Nangwarry Native Forest Reserve Orchid Survey 2008

Report by R. Bates November 2008

BB, Thelymitra matthewsii, Nangwarry NFR, 2008

Introduction
This survey instigated by Troy Horn of Forestry SA Mt Gambier was carried out by members of the Native Orchid Society of South Australia (NOSSA). The organisation was done chiefly by NOSSA secretary Cathy Houston in liaison with Troy and other NOSSA members and the surveys were done over twelve days in August, September and October 2008.

Methods: The plan was to record all the orchid species growing on the many fire breaks and tracks which divide the reserve up into mostly small blocks. This was to be achieved by walking all suitable slashed areas recording data on spread sheets prepared by Cathy Houston. Data included population size of each species, with GPS and stage of flowering, for each section of track.
Sections referred to each adjacent block so that orchids recorded on NA8/NA24 were those on the slashed track sides between block 8 and block 24.
Due to the fact that many orchid species are only identifiable, indeed visible, when in flower, it was necessary to walk the area in three different months; August to catch the winter flowered species, September for early spring flowerers and late October/November for the rest.
The following people participated: Ken and Barb Bayley, Thelma and Phil Bridle, Rob and Deidre Bates, Cathy and Mal Houston, June Niejalke and Dianne Richman, Peter McCauley, with locals Christine Jackson and her daughter in law Sheryl Holliday, Troy Horn and Bryan Haywood. It was most efficient for the surveyors to work in pairs as one could record while the other searched.
Others, including local botanist Kath Alcock were consulted regarding orchids previously seen at Nangwarry. Collections at Adelaide Herbarium (AD) from the area, including many not in the herbarium data base were checked.
Because it was a dry year it was noted that on east-west lines many orchids were only present on the north or shaded edge of the cleared lines. In the 1970's it had been the southern or sunny side which had the best flowering. This is an example of a climate change effect already obvious. Images were taken of many of the orchids.
The effort was co-ordinated by NOSSA secretary Cathy Houston with NOSSA field trip coordinator Rob Bates as the scientific advisor.
Accommodation was at the nearby Whiskas Woolshed owned by Andy Clifford. Funding was provided by Forestry SA to assist with costs of travel and accommodation.
Only orchids on slashed areas were recorded unless they were rare species in nearby bush and not seen elsewhere.
The names used here are the most up to date and are those most likely to be used in recent orchid books and CD's i.e. Orchids of Australia (2006), Orchids of the ACT (2008), the Flora of the Otways (2006), Orchids of SA (CD 2008) and the Interactive key of Australian Orchids (2007). Wild Orchids of Victoria (2006) uses the older names but uses the same groupings of species indicating that the authors do recognise the new genera as separate entities.

Results:
More than sixty different orchids were recorded despite an overall deficit in rainfall, both in 2008 and most of the previous seven years. Fortunately there had been enough winter rainfall to carry orchids over into the record dry spring.

The reserve is relatively weed-free and the wide slashed areas were ideal for flowering of many species. Shade loving species were mostly confined to the very edge of tracks, (excluding the hot southern edges).
Present management seems ideal for most species.
Of the orchid species seen many were of conservation significance. These are treated below in order of significance.

1: *Thelymitra matthewsii*, the spiral leaf sun orchid, was indeed the highlight of the survey. This species was unexpected as it had never been seen in the lower South-east and was considered possibly extinct in the upper SE. It was first spotted in bud, by June Niejalke and Dianne Richman during the August visit. As soon as she found the first spiral leaf June rushed to consult the botanist who confirmed that it was indeed one of Australia's best known and most endangered orchids. Dr. Mike Duncan of Melbourne, who is writing the recovery plan for the species, later advised that before our find less than a thousand plants were known in the world. Remarkably at least five hundred plants were the likely total at Nangwarry, making this population the world's largest!
The species produces a single, self-pollinated flower (see photo). Flowering occurs in late August and early spring.

JN, *T. matthewsii*, September

2: *Corysanthes dentata*, the white toothed helmet orchid is even more endangered, if less well known and less distinctive. It was located on the edge of a firebreak here by Cathy, Malcolm and Troy. The species had previously only been recorded from the Southern Lofty region and is considered nationally endangered, perhaps critically. Once again the Nangwarry population may be the largest. The species flowers in winter and is best recognised by the white toothed labellum margins and the flower often leaning back off the leaf. See image in appendix.

3: *Thelymitra aristata*, the great sun orchid. This species was found here near Tower Road on the edge of a dry swamp in slashed heath, the drought had knocked it about and the flowers aborted. It is one of the most endangered orchids in SA and these plants may be the last in SA. It flowers in late spring (see image in Wild Orchids of Victoria pg 199).

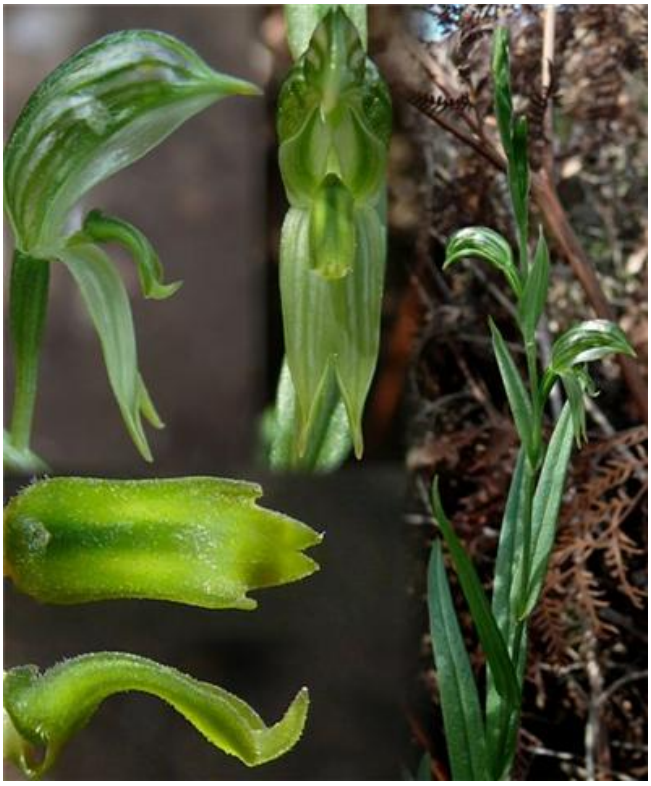
4: *Bunochilus chlorogrammus* a spectacular, tall greenhood was found here by the Jackson girls. It is endangered in South Australia where it is confined to the lower

South-east. At a national level estimates vary but it is at least nationally rare. See image in appendix.

5*: Calochilus paludosus* the swamp beard orchid. This rare and beautiful species is restricted to swamp margins in South Australia and like most swamp species is endangered at a state level.

6: *Diuris aff. chryseopsis* the swamp golden moths. This species was found here by Thelma and Phil Bridle in damp heath. As for most un-named species its conservation status is unsure but it is likely to be nationally vulnerable.

7: *Arachnorchis venusta* the beautiful white spider orchid has in times past been seen in various blocks but during the survey was found only once. Habitat was a swampy ditch and unfortunately the plants were slashed before seed was released so they will need future protection. The species is vulnerable in South Australia and nationally rare.



JN, *Bunochilus chlorogrammus*, September

8: *Bunochilus melagrammus* the black lip tall-greenhood. This species is endangered in South Australia but common in Victoria and was seen as very few plants in Nangwarry. See image in appendix.

9: *Paracaleana minor and Caleana major* the duck orchids. *Caleana major* is endangered in South Australia and critically endangered in the South east. Although not seen on this survey there are numerous reports of its past occurrence. I know of only one other population in the SE at Mount Macintyre NFR. *Paracaleana minor* has been considered vulnerable in South Australia and this survey showed that Nangwarry NFR has the state's largest populations.

10: *Thelymitra holmesii,* blue swamp sun orchid. This swamp loving species is vulnerable in South Australia and only a few have ever been seen in Nangwarry, mostly in the north-west corner including north of Tower Rd.

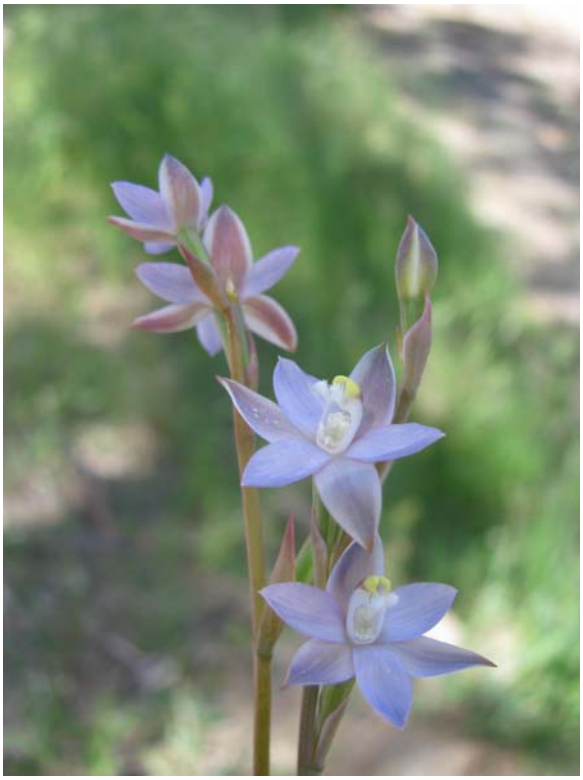
11: *Nemacianthus caudatus* is endangered in the South-east although common enough elsewhere in SA. The colony at Nangwarry is the only one I have seen in the lower SE.

Undescribed Orchid species at Nangwarry

In addition to the above there are some other 'undescribed' orchids in Nangwarry including *Diuris* aff. *brevissima* (see *D* aff. *pardina*, Wild Orchids of Victoria page 231). This species has long been recognised in South Australia as different from *D. pardina*. It was seen only as a single small population growing with *Calochilus paludosus* and flowered in October.

The species of the genus *Linguella* in South Australia are all likely to be un-named. David Jones, the doyen of Australian orchidologists, has most of them in manuscript. At least two and probably three occur in Nangwarry, two of them commonly so and it is a good place to observe how distinct they are.

The greatest numbers of undescribed orchids at Nangwarry are sun orchids, of the *Thelymitra pauciflora* complex. In fact true *T. pauciflora* may not even occur here.
The author has many of these in manuscript. The best known include T. sp. 'Rubricaulis' although it was not seen during the survey, probably due to drought conditions. (Many sun orchids aborted their flowers this year).
The most common of the undescribed sun orchids here is T. sp. 'Latifolia' with its short flat leaf, stem emerging at ground level, two sterile bracts and lilac flowers.



RB, *Thelymitra* sp Pale capsules

Other common undescribed sun orchid species here include *T*. sp. 'Pale capsules', easy to recognise even when flowers are not open because of its short stems, single bract and pale ovaries and *T*. sp. 'Insipid' with its very slender stems, high fistula and hardly opening flowers.

The most Common species at Nangwarry

The ten most common species in Nangwarry NFR make up 90% of the orchid plants here. In rough order descending from most abundant we have:
1: *Disa bracteata* the weed orchid which is present as millions of seedlings, hopefully most of which will not reach maturity. The dry conditions in 2008 meant that most mature plants did not produce seed this year but those which did will have released trillions of seeds. See image in appendix.

2: Leporella fimbriata the fringed hare orchid often sets up colonies of thousands of plants. Very few seed pods were seen of this autumn flowered species which loves bare sandy ground.

3: *Glossodia major* the wax-lip orchid is the most obvious spring orchid because of its size and colour. It is certainly the most abundant species away from the tracks and firebreaks.

4: *Pyrorchis nigricans* was seen only as leaves but sometimes in thousands. It requires a summer fire to flower but on firebreaks is clonal.

5: *Petalochilus carneus* is another easily seen species when in flower and is just as common in bushland away from the tracks.

6: *Thelymitra pauciflora* is the most abundant sun orchid, but in reality as there are several species included under that name it may be beaten by the spotted sun orchid *T. juncifolia* which is sometimes included under the name *T. ixioides*.

7: *Microtis* sp. The onion orchid leaves were ubiquitous here but as few survived the dry conditions to flower we are unsure which Microtis species made up the bulk.

8: During the first visit in winter it looked as if the shade loving *Corysanthes dilatata* the common helmet orchid was most abundant and this may be the case off the tracks. It is certainly not a species that likes bare open sites. Many of the suspected *C. dilatata* may have been *C. incurva*.

9: Mosquito orchids *Acianthus and Cyrtostylis* were present on the edge of tracks in about equal numbers but the latter was recorded more often as it was in flower during the survey.

10: *Diuris orientis* was abundant according to its leaves which were in large colonies but flowers were rare. It is a different matter after a summer fire when they bloom in thousands.

11: *Pterostylis pedunculata*, although hardly seen on the tracks was very common on the very edges in shaded spots and could well be included in the top ten somewhere between 4-8th place.

11: *Arachnorchis parva* is the most common spider orchid here and if we include *A. phaeoclavia* as being just a form of it would come in at about number six on this list.

Orchid genera expected but missing from the survey list…

Several genera which are widespread in the SE were not seen during the survey; these include the large genus *Prasophyllum* which was reported at two sites but not relocated at flowering time so this may have been an error in identification. Nevertheless one would expect tha*t P. elatum* will be present as tall flower spikes after a bushfire but not on the breaks.
Stegostyla have never been reported that I know of, for this reserve.
Several greenhood genera were missing, notably *Plumatichilo*s (plumed greenhoods) which are sure to be in the reserve somewhere.
One of the most common orchid genera in the SE is *Diplodium* the shell greenhoods yet none were seen here.
Other 'greenhood' genera missing include *Oligochaetochilus* and *Taurantha*.

Caladenia was suggested by a few as 'should be present' but the South Australian species *C. latifolia* was not recorded this time. There were no horned orchids *Orthoceras* but these flower late and could easily have been missed during the survey.

Other genera widespread in swamps of the SE and likely to have been present in the many swamps around Nangwarry before settlement are *Cryptostylis, Spiranthes* and the *Chiloglottis* group. The formation of artificial wetlands in the area may see the return of these.

RB, *T.* aff *bracteata* pale

RB, *T. holmesii*

*Both rare species in Nangwarry

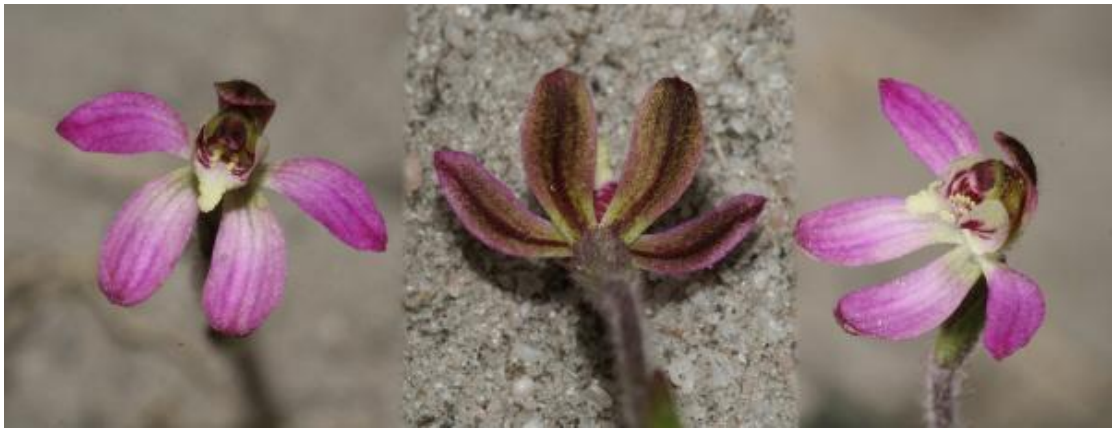
Complete Orchid list for Nangwarry NFR

Species name	Notes	Cons status
Acianthus pusillus	Mosquito orchids, mostly on shady edges of tracks in winter	
Anzybas unguiculatus	Little pelicans, common in southern half in shady track edges	U in SA
Arachnorchis dilatata	Late comb spider orchid; flowers November-Dec, most aborted in 2008	R in SA
A. parva	Small comb spider orchid; flowers September, the most common spider orchid here	
A. phaeoclavia	Green comb spider orchid, perhaps a form of *A. parva.*	V in SA
A. venusta	Large white spider orchid, rare here	V in SA
A. villosissima	Hairy spider orchid, probably a form of *A. parva*	K
A. phaeoclavia x A. venusta +	Hybrid spider orchid.	i
Bunochilus chlorogrammus +	Green-lip banded greenhood, mostly in shaded track edges	E in SA
B. melagrammus +	Black-lip banded greenhood, smaller and on tracks	E in SA
?B. smaragdynus	May be a misidentification	
Caleana major	Flying duck orchid, on some old lists, see Kath Alcock	E in SA
Calochilus herbaceus	Leafless beard orchid, seen after a fire in the 1980's, not seen during survey.	Nationally rare, E in SA
C. paludosus	Swamp beard orchid, rare here	E in SA
C. platychilus +	Woodland beardies, on track edges	
C. robertsonii +	Heath beard orchids, commonest beardie here	U in SA
Corysanthes dilatata	Veined helmet orchids, common on shaded edge of tracks in winter	
C. dentata +	Scattered in south on shaded edge of tracks	E nationally, new to SE
C. incurva	Shy helmet orchid, scattered colonies in August	
Corysanthes x miscellus	Hybrid helmet orchid	i
Corunastylis sp.	Single plant in seed	
Cyrtostylis reniformis	Gnat orchids, common here	
Dipodium sp.	Hyacinth orchid.	
**Disa bracteata*	Weed orchid, abundant on tracks,	
Diuris aff. chryseopsis	Localised and rare here on damp soil	V in SA
D. aff. brevissima +	Rare on edge of swamps in October	E in SA
D. orientis	Bulldog orchid; common after bush-fires, few on tracks	
D. sulphurea	Leopard orchid; flowers November, common here	U in SA

Eriochilus cucullatus +	Parsons bands, autumn bunnies, smooth leaf form	
Gastrodia sesamoides	Potato orchids, one colony near track	R in SA
Glossodia major	Waxlips, abundant here in spring, a real splash of colour	
Leptoceras menziesii	Rabbit ears, very rare here, seen at only one location, may be more after fire	
Leporella fimbriata	Fringed hare orchid, common here on tracks	
Linguella sp. Hills nana +	Common small greenhood; flowering early spring	
Linguella sp. Mallee nana +	Scattered all through on shaded edges especially with *Acacia mearnsii*.	
Linguella spp. +	There may be other small greenhoods here	
Microtis arenaria	Sandhill onion orchid, common but few flowered in 2008	
M. frutetorum	Common onion orchid	
M. parviflora	Small onion orchid; common in swampy areas	
M. sp. Short leaf	Short onion orchid, rare here	
Nemacianthus caudatus +	Mayfly orchid, the colony of a hundred or so is the only one I have ever seen in the lower SE	E in SE
Paracaleana minor	Little duck orchids	R in SA
Petalochilus carneus	Pink fairy orchids; common here	
P. prolatus	Seen at only one location	
P. pusillus	Tiny pink fingers, but rare here in spring	U in SE
P. sp Dark buds +	Tiny rare purplish, whole plant	K, ?E
Pheladenia deformis	Rare and mostly after fire here	
Pterostylis nutans	Nodding green hood; on shaded edges of tracks	
P. pedunculata	Maroon hoods; common here	
Pyrorchis nigricans	Fire orchids, common on tracks	
Speculantha obesa ms	Red tip greenhood, see Wild Orchids of Victoria pg 153 for an image	E in SA
Thelymitra antennifera	Rabbit eared sun orchid, just a few	
T. aristata	Large swamp sun orchid, rare here on swamp edges	E critical in SA
Thelymitra aff bracteata 'Pale'	There are several species in Victoria that may fit this one	K
T. brevifolia	Short leaf sun orchid, common here	
T. exigua	Short clumping sun orchid, in River red gum areas	V in SA
T. flexuosa	Little yellow sunny, rare here	U in SA
T. holmesii	Only a few seen here at three locations	V in SA
T. ixioides	Has been reported for the area, not on	

	tracks	
T. juncifolia	Blue spotted sun orchid, common here in two forms, ?species	
T. luteocilium	Dull pink sun orchid, seen nearby	
T. matthewsii +	Spiral leaf sun orchid, world's largest population	E nationally
T. pauciflora complex	Several un named taxa see below	
T. rubra	Common pink sun orchid	
Thelymitra sp Insipid +	Slender sun orchid	
Thelymitra sp Latifolia +	A common small blue sun orchid in shady places	
Thelymitra sp Rubricaulis	Rare here in swamp edges, see image in Orchid CD	E nationally
Thelymitra sp Pale capsules	This species is restricted to swampy depressions here	
Thelymitra x chasmogama +	Slate sun orchid, one only	i
Thelymitra x truncata	Hybrid sun orchid	
Urochilus sanguineus	Maroon banded greenhood	

Legend:
* introduced taxa
+ indicates a collection made for state herbarium
Conservation status: E endangered, V vulnerable, R rare, U uncommon, K thought to be threatened and i indicates an unusual occurrence of a non threatened taxon.



MH, *Petalochilus* sp. Dark buds, Nangwarry, early November

Management

Quite obviously the common species here have enjoyed the long term and present management and the present management should be continued where they are presently thriving.

It can be noted that some present overall actions are not beneficial to native plant diversity. These include

1: ploughing: most plough lines are relatively free of orchids (or indeed natives) as orchid tubers are shallowly buried and destroyed when cut by ploughs. Ploughed areas attract weeds, although this is not too obvious in Nangwarry yet as weeds are not a feature of the surrounding area. No further ploughing should be done near rare orchid populations as this will allow the orchids to colonise ploughed areas.

2: heavy vehicles should be discouraged from turning on firebreaks between April and November. During the survey many vehicles were observed turning here.

3: as the majority of orchids on east west tracks were right on the edge of tracks these should not be allowed to narrow. There were many old slashed areas which had been allowed to overgrow and these perhaps could be re-slashed particularly near swamps.

4: swamp heath areas adjacent to tracks would benefit from having a few slashed lines put through them as swamp orchids will flower only after fire or slashing and this will allow for their populations to expand. Wetland areas are the first to suffer in periods of climate drying so the swamp orchids will need all the help they can get. This will benefit the rarest species like *Thelymitra aristata* and *Calochilus herbaceus* which are otherwise doomed.

5: Cool season burns (i.e. orchid growing season) are detrimental to orchids and perennial herbs as they can be killed by fire when in full growth. Brian Gepp of Forestry SA Mount Crawford devised a plan to overcome this destruction by doing cool season burns as a patchwork, the burns only a few metres apart separated by irregular unburned patches to give a mosaic burn. This meant that sensitive plants flowered the following year in the unburnt sections to produce seed which recolonised bare burned earth the next season.

Last season's cool burns at Nangwarry were almost devoid of orchid plants this year indicating an almost complete kill. As a child I remember that burn offs were done after a rainy day in the November- April period. This was ideal for orchids but these days burns have to be planned months in advance so we find that all those orchids which require a summer burn are dying out.

6: As current slashing regimes seem to benefit the majority of species it would be wise not to alter these. It would be better to expand the width of some breaks and it is certainly not a good idea to close any tracks.

*Slashing is good, excessive vehicle traffic is bad!

7: It may be useful to do a complete count of *Thelymitra matthewsii* in mid August as that would be the time when most leaves and flower buds will be obvious. After that browsing and insect damage will reduce the number visible.

General Management discussions

Two of the perennial topics in management of forest reserves are *slashing* and *fire regimes*. Both are very sensitive issues when it comes to orchids and other small geophytes, herbs and annuals. There are numerous papers available from throughout Australia and the world so I have not chosen any here. But they all reach the same conclusions.

Slashing: the general consensus is that slashing should be done after most of these small plants have flowered and released their seed, i.e. in summer-autumn. This could be brought forward in dry times to late November.

Some species will require modification to this i.e. *Thelymitra aristata, Paracaleana* and *Calochilus* release seed in mid summer and wherever there are populations of these they need to be marked for autumn slashing.

This may mean that the usual contractors for slashing should not do these sensitive species areas and Forestry SA workers may be required to do so.

Many endangered species do better after appropriate slashing i.e. *T. matthewsii*, so that pro-active, environmental biodiversity slashing may be used to increase their populations. With *Calochilus paludosus, T. matthewsii* and *T. aristata* slashing heath and heathy swamps adjacent the main populations would be beneficial. Experimental slashing at different heights would over time show which height best suits each species.

It could be observed during the survey that some previously slashed areas are no longer slashed and have become overgrown. In times past these harboured rare orchids. Perhaps they should occasionally be slashed again. Local observation by an environmental officer will show when most seed capsules have dehisced and therefore show when slashing can safely be done.

Shade loving species like the endangered *Corysanthes dentata* will not benefit from slashing.

*DEH is losing many rare species from their reserves because they allow old tracks, fire breaks and access tracks to grow over. This is always a mistake and I suggest Forestry SA can avoid making the same mistake.

The plant species which make up most of the diversity in any reserve are the small lilies, orchids, herbs and dwarf annuals. When open spaces grow over they gradually disappear and local extinctions increase.

Allowing tracks to grow over is also bad management is it does not allow fire fighting access or easy observation of how rare plants and animals are faring.

Take for example, the latest enormous bushfires on Kangaroo Island which were easily stopped on private property due to good track access. No blue gum plantations were destroyed but the National Parks, where access tracks were grown over, were almost completely burnt out allowing no survivors to recolonise.

Fire: Brian Gepp of Forestry SA, Mt Lofty Ranges, developed a system of mosaic burning which gave maximum biodiversity in areas managed by him in the 1980-90's. His burns could be done at any time of year without wiping out any species simply because his hundreds of burns just metres across left a patchwork of burned and unburned vegetation. This would be a useful strategy in Nangwarry. Studies done of forest reserves in other states have shown that frequent cool burns over a whole block quickly decrease biodiversity.

Our survey at Nangwarry this year showed that most areas cool burned in the last two years were almost devoid of orchids, or had few leaves or flowers.
Yet one burned block was a-blaze with orchids. I did not enquire when each burn was done but clearly this one was done in an ideal way and the others were not. Nangwarry could become a showcase of good fire management.

I would like to see slashed lines some 10 metres across put through some dense swamp heath areas so that small plants which are smothered at present may regenerate.

Most native plants require fire or disturbance for regeneration so this will always be a big part of any management, particularly of orchids.

Ploughing: Ploughed areas in other reserves often become smothered in weeds but this has not happened in Nangwarry simply because there are few weed problems in the larger area outside the reserve. This will need future monitoring. In any case orchids do not survive regular ploughing and I would not like to see any increase in ploughed areas.
Feral pines: these have been well managed in the area.

Traffic: during our survey we noted a high degree of traffic through the reserve including logging trucks, other wildlife surveyors and even a wood collector. Some of these were observed doing wheelies or similar activities on diverse vegetation. Sensitive areas may benefit from some traffic modification.
Tracks should not have spoil or similar used to build them up as this may contain weed seeds. Fortunately present soils are not all that fertile and weeds would not thrive unless extra nutrient were provided. Fertiliser spills and the like would be detrimental.

Drug crops: at least one Marijuana planting was found during the survey and this was a boxed container with several small plants. Drug crops in the Adelaide Hills are a known source of weeds along creek-lines but are less likely to be a problem here.

Additional notes about orchid species listed:

Eriochilus species: The *Eriochilus* species seen here had large, elongate, smooth, pale green leaves quite unlike those of the Adelaide Hills species which has heart shaped, dark green, ribbed and bristled leaves which are purple below. It is likely that each is a different, probably un-named species as the genus is under review. It would be worth photographing the Nangwarry species in flower.

Arachnorchis parva versus *A. phaeoclavia* and *A. villosissima:*
Plants identifiable as each of these were located but recent studies by Bower et al indicate that as each has the same pollinator and similar morphology they probably represent one variable species.
Bunochilus species: images taken by June Niejalke of flower close ups show a species without labellum hairs and these agree with *Bunochilus stenopetalus* DL Jones a species not yet recorded for South Australia.

Leptoceras: although *Leptoceras menziesii* is listed on a sighting of its leaves it is possibly an error based on similarity of its leaves to those of the local *Eriochilus.* I did not see it there myself.

Petalochilus: the common outcrossing pink flowered *P. carneus* is extremely variable here. The smaller flowered *P. prolatus and P. vulgaris* can be expected here but neither was seen by me although *P. prolatus* was reported by at least one participant. Of the tiny species, there appeared to be two present, a pale pink early flowered and a dark late flowered form. The former is recorded as *P. pusillus* the latter as *P.* aff. *mentiens* (sp. Dark buds) but perhaps both are undescribed as the group is under revision. The *P.* aff. *mentiens* was photographed by Mal Houston.

Hybrids: surprisingly few hybrids were seen, most likely because the slashed areas have now become quite constant and hybrids occur mostly at recently modified locations.
All hybrids at Nangwarry have been previously recognised elsewhere; some like the *Arachnorchis phaeoclavia* x *A. venusta* were photographed (see image in appendix). There were also some sun orchid hybrids.

Several rare non-orchid flowering plants were seen including the endangered *Dillwynia cinerascens* (see image in appendix).

Highlights: not all orchids reported during the past years were located, but about twenty species not previously known for the reserve were seen during the survey.
The most spectacular discovery was the nationally endangered spiral leaf sun orchid *Thelymitra matthewsii* first spotted by June Niejalke and Dianne Richman in August while still in bud. Mike Duncan (Victoria) who is in the process of preparing recovery plans advises that the previous total count of plants worldwide was about 800. Well that is likely to be almost doubled by the Nangwarry discovery which has at least 500 plants. Forestry SA has begun management strategies to ensure this species thrives here.
Thelymitra, the sun orchids ruled on this survey with more species of these than any other genus in the reserve. In fact we found several undescribed species.

New records for SE include the nationally endangered *Corysanthes dentata* found by Mal, Cathy and Troy. Also new for the lower SE was *Nemacianthus caudatus*.

Summary:
Thank you to all participants in the Survey i.e. Barb and Ken Bayley, Thelma and Phil Bridle, Cathy and Malcolm Houston, June Niejalke, Dianne Richman, Sheryl Holliday and Christine Jackson, Peter McCauley, Rob and Deidre Bates and especially to Troy and Bryan who invited us to do the survey.

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