UNIVERSITY OF BALLARAT

NANYA STATION WESTERN NEW SOUTH WALES:

CONSERVATION RESEARCH EDUCATION

Nanya Station, owned and managed by the University of Ballarat was purchased with assistance from the Department of Environment and Heritage. The University gratefully acknowledges support for ongoing management from the Lower Murray Darling Catchment Management Authority. Production of this brochure was made possible through funding from the Commonwealth Government Caring for our Country program.

CARING FOR OUR COUNTRY

UNIVERSITY of BALLARAT Australia

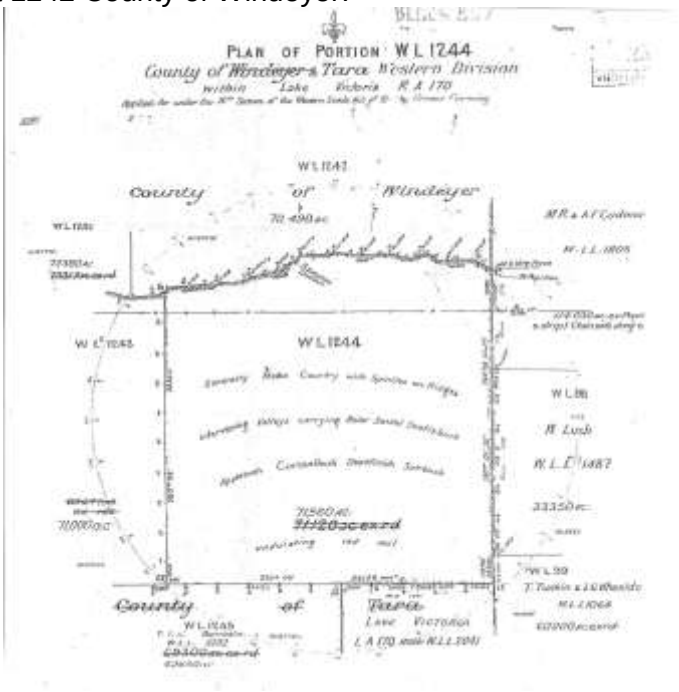
Lower Murray Darling CMA CATCHMENT MANAGEMENT AUTHORITY

FOREWORD

This booklet has been prepared as an introduction for visitors to Nanya Station. Nanya is managed for conservation, research and education and affords protection to highly significant environments including two endangered communities and twenty three endangered or vulnerable species. On your visit, please respect these values.

NANYA STATION

Nanya Station is located in the Scotia country, west of the Darling Ana-Branch in far western New South Wales and consists of the Nanya Western Lands Pastoral Lease 3281 – Perpetual Leasehold Lot 1244 in Deposited Plan 762778, Parish of Winnebaga, County of Tara and part of Lot 1242 County of Windeyer.



ABORIGINAL HISTORY

Nanya is within the tribal area of the Danggali Aboriginal people, a sub-group of the Barkindji. Many Aboriginal sites have been recorded adjacent to major rivers in the region providing evidence that these areas supported a large population. In areas such as Nanya located distant from any major water source, Aboriginal sites are generally restricted to sand dune locations near a soak or claypan. It is probable that the lack of water and the relative poverty of the mallee sandridge country mitigated against significant Aboriginal use of areas away from the rivers (NPWS 2001). Little is known about Aboriginal occupation of Nanya. A few artefact scatters were found during surveys prior to oil exploration in 1985.

An Aborigine known as Nhaanya left his camp near Pooncarie about 1860 with two women and a steel axe. He went into the Scotia area where he lived for over thirty years. By the early 1890s frequent sightings of the 'wild tribe' and tracks indicated that Nhaanya's family was increasing. White settlers, previously indifferent, became anxious for their welfare. In 1893 Aboriginal stockmen tracked down the family and persuaded them to return to the river. The twelve men, eight women and ten children, all in good physical condition, reached Popiltah station on 11 August (Lindsay 1986).

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Prepared by Martin Westbrooke,
Photography: Martin Westbrooke.
Map ; Sara Munawar. Location map courtesy 'The Age'

Nanya Homestead complex

Nanya Discharge Complex (G. Thomas)

Old-growth mallee

Nanya Homestead complex

PASTORAL HISTORY

The Scotia region has one of the shortest stock grazing histories of western NSW. Along with five other Scotia properties, Nanya was created as a pastoral lease in 1927. The first European settlement on the land followed exploration of the area by Sturt and Eyre (Withers 1989). In 1854, the Lake Victoria lease which encompassed this area comprised 465,000ha.included Scotia blocks 1, 2, 3 and 4, Amoskeag and Winnebaga which formed the area known as the Scotia. It was described as a region of thick mallee scrub, interspersed with bluebush flats and Belah woodland. The Land Act of 1884 divided large pastoral holdings into two areas, the leasehold to be held under a pastoral lease with tenure of fifteen years and the resumed area. Homestead leases from 15-25,000ha. were granted within the resumed areas. Following this act, the back blocks of the Lake Victoria lease, part of the Resumed Area, were offered as Homestead Leases however without access to water they remained untenanted, but sometimes adjacent properties used the land to run wethers during winter months. In the 1920s artesian water was found and the dry Scotia country was surveyed and divided into six Homestead leases allocated by ballot (Withers 1989). All properties were approximately 30,000ha. with a recommended stocking level of 3,000 sheep.

Winnebaga (renamed Nanya) was taken up by Gordon Cumming. He initially dug a dam near the southeast corner of the property. A larger ground tank and rudimentary dwelling at the site of the present complex was later established. An adjacent area was cleared and cropped to provide feed for the horses used in digging the earth tanks. The ruins of the original building are located between the shearing shed and Homestead Tank. A cottage was built in the 1930s and a more substantial Red Gum framed homestead in the early 1950s. The lease was held by Mr Gordon Cumming until 1984 when it was purchased by Mr Norm Scadding as an extension to the adjacent lease, Belvedere. It was sold in 1995 to Mr Rob Taylor of Waikerie then in 1999 to BeMax Pty. Ltd., a sand mining company. These last three owners all permitted use of the property by the University for teaching and research.

UNIVERSITY PURCHASE

The Centre for Environmental Management at the University of Ballarat had been involved in studies of flora and fauna in western New South Wales since 1988. Studies became concentrated on the Scotia region with its variety of intact ecosystems due to a short pastoral history. Of particular significance is a system of natural salt lakes of which the most extensive is the Scotia Discharge Complex located on Nanya Station. An extensive vegetation survey of the Scotia region (Westbrooke *et al*. 1998) highlighted the significance of the area both in terms of the range of communities in relatively intact condition and the occurrence of species and communities of restricted distribution. Nearly 400 species were recorded of which nine had either not previously been recorded or have restricted distribution in western NSW. Twenty-two plant communities occur on Nanya Station of which two, *Halosarcia lylei* low open shrubland and *Hemichroa diandra/Halosarcia/Frankenia* low open shrubland, are dominated by species not previously recorded from NSW. *H. lylei* and *Acacia loderi* shrublands are listed as endangered under the NSW Threatened Species Conservation Act.

As noted, the area has a relatively short grazing history and, due to the presence of large areas of mallee with a *Triodia* understorey and restricted water supplies, stocking rates have been low. The diversity of ecosystems in relatively intact condition and extensive areas of old growth mallee made Nanya a highly significant refuge for biological diversity. This factors led to the purchase of Nanya Station by the University of Ballarat in 2004 with the assistance of the Department of Environment and Heritage for the purposes of conservation, research and education. In 2010 the southern paddocks of Nagaella Station (10,000ha.) which lie along the northern boundary, were purchased with the assistance of Lower Murray Darling Catchment Management Authority and added to the Nanya lease to provide complete protection for the communities of the Nanya Discharge Complex and further high quality Malleefowl habitat.

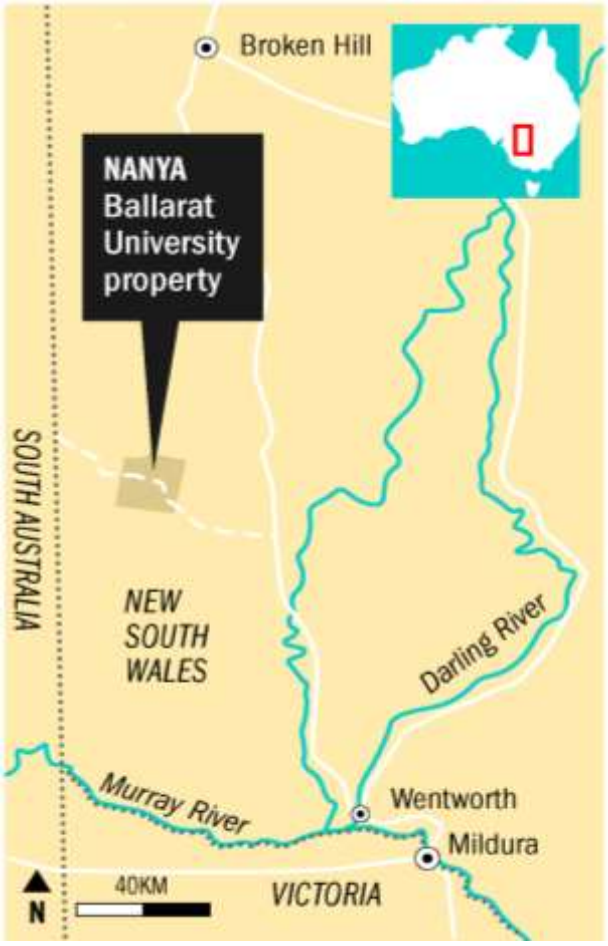


Fig. 1. Location of Nanya Station

PASTORAL HERITAGE FEATURES

Small 'Homestead leases', created as a result of government policy to break up the large pastoral holdings, provide a fascinating insight into a later period in the pastoral history of NSW and a period of Australia's history that is often not explored (Westbrooke & Westbrooke 2010). Pastoral heritage features present on Nanya include dwellings and outbuildings from three phases of its history and other elements including shearing shed with frame of Native Pine bush poles, yards with post and rail and palisade fencing, and a disused bore. The University aims to retain these reminders of its previous use alongside the environmental conservation measures being undertaken.

Ruins of original homestead

1930s cottage

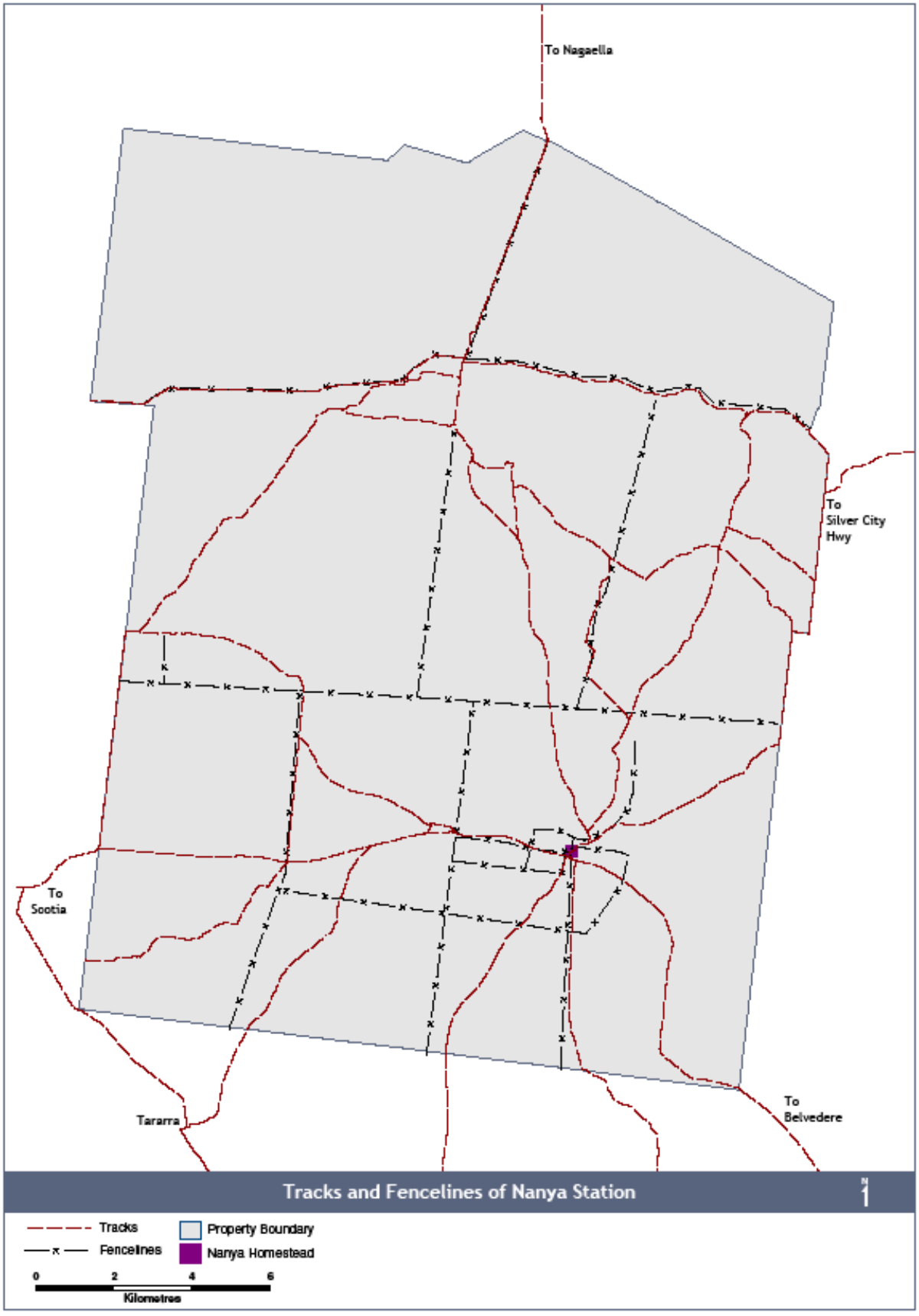
The disused Sturt Bore

1950s homestead

CONSERVATION MANAGEMENT

Nanya is to be managed under IUCN Category 1a conditions for preservation of ecosystems, research and education. It is the subject of a permanent conservation agreement with the NSW Government. The conservation values of Nanya are being protected and enhanced by:

- Reduction in total grazing pressure through closure of ground tanks, goat control and ripping of rabbit warrens. Assisting regeneration of restricted and endangered communities through total exclusion fencing of critical communities.
- Protecting the Malleefowl population through intensive exotic predator control and survey and monitoring of nest sites.
- Environmental research into topics including:
  - factors affecting distribution of plant and animal species
  - biodiversity impacts of ground tank closure
  - the interacting impacts of grazing, fire and flood.
  - adaptation of plants to salinity and gypsophily
- Aboriginal cultural sites identified will be managed in consultation with the Barkintji community.
- European cultural heritage sites will be conserved within the guidelines of the Burra Charter and the recommendations of recognised authorities in heritage conservation.


To Nagaella
To
Silver City
Hwy
To
Sootia
Tararra
To
Belvedere
Tracks and Fencelines of Nanya Station
N
Tracks
Fencelines
Property Boundary
Nanya Homestead
0
2
4
6
Kilometres

CLIMATE

The climate is classified as cool semi-arid (Dick 1975), the area being within climatic zone 1B for New South Wales (Edwards 1979): temperatures are high in summer and mild in winter with average daily maximum of 32^{O}C in February and 15^{O}C in July and average daily minima of 16^{O}C in February and 5^{O}C in July. The mean annual rainfall is approximately 220 mm; the seasonal distribution of rainfall is fairly even but annual variation is high.

GEOLOGY AND GEOMORPHOLOGY

Nanya lies within the Murray Basin geological province and consists of Quaternary material, with little rock outcropping (Lawrie & Stanley 1980). Two broad land systems dominate the landscape: dunefields consisting of low parallel ridges running east-west composed of red earthy sands and sandy solonised brown soils overlying sandy clays; and calcareous sandplains of loam or sandy loam solonised brown soils often with limestone nodules at the surface (Walker 1991). A number of salt lakes occur on Nanya. The largest complex of salt lakes, referred to as the Scotia Discharge Complex, has been the subject of a detailed hydrological study by Ferguson *et al.* (1995).

LAND SYSTEMS

Five distinct land systems occur on Nanya (Walker 1991) (Fig. 3).

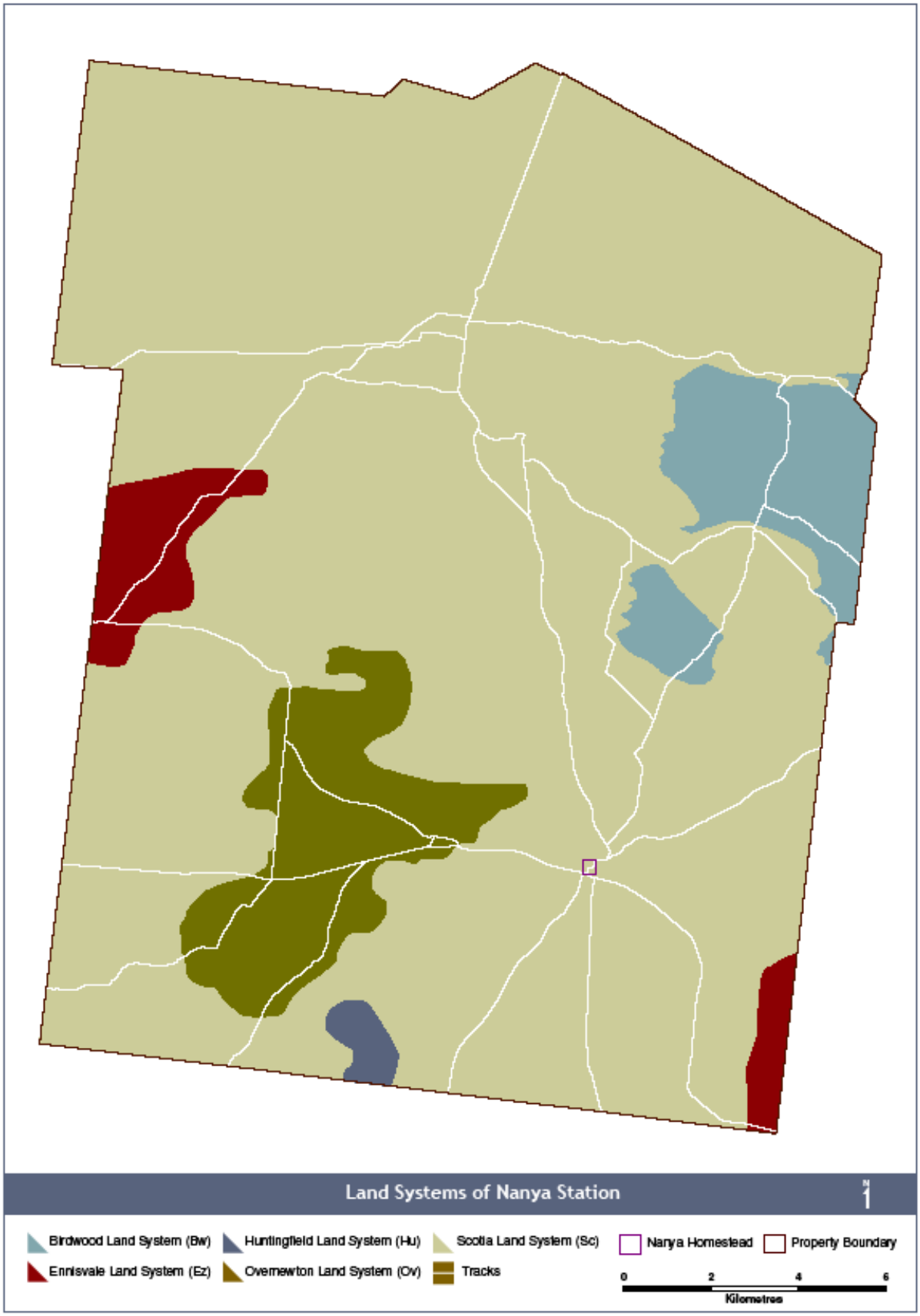
Scotia Land System (Sc)**:** this land system is evident through the majority of the property and comprises approximately 75% of the total area. It is typified by broad to narrow swales with earthy sands, loamy texture contrasts soils and solonised brown soils in swales. Isolated flats of brown soils with areas of dense mallee with inedible shrubs and spinifex.

Overnewton Land System (Ov)**:** this land system is evident through the central south western area of the property and comprises approximately 12% of the total area. It is typified by level to slightly undulating sand plains with isolated sandy hummocks and depressions, sand plains of calcareous loams and sandy loams with scattered bluebush,hopbush and emubushes.

Birdwood Land System (Bw)**:** comprises approximately 8% of the property's area and is evident near the far north east boundary of the property. It is typified by small relict ground water basins and lunettes with extensive associated sand plains and calcareous rises, and grey earths with scattered Belah and mallee.

Ennisvale Land System (Ez)**:** this land system occurs in the north west and south east corners of the property and comprises approximately 4% of the total area. It is typified by level to slightly undulating swales with aligned dunes and isolated flats. Solonized brown soils and red texture contrasts soils and dunes of deep brown sands with dense mallee, inedible shrubs and clumps of Black Bluebush.

Huntingfield Land System (Hu)**:** this land system juts into the central south boundary of the property and comprises approximately 1% of the total area. It is typified by small relict lakes and lunettes with extensive associated sand plains of scalded sandy loam to sandy solonised brown soils with Belah and Rosewood and abundant short grasses. Basin floors of highly saline or calcareous grey clays with scattered shrubs.


Land Systems of Nanya Station
Birdwood Land System (Bw)
Huntingfield Land System (Hu)
Scotia Land System (Sc)
Nanya Homestead
Property Boundary
Ennisvale Land System (Ez)
Overnewton Land System (Ov)
Tracks
0
2
4
6
Kilometres

VEGETATION

The vegetation of Nanya consists predominantly of *Eucalyptus gracilis/E. dumosa/E. socialis* open shrubland and *Casuarina pauper/Alectryon oleifolius* open woodland but 22 distinct communities occur (Table 1). While several of the communities are of limited distribution they add significantly to the conservation values of the property. The approximate percentage area occupied by each community, mean species richness, total species richness, mean percentage weediness and Benson (2006) equivalence of these communities are given in Table 1. Communities are described and illustrated grouped according to structural and floristic attributes.

Distribution of plant communities

The distribution of plant communities on Nanya is largely determined by minor changes in topography and associated soil type. *Eucalyptus* open-shrubland with *Triodia scariosa* understorey occurs on deep sandy soils of the dunes. *Eucalyptus* shrubland with a shrub understorey occurs in the swales. *Casuarina pauper* woodland occurs on calcareous plains of loamy solonised brown soils. *Atriplex vesicaria* low open shrubland is associated with the areas around the salt lake systems and on islands within the salt lakes while *Halosarcia/Osteocarpum/ Frankenia* and *Halosarcia lylei* low open-shrublands occur on and around the fringes of salt lakes.

Conservation values

Halosarcia lylei low open-shrubland has not previously been recorded from NSW (Harden 1990-1993). Whilst the species is not listed as endangered for Australia (Briggs and Leigh 1988) this is the only site in NSW from which it has been recorded and the community is now listed under the NSW Threatened Species Act. *Halosarcia/Frankenia/Osteocarpum* low open shrubland frequently includes *Hemichroa diandra* which has not previously been recorded from NSW. This species is not listed as endangered for Australia (Briggs and Leigh 1988) but is endangered in Victoria (Gullan *et al*. 1990). It is a new record for NSW and its widespread occurrence in this area is significant. A small area of *Acacia loderi open* shrubland, listed under the NSW Threatened Species Act, occurs to the north of the homestead complex. Gypseous low shrubland dominated by *Kippistia suaedifolia*, the *Atriplex vesicaria* shrubland and the *Callitris glaucophylla* open woodland are listed by Benson (2006) as vulnerable. The distribution of communities is shown on Fig. 4.

Species

Over 400 vascular plant species from 66 families have been recorded from Nanya including 62 (15%) exotics. The area, weediness, and species richness of each community is given in Table 1. A full listing of species is given as Appendix 1.

None of the species recorded is rare or threatened Australia-wide (Briggs & Leigh 1988) but nine have not previously been recorded, or have restricted distribution in western NSW (Harden 1990-93). *Halosarcia lylei*, *Hemichroa diandra, Podotheca angustifolia, Dodonaea stenozyga* and *Elachanthus glaber* have not previously been recorded for NSW; *Bergia trimera* and *Ptilotus atriplicifolius* have not been recorded for the south far western province; *Cratystylis conocephala* and *Kippistia suaedifolia* were previously known only from a few sites in NSW and were listed by Pressey (1993) as at risk. Beckers (1997) records *C. conocephala* and *K. suaedifolia* on Schedule 1, Part 1 endangered species for the Western Zone of NSW but does not list the other six species due to lack of records. With the exception of *C. conocephala, D. stenozygza* and *P. angustifolia,* which occur within *Eucalyptus* shrubland, these species are associated with the salt lakes. Nanya contains highly significant plant communities not otherwise represented in conservation reserves. The vegetation communities of south-western NSW have until recently been poorly conserved and the communities of Nanya are of particular significance due to their species richness, low weediness and occurrence of significant species.

Exotic species

Sixty exotic species have been recorded of which only one, *Nicotiana glauca* is a woody perennial. The most frequently occurring exotic species are the grasses, *Schismus barbatus*, *Medicago minima* and *Sisymbrium* spp..

Community	Area (ha)	Benson (2006) equivalent	Mean Species Richness	Mean % Weediness	Total Species Richness
1a *Casuarina pauper* woodland/open-woodland, mixed shrub understorey `		58	18	6	210
1b *Casuarina pauper* woodland/open-woodland, *Maireana sedifolia* understorey		254	12	33	12
1c *Casuarina pauper* woodland/Geijera parviflora open-woodland		57	22	11	57
1d *Callitris glaucophylla* open-woodland		28	23	5	62
1d *Hakea tephrosperma/ Hakea leucoptera* low open woodland		199	34	13	88
3a *Acacia aneura* open-shrubland		119	23	9	103
3b *Acacia loderi* tall open-shrubland		128	24	13	24
3a *Eucalyptus* spp. open-shrubland - shrub understorey		170/173	21	3	151
3b *Eucalyptus* spp. open-shrubland - *Triodia* understorey		171/172	14	1	75
3c *Eucalyptus gracilis/Melaleuca lanceolata,* open-shrubland		191	19	1	207
3d *Eucalyptus gracilis* open shrubland			24	25	25
4a *Dodonaea/Eremophila* shrubland		143	22	14	215
4b *Nitraria billardieri* shrubland		163			
4c *Lycium australe* shrubland		196			
4d *Atriplex vesicaria* low open-shrubland		157	11	5	53
4e *Maireana sedifolia* low open shrubland					
4f*Halosarcia/Frankenia/Hemichroa* low open-shrubland			8	2	96
4g *Halosarcia pergranulata* low shrubland		64			
4h *Halosarcia lylei* low open-shrubland		65	3	0	2
4i Gypseous shrubland		253			
5a *Stipa* spp. tussock grassland		165	12	25	12
5b Exotic herbland			12	41	37

Table 1. Area, Benson (2006) community equivalent, species richness and weediness of plant communities of Nanya Station.

Disturbance

Despite the relatively short grazing history of the area, some direct and indirect impacts of pastoral activity are evident. An area south of the homestead was cleared soon after the establishment of the lease and cropped for a few years to grow feed for horses used to assist in digging the earth tanks. Chaining (the clearing of overstorey trees by dragging a heavy chain between two bulldozers) was applied to limited areas in the 1970's to improve pasture growth. These chained areas of *C. pauper* open woodland now carry *Dodonaea/Eremophila* shrubland. A large number of 'shot lines' were bulldozed in the 1980's during geological survey. These are now regenerating but can still be identified.

Species richness of plant communities

More species have been recorded from both the *Casuarina pauper* open-woodland and the *Eucalyptus* shrubland communities than reported from surveys of examples of the communities at Mungo National Park (Westbrooke & Miller 1996) and Mallee Cliffs National Park (Morcom & Westbrooke 1990). Whilst this may be due to variation in sampling effort and seasonal variation in herb species it is likely to be a reflection of the relatively short grazing history of Nanya. Also of note is the high total species richness (215) of the *Dodonaea viscosa* ssp. *angustissima/ Eremophila sturtii* shrubland/open-shrubland. This may reflect its derivation from more than one naturally occurring community.

1. Woodlands

1a. *Casuarina pauper/Alectryon oleifolius* woodland/open-woodland with a mixed shrubby understorey

Casuarina pauper, growing to 10-12m, occurs as a dominant species on the loamy sands of interdune areas. It is frequently associated with *Alectryon oleifolius* ssp. *canescens* and/or *Myoporum platycarpum*. Commonly associated understorey shrubs are *Enchylaena tomentosa, Chenopodium curvispicatum, Maireana pentatropis, M. georgei, Sclerolaena obliquicuspis, Eremophila sturtii, Olearia muelleri* and *Senna artemesioides. Stipa* spp., *Vittadinia cuneata* and *Dissocarpus paradoxus* are frequent in the ground layer.

1b *Casuarina pauper/Alectryon oleifolius* woodland/open-woodland with *Maireana sedifolia* understorey

A *Casuarina pauper* community characterised by an understorey dominated by *Maireana sedifolia* occurs in areas near Seawards Tank in the north, around Sturt Bore in the west and on the eastern boundary.

1c *Casuarina pauper Alectryon oleifolius/Geijera parviflora* woodland/open-woodland with a mixed shrubby understorey

In the south east corner of the property *Casuarina pauper* woodland occurs in association with *Geijera parviflora*. *G. parviflora* has been shown to have a significant facilitation effect on ground flora (Warnock *et al*. 2008).

1d *Callitris glaucophylla* open-woodland

Callitris glaucophylla to 10m occurs as the dominant tree on a few sandy ridges. The community has an understorey of herbs and grasses including the native species *Actinobole uliginosum, Calandrinia eremaea, Calotis hispidula, Tetragonia tetragonioides Crassula colorata, Rhodanthe moschata* and *Zygophyllum ammophilum* with a high occurrence of exotic weeds including *Brassica tournefortii, Bromus rubens, Erodium cicutarium, Medicago minima* and *Sisymbrium irio*.

1e *Hakea leucoptera*/*Hakea tephrosperma* low open woodland

In a number of locations a low open-woodland with a near monospecific overstorey of *Hakea leucoptera* or *H. tephrosperma* to 7m occurs with an understorey of grasses and herbs.

2. Eucalypt shrublands (mallee)

2a *Eucalyptus oleosa/E. gracilis/E. dumosa* open-shrubland

Eucalyptus open-shrubland dominated by *E. oleosa*, *E. gracilis,* and *E. dumosa* to 8m. occurs on interdune plains. Understorey shrubs include *Enchylaena tomentosa, Chenopodium curvispicatum, Atriplex stipitata, Maireana pentatropis, M. georgei, Sclerolaena obliquicuspis, Eremophila sturtii, E. glabra, Olearia muelleri, Senna artemisioides*, *Myoporum platycarpum, Dodonaea viscosa* and *Acacia colletioides.* Frequently occurring grasses and herbs include *Stipa* spp., *Vittadinia cuneata* and *Dissocarpus paradoxus*.

2b *Eucalyptus* open-shrubland with *Triodia* understorey

On dune ridges *Eucalyptus* open-shrubland to 8m occurs characterised by the presence of *Triodia scariosa* as the dominant component of the understorey. The most frequent dominants are *Eucalyptus socialis, E. dumosa* and *E. gracilis* with *E. oleosa, E. costata* and *E. leptophylla* as more occasional associates. Commonly associated shrubs include *Dodonaea viscosa*, *Maireana pentatropis*, *Eremophila glabra* and *Grevillea huegelii*. Associated grasses and herbs include *Stipa* spp., *Podolepis capillaris* and *Vittadinia cuneata.*

2c *Eucalyptus gracilis/Melaleuca lanceolata* open-shrubland

In a narrow fringe around the salt lakes a mallee community to 8m occurs in which *Melaleuca lanceolata* is a prominent component. Associated shrubs confined to this community include *Leptospermum coriaceum, Acacia rigens* and *Hibbertia virgata. Disphyma crassifolium* ssp *clavellatum* is a common component of the ground layer.

2d *Eucalyptus gracilis* open-shrubland with *Disphyma crassifolium* ssp. *clavellatum*

Around the eastern edges of many of the salt lakes is a community dominated by generally aged examples of *Eucalyptus gracilis* with a low understorey dominated by *Disphyma crassifolium* ssp. *clavellatum and Maireana pentatropis.*

3. Acacia shrublands

3a *Acacia aneura* open-shrubland

Small areas of *Acacia aneura* tall open shrubland to 8m occur at a number of sites. The disturbed area around the homestead may have included a significant area of this community. Areas of *A. aneura* tall open shrubland are generally surrounded by *Casuarina pauper* woodland. The understorey is dominated by herbs and grasses.

3b *Acacia loderi* open-shrubland

An area of *A. loderi* tall open shrubland to 6 m occurs 500m north of the homestead. *A. loderi* shrubland is listed on the NSW Threatened Species Act as endangered due to lack of regeneration. The area on Nanya has been exclusion fenced to encourage regeneration within this community.

4. Low open shrublands

4a *Dodonaea viscosa* ssp. *angustissima/ Eremophila sturtii* shrubland/open-shrubland

In a number of areas *Dodonaea viscosa* ssp. *angustissima* and/or *Eremophila sturtii* form stands of varying density to 2m. *Acacia burkitti* may also be associated. The understorey consists of a variety of grasses and herbs. This community is regarded as resulting from past clearing of eucalypt open-shrubland or *Casuarina pauper* woodland.

4b *Nitraria billardieri* shrubland

Nitraria billardieri is a low rounded native shrub which is unpalatable to most grazers. It has tended to increase in areas of heavy grazing such as around water points.

4c *Lycium australe* shrubland

Small areas of low shrubland dominated by *Lycium australe* occur on the plains surrounding the salt lake system.

4d *Atriplex vesicaria* low open-shrubland

An extensive open-shrub community dominated by *A. vesicaria* occurs around the salt lakes. Frequently associated species include *Lycium australe, Disphyma crassifolium* ssp. *clavellatum, Maireana pentatropis, Scleroleana obliquicuspis* and *Stipa* spp.

4e *Maireana sedifolia* low open shrubland

To the south of Sturt Bore an area of *Maireana sedifolia* low open shrubland occurs, an example of a community far more extensive to the east of Nanya.

4e *Halosarcia/Frankenia/Osteocarpum* low open-shrubland

Around the perimeter of many salt lakes is a community dominated in varying proportions by *Halosarcia spp., Hemichroa diandra* (only known from this location in NSW), *Frankenia* spp. and *Osteocarpum acropterum* ssp. *diminutum.*

4f *Halosarcia lylei* low open-shrubland

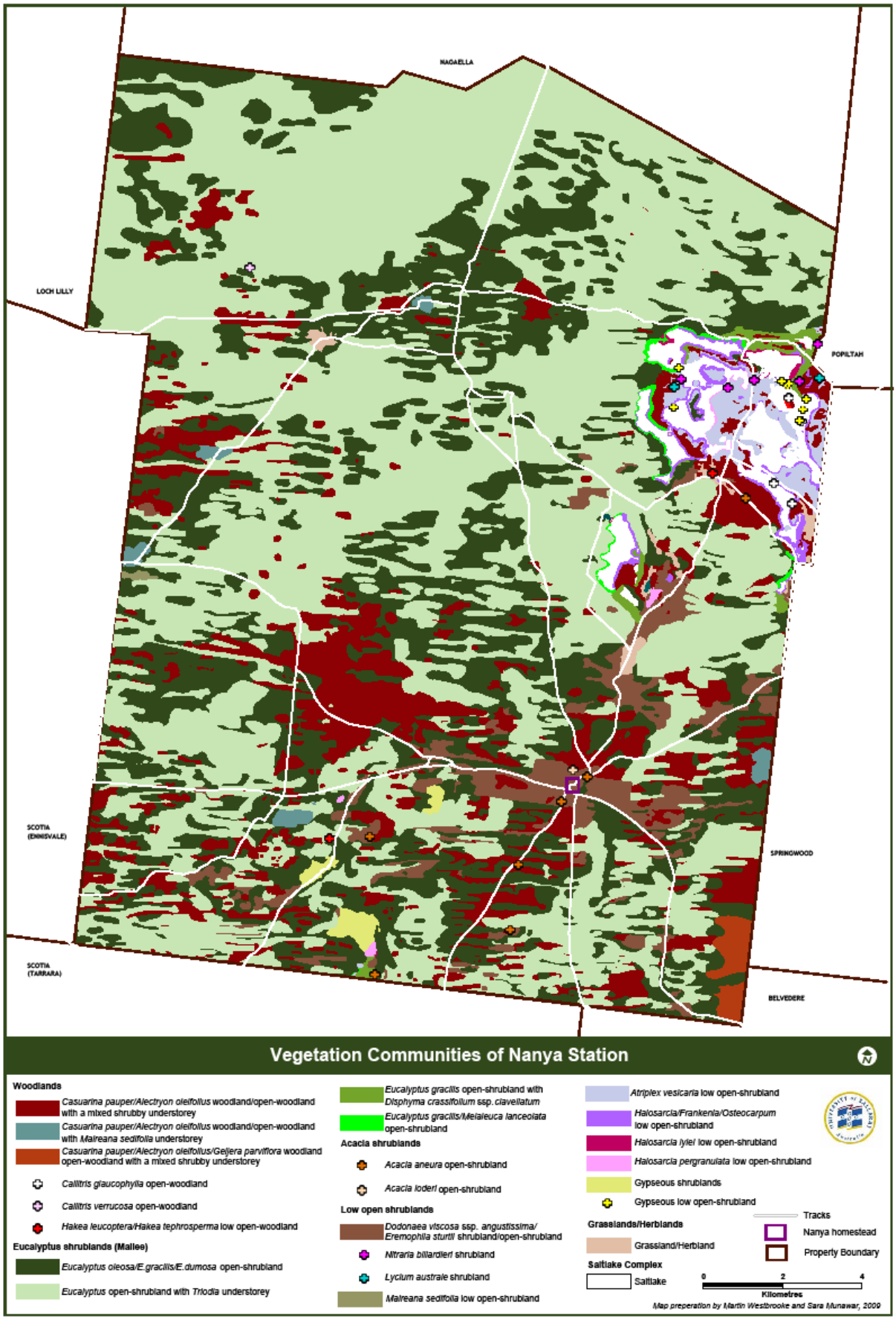
A near monospecific community of *Halosarcia lylei* occurs across the bed of smaller salt lakes and around the perimeter of larger lakes.

4g *Halosarcia pergranulata* low open-shrubland

Across many of the smaller lakebeds and around the perimeter of larger lakes is a near monospecific community dominated by *Halosarcia pergranulata*.

4h Gypseous shrubland

Areas of gypseous dunes around the salt lakes and on some islands within the salt lake complex support a low shrubland community dominated by the gypsophile, *Kippistia suaedifolia*.


NAGAELLA
LOCH LILLY
POPILTAH
SCOTIA (ENNISVALE)
SPRINGWOOD
SCOTIA (TARRARA)
BELVEDERE
Vegetation Communities of Nanya Station
Woodlands
Casuarina pauper/Alectryon oleifolius woodland/open-woodland with a mixed shrubby understorey
Casuarina pauper/Alectryon oleifolius woodland/open-woodland with Maireana sedifolia understorey
Casuarina pauper/Alectryon oleifolius/Geijera parviflora woodland open-woodland with a mixed shrubby understorey
Callitris glaucophylla open-woodland
Callitris verrucosa open-woodland
Hakea leucoptera/Hakea tephrosperma low open-woodland
Eucalyptus shrublands (Mallee)
Eucalyptus oleosa/E.gracilis/E.dumosa open-shrubland
Eucalyptus open-shrubland with Triodia understorey
Eucalyptus gracilis open-shrubland with Disphyma crassifolium ssp. clavellatum
Eucalyptus gracilis/Melaleuca lanceolata open-shrubland
Acacia shrublands
Acacia aneura open-shrubland
Acacia loderi open-shrubland
Low open shrublands
Dodonaea viscosa ssp. angustissima/ Eremophila sturtii shrubland/open-shrubland
Nitraria billardieri shrubland
Lycium australe shrubland
Maireana sedifolia low open-shrubland
Atriplex vesicaria low open-shrubland
Halosarcia/Frankenia/Osteocarpum low open-shrubland
Halosarcia lylei low open-shrubland
Halosarcia pergranulata low open-shrubland
Gypseous shrublands
Gypseous low open-shrubland
Grasslands/Herblands
Grassland/Herbland
Saltlake Complex
Saltlake
Tracks
Nanya homestead
Property Boundary
0
2
4
Kilometres
Map preperation by Martin Westbrooke and Sara Munawar, 2009

5. Grasslands/Herblands

5a Grassland

Open areas which are bare for extended periods develop dense *Stipa* spp. grassland after good spring rains.

5a Herbland

An artificial community consisting of largely exotic grasses and herbs with few associated shrubs occurs around the more reliable groundwater tanks and other highly disturbed areas.

VEGETATION MANAGEMENT

Single plant of *Dodonaea stenozyga* fenced for protection

Belah woodland - one of 22 community photopoints

Sugarwood regeneration

Acacia *loderi* grazing exclosure

FIRE

Eucalyptus shrubland is highly flammable and large areas burnt in the wildfires of 1976 (Rodda 1978). Fire promoted species such as *Codonocarpus cotonifolius* and *Halgania cyanea* were evident in these areas but are now declining. It is likely that much of the property burnt in the extensive wildfires that occurred in the region in 1917. In December 1996 a wildfire burned 3,000ha in the north west of Nanya and a further fire in December 1997 burned 5,000ha to west of the saltlake complex. Areas of *C. pauper* woodland, having a relatively non flammable understorey, and the chenopod shrublands did not burn in these fires. The distribution of the 1976, 1996 and 1997 fires is shown on Fig. 5.

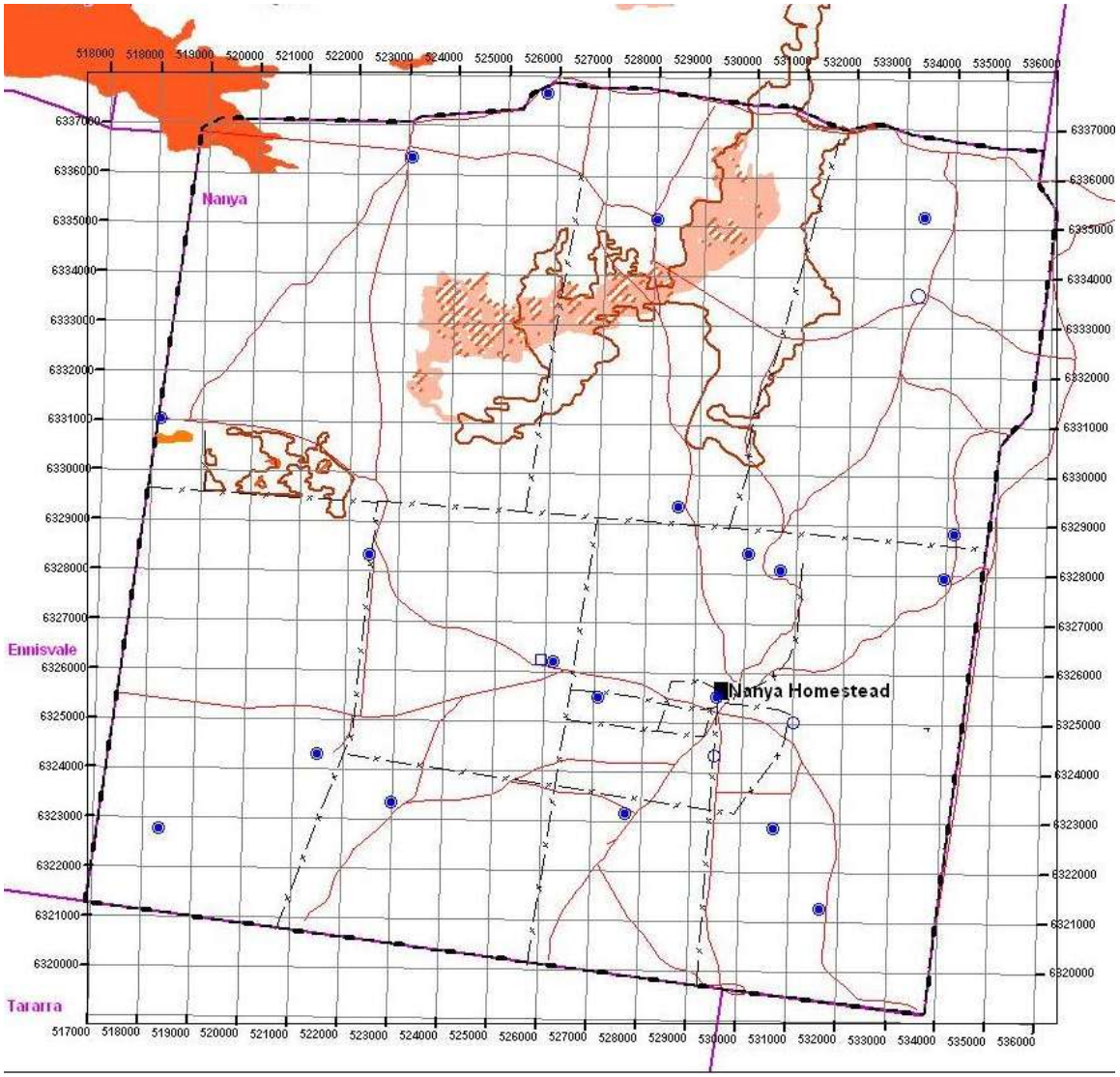


Fig. 5. Nanya fire history

1996 fire grazing exclusion

Desert Poplar – common after fire

FAUNA

The relatively intact communities and diverse vegetation of Nanya provides habitat for a wide range of mammals, birds, reptiles and invertebrates. Nanya is known to be home to 18 native mammal species, 110 species of birds, 47 species of reptile and one species of frog. A list of vertebrate species recorded is given as Appendix 2. Four exotic species are present: House Mouse, *Mus musculus* only occurs around the homestead complex, Fox, *Vulpes vulpes* and Cat *Felis cattus* are the subject of an intensive control program and Feral Goat, *Capra hircus*, is regularly trapped at water points. It is anticipated that the program of closure of watering points will help to eliminate the latter species.

Mammals

The most conspicuous members of the mammal fauna are Western Grey and Red Kangaroos however six small mammals and nine species of bat have also been recorded. Two species of mammal; *Cercartetus coccinnus,* Western Pygmy-possum and *Pseudomys bolami* Bolam's Mouse are listed as endangered under the NSW Threatened Species Conservation (TSC) Act. A further five species of mammals are listed as vulnerable under that Act: *Ningaui yvonneae*, Southern Ningaui, *Nyctophilus timorensis*, Eastern Long-eared Bat, *Pseudomys hermannsbergensis*, Sandy Inland Mouse, *Saccolaimus flaviventris*, Yellow-bellied Sheathtail Bat and *Vespadelus baverstocki*, Inland Forest Bat.

Birds

Nanya is home to a wide range of bird species. They include the nationally endangered *Leipoa osellata*, Malleefowl and *Manorina melanotis,* Black-eared Miner, listed under the Commonwealth Environmental Protection and Biodiversity Conservation Act. A number of active Malleefowl nests and live birds have been observed and a program of systematic survey has been initiated to map and characterise all nests. Nanya contains extensive old growth mallee providing suitable habitat for the Black-eared Miner. These species are also listed as endangered under the NSW TSC Act. A further four bird species are listed as vulnerable under this Act: *Amytornis striatus*, Striated Grasswren, *Cacatua leadbeateri*, Major Mitchell's Cockatoo, *Cinclosoma castanotus*, Chestnut Quail-thrush, and *Neophema splendida*, Scarlet-chested Parrot.

Reptiles

There is a highly diverse and abundant reptile fauna in all vegetation communities. It includes nine snakes and thirty-eight lizards. *Pseudonaja modesta,* Ringed Brown snake, is listed as endangered and *Tiliqua occipitalis*, Western Blue-tongued Lizard, as vulnerable under the TSC Act.

Amphibia

One burrowing frog, *Neobatrachus centralis*, Trilling Frog has been recorded from Nanya. This species occurs in large numbers following high rainfall events.

Mallefowl

Active Malleefowl nest

Western Pygmy-possum

Bolam's Mouse

Gould's Sand Goanna

Carpet Python

Peregrine Falcon

Major Mitchell's Cockatoo

Emu and chicks

Mallee Dragon

Striated Grass Wrens

Banded Brown Snake

APPENDIX 1 – VASCULAR PLANT SPECIES RECORDED FROM NANYA

Nomenclature according to Harden (1990-1993)
Exotic species denoted thus *

ADIANTACEAE
Cheilanthes austrotenuifolia

AIZOACEAE
Disphyma crassifolium ssp. *clavellatum*
**Mesembryanthemum crystallinum*
**Psilocaulon tenue*
Tetragonia eremaea

ALSTROMERIACEAE
Dicrastylis verticillata

AMARANTHACEAE
Hemichroa diandra
Ptilotus sessifolius
Ptilotus erubescens
Ptilotus exaltatus
Ptilotus gaudichaudii
Ptilotus nobilis
Ptilotus obovatus
Ptilotus polystachyus
Ptilotus seminudus
Ptilotus sessilifolius var. sessilifolius
Ptilotus spathulatus

APIACEAE
Daucus glochidiatus

ASCLEPIADACEAE
Leichhardtia australis
Rhyncharrhena linearis

ASTERACEAE
Actinobole uliginosum
Angianthus spp.
Angianthus tomentosus
**Arctotheca calendula*
Brachyscome ciliaris
Brachyscome exilis
Brachyscome lineariloba
Brachyscome trachycarpa
Bracteantha bracteata
Calotis cymbacantha
Calotis erinacea
Calotis hispidula
**Carthamus lanatus*
**Centaurea melitensis*
Centipeda crateriformis ssp. *compacta*
Centipeda cunninghamii
Centipeda minima
Centipeda thespidioides
**Chondrilla juncea*
Chrysocephalum apiculatum s.l.
Chthonocephalus pseudevax
**Cirsium vulgare*
**Conyza bonariensis*
Cratystylis conocephala
**Dittrichia graveolens*
Elachanthus glaber
Eriochlamys behrii
Euchiton sphaericus
Gnephosis arachnoidea
Gnephosis tenuissima
**Hedypnois cretica*
Hyalosperma demissum
Hyalosperma stoveae
**Hypochoeris glabra*
**Hypochoeris radicata*
Isoetopsis graminifolia
Ixiolaena leptolepis
Kippistia suaedifolia
**Lactuca serriola*
Lemooria burkittii
Millotia greevesii
Millotia myosotidifolia
Minuria cunninghamii
Minuria intergerrima
Myriocephalus rhizocephalus
Myriocephalus stuartii
Olearia muelleri
Olearia pimeleoides
Olearia subspicata
**Onopordum acaulon*
Podolepis capillaris
Podotheca angustifolia
Pogonolepis muelleriana
Pseudognaphalium luteoalbum
Pycnosorus pleiocephalus
**Reichardia tingitana*
Rhodanthe corymbiflora
Rhodanthe microglossa
Rhodanthe moschata
Rhodanthe pygmaea
Rhodanthe stuartiana
Rhodanthe tietkensii
Senecio glossanthus
Senecio minimus
Senecio pinnatifolius
Senecio quadridentatus
Senecio runcinifolius
**Sonchus asper s.l.*
**Sonchus oleraceus*
Stuartina muelleri
Triptilodiscus pygmaeus
Vi ttadinia cervicularis
Vittadinia cuneata
Vittadinia dissecta
Waitzia acuminata var. acuminata
**Xanthium spinosum*

BORAGINACEAE
**Echium plantagineum*
Halgania andromedifolia
Halgania cyanea
Heliotropium curassavicum
**Heliotropium europaeum*

*Heliotropium supinum
Omphalolappula concava
Plagiobothrys plurisepalus

BRASSICACEAE
*Alyssum linifolium
Arabidella trisecta
*Brassica tournefortii
*Carrichtera annua
Geococcus pusillus
Harmsiodoxa blennodioides
Harmsiodoxa brevipes var. brevipes
Lepidium leptopetalum
Lepidium papillosum
Lepidium phlebopetalum
Menkea australis
*Sisymbrium erysimoides
*Sisymbrium irio
*Sisymbrium orientale
Stenopetalum lineare
Stenopetalum sphaerocarpum

CACTACEAE
*Opuntia vulgaris

CAESALPINIACEAE
Senna artemisioides nothossp. coriacea
Senna artemisioides ssp. filifolia
Senna artemisioides ssp. Petiolaris
Senna artemisioides ssp. artemisioides

CAMPANULACEAE
Wahlenbergia communis s.l.
Wahlenbergia gracilenta s.l.
Wahlenbergia gracilis s.l.

CARYOPHYLLACEAE
Gypsophila tubulosa
*Herniaria cinerea
Scleranthus minusculus
*Silene apetala
*Spergularia diandra
*Spergularia rubra

CASUARINACEAE
Casuarina pauper

CHENOPODIACEAE
Atriplex acutibractea
Atriplex eardleyae
Atriplex holocarpa
Atriplex lindleyi ssp. inflata
Atriplex nummularia
Atriplex pumilio
Atriplex stipitata
Atriplex suberecta
Atriplex vesicaria
*Chenopodium album
Chenopodium cristatum
Chenopodium curvispicatum
Chenopodium desertorum ssp. desertorum
Chenopodium desertorum ssp. rectum
Chenopodium melanocarpum
*Chenopodium murale
Chenopodium nitrariaceum
Chenopodium spp.
Chenopodium ulicinum
Dissocarpus paradoxus
Einadia nutans
Enchylaena tomentosa var. tomentosa
Eriochiton sclerolaenoides
Halosarcia halocnemoides ssp. halocnemoides
Halosarcia indica
Halosarcia lylei
Halosarcia pergranulata
Halosarcia pterygosperma ssp. pterygosperma
Maireana appressa
Maireana brevifolia
Maireana ciliata
Maireana decalvans
Maireana erioclada
Maireana georgei
Maireana integra
Maireana lobiflora
Maireana pentatropis
Maireana pyramidata
Maireana radiata
Maireana rohrlachii
Maireana sedifolia
Maireana trichoptera
Maireana triptera
Maireana turbinata
Malacocera tricornis
Neobassia spp.
Osteocarpum acropterum var. deminutum
Rhagodia spinescens
Rhagodia ulicina
Salsola kali
Sclerolaena bicornis
Sclerolaena decurrens
Sclerolaena diacantha
Sclerolaena divaricata
Sclerolaena muricata
Sclerolaena obliquicuspis
Sclerolaena parviflora
Sclerolaena patenticuspis
Sclerolaena tricuspis
Sclerostegia tenuis
Stelligera endecaspinis

CONVOLVULACEAE
Convolvulus erubescens

CRASSULACEAE
Crassula colorata
Crassula sieberiana

CUCURBITACEAE
*Citrullus colocynthis
*Cucumis myriocarpus
Mukia micrantha

CUPRESSACEAE
Callitris glaucophylla

Callitris verrucosa

CYPERACEAE
Schoenus subaphyllus

DILLENIACEAE
Hibbertia virgata

ELATINACEAE
Bergia trimera

EUPHORBIACEAE
Beyeria opaca
Chamaesyce drummondii
Poranthera microphylla

FABACEAE
Daviesia ulicifolia
Eutaxia diffusa/microphylla
Indigophora australis
Lotus cruentus
**Medicago laciniata*
**Medicago minima*
**Medicago polymorpha*
**Melilotus indicus*
Swainsona murrayana
Swainsona purpurea
Templetonia egena

FRANKENIACEAE
Frankenia connata
Frankenia foliosa
Frankenia pauciflora ssp*. pauciflora*
Frankenia serpyllifolia
GENTIANACEAE
**Centaurium spicatum*
**Centaurium tenuiflorum*

GERANIACEAE
**Erodium botrys*
**Erodium cicutarium*
Erodium crinitum

GOODENIACEAE
Goodenia fascicularis
Goodenia pinnatifida
Goodenia pusilliflora
Scaevola depauperata
Scaevola spinescens
Velleia connata

GYROSTEMONACEAE
Codonocarpus cotinifolius

HALORAGACEAE
Glischrocaryon behrii
Haloragis aspera
Haloragis odontocarpa
Myriophyllum verrucosum
Myriophylum sp*.*

LAMIACEAE
**Marrubium vulgare*
**Salvia verbenaca*
Teucrium racemosum var. racemosum
Westringia rigida

LAURACEAE
Cassytha melantha

LILIACEAE
Bulbine bulbosa
Dianella revoluta
Thysanotus baueri

LOGANIACEAE
Logania nuda

LORANTHACEAE
Amyema linophyllum ssp. orientale
Amyema miquelii
Amyema miraculosum ssp. boormanii
Amyema preissii
Lysiana exocarpi ssp. exocarpi

MALVACEAE
Abutilon fraseri
Lawrencia glomerata
Lawrencia squamata
**Malva parviflora*
**Modiola caroliniana*
Radyera farragei
Sida ammophila
Sida corrugata var*. corrugate*
Sida fibulifera
Sida intricate
Sida spodochroma
Sida trichopoda

MARSILEACEAE
Marsilea angustifolia
Marsilea costulifera
Marsilea drummondii

MIMOSACEAE
Acacia acanthoclada
Acacia aneura
Acacia brachybotrya
Acacia burkittii
Acacia colletioides
Acacia ligulata
Acacia loderi
Acacia oswaldii
Acacia rigens
Acacia sclerophylla
Acacia wilhelmiana

MYOPORACEAE
Eremophila deserti
Eremophila divaricata ssp*. divaricata*
Eremophila glabra ssp. *glabra*
Eremophila glabra ssp. *murrayenis*
Eremophila hillii
Eremophila longifolia
Eremophila maculata var*. maculata*
Eremophila oppositifolia ssp*. oppositifolia*

Eremophila scoparia
Eremophila sturtii
Myoporum platycarpum
Myoporum viscosum

MYRTACEAE
Baeckea crassifolia
Eucalyptus costata/incrassata
Eucalyptus dumosa
Eucalyptus gracilis
Eucalyptus leptophylla
Eucalyptus oleosa
Eucalyptus porosa
Eucalyptus socialis
Leptospermum coriaceum
Melaleuca lanceolata

NYCTAGINACEAE
Boerhavia dominii

OLEACEAE
Jasminum didymum ssp*. lineare*

OPHIOGLOSSACEAE
Ophioglossum lusitanicum

ORCHIDACEAE
Pterostylis biseta s.l.

OXALIDACEAE
Oxalis perennans
**Oxalis pes-caprae*

PITTOSPORACEAE
Billardiera cymosa
Pittosporum phylliraeoides

PLANTAGINACEAE
Plantago cunninghamii
Plantago drummondii
Plantago varia

POACEAE
Agrostis avenacea
Amphipogon caricinus var*. caricinus*
Aristida contorta
Aristida spp.
Austrostipa acrociliata
Austrostipa drummondii
Austrostipa elegantissima
Austrostipa eremophila
Austrostipa mollis
Austrostipa nitida
Austrostipa scabra ssp*. scabra*
Austrostipa spp.
Austrostipa trichophylla
Austrostipa tuckeri
Bromus arenarius
**Bromus rubens*
Chloris truncata
**Critesion murinum* ssp*. leporinum*
Cynodon dactylon
Danthonia eriantha
Danthonia setacea
Enneopogon intermedius
Enneapogon nigriceps
Enteropogon acicularis
Eragrostis australasica
Eragrostis dielsii
Eragrostis eriopoda
Eragrostis falcata
Eragrostis setifolia
**Holcus lanatus*
**Panicum capillare*
Paspalidium gracile
**Rostraria pumila*
**Schismus barbatus*
Triodia scariosa ssp*. scariosa*
**Vulpia myuros*

POLYGONACEAE
**Emex australis*
Muehlenbeckia diclina
Muehlenbeckia florulenta
Polygonum plebeium
**Rumex crispus*
Rumex tenax

PORTULACACEAE
Calandrinia eremaea

PRIMULACEAE
**Anagallis arvensis*

PROTEACEAE
Grevillea huegelii
Grevillea pterosperma
Hakea leucoptera
Hakea tephrosperma

RANUNCULACEAE
Ranunculus pumilio

RHAMNACEAE
Cryptandra propinqua

RUBIACEAE
Asperula conferta
Synaptantha tillaeaceae

RUTACEAE
Geijera parviflora

SANTALACEAE
Exocarpos aphyllus
Exocarpos sparteus
Santalum acuminatum

SAPINDACEAE
Alectryon oleifolius ssp*. canescens*
Dodonaea bursariifolia
Dodonaea viscosa ssp*. angustissima*
Dodonaea stenozyga
SCROPHULARIACEAE
Limosella australis

Stemodia floribunda

SOLANACEAE
Duboisia hopwoodii
Lycium australe
**Lycium ferocissimum*
**Nicotiana glauca*
Nicotiana goodspeedii
Nicotiana occidentalis
Nicotiana simulans
Nicotiana velutina
Solanum coactiliferum
Solanum esuriale
**Solanum nigrum*

THYMELAEACEAE
Pimelea microcephala ssp. microcephala
Pimelea simplex ssp. *simplex*
Pimelea trichostachya

URTICACEAE
Parietaria debilis

VERBENACEAE
**Verbena supina*

XANTHORRHOEACEAE
Lomandra effusa
Lomandra leucocephala ssp. robusta

ZYGOPHYLLACEAE
Nitraria billardierei
Tribulus terrestris
Zygophyllum ammophilum
Zygophyllum angustifolium
Zygophyllum apiculatum
Zygophyllum aurantiacum
Zygophyllum billardieri
Zygophyllum crenatum
Zygophyllum eremaeum
Zygophyllum glaucum
Zygophyllum iodocarpum
Zygophyllum ovatum

APPENDIX 2 – VERTEBRATE SPECIES RECORDED FROM NANYA

CLASS MAMMALIA

EUTHERIA

Muridae

Pseudomys hermannsbergensis	Sandy Inland Mouse
Pseudomys bolami	Bolam's Mouse
**Mus musculus*	House Mouse

Eballonuridae

Saccolaimus flaviventrus	Sheathtail Bat

Molossidae

Mormopterus planiceps	Little Mastiff Bat
Nyctinomus australis	White-striped Bat

Verspertilionidae

Chalinolobus gouldii	Gould's Wattled Bat
Chalinolobus picatus	Little Pied Bat
Nyctophilus geoffroyi	Lesser Long-eared Bat
Nyctophilus timoriensis timoriensis	Eastern Long-eared bat
Scotorepons balstoni	Greater Long-eared Bat
Vespadelus baverstocki	Inland Forest Bat

Canidae

**Vulpes vulpes*	European Red Fox

Bovidae

**Capra hircus*	Feral Goat

MONOTREMATA

Tachyglossus aculeatus	Echidna

MARSUPALIA

Dasyuridae

Sminthopsis crassicaudata	Fat-tailed Dunnart
Sminthopsis murina	Common Dunnart
Ningaui yvonnii	Yvonne's Ningaui

Macropodidae

Macropus rufus	Red Kangaroo
Macropus fuliginosus melanops	Western Grey-kangaroo

Phalangeridae

Cercartetus concinnus	Western Pygmy-possum

CLASS REPTILIA

Boidae	
Morelia spilota metcalfei	Victorian Carpet Python
Elapidae	
Demansia psammophis	Yellow-faced Whipsnake
Furina diadema	Red-naped Snake
Pseudonaja modesta	Ringed Brown Snake
Simoselaps australis	Coral Snake
Vermicella annulata	Bandy-bandy
Brachyurophis australis	Australian Coral Snake
Suta nigriceps	Curl Snake
Typhlopidae	
Ramphotyphlops australis	Southern Blind Snake
Varanidae	
Varanus gouldii	Sand Goanna
Varanus varius	Lace Monitor
Gekkonidae	
Diplodactylus vittatus	Eastern Stone Gecko
Diplodactylus williamsi	Eastern Spiny-tailed Gecko
Diplodactylus elderi	
Diplodactylus intermedius	Spiny-tailed Gecko
Gehyra variegata	Varigated Detalla
Heteronotia binoei	Bynoe's Gecko
Lucasium damaeum	Beaded Gecko
Nephrurus levis	Smooth Knob-Tailed Gecko
Oedura marmorata	Marbled Velvet Gecko
Rhynchoedura omata	Beaked Gecko
Pygopodidae	
Delma australis	Southern Legless Lizard
Delma butleri	Butler's legless lizard
Pygopus nigriceps	Hooded Scaley-Foot
Lialis burtonis	Burton's snake-lizard
Scincidae	
Cryptoblepharus carnabyi	Carnaby's Wall Skink
Ctenotus atlas	Spinifex Stripped Skink
Ctenotus regius	Royal Ctenotus
Ctenotus schomburgkii	
Ctenotus brachyonyx	Skink
Egernia inornata	Desert Skink
Egernia striolata	Tree Skink
Eremiascincus richardsonii	Broad-banded Sand-Swimmer
Lerista labialis	
Lerista punctatovittata	Speckled Short-limbed Skink
Lerista xanthura	
Menetia greyii	Grey's Skink
Morethia boulengeri	Fire Skink
Morethia adelaidensis	Skink
Tiliqua occipitalis	Western Blue-Tongue
Trachydosaurus rugosa	Stumpy-Tailed Lizard
Agamidae	
Amphibolurus nobbi coggeri	Nobbi Dragon
Ctenophorus fordi	Mallee Military Dragon
Ctenophorus pictus	Painted Dragon
Ctenophorus pictus	Painted dragon
Pogona barbata	
Pogona vitticeps	Central Bearded Dragon

CLASS AMPHIBIA

Myobatrachidae	
Neobatrachus centralis	Trilling Frog

CLASS AVES	
Casuariidae	
Dromaius novaehollandiae	Emu
Megapodiidae	
Leipoa ocellata	Malleefowl
Anatidae	
Chenonetta jubata	Australian Wood Duck
Anas superciliosa	Pacific Black Duck
Anas gracilis	Grey Teal
Podicipedidae	
Tachybaptus novaehollandiae	Australasian Grebe
Ardeidae	
Ardea pacifica	White-necked Heron
Accipitridae	
Haliastur sphenurus	Whistling Kite
Elanus axillaris	Black-shouldered Kite
Milvus migrans	Black Kite
Accipiter cirrhocephalus	Collared Sparrowhawk
Aquila audax	Wedge-tailed Eagle
Hieraaetus morphnoides	Little Eagle
Falconidae	
Falco peregrinus	Peregrine Falcon
Falco berigora	Brown Falcon
Falco cenchroides	Nankeen Kestrel
Rallidae	
Gallinula tenebrosa	Dusky Moorhen
Gallinula ventralis	Black-tailed Native-hen
Turnicidae	
Turnix velox	Little Button-quail
Charadriidae	
Elseyornis melanops	Black-fronted Dotterel
Erythrogonys cinctus	Red-kneed Dotterel
Vanellus miles	Masked Lapwing
Laridae	
Larus novaehollandiae	Silver Gull
Columbidae	
Phaps chalcoptera	Common Bronzewing
Ocyphaps lophotes	Crested Pigeon
Geopelia cuneata	Diamond Dove
Cacatuidae	
Eolophus roseicapilla	Galah
Cacatua sanguinea	Little Corella
Cacatua leadbeateri	Major Mitchell's Cockatoo
Psittacidae	
Barnardius zonarius	Australian Ringneck
Psephotus varius	Mulga Parrot
Neophema splendida	Scarlet-chested Parrot
Neophema chysostoma	Blue-winged Parrot
Northiella haematogaster	Blue Bonnet
Polytelis anthopeplus	Regent Parrot
Psephotus haematonotus	Red-rumped Parrot
Melopsittacus undulatus	Budgerigar
Cuculidae	
Cuculus pallidus	Pallid Cuckoo
Chrysococcyx osculans	Black-eared cuckoo
Chrysococcyx basalis	Horsfield's Bronze-Cuckoo
Strigidae	
Ninox novaeseelandiae	Southern Boobook
Caprimulgidae	
Eurostopodus argus	Spotted Nightjar
Aegothelidae	
Aegotheles cristatus	Australian Owlet-nightjar
Halcyonidae	

Todiramphus pyrrhopygia	Red-backed Kingfisher
Meropidae	
Merops ornatus	Rainbow Bee-eater
Climacteridae	
Climacteris picumnus	Brown Treecreeper
Climacteric affinis	White-browed treecreeper
Neosittidae	
Daphoenositta chysoptera	Varied Sittella
Maluridae	
Malurus splendens	Splendid Fairy-wren
Malurus leucopterus	White-winged Wren
Malurus lamberti	Variegated Fairy-wren
Sub.Fam. Amytornithinae	
Amytornis striatus	Striated Grasswren
Pardalotidae	
Pardalotus punctatus	Spotted Pardalote
Pardalotus striatus	Striated Pardalote
Smicrornis brevirostris	Weebill
Acanthiza apicalis	Inland Thornbill
Acanthiza uropygialis	Chestnut-rumped Thornbill
Acanthiza nana	Yellow Thornbill
Aphelocephala leucopsis	Southern Whiteface
Drymodes brunneopygia	Southern Scrub-robin
Hylacola cauta	Shy Heathwren
Meliphagidae	
Acanthagenys rufogularis	Spiny-cheeked Honeyeater
Plectorhyncha lanceolata	Striped Honeyeater
Manorina melanotis	Black-eared Miner
Manorina flavigula	Yellow-throated Miner
Lichenostomus virescens	Singing Honeyeater
Lichenostomus leucotis	White-eared Honeyeater
Lichenostomus ornatus	Yellow-plumed Honeyeater
Lichenostomus plumulus	Grey-fronted Honeyeater
Melithreptus brevirostris	Brown-headed Honeyeater
Phylidonyris albifrons	White-fronted Honeyeater
Certhionyx variegatus	Pied Honeyeater
Epthianura tricolor	Crimson Chat
Epthianura albifrons	White-fronted Chat
Petroicidae	
Microeca leucophaea	Jacky Winter
Petroica goodenovii	Red-capped Robin
Melanodryas cucullata	Hooded Robin
Pomatostomidae	
Pomatostomus superciliosus	White-browed Babbler
Pomatostomus ruficeps	Chestnut-crowned Babbler
Cinclosomatidae	
Cinclosoma castanotum	Chestnut Quail-thrush
Pachycephalidae	
Oreoica gutturalis	Crested Bellbird
Pachycephala rufiventris	Rufous Whistler
Pachycephala rufogularis	Red-lored Whistler
Pachycephala pectoralis	Golden Whistler
Pachycephala inornata	Gilberts Whistler
Colluricincla harmonica	Grey Shrike-thrush
Dicruridae	
Grallina cyanoleuca	Magpie-Lark
Rhipidura leucophrys	Willie Wagtail
Myiagra inquieta	Restless Flycatcher
Campephagidae	
Coracina novaehollandiae	Black-faced Cuckoo-Shrike
Lalage sueurii	White-winged Triller
Artamidae	
Artamus personatus	Masked Woodswallow

Artamus superciliosus	White-browed Woodswallow
Artamus cyanopterus	Dusky Woodswallow
Artamus cinereus	Black-faced Woodswallow
Cracticus nigrogularis	Pied Butcherbird
Cracticus torquatus	Grey Butcherbird
Streptera versicolour	Grey Currawong
Gymnorhina tibicen	Australian Magpie
Corvidae	
Corvus coronoides	Australian Raven
Corvus mellori	Little Raven
Corcoracidae	
Corcoraz melanorhamphos	White-winged Chough
Struthidea cinerea	Apostlebird
Motacilidae	
Anthus novaeseelandiae	Richard's Pipit
Dicasidae	
Dicaeum hiriundinaceum	Misteltoebird
Hirundinidae	
Hirundo neoxena	Welcome Swallow
Hirundo nigricans	Tree Martin
Hirundo ariel	Fairy Martin
Sylviidae	
Cinclorhamphus cruralis	Brown Songlark
Sturnidae	
Sturnus vulgaris	Common Starling

WILDLIFE RESEARCH

Radio tracking feral goats

Monitoring Malleefowl nest

Bandy bandy

Pitfall traps for reptiles and small mammals

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Frankenia foliosa

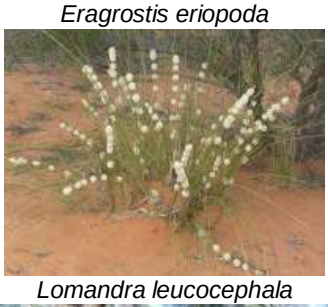
Sclerolaena diacantha

Eremophila glabra

Eragrostis eriopoda

Hemichroa diandra

Disphyma crassifolium



Lomandra leucocephala

Dodonaea stenozyga

Maireana sedifolia

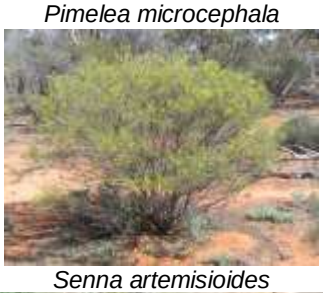
Exocarpos aphyllus

Eremophila scoparia

Pimelea microcephala

Swainsona formosa

Eremophila maculata



Senna artemisioides

Acacia colletioides

Maireana georgii

Zygophyllum aurantiacum

Grevillea huegelii

Cratystylis conocephala

Alectryon oleifolius

SOME PLANTS OF NANYA