the conservation areas and all are managed by the Parks and Wildlife Commission NT.

8.4 Water Resources and Flooding

Alice Springs draws its main water supply from the Roe Creek Borefield, approximately 15km south of the town centre. Water is drawn from confined aquifers within the Amadeus Basin, known as the Mereenie Aquifer System and the Pacoota Sandstone and Shannon and Goyder Formations. The Alice Springs Water Resources Strategy 2006-2015 predicts the 'sustainable ground water yield' cap will be reached by 2017.

At this point in time extraction must be re-evaluated, adding to costs and increasing the likelihood of the entire bore field being moved to Rocky Hill, resulting in a need for significant investment in infrastructure. Figure 8.2 shows groundwater resources for the region.

Figure 8.2 Groundwater Resources



To reduce the potential for exceeding the sustainable groundwater yield cap, there must be significant consideration of potential increases in water use due to growth in population and industry. Whilst there are significant horticultural activities near Rocky Hill, expansion of such activities will require an assessment of water use and soil suitability. Water intensive crops such as grapes may be unsuited in areas with unconsolidated sediments such as areas to the east of Alice Springs, specifically that area bounded by the Ross Highway, Roe Creek and Todd River.

From a non-consumptive perspective the NT Government¹⁴ has followed the principle that 95% of surface water flows shall be allocated for environmental, aesthetic, recreational, Indigenous cultural and other public benefit outcomes. This will preserve surface water features, the health of the environment and maintain regional catchment recharge into aquifers within the District. It is assumed that this protection of environmental values will also maintain the condition of places that are valued by indigenous people for cultural purposes.

The Todd River is a normally dry, sandy river bed in Alice Springs that has a catchment area located mainly to the North of Alice Springs. Heavy rainfall, together with the rocky terrain and steep river slope of the catchment area, can sometimes cause flash flooding in the Todd River.

The areas prone to flooding are depicted in Figure 8.3, and include the area to the east of the CBD and a large area to the south-east of the township between the Ranges and the airport. Development within these areas will need to take into consideration flood frequency.

8.5 Climate Change and Implications on Urban Form

Whilst the impact of global warming on the environment is well recognised, there are also implications as to where and how urban development should generally be planned in the future, with such being of relevance to the Alice Springs Regional Land Use Plan.

Development at the fringe of townships requires the provision of more service infrastructure and discourages the use of public transportation. At the same time, low density housing forms with larger private open spaces also require more water consumption.

These issues are exacerbated in Rural Residential zones where densities are as low as 0.3 allotments per hectare. Environmental Living zones, which have been implemented in NSW, may be part of a sustainable solution, but are not a key measure to address population growth.

¹⁴ Alice Springs Water Allocation Plan 2013-2018

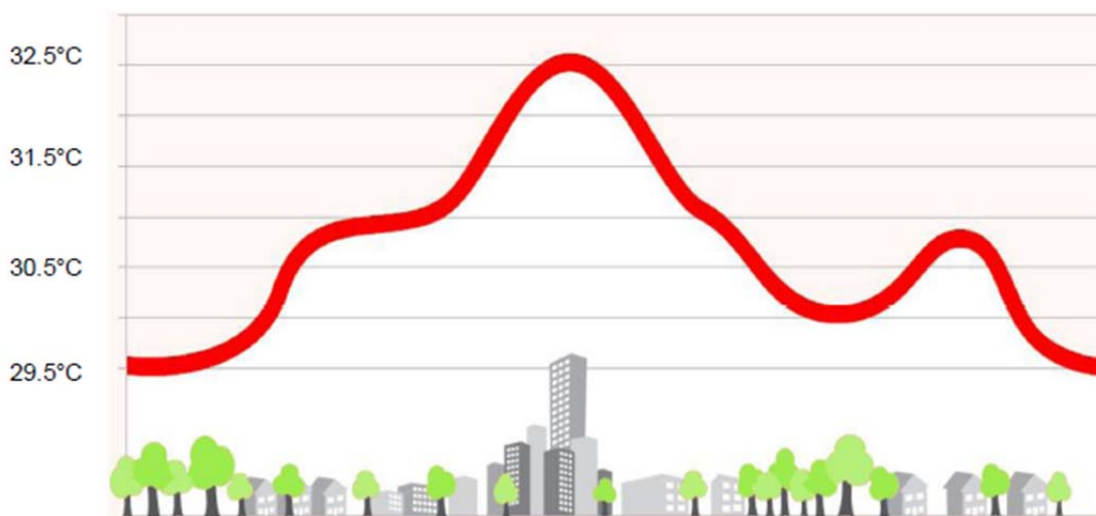
Densification of the existing urban footprint enables a more efficient use of services including public transportation. Increasing the residential population of Alice Springs CBD and surrounding suburbs would centralise employment and living uses thereby reducing commuting and encouraging walkability. More compact housing forms and multi-level residential developments also help to reduce the use of irrigation/water consumption.

Notwithstanding the above advantages, 'urban heat islands' contribute to the rise of temperatures through more extensive use of sealed, unshaded and unirrigated surface. Such is indicatively demonstrated by Figure 8.3.

Studies have identified that the relationship between higher temperatures and the vegetation index is high. The use of green infrastructure both horizontally and vertically, coupled with the systematic reuse of stormwater, would therefore prevent localised high temperatures and sustain the liveability of densified areas.

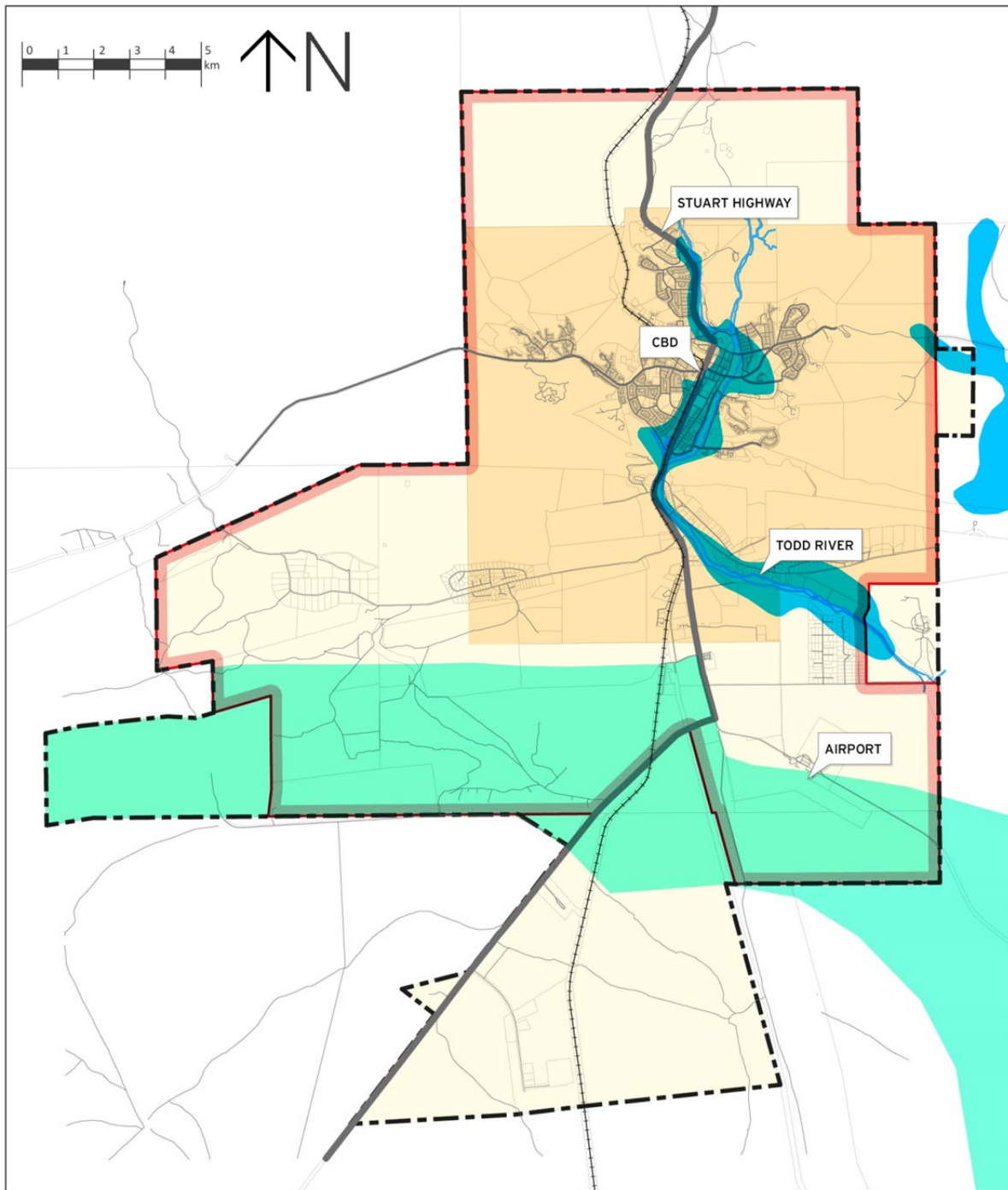
Such design outcomes could be introduced as planning policy where densification with arid climates is sought.

Figure 8.3 Urban Heat Island Effect¹⁵



¹⁵ AECOM, Economic Assessment of the Urban Heat Island Effect, 2012

Figure 8.3: Water Resources and Flooding



LEGEND

- | | | |
|----------------------------|----------|-----------------------|
| STUDY AREA | CADASTRE | WATER MANAGEMENT AREA |
| ALICE SPRINGS MUNICIPALITY | RAIL | DEFINED FLOOD AREA |
| TOWNSHIP BOUNDARY | RIVER | |

8.6 Landscape Features

Landscape features vary from salt lakes to mound springs, sand dunes, floodplains, mountain ranges and broad alluvial plains. Soils in Central Australia are derived from strongly weathered parent material, generally shallow, low in fertility, and are very fragile.

Such limitation affects productivity or predisposes the land to degradation. Natural regeneration of degraded land in arid climate zones does occur but this is over a long time period of 25-50 years. It appears that responsible land management practices and the control of feral animals and plants are the only practical means of conserving the soil resource.

8.7 Land Use

Pastoralism and agriculture

The Alice Springs Region is mainly based on pastoralism with over 70 pastoral properties; some owned and managed by traditional owners. The cattle industry is worth approximately \$30 million per year to the Northern Territory and is indicative of the highly productive land in the region.

Areas currently used for pastoral activities are shown in Figure 8.5.

Figure 8.5: Pastoral land



In recent times there has been a developing interest in camel harvesting around Alice Springs. To date this has yet to be developed into a significant contributor to the economy or the environment. The demand for camel meat from overseas is increasing and as such could become a significant economic contributor. In addition, removal of feral camels from the environment would positively impact on vegetation communities and represent a significant contribution to sustainable land use.

Agricultural land use is limited due to extreme weather conditions rendering the land largely unproductive for traditional crops.

Horticulture

Horticulture is an emerging industry in the Alice Springs region. Substantial areas that have a high capability for horticulture could contribute to the ongoing economic growth of the region.

As previously noted the vast majority of soils in the region have limitations which affect productivity or predispose the land to degradation. However responsible land management practices such as controlling pest plants and growing crops suited to the arid climate provide a step forward in sustaining land resources and utilising the area to its full capability.

There is a great potential to use the land for production of Aboriginal food crops or “bush tucker” supplying to a niche market. Bush tucker crops are ideally suited to the climate and soils of the region. Further investigation into establishing such industries is required particularly in areas of unproductive pastoral lands.

8.8 Areas of Cultural Significance

Alice Springs is the regional hub of Central Australia. It therefore attracts people from all over that region and well beyond, in addition to its traditional owners, the Central Arrente people.

As identified in Figure 8.6, there are 137 registered sacred sites in the Alice Springs Township, many related to the Todd River and 36 sacred sites in the hinterland area of Alice Springs.

A number of sites of cultural significance are linked by the ‘dreaming trail’. Responsible tourism in the region, such as sacred site tours, assists with providing a means of understanding the significance of the region’s cultural heritage. The Alice Springs region may benefit from integrating existing cultural sites into self-guided dreaming trails for tourists to experience the rich cultural history of the region.

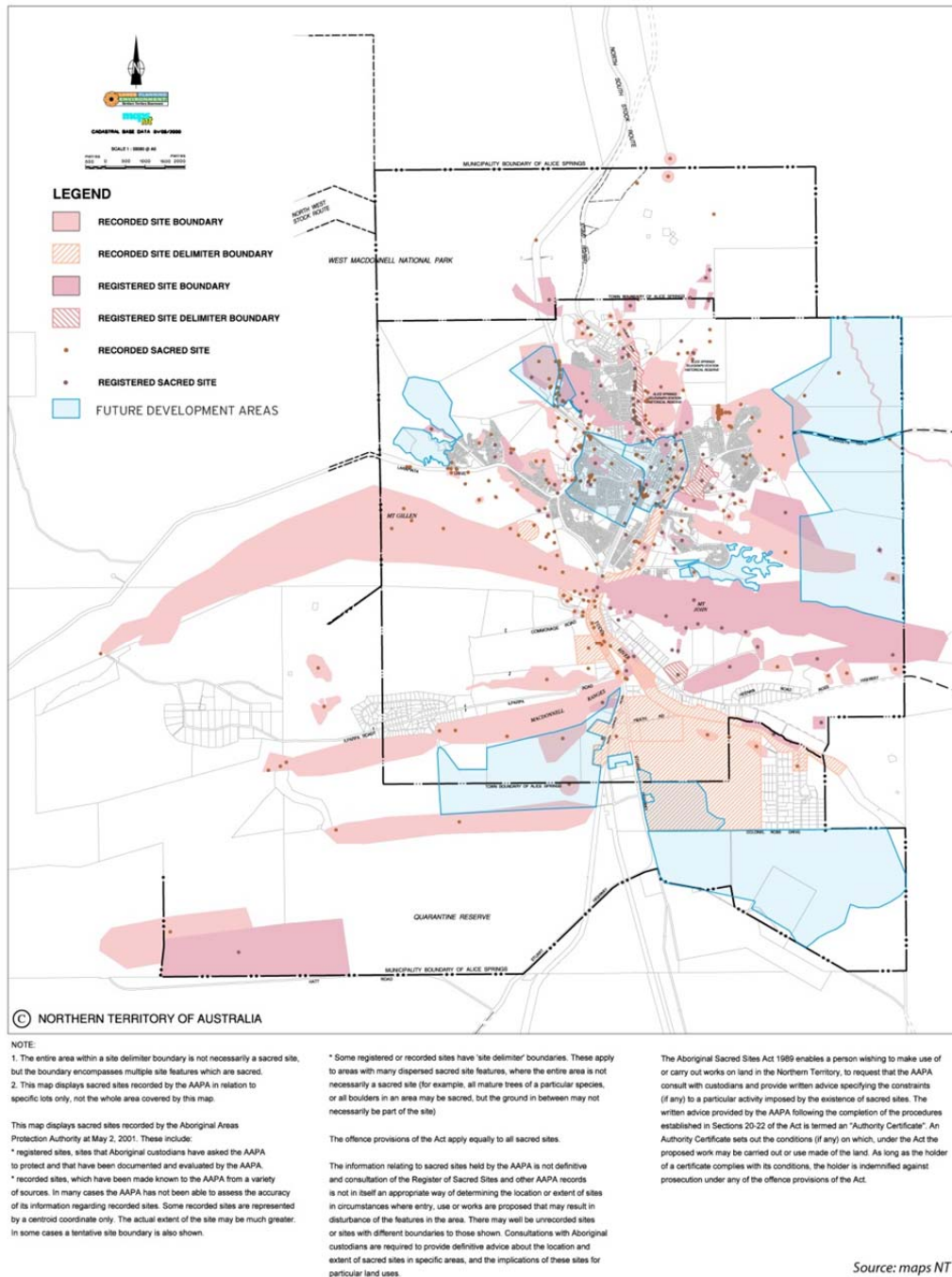
All sacred sites in the Northern Territory are protected by the Northern Territory Aboriginal Sacred Sites Act.

The Aboriginal Areas Protection Authority (AAPA) maintains records of all sacred sites that it has identified in the Northern Territory. There are strict secrecy provisions in the Northern Territory Aboriginal Sacred Sites Act and Aboriginal cultural traditions covering these sites.

The sites that the Authority holds records for are recorded and registered sacred sites. Recorded sacred sites are sites that have been made known to the Authority from a variety of sources. In many cases these sites have not been comprehensively documented and evaluated and they have not gone through the formal registration process.

Registered sacred sites are sites that Aboriginal custodians have asked the Authority to protect. They have been comprehensively documented and evaluated by the Authority, including information on their locations and boundaries.

Figure 8.6: Recorded and Registered Sacred Sites



It is noted that a number of other sites of cultural significance may exist as the current register of sacred sites is not definitive. Any site that is identified for development will require further investigation and consultation with the AAPA.