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Moningarin BioBlitz Report

Moningarin Water & Recreation Reserves
(Ninghan L 9231 & 21333)

September 2003

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Cover photo: The 2003 Moningarin BioBlitz team. Photo: Mick Davis/WWF-Australia. All other photos by Mick Davis/WWF-Australia unless otherwise stated.

Acknowledgments

WWF-Australia would like to acknowledge the many individuals and groups who helped in the preparation, delivery and wrap-up of the 2003 Moningarin BioBlitz. Special thanks are extended to the following:

- Koorda Community Landcare Coordinator Vanessa Fuchsbichler and the Shire of Koorda - for their invaluable help with logistics before, during and after the event;

- the Badgerin Tennis Club and its members - who provided their club grounds as a base-camp and headquarters for the BioBlitz, and joined in the activities on the day;

- Paul Blechynden, Regional Manager of the Merredin Office of the Department of Conservation and Land Management - who provided invaluable support the BioBlitz;

- the WA Water Corporation - which provided access to, and information about, the Moningarin Reserve for use in the BioBlitz planning and reporting.

Special thanks are also extended to all of the BioBlitz Team Leaders; and to Kevn Griffiths and Eric McCrum for additional collection and identification of fungi and lichens.

Finally, a sincere thank-you to all of the volunteer participants who made the trip to Koorda for the 2003 BioBlitz, and the members of the local community, who contributed their time and expertise to help make the 2003 Moningarin BioBlitz such a great success.

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Woodland Watch Project Officer
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1. INTRODUCTION

1.1. Project Description

The 2003 Moningarin BioBlitz, the second BioBlitz to be conducted by WWF-Australia in the WA Wheatbelt, was conducted over the weekend of September 13 and 14, 2003[1]. The 2003 Moningarin BioBlitz was a community-based, collaborative, 24-hour biological survey of the Moningarin Water and Recreation Reserve in the Shire of Koorda, and was conducted as a core component of WWF's Woodland Watch project. In the north-eastern Wheatbelt this project is delivered in partnership with the North Eastern Wheatbelt Regional Organisation of Councils (NEWROC), of which the Shire of Koorda is a member, and the Avon Catchment Council. During the 2003 Moningarin BioBlitz, professional and amateur biologists, ecologists and naturalists – all working as volunteers for WWF-Australia – carried-out a series of concurrent biological surveys. They were joined by members of the Koorda, Mollerin and Badgerin communities who attended the BioBlitz primarily to discover more about the biodiversity of one of the community's favourite local reserves. The data obtained during the 2003 Moningarin BioBlitz is useful as a general indicator of the environmental health and conservation value of the Reserve, as well as providing valuable baseline data for future monitoring and Reserve management and conservation decision-making.

1.2. Background

The 2003 Moningarin BioBlitz involved the gathering of an enthusiastic, multidisciplinary biodiversity survey team which had been brought together specifically for the event by staff from WWF-Australia's Woodland Watch project. The 2003 Moningarin BioBlitz was the second BioBlitz organised by WWF-Australia in the NEWROC area - following the very successful 2002 Lake McDermott BioBlitz, which was conducted in the Shire of Mount Marshall.

[1] For more information on the BioBlitz process, please refer to the BioBlitz Organisational Guide **(CMNH 1995)** online at http://web.uconn.edu/mnh/bioblitz/

The Woodland Watch BioBlitz was fully supported by NEWROC - with which WWF-Australia has a partnership agreement.

In recent decades there has been a gradual increasing of awareness within the Shire of Koorda regarding the significance of the region's natural assets, with a number of surveys being conducted in some of the region's more significant patches of remnant vegetation.

At least one biological survey is known to have previously been conducted in the Moningarin Reserve - during the early 1990s - as part of a review of WA Wheatbelt water reserves by the Western Australian Water Corporation. No other surveys are known to have been carried-out in the Moningarin bushland.

In recognition of the value of biological data to better inform planning and decision-making, the Shire of Koorda was integrally involved in the organisation and delivery of the 2003 Moningarin BioBlitz, providing logistical, personnel and in-kind support, as well as authorization (in addition to the relevant state government agencies) for the collection of botanical specimens from the Shire Reserve.

1.3. Rationale

The annual NEWROC BioBlitzes have been conducted to provide much-needed knowledge about the biological composition of specific Wheatbelt reserves, as well as contributing towards increased community capacity; raised awareness about the natural values of significant patches of local bush; and the key threatening processes affecting their long-term future. In organising the BioBlitz, WWF-Australia has collaborated with NEWROC and its member communities (the shires of Koorda, Wyalkatchem, Mount Marshall, Trayning, Nungarin, Mukinbudin and Westonia) to learn more about biodiversity in the region and the value of remnant vegetation under local government management. The BioBlitz concept is a cost-effective, volunteer-focused and community-based activity that features a rapid field assessment of *in situ* flora and fauna - that provides a rapidly-acquired 'snapshot' of the Reserve's biodiversity. This data can

subsequently be used by the NEWROC shires to better incorporate biodiversity conservation into land use planning and management.

The volunteers who participated in the 2003 Moningarin Reserve BioBlitz included scientists, amateur naturalists and biologists, and enthusiastic 'learners'.

1.4. Goals

As for all BioBlitzes, the primary goals of the 2003 Moningarin BioBlitz were to:

- collect data on as many species, from as many taxonomic groups, as possible in a 24-hour time period;
- identify any rare and unique taxa that may be located in the reserve; and
- document the species' occurrence

Other (secondary) goals were to:

- bring biodiversity specialists with considerable expertise to a isolated rural community - to share their knowledge, and demonstrate the benefits of scientific endeavour, collaboration and advocacy. This also provides a unique learning opportunity for young scientists and natural science enthusiasts - to work in the field alongside experienced scientists;
- build linkages between (largely urban-based) scientists and (mostly isolated rural) community members;
- raise awareness of the biodiversity richness (and inherent natural value) of a particular, local patch of remnant vegetation; and
- create a learning opportunity - one of the best ways to learn about biodiversity is to get out into the field alongside experienced scientists and have fun while doing it.

2. LIST OF PARTICIPANTS

The 2003 Moningarin BioBlitz benefited from an impressive number of participants from a variety of backgrounds and places-of-origin, who brought with them a broad array of knowledge and experience - both professional and amateur. Many of these individuals had also participated in the previous year's inaugural BioBlitz – which was conducted at Lake McDermott Reserve in the Shire of Mount Marshall in September 2002.

Without the efforts of the individuals listed below, and their ability to work collaboratively and generously share their knowledge of Western Australian flora and fauna, the 2003 Moningarin BioBlitz would not have been possible. A special thank you is extended to each of the team leaders, whose names appear in bold text below.

Bevan Burchell
Brad Degens
Brendan Oversby
Carl Danzi
Cheryl Gole
Cheryl King
Chris Curnow
Damien Sonneman
David Free
David Garlick
David Pattison
Hon. Dee Margetts MLA
Diane Beckingham
Edd Stockdale
Gemma Walker
Glenda Marshall
Grahme Fuchsbichler
Greer Wilson
Ian Johnson
Jane Madgwick
Jaquie Milner
Jeffery Howe
Joel Andrew
John Hansen
Jon Pridham
Karen Hoddy
Kate Gole
Kate Harvey
Kevn Griffiths
Leanne Ensly
Leon Miller
Martin Gole
Melaine Norman
Michelle Cumbers
Mick Davis
Mike Griffiths
Mike Hislop
Mike McFarlane
Myles Menz
Neville Boshemer
Nina McLaren
Noreen Fuchsbichler
Robin Campbell
Ryan Phillips
Sarah Edmonds
Sarah Muirhead
Sean Tomlinson
Sharron Perks
Stephanie Degens
Susanne McFarlane
Sylvia Garlick
Trevor Howe
Vanessa Fuchsbichler
Zoe Fulwood

3. SITE DESCRIPTION

3.1. Site Location

The Moningarin Water and Recreation Reserve – the location for the 2003 Moningarin BioBlitz - is located approximately 25 kilometres northwest of the town of Koorda, which is 250 kilometres northeast of Perth, Western Australia's capital city. The Shire of Koorda is one of 41 shires in the Avon River Basin, which, in turn, is one of fifty-seven Natural Resource Management zones in Australia (Commonwealth of Australia 2002, 2004a). The Moningarin Water and Recreation Reserve is located in the Yilgarn sub-catchment of the Avon Basin, which has its headwaters east of what is called 'the clearing line' and the easternmost of the region's rabbit proof fences. Water flows intermittently, if at all, through the Yilgarn and its tributary creek lines to eventually feed into the Avon, then into the Swan River - which ultimately flows through the city of Perth.

Figure 1 - Aerial photo of the 613ha Moningarin Reserve looking southwest showing the surrounding landscape and variations in vegetation type within the Reserve.

The Moningarin Reserve is located high in the local landscape - between 336m and 386m above sea level. It provides a commanding vantage point for views over the surrounding district, and is the largest and most intact patch of remnant vegetation within approximately 20km radius. A number of roads dissect or flank the Reserve, with their roadside vegetation corridors providing excellent opportunities for connectivity with other native vegetation remnants in the region.

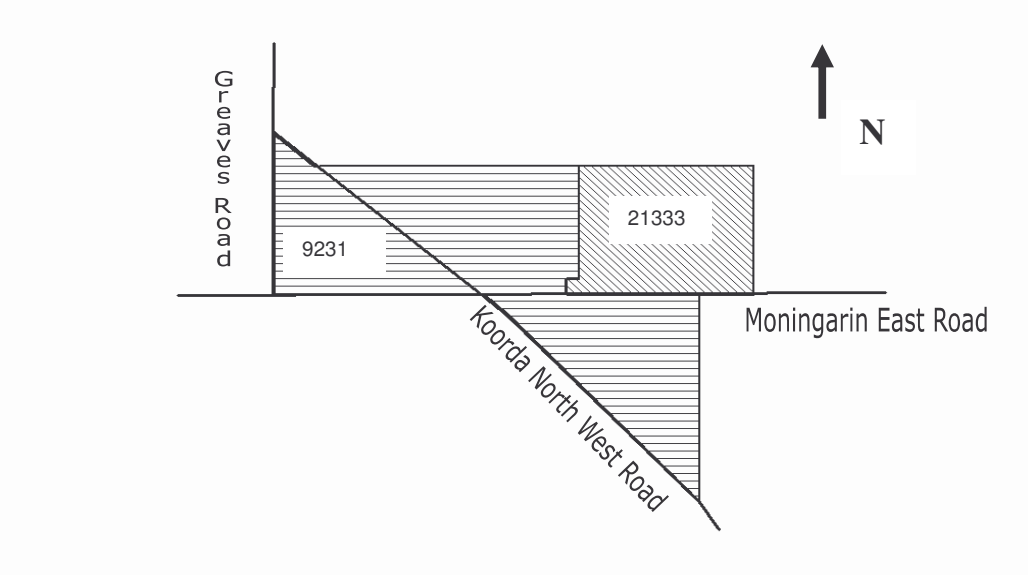

Figure 2 - Vesting Authorities at Moningarin Reserve.

Water Corporation lands (Water Reserve);

Shire of Koorda land (Recreation Reserve)

The land parcels that comprise the Moningarin Reserve are managed by and vested in two separate entities. The southern section, which encompasses a large granite outcrop - upon which a rock-wall and water tank was built in 1929 – is vested in the Western Australian Water Corporation (see figure 2), as well as a block of land to the west of the Koorda North East Road, known in its entirety as Ninghan Location 9231. The land to the east of the Granite, within which are located the Badgerin Tennis Club grounds, a waste disposal site and a number of gravel pits on Ninghan Location 21333, is vested in the Shire of Koorda.

3.2. GPS and Map Co-ordinates

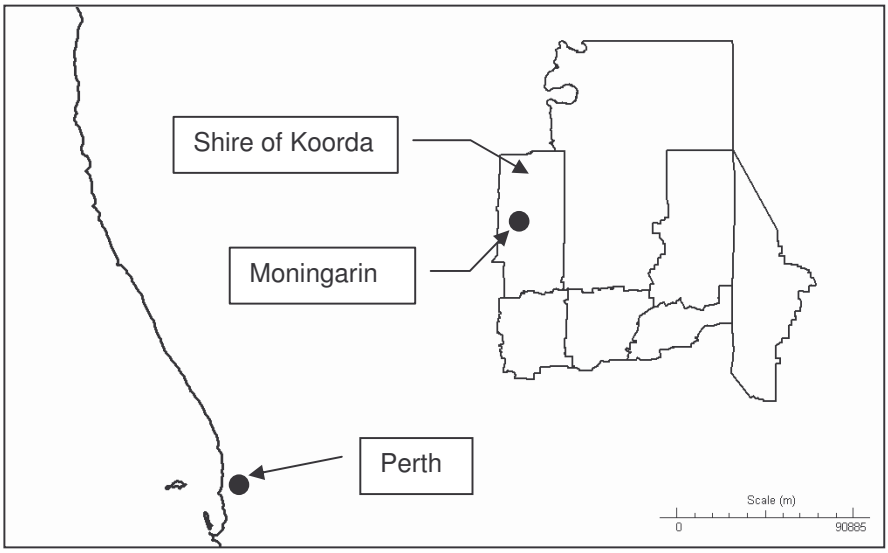

Figure 3 - Moningarin Reserve, within the Shire of Koorda, is approximately 250km from the city of Perth. Created using data from the Avon Catchment Council's *Spatial Data Project*

Moningarin Reserve: Latitude **30.6°S** Longitude **117.2°E** (WGS84)
Sheet 2336 Koorda (1:100 000 scale)
National Topographic Map Series

3.3. Weather Conditions

The climatic conditions of the Koorda district are typically Mediterranean, with warm, dry summers and cool, wet winters. The rainfall falls predominantly in the winter months (between June and August), is typically low, and increasingly unreliable. The Koorda District averages between 300mm and 350mm of rainfall per annum (Safstrom 1999). Summer rainfall occurs sporadically, often as a result of tropical monsoonal activity occurring further north in the State.

Temperatures in the area typically range from 5°C to 18°C in the winter months (June-August), and from 17°C to 34°C during the summer months (December-February) (Safstrom 1999).

During the 2003 Moningarin BioBlitz, the weather conditions ranged from being mild and slightly overcast on the Saturday morning, to clear and sunny conditions on the Sunday. The temperatures recorded for the weekend ranged between: 5.5°C (min) and 22.8°C (max) on the Saturday; and 6.8°C (min) and 14.9°C (max) on Sunday. No rainfall was recorded.

3.4. Geology and Soils

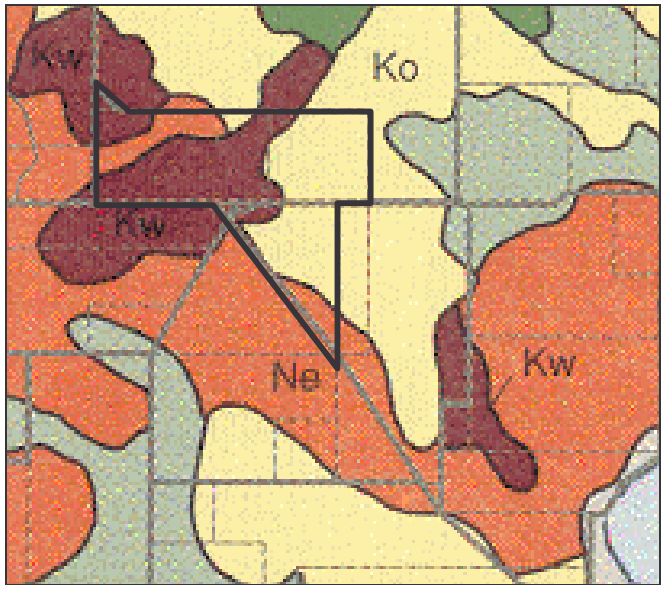

Figure 4 -Extract from landscape map of the Bencubbin area (Grealish & Wagnon 1995) showing localised soil types around Moningarin. The solid black line delineates the Moningarin Reserve.

The Moningarin area is part of the Yilgarn Block, an ancient rigid 'shield' comprised mainly of Archaean granite and gneiss with some altered volcanic and sedimentary structures. These latter structures occur in greenstone belts, which are typical of the eastern goldfields.

The Moningarin Reserve contains a mosaic of soil types (see Figure 4 above), predominantly the Koorda and Kwelkan Soil Systems, with minor intrusions of the Nembudding System. The Koorda (Ko) System (extending into the Shire land in the eastern sector of the Reserve) characteristically occurs in the region on gently undulating rises in upland areas, covering small valleys and minor channels. Heath and shrubland are typical vegetation types in the System, with minor areas of salmon gum on the crests (Grealish & Wagnon 1995).

Figure 5 - Typical Kwelkan vegetation showing exposed granite sheet, and Moningarin Water Tank.

Soils of the Kwelkan (Kw) System (occurring mainly in the central and western parts of the Reserve) are generally found throughout the region on undulating hill country, and are characterised by granite rock outcrops in all positions of the landscape. Gritty quartz sands, grading to sandy loams, dominate the soils, associated with York gum and jam wattle bushland (Grealish & Wagnon 1995).

The Nembudding (Ne) System soils (which occur in the NW and SE parts of the Reserve) are characteristically located between upland areas and valleys in the north-eastern Wheatbelt. Dominant soils in this system have an interesting texture contrast, with a hard-setting sandy loam occurring over a calcareous, reddish clay subsoil - supporting mallee bush and woodland (Grealish & Wagnon 1995). Breakaways may also be present, and Epacrid vegetation types are scattered throughout.

3.5. Regional Significance

The Shire of Koorda extends over an area of approximately 218,000 hectares, of which 16% is remnant vegetation (Safstrom 1999). Approximately 6.5% of the bush is located on private land. As a large (613ha) reserve in a highly cleared shire, the Moningarin Reserve has significant environmental, community and aesthetic values.

Figure 6 – A constructed rock catchment collecting water from the granite sheet at Moningarin Reserve.

Moningarin was the first part of the Koorda district to be opened up for intensive agriculture, with the first farmers settling there in 1910 - the first year that rainfall records were sent to Perth from the area. Also of note historically was the construction of the Moningarin Water Tank in 1929, at a cost of £4,550 (Braid & Forbes 1997). The old rock catchment is still filling the 500,000L water tank, which provides an important water resource for the landholders in the area.

As a large and representative patch of Wheatbelt remnant vegetation, the Moningarin Reserve is an important local biodiversity asset. Recent research conducted by the Western Australian Department of Environment identified the bush around Moningarin to have a high regional biodiversity value (pers. comm. Chantelle Noack, 2004).

4. SURVEY METHODOLOGY

The 2003 Moningarin BioBlitz began at noon on Saturday, September 13, 2003, when all participants were assembled at the BioBlitz HQ for their final briefing before heading out into the field. Having previously been prepared and briefed, specialist team leaders were assigned a group of between four and six volunteers to assist them during the survey sessions. Each specialist's team operated independently, collecting data on particular fields of expertise, with the team leaders responsible for returning the data to the BioBlitz headquarters at the end of each survey period.

Figure 7- Team Leaders briefing volunteers prior to heading off into the bush to look for flora and fauna.

The first survey period was conducted between 1pm and 5pm on Saturday, September 13, with the second survey period occurring between 8am and 11am the following day – Sunday, September 14. Two specialist birding teams conducted surveys outside this timeframe to capitalise on the increased bird activity at dawn and dusk. A large group of the 'BioBlitzers' also participated in an evening walk – between 7pm and midnight - as part of the Great Australian Marsupial Nightstalk.

Team Leaders submitted records of all of the data collected by 1pm on the Sunday – which marked the end of the 24 hour survey. Although much of the information had been verified in the field and at the BioBlitz HQ, some verification required further study and expertise after the event. The Results therefore were collated post-BioBlitz.

5. RESULTS

A total of 244 taxa were recorded at the Moningarin Reserve during the 24 hour BioBlitz survey period. These included 6 mammals, 6 reptiles, 56 birds, 17 invertebrates, 141 plants, 7 fungi, and 11 lichens. A full list of the taxa recorded is presented in Appendix I.

5.1. Fauna

Two threatened fauna species were identified - the malleefowl (*Leipoa ocellata*) and tree-stem trapdoor spider (*Aganippe castellum*). Both of these species are listed as species of national significance (Wildlife Conservation [Specially Protected Fauna] Notice 1999).

Of the six mammal species recorded, three were introduced feral animals – the European fox *(Vulpes vulpes),* European rabbit *(Oryctolagus cuniculus)* and feral cat (*Felis catus*). The other three mammal species recorded are considered to be relatively common in the region - the western grey kangaroo (*Macropus fuliginous*), the short-nosed echidna (*Tachyglossus aculeatus*) and the white-striped mastiff bat (*Tadaria australis*).

Six reptile species were recorded, comprising two snakes and four lizards. No amphibians (frogs) were recorded. The two snake species recorded were: the relatively common dugite (*Pseudonaja affinis*) and the gwardar (*Pseudonaja nuchalis*), both of which are frequently recorded in the northeastern Wheatbelt (Storr, Smith & Johnstone).

The lizard species recorded comprised one dragon lizard, two geckos and one skink. The crested dragon (*Ctenophora cristatus*) is considered to be common in Eucalypt woodlands (Bamford 1995).

Figure 9 – A crested dragon lizard (*Ctenophorus cristatus*) sunbaking on fallen wood.

Also identified, in the Water Reserve, were two granite gecko species - *Diplodactylus granariensis* and *Diplodactylus pulcher)* (figure 10). The commonly occurring fence skink (*Cryptoblepharus plagiocephalus*) was found among fallen logs and scattered rocks in the Reserve.

Figure 10 - *Diplodactylus pulcher* observed on the exposed granite water catchment above the Moningarin water tank.

Figure 11 – Birding team volunteers make their way through mallee scrub to add to the bird count.

Six ornithological teams identified 56 bird species, from the woodland, shrubland, mallee and granite habitats within the project area. A total of 35 of the species observed are considered remnant-dependant and known to be declining in the Wheatbelt (pers. comm. Cheryl Gole 2004).

These declining species were the Australian owlet-nightjar, black-faced wood swallow, blue-breasted fairy-wren, brown falcon, brown goshawk, brown honeyeater, brown-headed honeyeater, chestnut-rumped thornbill, common bronze wing, golden whistler, grey butcherbird, grey fantail, grey shrike-thrush, Horsfield's bronze-cuckoo, inland thornbill, jacky winter, malleefowl, peregrine falcon, red wattlebird, red-capped robin, red throat, rufous whistler, shining bronze-cuckoo, southern scrub-robin, spiny-cheeked honeyeater, striated pardalote, tawny frogmouth, wee bill, western gerygone, western yellow robin, white-browed babbler, white-eared honeyeater, white-fronted honeyeater, white-winged triller, willy wagtail and yellow-rumped thornbill.

A total of 17 different types of invertebrates were identified during the BioBlitz, including ants, beetles, termites, weevils, flies, spiders, centipedes and moths. More comprehensive sampling would undoubtedly yield a much higher number of terrestrial and aquatic invertebrates.

Of highest significance, was the discovery of a small population of the threatened tree-stem trapdoor spider *(Aganippe castellum)* (see figure 12) which was located in thick tamma sheoak (*Allocasuarina campestris*) scrub vegetation. Also observed was the more common Australian trapdoor spider (*Anidiops villosus*).

Figure 12 - A typical Tree-stem Trapdoor Spider burrow, positioned against a Sheoak shrub

Eight of the invertebrate species recorded were aquatic invertebrates – which were predominantly observed living in and around the rock-wall catchment above the Moningarin water tank. These included beetles, fly larvae, leeches, snails, mites, nematode worms and seed shrimps.

During the evening 'Night Stalk', a few invertebrates were observed, although the more memorable observations were of a barn owl (*Tyto alba*), a number of white -striped mastiff bats, and numerous galahs (*Cacatua roseicapilla)* - the latter frequently observed resting in nesting hollows. No arboreal mammals were observed despite the application of the high-powered torches brought along to investigate tree forks and hollows.

Figure 13 - Bright red Crustose lichen growing on a Melaleuca branch found during the BioBlitz.

A number of lower-order plants and fungi were collected during the two days by a fungi specialist team, which yielded 11 lichens and 7 fungi. The fungi included earthballs (*Pisolithus marmoratus),* stalked puffballs (*Tulostoma albicans*) and the scarlet bracket fungi. (*Pycnoporus coccines*).

Recent rains had also encouraged scattered occurrences of pretty mouths (*Calostoma luridum*) and true mushrooms (Agaricus sp.), as well as *Phelinus rimosus* and *Phaeotrametes spp.*

5.2. Flora

A total of 141 plant taxa were identified during the BioBlitz, mostly from targeted (Woodland Watch) quadrat-based surveys conducted in the *Eucalyptus supralaevis* mallee and inland white gum (*E. capillosa*) woodland on the Shire Recreation Reserve. Additional 'random stratified walk' recordings were made in the shrublands around the granite sheet, and other areas throughout the Water Reserve, although no flora specimens were collected generally from within the Water Reserve. Experienced botanical team leaders recorded taxa in the salmon gum and gimlet woodland, and the mallee throughout the Reserve.

Figure 14 - Calytrix sp. in bloom in the Mallee

Figure 15 - The DRF species *Boronia adamsiana* found at Moningarin

Threatened Flora

Three populations of threatened flora were recorded within the Reserve. The most significant of these being *Boronia adamsiana (*F.Muell*)*, a Declared Rare Flora (DRF) species. This plant was photographed by a participant and subsequently identified from the image (See Figure 15). Also recorded were two priority three (P3) plant species *Hyalosperma stoveae* (D.A.Cooke) Paul G.Wilson – representing only the third recording of the species in Western Australia (pers. comm. Mike Hislop, WA Herbarium) and *Gunniopsis rubra* Chinnock, often found in saline environments (pers.

comm. Mike Hislop). Specimens of the latter two species were subsequently vouchered by the WA Herbarium, the former being noted as present in the bushland.

Seven of the plant species recorded during the 2003 Moningarin BioBlitz were introduced weed species: red brome grass (*Bromus rubens**), wild oats (*Avena barbarta**), false hairgrass (*Pentaschistis airoides**), Patterson's curse (*Echium plantagineum**), slender iceplant (*Mesembryanthemum nodiflorum*),* stinking rodger *(Tripterus clandestina*)* and *Zaluzianskya divaricata*.*

6. RECOMMENDATIONS

The Moningarin Water and Recreation Reserve is a large patch of remnant vegetation of high conservation value within the Shire of Koorda. It is representative of the Kwelkan and Koorda vegetation communities which are unique to the Avon Wheatbelt.

Significantly, it provides a refuge for previously unrecorded populations of rare flora (three species) and fauna (two species), as well as 35 species of birds that are declining or remnant dependant. At least 244 species of flora and fauna occur in the Reserve, with the actual number likely to be considerably higher.

Apart from its important community function for water collection and storage, the Reserve is also used regularly by members of the Koorda community for sports recreation and leisure activities. In addition, gravel is extracted from a number of pits in the Reserve, providing a valuable resource for local infrastructure. A small refuse disposal area is also used by the Shire and Tennis Club. The Moningarin Reserve has a long history of use by the local community, which is likely to continue well into the future.

Management planning for the Reserve, which is vital for its future, is in its initial stages, involving a range of key stakeholders including the Shire of Koorda, the Water Corporation, the Koorda Land Conservation District Committee members, the Department of Conservation and Land Management (CALM), the community and WWF-Australia.

The information gathered during the 2003 Moningarin BioBlitz represents a significant contribution towards a better understanding of the composition and value of the Reserve, while providing a 'snapshot' impression of the Reserve's value as a regional biodiversity asset. The data has also helped identify a suite of management actions that need to be addressed to protect these special vales.

Based on the data collected, observations made, advice put forward by the specialists attending the BioBlitz, and contributions from local key stakeholders and community members, the following recommendations are made:

1 That copies of the 2003 Moningarin Reserve BioBlitz Report be forwarded to the Avon Catchment Council for use in its Regional NRM planning; to the Shire of Koorda and Water Corporation for use in their Reserve management and planning; and to the CALM Regional Office in Merredin for its information;

2 That the Shire of Koorda changes the 'Purpose' of the Moningarin Recreation Reserve to include 'for protection of flora and fauna';

3 That, in collaboration with WWF-Australia and the WA Water Corporation, the Shire of Koorda develops a Management Plan for the Moningarin Reserve;

4 That, in collaboration with WWF-Australia, the Shire of Koorda develops a Conservation Policy to guide the management and protection of all reserves of high conservation value which are vested in its authority;

5 That the location of the three threatened flora and two threatened fauna species be reported to the CALM Regional Office in Merredin;

6 That the Water Corporation and Shire of Koorda collaborate to eradicate the Patterson's curse weed outbreaks located around the Moningarin water tank, and along access roads within the Reserve;

7 That the Shire of Koorda consider planning for control of Paterson's curse at an operational level in the Moningarin Recreation Reserve;

8 That the Shire of Koorda initiates a rubbish collection plan for the refuse area adjacent to the Badgerin Tennis Club;

9 That the Avon Catchment Council applies the BioBlitz methodology within its biodiversity project ‘toolkit’ as a means to galvanise broad-based community support for biodiversity conservation in the Avon River Basin.

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Wildlife Conservation (Specially Protected Fauna) Notice – 1999

Appendix I - Full List of Species Recorded

Scientific Name	Common Name
Mammals	**6**
Felis catus	Feral Cat
Macropus fuliginosus	Western Grey Kangaroo
Oryctolagus cuniculus	European Rabbit
Tachyglossus aculeatus	Echidna
Tadaria australis	White-Striped Mastiff Bat
Vulpes vulpes	European Fox
Reptiles	**6**
Cryptoblepharus plagiocephalus	Fence Skink
Ctenophora cristatus	Crested Dragon
Diplodactylus granariensis	Granite Gecko
Diplodactylus pulcher	
Pseudonaja affinis	Dugite
Pseudonaja nuchalis	Gwardar
Birds	**56**
Leipoa ocellata	Malleefowl
Acanthagenys rufogularis	Spiny-cheeked Honeyeater
Acanthiza apicalis	Inland Thornbill
Acanthiza chrysorrhoa	Yellow-rumped Thornbill
Acanthiza uropygialis	Chestnut-rumped Thornbill
Accipiter fasciatus	Brown Goshawk
Aegotheles cristatus	Australian Owlet-Nightjar
Anthochaera carnunculata	Red Wattlebird
Aquila audax	Wedge-tailed Eagle
Artamus cinereus	Black-faced Woodswallow
Barnardius zonarius	Australian Ringneck
Cacatua pastinator	Western Corella
Cacatua roseicapilla	Galah
Calyptorhynchus banksii	red-tailed Black-cockatoo
Chrysococcyx basalis	Horsfield's Bronze-cuckoo
Chrysococcyx lucidus	Shining Bronze-cuckoo
Circus assimilis	Spotted Harrier
Colluricincla harmonica	Grey Shrike-thrush
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Corvus bennetti	Little Crow
Cracticus torquatus	Grey Butcherbird
Drymodes brunneopygia	Southern Scrub-robin

Eopsaltria griseogularis	Western Yellow Robin
Epthianura albifrons	White-fronted Chat
Falco berigora	Brown Falcon
Falco cenchroides	Nankeen Kestrel
Falco peregrinus	Peregrine Falcon
Gerygone fusca	Western Gerygone
Gymnorhina tibicen	Australian Magpie
Hirundo neoxena	Welcome Swallow
Hirundo nigricans	Tree Martin
Lalage sueurii	White-winged Triller
Lichenostomus leucotis	White-eared Honeyeater
Lichenostomus virescens	Singing Honeyeater
Lichmera indistincta	Brown Honeyeater
Malurus pulcherrimus	Blue-breasted Fairy-wren
Manorina flavigula	Yellow-throated Miner
Melithreptus brevirostris	Brown-headed Honeyeater
Microeca fascinans	Jacky Winter
Neophema elegans	Elegant Parrot
Ocyphaps lophotes	Crested Pigeon
Pachycephala pectoralis	Golden Whistler
Pachycephala rufiventris	Rufous Whistler
Pardalotus striatus	Striated Pardalote
Petroica goodenovii	Red-Capped Robin
Phaps chalcoptera	Common Bronzewing
Phylidonyris albifrons	White-fronted Honeyeater
Podargus strigoides	Tawny Frogmouth
Pomatostomus superciliosus	White-Browed Babbler
Psephotus varius	Mulga Parrot
Pyrrholaemus brunneus	Redthroat
Rhipidura fuliginosa	Grey Fantail
Rhipidura leucophrys	Willy Wagtail
Smicrornis brevirostris	Weebill
Taeniopygia guttata	Zebra Finch
Tyto alba	Barn Owl
Invertebrates	**17**
Aganippe castellum	**Tree-stem Trapdoor Spider**
Arachnida sp.	Scorpion
Blatodea spp	Beetles (X3 Species)
Chilopoda sp.	Tiger Centipede

Curculionidae sp.	Giant Weevil
Euhirudinea sp.	Leech
Gaius villosus	Wolf Spider
Gastropoda sp.	Snail
Iridomyrmex sp.	Meat Ant
Isoptera	Termite
Lycosa sp.	Common Wolfspider
Nematoda sp.	Nematodes
Ostracoda sp.	Seed Shrimp
Pyroglyphidae sp.	Mite
Tabanidae sp.	March Fly
Plants	**141**
Acacia acuaria	Wattle
Acacia assimilis	Fine-leaf Wodjil
Acacia brumalis	Wattle
Acacia erinacea	Spiny Wattle
Acacia fragilis	Wattle
Acacia hemiteles	Tan Wattle
Acacia longispinea	Wattle
Acacia mackeyana	Wattle
Acacia neurophylla	Wattle
Acacia nigripilosa	Wattle
Acacia resinomarginia	Wattle
Acacia stereophylla var stereophylla	Wattle
Acacia yorkrakinensis	Soft-leaf Wodjil
Actinobole uliginosum	Flannel Cudweed
Allocasuarina acutivalvis	Black Tamma
Allocasuarina campestris	Tamma
Alyxia buxifolia	Dysentery Bush/Camelbush
*Arctotheca calendula**	Capeweed
Astartea heteranthera	
Austrostipa elegantissima	Elegant Speargrass
Austrostipa nitida	Speargrass
*Avena barbarta**	Wild Oats
Baeckea megaflora	Baeckea
Beyeria brevifolia var robustior	
Blennospora drummondii	Dwarf Beauty-heads

Boronia adamsiana DRF	Barbalin Boronia
Boronia ternata	
Borya constricta	Pin Cushions
Borya laciniata	Pin Cushions
Borya sphaerocephala	Pin Cushions
Brachyscome pusilla	Small Daisy
*Brassica tournfortei**	Mediterranean Turnip
*Bromus rubens**	Red Brome Grass
*Bromus rubens**	Red Brome Grass
Caladenia spp.	Ant Orchid
Caladenia spp.	Spider Orchid
Calothamnus gilesii	Claw Flower
Calotis hispidula	Bindy Eye
Calytrix depressa	Starflower
Calytrix glauca	
*Cleretum papulosum**	
Crassula colorata	Dense Crassula
Crassula colorata var acuminata	Dense Crassula
Cyanicula amplexans	
Daviesia nematophylla	
Dianella revoluta	Blueberry Lily/Spreading Flax Lily
Dodonaea adenophora	Hop Bush
Dodonaea caespitosa	Hop Bush
Dodonaea inaequifolia	Hop Bush
Drosera macrantha	Bridal Rainbow
Drosera subhirtella	
*Echium plantagineum**	Patterson's Curse
Enekbatus spp.	
Eremophila drummondii	Poverty Bush
Eremophila oppositifolia	Twin-leaf Eremophila
Eucalyptus capillosa	White Gum/Inland/Wheatbelt Wandoo
Eucalyptus erythronema	Red-Flowered Mallee
Eucalyptus loxophleba ssp. lissophloia	York Gum
Eucalyptus salmonophloia	Salmon Gum
Eucalyptus salubris	Brown Gimlet
Eucalyptus semivestita	
Eucalyptus sheathiana	Ribbon-Barked Gum/Mallee
Eucalyptus subangusta ssp subangusta	Black Marlock
Eucalyptus transcontinentalis	

Gastrolobium angustifolia	Narrow-leafed Poison
Gastrolobium benettsiana	
Glischrocaryon aureum	
Gonocarpus sp	
Goodenia berardiana	
Grevillea huegelii	Comb Grevillea
Grevillea levis	
Grevillea paradoxa	Bottlebrush Grevillea
Grevillea petrophiloides	
Gunniopsis rubra **P4**	
Hakea errecta	
Hakea francisiana	Bottle Brush/Pink Spike Hakea
Hemigenia westringioides	
Hibbertia eatoniae	
Hyalosperma demissum	Tiny Sunray
Hyalosperma glutinosa	
Hyalosperma stoveae **P3**	
Hypocalymma demissum	
Isopogon scabraesculus	
Leptomeria preissiana	
Leptosema daviesioides	
Levenhookia pentandra	
Levenhookia pusilla	Midget Stylewort
Lolium hybridum	
Lyziosepalum sp	
Maireana brevifolia	Small-leaved Bluebush
Maireana carnosa	Cottony Bluebush
Maireana tomentosa	
Malleostemon tuberculatus	
Melaleuca atroviridis	
Melaleuca conothamnoides	Wheatbelt Honey Myrtle
Melaleuca cordata	Heart-leaf Honey Myrtle
Melaleuca coronicarpa	Tangling Melaleuca
Melaleuca ctenoides	
Melaleuca lateriflora ssp lateriflora	Oblong-leaf Honey Myrtle (Gorada)
Melaleuca platycalyx	
Melaleuca radula	Graceful Honey Myrtle
Melaleuca scalena	
Melaleuca vinnula	

*Mesembryanthumum nodiflorum**	Slender Iceplant
Micromyrtus obovata	
Millotia tenuifolia var tenuifolia	Soft Millotia
Neurachne alopecuroidea	Foxtail Mulga Grass/Hairy Grass
Olearia muelleri	Goldfields/Mueller's/Dusky Daisy Bush
*Pentaschistis airoides**	False Hairgrass
Persoonia coriacea	
Petrophile shuttleworthiana	
Phebalium aff brachycalyx	
Phebalium tuberculosum	
Pimelia avonensis	
Platysace trachymenioides	
Podolepis lessonii	Yellow Buttons
Podolepis tepperi	
Podotheca angustifolia	
Podotheca gnathalioides	
Poranthera microphylla	Small Poranthera
Prasophyllum gracile	Little Laughing Leek Orchid
Psammomoya choritroides	
Pterostylis aff nana	Greenhood Orchid
Schoenus nanus	Tiny Bog Rush
Sclerolaena diacantha	Grey Bindii/Copperburr
Siloxerus multiflora	
Spartochloa scispoidea	
Stackhousia monogyna	White Candles
Stylidium dielsianum	
Stylidium yilgarnensis	
Thryptomene cuspidate	
Thysanotus patersonii	Twining/ Climbing Fringed Lily (Tjungoori)
Trachymene cyanopetala	
Trachymene ornata	
*Tripterus clandestina**	Stinking Roger
Velleia cycnopotamica	Spongefruit
Verticordia chrysanthella	Featherflower
Wahlenbergia gracilenta	Bluebell
Waitzia acuminata var acuminata	Orange Immortelle/Golden Everlasting
Westringia cephalantha	
*Zaluzianskya divaricata**	
Fungi	**7**

Agaricus sp	Mushroom
Calostoma luridum	Pretty Mouths
Phaeotrametes spp.	
Phelinus rimosus	
Pisolithus marmoratus	Earthball
Pycnoporus coccines	Scarlet Bracket Fungi
Tulostoma albicans	Stalked Puffballs
Lichens	11
Cladia aggregata	
Diplochistes ocellata	
Flavoparmelia rutidota	
Haematomma eremaeum	
Heterodia muellerii?	
Heterodia sp?	
Leannora sp	
Peltigera sp?	
Usnea ramulosissima	
Usnea scabrida	
Xanthoparmelia cheelii	
* Plant species marked with an asterix* are introduced weed species.	