



6. The fire history of Rainbow Valley Conservation Reserve 1984–2005

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Acknowledgements

Various ranger staff provided access to park-based records, and registry staff assisted in locating current and archived registry files. Carly Steen and Ben Sparrow provided GIS support, and Anthony Knapton scanned the large paper maps on a flatbed scanner. Grant Allan provided advice on landscape-scale fire mapping and early fire history.

Shortened forms

ASTSHR	Alice Springs Telegraph Station Historical Reserve
FMS	Fire Management System
GIS	Geographic Information System
PWSNT	Parks and Wildlife Service Northern Territory

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Glossary

Annual fire report and plan: a written document (with maps) containing details of wildfires and fire management that has been implemented in the last year or planned for the year ahead.

Fire history report: a written document (with maps) providing background information for producing strategies and annual plans (e.g. this document).

Fire management strategy: a written document (with maps) that covers many years (typically between five to ten years).

Individual prescribed burn report: a written record of the implementation of a particular prescribed burn – prior to entry into a database and the annual fire report.

Individual wildfire report: a document reporting on a wildfire in the park.

Linear burn: a prescribed burn that is linear in shape and typically designed to act as a fire break; also referred to as a strip burn. Strip widths have typically been prescribed at around 100–200 metres.

Patch burn: a prescribed burn that is designed to create a diversity of fire ages, typically in spinifex communities. The result of many patch burns over time is a ‘mosaic’ of fire ages. This term encompasses a broad range of patch sizes.

Strategic burn (also strategic fire break): any burn that is intended to exclude fire from entering one area from another, effectively ‘blocking up’ the park into fire management zones. To be effective, such burns must connect (‘tie off’) to other natural or created breaks. Strategic burns need not necessarily be linear. Presently, there is an increasing focus in southern region parks on creating long-term strategic breaks that are maintained. The areas burnt to create and maintain long-term strategic breaks will have particularly frequent fire regimes and have been referred to as ‘ecological sacrifice zones’.

6. The fire history of Rainbow Valley Conservation Reserve 1984–2005

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6.1 Summary

Rainbow Valley Conservation Reserve ('the Reserve') was established in 1984 and fire has been used as a management tool since that time, primarily to reduce the risk of wildfires, but also to enhance biodiversity.

All previous fire plans, reports and paper maps for the Reserve have been reviewed. The Geographic Information System (GIS) data for the park have been checked and re-organised, and the perimeters of additional fires shown on paper maps have been digitised.

No wildfire has occurred in the Reserve since 1984. It is possible that many of the spinifex-dominated parts of the Reserve were burnt by the large wildfires in the summer of 1975–76 after the exceptionally high rainfall in 1974–75; however, we could not confirm this. We speculate that prior to 1975, spinifex-dominated parts of the park were burnt every few decades, either by wildfires or by deliberate human ignitions. The past use of fire by pastoralists is unknown. We also have no information on the use of fire by traditional Aboriginal owners of the area but assume that fire was used actively prior to the appropriation of the land for grazing cattle.

Based on the prescribed burning reports and maps it would appear that active fire management has been restricted to three main periods: 1984, 1989–93 and 2001–05. However, it is likely that some prescribed fires were not mapped or recorded in the past.

There has been more prescribed burning in parts of the park that are accessible by vehicle (spinifex sand plain and sand dune), but there has also been some burning in the rocky hills. The earlier periods of prescribed burning created both large and small patches, some of which have a strategic value for limiting potential wildfires. The recent burning (past five years) has focused on strategic burns, mostly relatively narrow linear burns, but also including extensive off-reserve burns adjacent to the boundary.

Large parts of the Reserve have moderate to high fuel loads of spinifex grassland, mostly greater than 20 years old. Despite plans for strategic breaks around and within the Reserve, the implementation of these burns is far from complete. Therefore there is still a strong possibility that large parts of the Reserve could be burnt in a single wildfire, whether the ignition is inside or outside the Reserve boundary and whether started by lightning, by accident or by deliberate human ignition. The Reserve was not affected by the extensive wildfires of 2002, which did not come close to the boundary and therefore did not test the fire breaks that had been established recently along sections of the boundary.

This review of fire history provides some useful insight into how much fire management can be achieved with the current staffing levels and training processes. Records from this and other reserves show that it is extremely difficult to implement an extensive network of burnt fire breaks.

Work is now required to produce a fire management strategy that will guide fire management on the Reserve over the next decade, based on new resource information and ecological understanding. Ongoing management should involve a combination of strategic burnt breaks and extensive patch burning, and fire mapping and record keeping should be given a higher priority than in the past.

6.1.1 Recommendations

- Develop a new fire management strategy for the Rainbow Valley Conservation Reserve.
- Establish a combination of strategic burnt breaks and extensive patch burns to improve fire management on the Reserve.
- Increase regional training effort to improve efficiency in all aspects of park-related fire management, including record keeping, planning and implementation.

6.2 Introduction and scope

This chapter documents the history of wildfire and fire management at Rainbow Valley Conservation Reserve and is a product of Desert Fire subproject 3c. Information in this chapter will be useful in developing a new fire management strategy for the Reserve and in formulating annual action plans to guide fire management on the Reserve. A comprehensive list of fire management issues (e.g. infrastructure, vegetation types and biodiversity assets) is not included, but these would need to be considered in a long-term fire management strategy for the Reserve.

6.3 Overview of Rainbow Valley Conservation Reserve

6.3.1 Tenure

The Reserve was established in 1984 when it was excised from the Orange Creek pastoral lease. The adjoining properties are Orange Creek Station (pastoral lease) and Aboriginal freehold (Pwete Marnte Marnte Aboriginal Corporation), which includes the outstation of John Holland Community.

6.3.2 Management arrangements

The reserve is 2483 hectares. Although much smaller than the major parks such as the West MacDonnell National Park (>200 000 ha), it is a substantial area of natural vegetation with high conservation value.

Vehicle access is limited without driving across country. Map 6.1 in Appendix 1 shows serviceable vehicle tracks. Although there is vehicle access along some other fence lines, the presence of erodible soils means that these are not generally used. Likewise, there is a disused track (unmapped) across the north-east corner of the Reserve.

The reserve is managed by the Parks and Wildlife Service of the Northern Territory (PWSNT) rangers based at the Alice Springs Telegraph Station Historical Reserve (ASTSHR). Management includes regular patrols, as well as trips for specific purposes such as management of weeds and fire, maintenance of visitor facilities and other infrastructure and campfire talks provided for visitors.

6.3.3 Vegetation

The vegetation and terrain of the Reserve were mapped by Brenda Pitts as part of the biophysical mapping program in 1997 (PWCNT 1998). A comprehensive GIS was developed under this program, together with detailed maps showing potential fire risk areas, natural fire breaks, fire indicator communities, fire-sensitive plant communities, the locations of rare plant species, proposed fire breaks and weed and fauna distributions.

The northern half of the Reserve is dominated by a sand plain with various irregular low sand dunes. *Triodia basedowii* (hard spinifex) dominates fuel loads on the sand country. The overstorey is varied, including desert oak (*Allocasuarina decasneana*), blue mallee (*Eucalyptus gamophylla*), various *Acacia* species (e.g. *A. melleodora* and *A. ligulata*), *Grevillea* species (*G. albiflora* and *G. juncifolia*) and fork-leaved corkwood (*Hakea divaricata*). There are also flat areas of mulga (*Acacia aneura*) and allied species, interspersed with more fire-tolerant spinifex sand plain vegetation.

Spinifex forms the majority of fine fuel for both wildfires and prescribed fires on the Reserve. Map 6.2 in Appendix 1 is a simplified vegetation map showing the distribution of the different types of spinifex on the Reserve. The sandstone outcrop that forms the main scenic rock feature of the Reserve is topped by *Triodia brizoides* vegetation, as are two similar outcrops nearby, all in the west of the Reserve. *T. brizoides* is a rigid 'hard' spinifex that typically develops very fire-prone vegetation. However, in the Reserve it is moderately protected from fires spreading from the surrounding sand plains due to the presence of rocky slopes and cliffs with sparse vegetation. The southern part of the park is dominated by rocky ranges that form the eastern extent of the James Range. The vegetation types of these ranges include soft spinifex (*T. melvillei*) in the understorey and mulga (*A. aneura*), which dominates the overstorey in most parts. Areas of mulga woodland with spinifex understorey are moderately fire prone, but where there is minimal spinifex this vegetation typically will only burn in extreme weather conditions. Various claypans occur in the north-west of the park and some are large, serving as substantial natural fire breaks.

6.3.4 Physical values and infrastructure

Infrastructure in the Reserve comprises boundary fencing, a bore, visitor car parking, a short walking track, camping and interpretive facilities and a rudimentary field base for rangers (near the bore). There are a number of Aboriginal art sites consisting of rock paintings and rock carvings, plus various scenic rock features.

6.4 Methods

6.4.1 Collation and review of written plans and reports

Copies of the available fire-related documents for the Reserve were collated. Previously, this material was scattered in various Northern Territory Government Registry Files and the ASTSHR ranger station filing cabinet. The majority of the documents are annual plans and reports, but some are reports or data sheets for individual fires. Appendix 2 lists these documents.

The written documentation was reviewed to identify:

- information about fires that were not mapped
- information about goals and methods of fire management
- changes in reporting and planning styles.

6.4.2 Mapping of fire extent

Prescribed burning on the Reserve has been mapped using a Geographic Information System (GIS) at ASTSHR since 2000. The GIS uses ESRI ArcView/ARCGIS software, and thematic data are stored as shapefiles.

As part of this review, polygons in the GIS were checked, and in a few cases the topology and shape were corrected. A recently developed standard for file naming was imposed, with a separate shapefile for each calendar year. For some polygons, fire attribute data (e.g. ignition date, purpose) were stored in the polygon attribute table. These attribute data were copied and rearranged in a new standard fire management database, set up in Microsoft Access (see Cowan et al. 2007).

Additional fire mapping was digitised into the GIS from two sources. An A1-size map (scale 1:10 000) had fires mapped from 1984, 1989, 1990 and 1991. The base for this map was accurate contours (5 m intervals). This map was scanned and registered in the GIS using the contours. The best accuracy was obtained by registering sections of the map separately, due to distortions of the paper map. The fire polygons were hand digitised on-screen over the raster image. This map appeared to be associated with the 1992 Central District Fire Management Strategy document.

Another map was found with additional fire polygons in a report titled *Fire Action Report 1993 – Central District Parks*, gathered from active and archived NT Government records (known locally as Registry Files). Two polygons were hand-digitised from a hand-drawn map in the report, using topographic features as location guides.

Broad-scale wildfires have been mapped from satellite imagery across the southern part of the Northern Territory since the 1970s. The initial dataset was developed by Griffin and Allan (1993) (see also Allan & Wilson 1994), and is now managed and updated by Bushfires NT (G. Allan unpublished data).

6.5 Results

6.5.1 Wildfire history

The regional fire history mapping maintained by Bushfires NT (G. Allan unpublished data) does not show any wildfires as having burnt the Reserve from 1970 to 2005. However, it is quite likely that some, or possibly much of the spinifex sand plain burnt in the 1970s but was not mapped (G. Allan 2006, pers. comm.). If wildfires occurred, the most likely timing of such events would have been around 1975–77, following very high rainfall in 1974–75. The first fire report in 1990 briefly mentions big blackened logs on the eastern boundary of the reserve and we speculate that these are from fire/s some time before 1984.

6.5.2 Prescribed burning history

The first fires to be documented at the Reserve were in 1984 (Map 6.3 in Appendix 1), when a lot of prescribed burning was conducted. There seems to have been a five-year break in prescribed burning until 1989 when regular fire management plans were written and implemented across all Central District Parks. Hard-copy maps of proposed burns were produced through the 1990s in conjunction with the fire reports, while the first GIS fire map was produced in 1999 (Map 6.4 in Appendix 1). Prescribed burns were recorded in the GIS from 1999 to 2005 (Maps 6.4 and 6.5 in Appendix 1). Map 6.1 in Appendix 1 depicts all known and implemented prescribed burns from 1984 to 2005.

The fire reports we reviewed mentioned some prescribed burning that was not mapped. It is possible that these could be mapped in the future from aerial photographs and satellite imagery.

Table 6.1 presents information for each mapped burn, including recorded fire type. For older fires, we have inferred the type. Very little attribute information is known about the earlier mapped fires. As part of the clean-up of all shapefiles, the prescribed burns listed below have been given new identifying codes (Burn_ID) in accordance with the standard naming conventions. Additional information that exists for each burn can be found in Appendix 3. Table 6.2 provides a summary of the number and area of fires in two main vegetation types. It is clear from Table 6.2 and Map 6.1 in Appendix 1 that only a small proportion of the park has been burnt by prescribed fire over the period of this analysis (1984–2005).

Table 6.1: Rainbow Valley Conservation Reserve – all recorded prescribed fires: 1984–2005

Year	Burn_Id	Area (m ²)	Fire type	Terrain-vegetation description
1984	RVCR1984_PB01	13849	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB02	12849	Prescribed	<i>T. basedowii</i> and <i>T. brizoides</i>
1984	RVCR1984_PB03	5645	Prescribed	<i>T. basedowii</i> and <i>T. brizoides</i>
1984	RVCR1984_PB04	37528	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB05	30045	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB06	55355	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB07	32070	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB08	532341	Prescribed	<i>T. basedowii</i> with <i>Grevillea albiflora</i>
1984	RVCR1984_PB09	139842	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB10	12386	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB11	247896	Prescribed	<i>T. basedowii</i> with <i>desert oak</i>
1984	RVCR1984_PB12	14426	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB13	8461	Prescribed	<i>T. basedowii</i>
1984	RVCR1984_PB14	633012	Prescribed	<i>T. basedowii</i> and <i>T. brizoides</i>
1989	RVCR1989_PB01	133614	Prescribed	<i>T. basedowii</i>
1989	RVCR1989_PB02	225300	Prescribed	<i>Eucalyptus gamophylla</i> , <i>Triodia pungens</i> , annual grasses
1989	RVCR1989_PB03	133393	Prescribed	Desert oak, <i>Acacia</i> , <i>Triodia</i> , other annual and perennial grasses
1989	RVCR1989_PB04	372340	Prescribed	<i>Eucalyptus gamophylla</i> , <i>T. pungens</i> , annual grasses
1990	RVCR1990_PB01	114079	Prescribed	<i>T. basedowii</i>
1990	RVCR1990_PB02	19981	Prescribed	<i>T. basedowii</i>
1991	RVCR1991_PB01	33194	Prescribed	<i>T. basedowii</i>
1991	RVCR1991_PB02	18648	Prescribed	<i>T. basedowii</i>
1993	RVCR1993_PB01	36651	Prescribed	<i>T. melvillei</i>
1993	RVCR1993_PB02	70215	Prescribed	<i>T. melvillei</i>
2000	RVCR2000_PB01	11636	Prescribed	
2000	RVCR2000_PB02	19557	Prescribed	
2000	RVCR2000_PB03	37505	Prescribed	
2000	RVCR2000_PB07		Prescribed	Spinifex
2000	RVCR2000_PB08	11784	Prescribed	Spinifex
2000	RVCR2000_PB09	28763	Prescribed	Spinifex
2000	RVCR2000_PB10	19276	Prescribed	Spinifex
2000	RVCR2000_PB11	10920	Prescribed	Spinifex
2001	RVCR2001_PB01	215576	Prescribed	Spinifex
2001	RVCR2001_PB02	291561	Prescribed	Spinifex
2001	RVCR2001_PB03	20627	Prescribed	Spinifex
2002	RVCR2002_PB01	117458	Prescribed	Spinifex
2002	RVCR2002_PB02	50979	Prescribed	Spinifex
2002	RVCR2002_PB03	3662882	Prescribed	Spinifex
2002	RVCR2002_PB04	99085	Prescribed	Spinifex
2002	RVCR2002_PB05	10819	Prescribed	Spinifex
2003	RVCR2003_PB02	399525	Prescribed	Spinifex
2003	RVCR2003_PB03	98604	Prescribed	Spinifex
2003	RVCR2003_PB05	33446	Prescribed	Spinifex
2004	RVCR2004_PB02	34651	Infrastructure – visitor protection	Sand plain with <i>T. basedowii</i> and desert oak
2004	RVCR2004_PB03	60954	Linear – boundary firebreaks	Blue Mallee with <i>T. basedowii</i> sand plain
2004	RVCR2004_PB04	68425	Linear – boundary firebreaks	<i>T. basedowii</i> and Ironwood (<i>Acacia estrophiolata</i>) sand plain
2004	RVCR2004_PB05	97265	Linear – other strategic breaks	<i>Triodia melvillii</i> covered hills

Year	Burn_Id	Area (m ²)	Fire type	Terrain-vegetation description
2004	RVCR2004_PB06	20500	Linear – boundary firebreaks	<i>T. basedowii</i> with <i>Grevillea albiflora</i> plains
2004	RVCR2004_PB07	18342	Linear – other strategic breaks	<i>T. melvillei</i> covered hills, 10–20% fuel load beforehand
2004	RVCR2004_PB08*	13572	Research Patches	<i>T. basedowii</i> sand plain and dune sides, various shrubs
2004	RVCR2004_PB09*	11633	Research Patches	<i>T. basedowii</i> sand plain and dune sides, various shrubs
2004	RVCR2004_PB10	30566	Linear – boundary firebreaks	Sand plain with <i>T. basedowii</i> and desert oak
2005	RVCR2005_PB01	5824	Prescribed	Spinifex
2005	RVCR2005_PB02	6925	Prescribed	Spinifex

*Experimental *Eremophila prostrata* plots, burnt to test germination and survival response

Note that vegetation descriptions are from the Fire History database with only minimal corrections to spelling and punctuation.

Table 6.2: Rainbow Valley Conservation Reserve – prescribed fire annual summaries: 1984–2005

Year	No. of polygons	Main vegetation type burnt ¹	Area burnt in each fire		Total area burnt per year		Polygon source
			ha	% ²	ha	%	
1984	14	<i>T. basedowii</i>	176.8	(7.1%)	177.6	(7.2%)	Hand-drawn map
		<i>T. melvillei</i>	0.7	(<0.1%)			
1989	5	<i>T. basedowii</i>	84.7	(3.4%)	86.5	(3.5%)	Hand-drawn map
		<i>T. melvillei</i>	1.8	(0.1%)			
1990	2	<i>T. basedowii</i>	13.4	(0.5%)	13.4	(0.5%)	Hand-drawn map
1991	2	<i>T. basedowii</i>	6.2	(0.2%)	6.2	(0.2%)	Hand-drawn map
1993	2	<i>T. brizoides</i>	10.7	(0.4%)	10.7	(0.4%)	1993 fire report
2000	6	<i>T. basedowii</i>	13.2	(0.5%)	15.6	(0.6%)	ASTSHR GIS
		<i>T. melvillei</i>	2.4	(0.1%)			
2001	6	<i>T. basedowii</i>	50.7	(2%)	52.8	(2.1%)	ASTSHR GIS
		<i>T. melvillei</i>	2.1	(0.1%)			
2002	5	<i>T. basedowii</i>	389.7	(15.7%)	394.1	(15.9%)	ASTSHR GIS
		<i>T. melvillei</i>	4.4	(0.2%)			
2003	4	<i>T. basedowii</i>	49.8	(2%)	53.2	(2.1%)	ASTSHR GIS
		<i>T. melvillei</i>	3.3	(0.1%)			
2004	11	<i>T. basedowii</i>	25.9	(1.0%)	35.6	(1.4%)	ASTSHR GIS
		<i>T. melvillei</i>	9.7	(0.4%)			
2005	2	<i>T. basedowii</i>	1.3	(0.1%)	1.3	(0.1%)	ASTSHR GIS
TOTAL	59				846.8	(34.1%)	

1 The division into spinifex types was based on GIS overlay of fire polygons with the broad spinifex-oriented vegetation map created by us from the biophysical mapping data.

2 Note that some burns were largely conducted along the outside of the Reserve boundary (e.g. in 2002). The percentage figures indicate the proportional size of the burn (inside and outside the Reserve) with respect to the size of the Reserve, not the actual percentage of the Reserve burnt.

6.5.3 Mapping accuracy

We manually digitised 34 out of 75 polygons from hand-drawn paper maps. The majority were from a single map showing fires in 1984, 1989, 1990 and 1991. The fire polygons were digitised to an accuracy of about 5–20 metres (estimated by comparing the raster contours with vector contours). However, it is likely that the boundaries of the fires were drawn with much less accuracy on the original map. It is not known who drew the boundaries. In some cases the boundaries were probably hand drawn on the base map, using sketch maps made on original fire reports. Others may have been drawn from memory of the burns, field observations or some other interim mapping. Accuracy is likely to vary from +/- 50 metres in the vicinity of hills to +/-200 metres in more open country.

Many of the fires in the past decade have been mapped with a handheld GPS, recording a track while walking the boundary. A majority of these boundaries can be presumed to be accurate to within +/- 10 metres (assuming that the 'differential' GPS data correction technique was used prior to cessation of 'selective availability'). However, the mapping method has not always been recorded, and even some recent polygons may have been hand digitised in ArcView without any GPS coordinates, or mapped with a combination of GPS data for some boundary sections and hand-digitising for others.

6.5.4 Review of reporting styles and content

There is a lot of variation in style and detail of written fire documentation. In some years a formal report was written, and sometimes separate documents were written to document proposed burning. For some years, it is unclear from the documents whether or not the proposed burns were implemented. There is a substantial gap in records between 1984 and 1989. Up to 1990, only single page pre- and post-fire monitoring forms exist, and only for some of the mapped fires. The quality of reporting was much improved for 1992, when the Central District Parks Fire Management Strategy (FMS) was created. The strategy states that fire history maps will be prepared and updated annually when a burn is conducted on the Reserve. However, no reports were found from 1992 to 1998. Reporting of burning activities only became relatively consistent from 1999 onwards. The biophysical mapping ranger training camp that occurred in 1998 provided extensive information on the Reserve's ecological issues and simultaneously raised the level of skill and understanding among rangers in fire management.

1984 (Map 6.3)

Two pre-fire report forms were found for 1984 and no other written documentation, yet a total of 14 prescribed burn polygons were found on paper maps. From the information provided from the two written records, both fires burnt through spinifex and were of low intensity, with one burning along the western section of the track towards the bore and the other in the western half of the Reserve. These fires are followed up by post-fire monitoring reports in March 1985, describing regrowth of plants at both sites.

1985–1988

No fire records were found for the period 1985–1988.

1989 (Map 6.4)

There were four pre-fire assessment forms and five post-fire reports for 1989 with four of the five burns successfully implemented. The main stated purposes of the prescribed fires were the protection of pastoral property, public safety in visitor areas and 'dividing the park in half'. The implemented burns were roughly drawn on the provided grids of the fire report forms.

1990 (Map 6.4)

In 1990 only two small patch burns had been recorded on the eastern boundary of the park. In the same year the first fire management plan for the Reserve was written (it was brief, and handwritten), followed by a more comprehensive 1992 fire management strategy document for Central District Parks which includes the Reserve.

1991 (Map 6.4)

In 1991 there were several small patch burns on the eastern boundary. There is a written reference to another area being burnt in the same year, in the central-northern part of the Reserve. The report stated that the area had been previously burned by prescribed fire over 10 years earlier, yet no mapping showing the locations of either of these burns could be found.

1992

In 1992 the first fire history map was produced for the Reserve. It included hand-drawn records of burns for 1984, 1989, 1990 and 1991. A 1992 pre-fire report also had on the back of the form a hand-drawn description of a burn, yet it is unclear whether this burn went ahead.

1993 (Map 6.4)

In 1993 two burns were prescribed in the western section along the ridges of the Reserve. Before 1993, areas that were burnt in the Reserve were associated with sand dune country only. One of the rangers on the park recommended in *Fire Action Report 1993 – Central District Parks*, that burning be discontinued at the Reserve for the following year (1995) due to extensive past burning programs and lack of vegetation in the dry conditions. Instead of burning, staff implemented mainly slashing and poisoning of fence lines in 1993.

1994–95

No fire records were found for these years.

1996

The 1996 fire action plan outlines the same aims as the 1992 report and makes reference to fire maps which have not been found. The report stated that the majority of the Reserve had vegetation that was more than 11 years old, and since little was known about the rare vegetation communities, a series of smaller 1–5 hectare fires were planned to break up the uniform vegetation, using control lines of 5–10 metres in width. There is no record of any of these fires having being implemented in 1996.

1997–98

No fire records were found for these years.

1999

In 1999 the Central District Parks fire action plan stated plans for a series of small burns along the western fence boundary in order to reduce the high spinifex loads. However, no records of their implementation have been found, other than a note stating that little burning was undertaken due to unseasonably dry conditions. The fire management objectives in this plan are the same as for the 1992 and 1996 reports. However, in 1999 a project was started to digitise fire history maps of previous burns onto the park's GIS/biophysical mapping database. An individual GIS folder for the Reserve was created in 1999 on the ranger station PC at ASTSHR (as for most parks).

2000 (Map 6.5)

Extensive breaks (>200 m wide) were burnt on the north-east boundary in 2000 and 2001, following the high rainfall in these years. Even though these breaks have not as yet been tested by wildfire, it is believed that a wildfire could be stopped in this vegetation type, following the examples in other parks. However, there was still some risk of a wildfire entering this area due to the burns not being tied off. The 2000 action plan listed eight prescribed burns with emphasis on infrastructure protection, limiting the spread of wildfire and protecting areas containing rare plant communities. Four of the prescribed burns are aimed at protecting *Eremophila prostrata*. Six of the eight prescribed burns have been mapped and therefore we presume the other two were not implemented.

2001 (Map 6.5)

A total of four burns are shown on the GIS map in the 2001 fire plan; however, only two of these burns had been implemented as stated in the following year's report.

2002 (Map 6.5)

The 2002 report outlines various prescribed fires mainly outside the western boundary of the Reserve. The intention was to prevent wildfires from entering the Reserve from that direction and to protect the rare plant communities situated in that section of the park. A total of five prescribed burns were implemented in that year.

2003 (Map 6.5)

In 2003 a total of seven burns were proposed. The plan took into consideration rare plant communities and natural fire breaks, with a combination of line and mosaic burning. Four of those burns were implemented and mapped. A review of the 2002 fire program was included in the annual report for the first time for this reserve.

2004 (Map 6.5)

The 2004 fire plan proposed eight burns, while the mapped polygons indicate that 11 burns took place. Some of the burns that were implemented were recorded as being incomplete, presumably because insufficient area was burnt to achieve the stated aim. The program included the burning of spinifex in plots to the south-west of the Reserve where the rare *Eremophila prostrata* is found. Another burn concentrated on protecting the ranger camp situated towards the middle of the Reserve, while the rest of the burns were boundary fire breaks.

The report outlined the various strategies of burning, including burning within three days after rain events or very close to, when vegetation still has moisture, preventing fire from damaging trees and shrubs. It recommended that burning be conducted in the late afternoon or evening. The 2004 report discussed in more detail the use of natural fire breaks and vegetation distribution as well as rare plant and fire-sensitive communities.

Barnetson (2004) compiled a report on spinifex fuel loads in the Reserve based on monitoring in March 2004. The report is a comprehensive review and attempts to establish trends with respect to 1998 data. It is possible that further analysis of data reported in Barnetson (2004) could help deduce where unmapped prescribed fires have been.

2005 (Map 6.5)

This report was the first to follow the new standard reporting and planning template, created to provide a more uniform approach to the reporting of both fire history and future planning across the entire southern region. A database was also created to record all relevant fire information, which was linked to the maps created in ArcView by a unique identification code for each burn. A burn to complete the fire break around the ranger camp was planned and successfully implemented. The only other burn that was implemented was an area between the two smaller claypans to the north-west of the Reserve. Three further burns were planned; however, none of these were implemented due to low fuel loads and time constraints.

6.5.5 History of methods and philosophy of fire management

The first records of fire management objectives and philosophy for the Reserve were outlined in the 1992 Central District Parks Fire Management Strategy. This report served as a basis to guide fire management in all Central District parks and reserves and stated the following four fire objectives:

1. To protect human life and park infrastructure
2. To protect historical and cultural sites
3. To protect rare, relict and uncommon species and fire-sensitive communities
4. To reduce the potential for wildfire burning major portions of the park.

This strategy has been implemented mainly by creating and maintaining fire breaks and establishing a burning program, in accordance with adjoining land holders, to reduce the risk of wildfires entering the Reserve. This strategy was implemented throughout the Reserve. Prescribed burning was conducted more regularly in the western section of the park than in the eastern section, as it has fewer natural fire breaks. Burning was noted to have been mainly carried out in cool conditions and soon after rain events and in the late afternoon or evening.

A combination of patch and line burning appears to have been used throughout the history of the Reserve in an attempt to produce plant communities in different stages of recovery from fire, and to protect sensitive areas from wildfires. These sensitive areas had been identified in the western region of the park in the 1980s and 1990s, because of the need to protect the rare *Eremophila prostrata* (previously known as *Eremophila* sp. Rainbow Valley), together with the uncommon *Daviesia arthropoda* and some older mulga and desert oak stands.

There was prolific recruitment of *E. prostrata* along the north-west boundary of the Reserve in 2000 and 2001 following comparatively large prescribed burns (Map 6.1 in Appendix 1). This species is listed under NT and Commonwealth legislation as ‘vulnerable to extinction’. An experiment was conducted in 2004 to further investigate the response of *E. prostrata* to fire (Desert Fire subproject 3e). This involved burning 13 plots (25 m x 25 m) with two treatments: burning when soil was wet; and burning when dry. Massive recruitment of seedlings occurred in the dry-burnt plots, moderate numbers grew in the wet-burnt plots and minimal numbers occurred in the control plots (Duguid & Barnettson in prep.).

Many past annual work plans have aimed to do much more than was possible with the available staff time, staff experience and equipment. Records from this and other reserves show that it is extremely difficult to implement an extensive network of burnt fire breaks. Good planning and continuity of management can greatly improve the efficiency of fire management. Map 6.6 in Appendix 1 shows a case study that illustrates this point: A relatively small burn (RVCR2000_PB08) was implemented in 2000, which created a control line between two rocky hills (one outside the Reserve). This allowed a larger burn to be implemented relatively easily the next year (RVCR2001_PB02) with little risk of the fire spreading to the south. Then in 2002, a relatively large burn (RVCR2002_PB02) was implemented with relatively little control effort, using the 2001 burn, the park boundary and station tracks as control lines.

There are huge gaps in the fire history record for the Reserve that limit our ability to analyse past management. These gaps hamper ongoing planning and management. There have been instances where rangers have attempted to implement a prescribed fire in areas of presumed old dense spinifex, but struggled to get fires to carry due to relatively recent prescribed burning that had not been mapped. Despite improved guidelines for planning and reporting fire management (provided in 2005–07), rangers have continued to struggle with mapping and record keeping.

Although the 1992 fire management strategy for the Reserve was revised in a draft document in 1999, many of the management philosophies and recommended methodologies in the document are outdated.

6.6 Detailed recommendations

We recommend that attempts be made to improve our understanding of the fire history of the Reserve, particularly of fires that occurred between 1975 and 1984. This would entail the examination of satellite imagery (where available) and aerial photographs. Further analysis of fire history may then be warranted (e.g. calculation of the proportions of different vegetation types burnt each year and estimates of fire frequency).

We recommend that a new fire management strategy be developed for the Reserve to guide fire management over the next decade. The biophysical mapping of the park by Brenda Pitts provides a basis for planning fire management using the GIS, and that process has been started (Chris Brock 2005, pers. comm.). A new fire management strategy would need to incorporate prescriptions for fire management in Duguid et al. (2009).

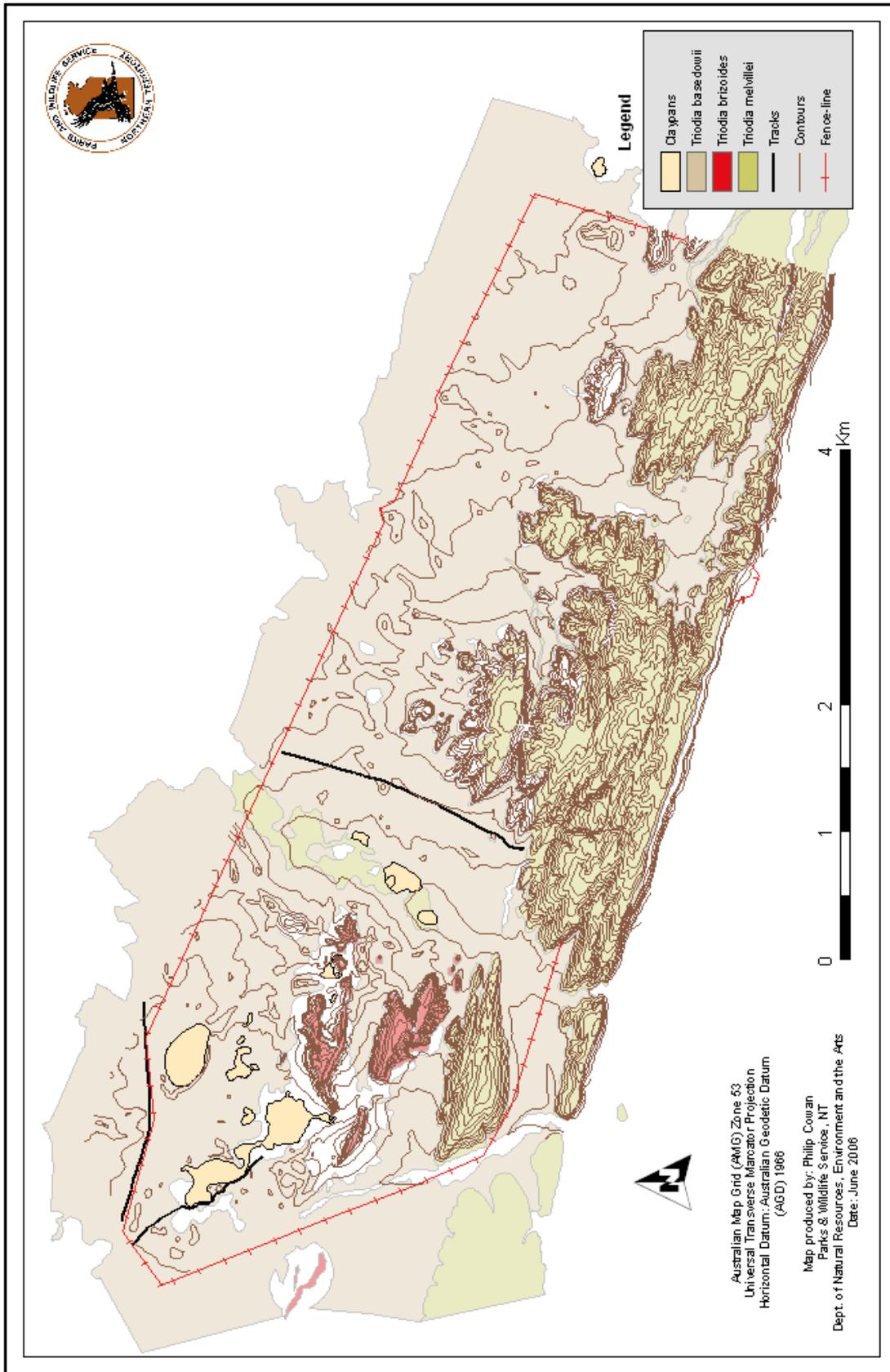
We recommended that ongoing management involve a combination of strategic burnt breaks and extensive patch burning. More than half of the park's vegetation is fire-tolerant spinifex that would tolerate much more frequent burning than has occurred so far in the area's history as a conservation reserve. However, it is also important for annual plans to be realistic so that staff can gain the satisfaction of achieving goals.

We recommend that more effort be put into training, in order to improve efficiency in all aspects of fire management, including record keeping, planning and implementation.

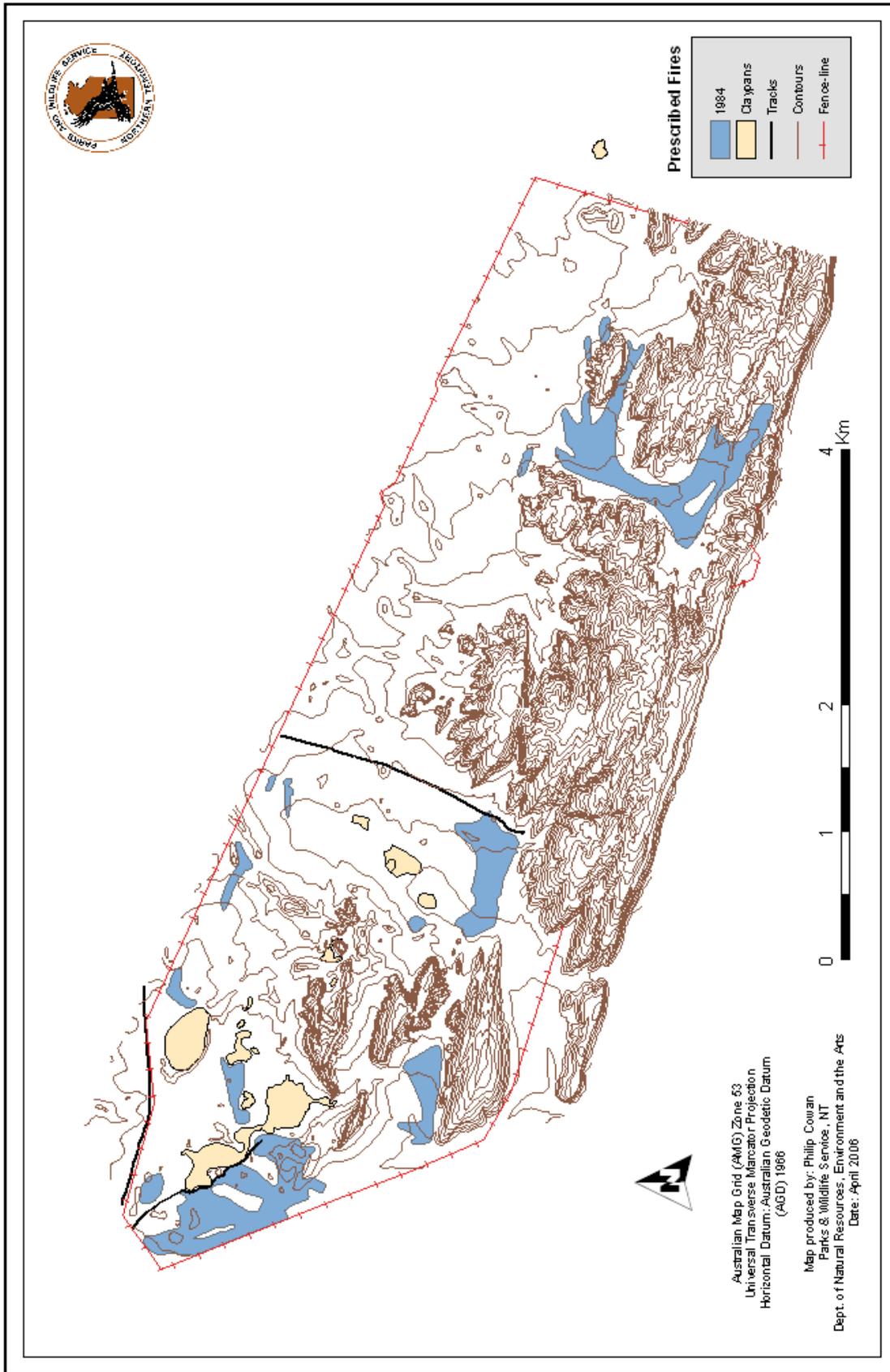
6.7 References

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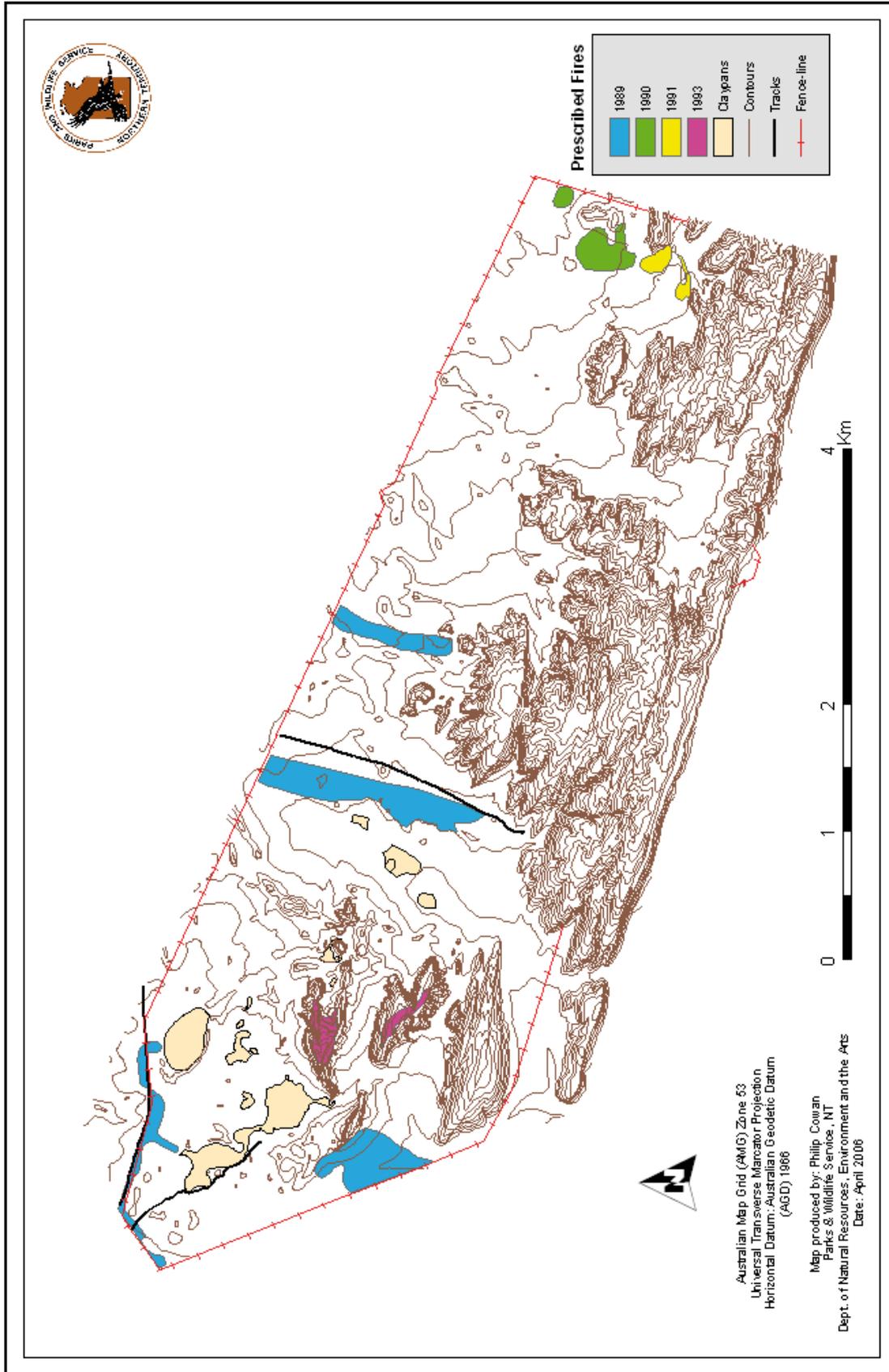
Map 6.2: Major spinifex types on Rainbow Valley Conservation Reserve



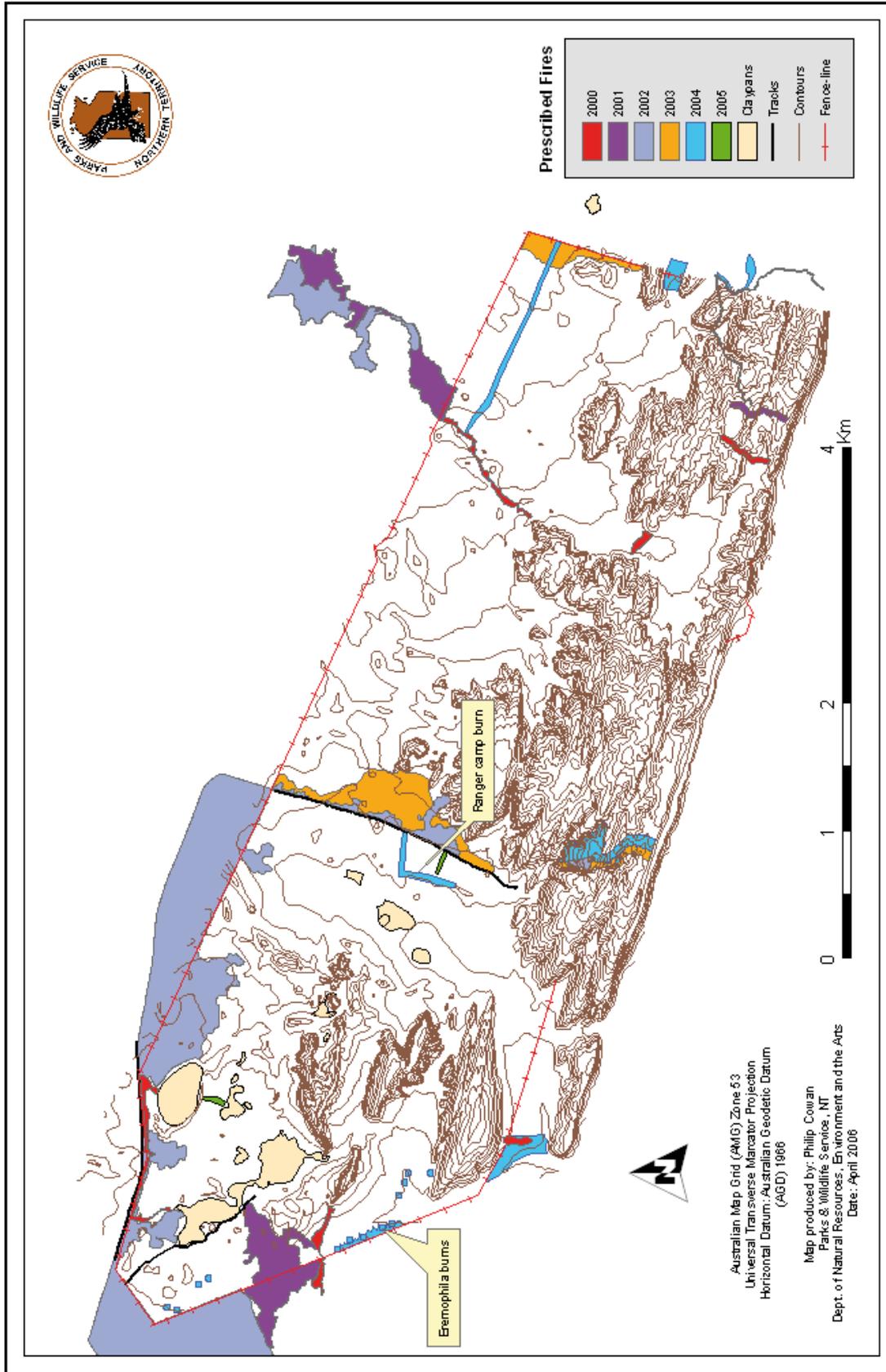
Map 6.3: Prescribed fire history: 1984



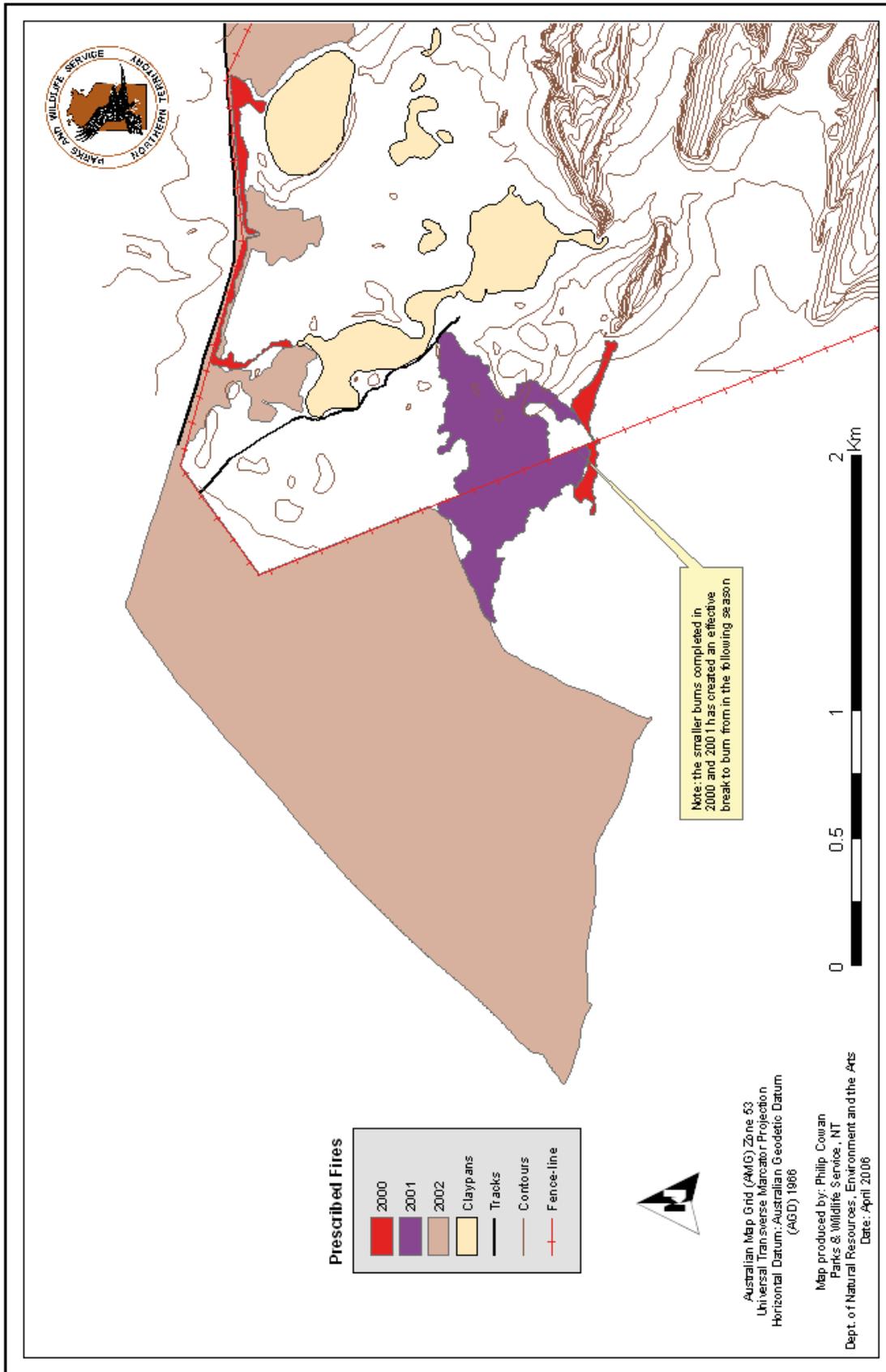
Map 6.4: Prescribed fire history: 1989, 1990, 1991 and 1993



Map 6.5: Prescribed fire history: 2000–2005



Map 6.6: Prescribed fire history: north-west boundary 2000–2002 case study



Appendix 2: Chronological list of fire planning and reporting documents collated for Rainbow Valley Conservation Reserve

Year	Document name	Park/ district	Type	Source	Comments	Authors
1985		RVCR	Post-fire monitoring	ASTS files	2 (monitoring 1984 fires)	G. Fyfe & D. Geoghegan
1989		RVCR	Individual fire prescribed reports	ASTS files	9	Graeme Horne + Dennis Matthews
1990	Rainbow Valley – Fire Management 28/07/1990	RVCR	Other	ASTS files	Ideas for fire management	
1990		RVCR	Individual fire prescribed reports	ASTS files	2	Bruce Gray
1991	Review 1991 Fire Burning Program – Central District Parks	Cent. Dist.	Annual Action Report	Registry files	27 November 1991	P. McCluskey
1992	Central District Parks Fire Management Strategy	Cent. Dist.	Strategic plans	Registry files	25 March 1992	
1992	Proposed 1992 Fire Burning Program	Cent. Dist.	Annual Action Plan	Registry files	29 January 1992	P. McCluskey
1993		RVCR	Individual fire prescribed reports	ASTS files	1	Noeleen Madrill
1993	Fire Action Report 1993 – Central District Parks	Cent. Dist.	Annual Action Report	Registry files	1st February 1994	Noeleen Madrill
1993	Fire Action Plan for 1993	Cent. Dist.	Annual Action Plan	Registry files	22/04/1993	P. McCluskey
1993	Proposed 1993 Prescribed Burning Program	Cent. Dist.	Annual Action Plan	Registry files	10 May 1993	P. McCluskey
1994	Proposed 1994 Fire Action Plan – Central District Parks	Cent. Dist.	Annual Action Plan	Registry files	1st February 1994	Noeleen Madrill
1995	1995 Remote Parks Action Plan	Cent. Dist.	Annual Action Plan	ASTS files		Wayne Gaskon
1995	Comments on 1995 Remote Parks Action Plan	Cent. Dist.	Other	ASTS files	31 July 1995	Grant Allan
1995	1995 Remote Parks Action Plan – Revised 1995	Cent. Dist.	Annual Action Plan	ASTS files		Wayne Gaskon
1996	1996 Remote Parks Fire Action Plan	Cent. Dist.	Annual Action Plan	ASTS files		Wayne Gaskon
1999	Central District Parks Fire Strategy – DRAFT ONLY	Cent. Dist.	Strategic plans	Registry files	Revised 1999	Ian Crealy
1999	Central District Parks Fire Action Plan 1999	Cent. Dist.	Annual Action Plan	ASTS files	17/06/1999	Ian Crealy
2000	Central District Parks 2000 Fire Report	Cent. Dist.	Annual Action Report	ASTS files	20 January 2001	Graeme Horne
2000	Central District Parks Fire Action Plan 2000	Cent. Dist.	Annual Action Plan	Registry files		
2001	2001 Fire Report for Central District Parks	Cent. Dist.	Annual Action Report	ASTS files		
2001	Central District Parks Fire Action Plan 2001	Cent. Dist.	Annual Action Plan	Registry files		
2002	Priority of Fire Work – Central District Parks Fire Action Plan 2002	Cent. Dist.	Annual Action Plan	ASTS files		
2002	East Central Barkly Fire Management Meeting	Cent. Dist.	Other	Registry files	28 May 2002	Dave Heard
2002	2002 Fire Report for Central District Parks	Cent. Dist.	Annual Action Report	Registry files		
2002	Central District Parks Fire Action Plan 2002	Cent. Dist.	Annual Action Plan	ASTS files		
2003	Central District Parks Fire Action Plan 2003	Cent. Dist.	Annual Action Plan	ASTS files		
2004	Central District Parks Fire Action Plan 2004	Cent. Dist.	Annual Action Plan	Registry files		John Liddle
2005	Central District Parks Annual Fire Report and Plan	Cent. Dist.	Annual Action Plan	ASTS files	March 2005	Philip Cowan

Appendix 3. Individual burn summary

Note that the following data are as output from the fire databases (in MS Access), without corrections to spelling, grammar or punctuation.

RVCR1984_PB01

Fire_Type: Prescribed fire
Date Not Recorded
Location: Eastern end of the reserve, close to the northern fence-line
Area: 1.4 ha Length: 157 m
Burnt Break Width: 43m at narrowest; 50m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB02

Fire_Type: Prescribed fire
Date Not Recorded
Location: West of the ranger camp access road just as you enter the reserve
Area: 1.3 ha Length: 256 m
Burnt Break Width: 35m at narrowest; 50m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii & T. brizoides
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB03

Fire_Type: Prescribed fire
Date Not Recorded
Location: West of the ranger camp access road, just off the fence-line
Area: 0.6 ha Length: 126 m
Burnt Break Width: 43m at narrowest; 48m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii & T. brizoides
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB04

Fire_Type: Prescribed fire
Date Not Recorded
Location: Along north-west to north centre fence-line
Area: 3.8 ha Length: 489 m
Burnt Break Width: 58m at narrowest; 65m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB05

Fire_Type: Prescribed fire
Date Not Recorded
Location: Along the north-west fence-line
Area: 3 ha Length: 352 m
Burnt Break Width: 62m at narrowest; 85m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB06

Fire_Type: Prescribed fire
Date Not Recorded
Location: Centre of the south-west section
Area: 5.5 ha Length: 436 m
Burnt Break Width: 40m at narrowest; 80m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB07

Fire_Type: Prescribed fire
Date Not Recorded
Location: Centre of the western boundary fence-line
Area: 3.2 ha Length: 258 m
Burnt Break Width: 100m at narrowest; 147m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB08

Fire_Type: Prescribed fire
Date Not Recorded
Location: South-eastern cnr along eastern fence-line
Area: 53.2 ha Length: 1452 m
Burnt Break Width: 260m at narrowest; 440m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii with Grevillea albeiflora
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB09

Fire_Type: Prescribed fire
Date Not Recorded
Location: South-west cnr, 400m inside fence-line
Area: 14 ha Length: 586 m
Burnt Break Width: 90m at narrowest; 120m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB10

Fire_Type: Prescribed fire
Date Not Recorded
Location: Directly north-west of large bore
Area: 1.2 ha Length: 145 m
Burnt Break Width: 75m at narrowest; 85m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB11

Fire_Type: Prescribed fire
Date Not Recorded
Location: Directly west of bore, adjacent to ranger camp road
Area: 24.8 ha Length: 1005 m
Burnt Break Width: 195m at narrowest; 230m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii with Desert Oaks
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB12

Fire_Type: Prescribed fire
Date Not Recorded
Location: Eastern end of the reserve, approx 850m from eastern fence-line
Area: 1.4 ha Length: 181 m
Burnt Break Width: 64m at narrowest; 90m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB13

Fire_Type: Prescribed fire
Date Not Recorded
Location: Eastern end of the reserve, approx 1km from east fence-line
Area: 0.8 ha Length: 207 m
Burnt Break Width: 44m at narrowest; 56m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1984_PB14

Fire_Type: Prescribed fire
Date Not Recorded
Location: South-eastern half of the reserve
Area: 63.3 ha Length: 1462 m
Burnt Break Width: 200m at narrowest; 450m predominant width
Remaining fuel: 30% burnt
Terrain & Vegetation: T. basedowii & T. brizoides
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1989_PB01

Fire_Type: Prescribed fire
Date_Start: 17/08/1989
Location: North-west cnr of the reserve
Area: 13.4 ha Length: 1995 m
Burnt Break Width: 41m at narrowest; 81m predominant width
Remaining fuel: 75-90% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1989_PB02

Fire_Type: Broad-scale fuel reduction
Date_Start: 24/08/1989
Location: South-west of reserve
Area: 22.5 ha Length: 901 m
Burnt Break Width: 500m at narrowest; 550m predominant width
Remaining fuel: 40-50% burnt
Terrain & Vegetation: Eucalyptus gamophylla, Triodia pungens, annual grasses
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1989_PB03

Fire_Type: Prescribed fire
Date_Start: 4/08/1989
Location: Centre of reserve, adjacent to northern fence-line, approx 800m east of ranger camp road
Area: 13.3 ha Length: 815 m
Burnt Break Width: 142m at narrowest; 203m predominant width
Remaining fuel: 30-70% burnt
Terrain & Vegetation: Desert oak, Acacias, Triodia, other annual & perennial grasses
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1989_PB04

Fire_Type: Prescribed fire
Date_Start: 24/08/1989
Location: Adjacent to ranger camp access road, on the western side, heading south from the gate towards the camp
Area: 37.2 ha Length: 1704 m
Burnt Break Width: 152m at narrowest; 238m predominant width
Remaining fuel: 40-50% burnt
Terrain & Vegetation: Eucalyptus gamophylla, Triodia pungens, annual grasses
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1990_PB01

Fire_Type: Prescribed burn
Date Not Recorded
Location: North-east cnr of reserve
Area: 11.4 ha Length: 500 m
Burnt Break Width: 202m at narrowest; 250m predominant width
Remaining fuel: 70% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1990_PB02

Fire_Type: Prescribed burn
Date Not Recorded
Location: North-east cnr of reserve
Area: 2 ha Length: 204 m
Burnt Break Width: 94m at narrowest; 156m predominant width
Remaining fuel: 70% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1991_PB01

Fire_Type: Prescribed burn
Date Not Recorded
Location: Eastern end of the reserve, approx 300m from fence
Area: 3.3 ha Length: 269 m
Burnt Break Width: 99m at narrowest; 158m predominant width
Remaining fuel: 80% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1991_PB02

Fire_Type: Prescribed burn
Date Not Recorded
Location: Eastern end of the reserve, approx 300m from fence
Area: 1.9 ha Length: 316 m
Burnt Break Width: 35m at narrowest; 35m predominant width
Remaining fuel: 80% burnt
Terrain & Vegetation: T. basedowii
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1993_PB01

Fire_Type: Prescribed burn
Date Not Recorded
Location: Ridge top in further west section of park to second burn
Area: 3.7 ha Length: 590 m
Burnt Break Width: 46m at narrowest; 85m predominant width
Remaining fuel: 80% burnt
Terrain & Vegetation: T. melvillei
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR1993_PB02

Fire_Type: Prescribed burn
Date Not Recorded
Location: Ridge top in west section of the park
Area: 7 ha Length: 512 m
Burnt Break Width: 132m at narrowest; 179m predominant width
Remaining fuel: 20% burnt
Terrain & Vegetation: T. melvillei
Mapping Status: Mapping complete; Method: From a 1:10000 hand drawn map

RVCR2000_PB01

Fire_Type: Prescribed fire
Date_Start: 12/09/2000
Location: S.W fenceline, outside the park
Area: 1.2 ha
Mapping Status: Method: GPS

RVCR2000_PB02

Fire_Type: Prescribed fire
Date_Start: 12/09/2000
Location: S.E corner of the park
Area: 2 ha
Mapping Status: Method: GPS

RVCR2000_PB03

Fire_Type: Prescribed fire
Date_Start: 12/09/2000
Location: N.W fenceline
Area: 3.8 ha

RVCR2000_PB08

Fire_Type: Prescribed fire
Date_Start: 3/07/2001
Area: 1.2 ha
Terrain & Vegetation: Spinifex
Mapping Status: Method: GPS
Old ID: RV1/00
People: Graeme Horne Ranger hours: 3

RVCR2000_PB09

Fire_Type: Prescribed fire
Date_Start: 5/07/2001
Area: 2.9 ha
Terrain & Vegetation: Spinifex
Mapping Status: ; Method: GPS; Comment: Differential
Old ID: RV5/00
People: Graeme Horne Ranger hours: 11

RVCR2000_PB10

Fire_Type: Prescribed fire
Date_Start: 24/01/2001 Extinguished on 03-May-02
Area: 1.9 ha
Terrain & Vegetation: spinifex
Other Comments: Extend and better establish 2000 control burn
Old ID: Rainbow 3D/01
People: Graeme Ranger hours: 1.5

RVCR2000_PB11

Fire_Type: Prescribed fire
Date_Start: 5/07/2001
Area: 1.1 ha
Terrain & Vegetation: Spinifex
Mapping Status: Method: GPS; Comment: Differential
Old ID: RV4/00
People: Graeme Horne Ranger hours: 3

RVCR2001_PB01

Fire_Type: Prescribed fire
Date_Start: 5/07/2001
Area: 21.6 ha
Terrain & Vegetation: Spinifex
Mapping Status: Method: GPS; Comment: Differential
Old ID: RV2/01
People: Graeme Horne Ranger hours: 24

RVCR2001_PB02

Fire_Type: Prescribed fire
Date_Start: 5/07/2001
Area: 29.2 ha
Terrain & Vegetation: Spinifex
Mapping Status: Method: GPS; Comment: Differential
Old ID: RV3/01
People: Graeme Horne Ranger hours: 14

RVCR2001_PB03

Fire_Type: Prescribed fire
Date_Start: 24/01/2001 Extinguished on 03-May-02
Area: 2.1 ha
Terrain & Vegetation: spinifex
Other Comments: Extend and better establish 2000 control burn
Old ID: Rainbow 3E/01
People: Graeme Ranger hours: 1.5

RVCR2002_PB01

Fire_Type: Prescribed fire
Date_Start: 28/07/2002 Ignition Time: 1600, Extinguished at 800on 29-Jul-02
Purpose: Strategic break
Implementation Status: Finalised (90%)
Area: 11.7 ha
Remaining fuel: zilch
Terrain & Vegetation: Spinifex Spin_diam(0.4) Fuel_load(0.3) %cured(0.85)
Old ID: A02
People: Graeme Gary Gil Ranger hours: 6

RVCR2002_PB02

Fire_Type: Prescribed fire
Date_Start: 28/07/2002 Ignition Time: 1600, Extinguished at 800on 29-Jul-02
Purpose: Strategic break
Implementation Status: Finalised (90%)
Area: 5.1 ha
Remaining fuel: zilch
Terrain & Vegetation: Spinifex Spin_diam(0.4) Fuel_load(0.3) %cured(0.85)
Old ID: A02
People: Graeme Gary Gil Ranger hours: 6

RVCR2002_PB03

Fire_Type: Prescribed fire
Date_Start: 27/07/2002 Ignition Time: 1600, Extinguished at 800on 28-Jul-02
Purpose: Strategic break
Implementation Status: Finalised (90%)
Area: 366.3 ha
Remaining fuel: zilch
Terrain & Vegetation: Spinifex Spin_diam(0.5) Fuel_load(0.5) %cured(0.85)
Old ID: C02
People: Graeme Gary Ranger hours: 8

RVCR2002_PB04

Fire_Type: Prescribed fire
Date_Start: 27/07/2002 Ignition Time: 1600, Extinguished at 800on 28-Jul-02
Purpose: Strategic break
Implementation Status: Finalised (90%)
Area: 9.9 ha
Remaining fuel: zilch
Terrain & Vegetation: Spinifex Spin_diam(0.5) Fuel_load(0.5) %cured(0.85)
Old ID: B02
People: Graeme Gary Ranger hours: 8

RVCR2002_PB05

Fire_Type: Prescribed fire
Date_Start: 28/07/2002 Ignition Time: 2100, Extinguished at 2200on 28-Jul-02
Purpose: Strategic break
Implementation Status: Finalised (90%)
Area: 1.1 ha
Remaining fuel: zilch
Terrain & Vegetation: Spinifex Spin_diam(0.5) Fuel_load(0.3) %cured(0.85)
Old ID: E02
People: Graeme Gary Gil Ranger hours: 3

RVCR2003_PB02

Fire_Type: Prescribed fire
Date_Start: 15/07/2003 Ignition Time: 700, Extinguished at 1700on 15-Jul-03
Location: Adjacent to Road
Purpose: Fuel reduction
Implementation Status: Finalised (90%)
Area: 40 ha
Remaining fuel: percent burnt: 60
Terrain & Vegetation: Spinifex Fuel_load(3) %cured(80)
Other Comments: Patchy burn
Mapping Status: Method: GPS; Comment: <800 Average Points
Old ID: DO3 BO3
People: Jason, John, Mike, Gary Ranger hours: 32

RVCR2003_PB03

Fire_Type: Prescribed fire
Date_Start: 15/07/2003 Ignition Time: 1700, Extinguished at 2100on 15-Jul-03
Location: Adjacent fenceline
Purpose: Fuel reduction
Implementation Status: Finalised (90%)
Area: 9.9 ha
Remaining fuel: percent burnt: 50
Terrain & Vegetation: Spinifex Fuel_load(3) %cured(80)
Other Comments: Patchy burn
Mapping Status: Method: GPS; Comment: <800 Average Points
Old ID: CO3
People: Jason, John, Mike, Gary Ranger hours: 14

RVCR2003_PB05

Fire_Type: Prescribed fire
Date_Start: 14/05/2003 Carried out over three days (14-15th May, 30th June); Ignition Time: 1000, Extinguished at 1400on 14-May-03
Purpose: Fuel reduction
Implementation Status: Finalised (90%)
Area: 3.3 ha
Remaining fuel: None
Terrain & Vegetation: Spinifex
Mapping Status: Method: GPS; Comment: Single Point
Old ID: E/03
People: Jason, Graeme, Rick, John, Bec, Gary Ranger hours: 72

RVCR2004_PB02 Ranger Camp Burn

Fire_Type: Infrastructure-visitor protection
Date_Start: 28/05/2004 subsequent trip on 16 June
Location: Horseshoe shape around north, west & south of camp and tying off to track
Purpose: Protect ranger camp infrastructure
Implementation Status: Implemented but incomplete
Area: 3.5 ha Length: 777 m
Burnt Break Width: 10m at narrowest; 50m predominant width
Connectivity: needs extending
Remaining fuel: mostly 70% of fuel burnt
Terrain & Vegetation: Sandplain with T. basedowii and Desert Oak
Soil Moisture: fully saturated
Control Line Info: rakehoe before
Weather Obs: First day during very wet week, saturated soil and high humidity. Strong wind dried out fuel however
Fire Behaviour: Nearly lost control due to wind despite high moisture levels.
Other Comments: Implemented in 2 separate trips. First stage by RH, JB, JL, LG ??? On northern edge
Mapping Status: Preliminary polygon; Method: Hand digitised - 100k Mapdata; Comment: Yet to be GPS'ed
Old ID: Rainbow_B04
People: 28/5/04: CDstaff: RH, JB, LG, PL
16/6/04: CD staff: PL, JB, JL, CW, HW, LG, Brenton Forrester Ranger hours: 40

RVCR2004_PB03 North-East Corner Burn

Fire_Type: Linear - boundary fire breaks
Date_Start: 25/05/2004
Location: Parallel to the NW fenceline, 200m into the park
Purpose: To prevent wildfire from entering the park
Implementation Status: Implemented but incomplete
Area: 6.1 ha Length: 1645 m
Burnt Break Width: 30m at narrowest; 35m predominant width
Connectivity: needs extending
Remaining fuel: 70% unburnt within the strip.
Terrain & Vegetation: Blue mallee with Triodia basedowii sand plain
Soil Moisture: fully saturated
Control Line Info: None
Weather Obs: 12 degrees, 0-5km/hr winds, SE wind direction, 100 Percent cloud cover, 80 percent RH
Fire Behaviour: Wet and didn't burn very well, required work to get a front going.
Other Comments: Majority of the burn still needs completing, between the strip and the fence.
Mapping Status: Preliminary polygon; Method: Hand digitised - 100k Mapdata; Comment: To be GPS'ed
Old ID: Rainbow_C04
People: RH, JL, JB, CW, LG, PL Ranger hours: 15

RVCR2004_PB04 Southern Boundary Fence

Fire_Type: Linear - boundary fire breaks
Date_Start: 27/05/2004 Finished on 16 June 04
Location: South western corner, adjacent to & outside southern fence (inside reserve)
Purpose: To prevent wildfire from entering the park
Implementation Status: Implemented but incomplete
Area: 6.8 ha Length: 499 m
Burnt Break Width: 200m at narrowest; 250m predominant width
Connectivity: ties off
Remaining fuel: 30-70% burnt, patchier in the northern section
Terrain & Vegetation: T. basedowii and Ironwood (Acacia estrophiolata) sandplain
Soil Moisture: fully dry
Control Line Info: Worked off fence-line track
Weather Obs: 15 degrees, 6km/hr wind speed from E/SE, no cloud, 45% RH
Fire Behaviour: 16/06/2004 Carried out at night, starting at 6pm. Fire intensity decreasing throughout burn.
Other Comments: Required considerable effort to get it to burn, and still fairly patchy in the north.
Mapping Status: Preliminary polygon; Method: Hand digitised - 100k Mapdata; Comment: Yet to be gps'ed
Old ID: Rainbow_D04
People: 27/05/2004: RH, LG, PL
16/06/2004: PL, JB, JL, CW, HW, LG, Brenton Forrester Ranger hours: 27

RVCR2004_PB05 Spinifex Hill

Fire_Type: Linear - other strategic breaks
Date_Start: 12/07/2004 Finished 13/07/2004
Location: Ranges in the middle of the park, not far north of the southern boundary
Purpose: To prevent wildfire from spreading throughout park
Implementation Status: Implemented as prescribed
Area: 9.7 ha Length: 729 m
Burnt Break Width: 60m at narrowest; 120m predominant width
Connectivity: ties off
Remaining fuel: 30-70% burnt
Terrain & Vegetation: Triodia melvillii covered hills
Soil Moisture: fully dry
Control Line Info: working off burn from previous years (2002 and 2003) and rocky outcrops
Weather Obs: 15-19 degrees, 25-30km/hr winds, E/SE winds, no cloud
Fire Behaviour: Fire intensity moderate, required work to get a front moving
Other Comments: Break satisfactory for this year but to be extended in future years.
Mapping Status: Preliminary polygon; Method: Hand digitised - 100k Mapdata; Comment: yet to be gps'ed
Old ID: Rainbow_E04
People: 12 July 04: JB, PL, JL, CW, HW, LG, Brenton Forrester
13 July 04: JB, PL, JL, CW, HW, LG, Brenton Forrester Ranger hours: 72.5

RVCR2004_PB06 Mid West Fenceline - fuel reduction

Fire_Type: Linear - boundary fire breaks
Date_Start: 27/05/2004
Location: Inside park, along W fenceline adjacent to southern Eremophila plots
Purpose:
Implementation Status: Implemented but varied substantially from prescription (eg escaped)
Area: 2 ha
Burnt Break Width: 55m at narrowest; 65m predominant width
Remaining fuel: 30-70% burnt
Terrain & Vegetation: T. basedowii with Grevillea albeiflora plains
Soil Moisture: fully saturated
Control Line Info: Worked off fence line and eremophila plot rake-hoe lines
Weather Obs: 18b degrees, 15km/hr wind speed, NE wind direction, 80% cloud cover, 70% RH
Fire Behaviour: Seemed to be burning well but still required a lot of work, and ended up patchy.
Other Comments: Mostly the same a a/b. Very patchily burnt. Not sufficiently complete to prevent a wildfire. Need to get landholder permission to burn on the other side of the fence too.
Mapping Status: Mapping complete; Method: Hand digitised - 100k Mapdata; Comment: wild guesstimate
People: RH, PL, LG Ranger hours: 10

RVCR2004_PB07 South East Hill Burn

Fire_Type: Linear - other strategic breaks
Date_Start: 25/05/2004
Location: Horseshoe shaped burn in ranges, just outside eastern boundary of park.
Purpose: To prevent wildfire from entering the park
Implementation Status: Implemented but incomplete
Area: 1.8 ha Length: 582 m
Burnt Break Width: 15m at narrowest; 20m predominant width
Connectivity: needs extending
Remaining fuel: 30-70% burnt. Patchy.
Terrain & Vegetation: T. melvillii covered hills. 10-20% fuel load beforehand.
Soil Moisture: fully saturated
Control Line Info: Worked off old burn
Weather Obs: 14 degrees, 15km/hr wind speed, NE wind direction, 90% cloud, 80% RH
Fire Behaviour: Wet and initially wouldn't burn. Waited a couple of hours and then had to work it hard to get a front.
Mapping Status: Preliminary polygon; Method: Hand digitised - 100k Mapdata; Comment: To be GPS'ed
Old ID: Rainbow_G04
People: RH, JB, JL, PL, CW, LG Ranger hours: 24

RVCR2004_PB08 Eremophila plots - dry burn treatment

Fire_Type: Research Patches
Date_Start: 27/05/2004 see report (in prep) for further details
Location: South-western corner of park
Purpose: Research on rare Eremophila species. To burn Eremophila plots Id.....
Implementation Status: Implemented as prescribed
Area: 1.4 ha Length: 594 m
Remaining fuel: >70% burnt
Terrain & Vegetation: T. basedowii sandplain and dune sides, various shrubs
Soil Moisture: surface is dry but substantially moist at/below 5 cm
Control Line Info: Rakehoeing a line around each plot. Outer ring burnt around plots previously to provide added security to control line?
Fire Behaviour: moderate-high intensity
Mapping Status: Mapping complete; Method: gps of points; Comment: small polygons extrapolated from GPS points
Old ID: Rainbow_H04
People: JB, PL, LG, RH, Angus Duguid (OIC), Mark Harris Ranger hours: 18

RVCR2004_PB09 Eremophila plots - wet burn treatment

Fire_Type: Research Patches
Date_Start: 27/05/2004 see report (in prep) for further details
Location: Further south than RV2004-PB08a Eremophila plots
Purpose: Research on rare Eremophila species. To burn Eremophila plots Id.....
Implementation Status: Implemented as prescribed
Area: 1.2 ha
Remaining fuel: >70% burnt
Terrain & Vegetation: T. basedowii sandplain and dune sides, various shrubs
Soil Moisture: fully saturated
Control Line Info: Rakehoeing a line around each plot. Outer ring burnt around plots previously to provide added security to control line?
Weather Obs: 18b degrees, 15km/hr wind speed, NE wind direction, 80% cloud cover, 70% RH
Fire Behaviour: Low intensity - burnt out remaining fuel by lighting individual clumps
Mapping Status: Mapping complete; Method: gps of points; Comment: small polygons extrapolated from GPS points
Old ID: Rainbow_H04
People: JB, PL, LG, RH, Angus Duguid (OIC), Steve Nicholson, Mark Harris Ranger hours: 10 Other NTG hours: 0

RVCR2004_PB10 Eastern Boundary Gap Burn

Fire_Type: Linear - boundary fire breaks
Date_Start: 16/06/2004 Finished on 17/06/2004
Location: Between two ridges, half-way along the Eastern boundary
Purpose: To prevent fire from entering the park
Implementation Status: Implemented as prescribed
Area: 3.1 ha Length: 266 m
Burnt Break Width: 110m at narrowest; 130m predominant width
Connectivity: ties off
Remaining fuel: 60-90% burnt
Terrain & Vegetation: Sandplain with T. basedowii and Desert oaks
Soil Moisture: fully dry
Control Line Info: 26/05/04: JB, CW, PL, RH Rakehoeing
Weather Obs: 15 degrees, 3.7km/hr average winds, 14.2km/hr max. gust., 1-5 Percent cloud cover, 39 percent RH
Fire Behaviour: Moderate. We burnt back against the wind to protect trees and shrubs.
Other Comments: Fuel loads of 20-30 percent.
Mapping Status: Preliminary polygon; Method: Hand digitised - 100k Mapdata; Comment: To be GPS'ed
Old ID: Rainbow_G04
People: 16/06/2004 JB, PL, CW
17/06/2004 JB, PL, CW Ranger hours: 24

RVCR2005_PB01 Ranger camp burn

Fire_Type: Infrastructure-visitor protection
Date_Start: 19/07/2005 Extinguished on 19-Jul-05
Location: South of the ranger camp
Purpose: linear break
Implementation Status: Implemented
Area: 0.6 ha
Remaining fuel: percent burnt: 65
Terrain & Vegetation: Spinifex
Mapping Status: ; Method: GPS; Comment: Single Point
Old ID: RV2005-RV E05
People: PC, GF, HW, SM, Kylie Green Ranger hours: 8
Volunteer hours: 2

RVCR2005_PB02 Claypan burn

Fire_Type: Linear - other
Date_Start: 19/07/2005 Extinguished on 19-Jul-05
Location: In between the 2 small claypans west of the main claypan Purpose: linear break
Implementation Status: Implemented but incomplete
Area: 0.7 ha
Remaining fuel: percent burnt: 45
Terrain & Vegetation: Spinifex
Mapping Status: - Method: GPS; Comment: Single Point
Old ID: RV2005-RV B05
People: PC, GF, HW, SM, Kylie Green Ranger hours: 10
Volunteer hours: 2.5