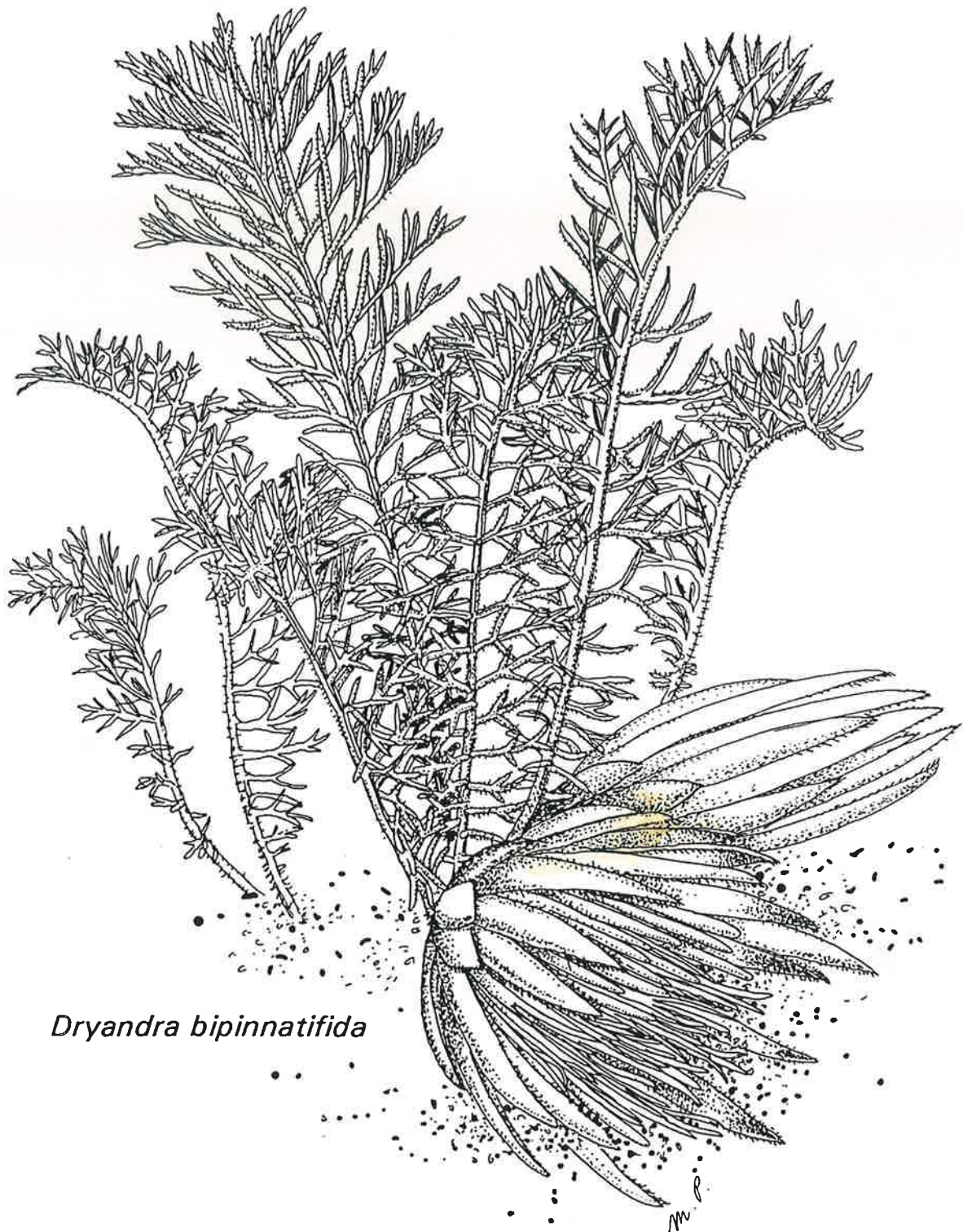


DRYANDRA STUDY GROUP

NEWSLETTER NO. 27



Dryandra bipinnatifida

ISSN 0728-151X

January, 1995

SOCIETY FOR GROWING AUSTRALIAN PLANTS

LEADER

Mrs. Margaret Pieroni
16 Calpin Cres.
ATTADALE,
WA 6156

NEWSLETTER EDITOR
Mr. Tony Cavanagh
16 Woodlands Dr.
OCEAN GROVE
Vic. 3226

Welcome to the first Newsletter of 1995. Our trip during August to October to Northern and north-western Australia was just great although because it was such a dry year, the wildflowers were in short supply in most areas. When we returned home, we found that the very dry winter and spring had taken its toll and we had a number of dead plants to remove, including one of my long-established *D. armata* plants. A much sadder loss occurred only recently when I lost my last sp. No. 12 (aff. *plumosa*). This was well established, 0.75 m. high, and looking very healthy. Margaret believes it probably dried out as they live naturally in quite moist conditions.

There are several items that Margaret and I would like to mention:

Annual SGAP Conference, Ballarat 22-29 September.

We will both be attending the Conference so if any Study Group members are coming, please make yourself known to us. I believe I will be giving a conference paper on the Saturday night and there is a display night on, I think, the Tuesday. We will have a Dryandra display and would appreciate any fresh dryandra flowers that anyone can bring (I know it is not the best time).

Post Conference Visit to Cranbourne

One of the post-conference tours will include a visit to Cranbourne on Wednesday, 4th October. I understand that the tour will probably involve looking at the whole Cranbourne complex but some time will be spent with the Dryandra Collection. Margaret, Elizabeth George and I will be at Cranbourne that day and again would like to meet any member who is on the tour.

Survey Forms

You will notice that there are two survey forms in this Newsletter, one for the Rare and Endangered Dryandra survey and the other for a listing of what dryandras people are currently growing. Several of you have recently sent in forms and I would like to thank you for this - if you have let me or Margaret know what you are growing within the last six months, you do not need to complete another form. Please note that it is a garden survey so we are really looking for plants that have survived for two or more years in your garden, rather than species which are in pots or younger than this. Could completed forms be sent to me and I will summarise for a future Newsletter.

Dryandra Study Group Index

Thanks to the great work of David Randall, there is an updated edition of the Index, current to Newsletter Number 26. The cost is \$2.00, postage included and copies are available from Margaret or myself. David has listed all the species and given the pages and the Newsletter where information can be found on that species. Using different type formats, he indicates whether the information is just the name or identification notes or locality in the wild etc. Altogether, the Index is a most useful addition to the Dryandra literature and David is to be thanked for his interest in compiling it.

And finally Subscriptions for 1994

If a cross appears in the box, your subscription of \$6.00 is due. Please pay Margaret as soon as possible.



We hope that you enjoy the Newsletter and thanks to all who contributed, especially Margaret for her articles.

Happy Dryandra growing

Tony
Tony Cavanagh.

Members please note. I will be overseas in June and July so the July Newsletter will hopefully come out in August.

Tony

Rare And Not So Rare: - Dryandras seen on a Three Springs - Badgingarra trip 25 - 28th July '94.

The region of northern sandplain heath is rich in dryandras several of which are gazetted as "priority species" and considered to be threatened. Anne Cochrane asked me to accompany her on a seed collecting trip and, of course, I eagerly accepted. The dryandras in question included *D. serratuloides*, the typical form from Mogumber and Gillingarra with very small bracts and the Badgingarra form which has bracts longer than the flowers. There are differences in the leaves and flowering times. Those of you who have visited Cranbourne will have seen the two forms growing there. Both were previously thought to be quite rare but a survey by botanists from the Herbarium last year revealed many more plants in nature reserves and a national park. In the Three-Springs Arrino area there are three species previously known only from roadside populations: *D. nos. 20, 23* and *42*. *D. no. 20* aff *armata* is the one Ted Griffin called *sp H*. It is a medium to large shrub with leaves similar to *D. armata* and very attractive inflorescences with yellow styles and egg-yolk yellow limbs on the flowers and yellow-green bracts almost as long as the flowers. *D. no. 23* is the "tree" *fraseri*. It is similar to typical *D. fraseri* but grows to be a large bushy shrub or small tree branching from near the ground. *D. no. 42* is very similar to *D. hewardiana* but with much bigger leaves and flowers. On a trip with Elizabeth George in January I met a young man Charles S. who works for the shire. His job of installing roadside markers to identify rare and endangered flora has led to his becoming very interested in the plants and a very good source of local knowledge. He told me that all three of the dryandras are common in the district so Anne had arranged to meet him on our second day, at Three Springs. The other two dryandras we wanted to see were *D. no. 46* which looks like a cross between *D. kippistiana* and *D. sclerophylla* and *D. no 15*. Ted Griffin's *sp I* which resembles *D. hewardiana* but has very narrow leaves with short lobes. I had seen quite a few populations of this one and I don't consider it to be rare.

Several months ago Alex George identified a new dryandra in the Herbarium collection. It had been collected by Ted Griffin in July and September west of Gillingarra. Although very similar to *D. cuneata* it has smaller flowers and more rigid leaves and is very distant from the nearest population of *D. cuneata*. I was hopeful of re-locating this dryandra to photograph it. I had already drawn the seed and capsule but the one seedling that germinated did not survive to have big enough leaves to draw.

On the first day we drove up the Great Northern Highway stopping to photograph *D. polycephala* in flower and finding the winter flowering *D. drummondii* which had finished. All other dryandras we saw further north were late flowering this year no doubt due to the very late start to the winter rains. We were extremely fortunate on the trip to have perfect sunny weather the whole time.

West of Gillingarra we looked for the *D. aff cuneata*. Not finding it at the road junction specified, we drove north looking for a large shrub with bright yellow flowers among the roadside heath plants. Almost on top of a laterite-gravelly rise I

spotted a small shrub, only about 60 cms tall with small, pale flowers. It turned out to be the one we were looking for. Somewhat larger plants about 1m x 1m were growing further away from the road but they were still only in bud and the largest were dead. We noticed some seedlings, however. The flowers are so pale they are almost white and the limb has a purplish tinge. The bracts are dark brown. It is quite an unusual dryandra. We saw several more plants on the next hill, once again the small ones on the very edge of the road were in flower. Two other dryandras were there: *D. kippistiana* and *D. shuttleworthiana*.

The next morning at Three Springs we met Charles and drove out to Kadathini Nature Reserve. Anne had already obtained permission from the farmer to obtain access through his property and we called in on our way to let them know we would be there. All three of the species are there in abundance! The "tree" *fraseri* no. 23 is particularly numerous at the northern end of the reserve and while it was possible to get photographs of all three together, invariably one would not be flowering as profusely as others in the vicinity. Some plants of *D. no. 23* were spectacular, the bright clear yellow flowers contrasting beautifully with the bluish-green feathery foliage. Some plants had flowers with a pink flush. This also occurs in other forms of *D. fraseri*.

Charles told us that he knew of several other locations where *no. 42* in particular was growing "like a weed". South-east of Arrino he directed us to several gravel pits where, once again we found them in abundance. At one dis-used gravel pit *D. no. 42* was re-establishing itself with a vengeance! At a nearby railway reserve we came across a population of *D. no. 20* that contained some extremely floriferous plants. Also in association with these dryandras is typical *D. fraseri* which is a low-growing species that nevertheless is quite variable in that area. One or two plants had extra fine bluish leaves (but not narrow ones as *var ashbyi*) and the bracts lacked the black hairs characteristic of the species.

We came to the conclusion that the inclusion of the three species previously thought to be rare, on the list of priority species, is unnecessary.

From Three Springs we drove directly west to Western Flora Caravan Park 20 kms north of Eneabba where we enjoyed the hospitality of Allan and Lorraine Tinker. Their knowledge of and enthusiasm for, their local flora is outstanding and I can recommend a stay there.

Anne wanted to locate some plants of a rare leucopogon as we were in the vicinity so we drove westwards on Beekeeper Road south of Eneabba and south on the (gas) pipeline road. I found in flower a prostrate "nivea" type of dryandra which I have previously seen further north and east and took to be *D. no. 26* which has very wide (for a nivea) leaves. These ones, however, have lobes which are more rigid, divided closer to the mid rib and do not tend to curl back like those of *D. no. 26* which occurs in Alexander Morrison National Park and, where we later saw it frequently at Tathra and on the Marchagee Track. These were not yet flowering.

We spent some time at the top of the hill at Tathra National Park, where in a rich low heathland there occur several dryandras. We noted a population of a tall *aff. armata* as

well as *sp no. 9, aff. falcata, D. shuttleworthiana, D. kippistiana, D. no. 32 aff. conferta* and *D. speciosa*, the last two being in full flower. Near the junction of Willis and Wilmott Roads we stopped at a population of *D no. 15*. Also at this location is the beautiful *no. 24 aff nobilis* which is also on Don and Joy Williams' property and Don told me, on another road further west near Mt. Lesueur. This is one of my favourite dryandras. I have it in my garden with its first flower out now. In habit is like *D. nobilis*. The leaves are narrower and not prickly. On older plants the dead leaves curl around the tall stem and become stiff and rather prickly which distracts somewhat from the plant's attractiveness. This is only evident on these plants which are growing among the tall *D. no. 15* and small eucalypts. The flowers are spectacular, with a spicy sweet scent. The styles are rich golden yellow and the hairs on the limb are either grey with a few copper-coloured ones at the tip or all copper on some plants. As with *D. nobilis* and several other dryandra species this variability in the colouring is characteristic. The perianth is sometimes purplish.

Further south on Willis Road is where Keith Alcock, Don Williams and Alex George have discovered *D. no 46*. Elizabeth George and I, after much searching found two plants, a few years ago while they were flowering, in November. In the meantime another survey has purportedly found about 100 plants at or near the same location. Anne and I could not find them. *D. kippistiana* is common in the area.

On reaching the junction of the Coorow - Greenhead Road and Tootbardi Road we were dismayed to see the whole of Alexander Morrison National Park completely burned. The fire, we later learned, started on a nearby property on New Years Eve. Most plants were still just bare sticks - very little re-sprouting had occurred. All but one small population of *D. serratuloides* was destroyed and we were not able to find plants of *D. no. 22 aff. blechnifolia* which was another species Anne was anxious to obtain seed from.

Fortunately Don and Joy's "Hi Vallee" was not affected by the fire and, once again I enjoyed their company and they took us for a quick tour of their property the next morning. It was Anne's first visit but we had to move on with more work to do on our last day.

Eastwards along the Marchagee Track we found the richest area of dryandras of the whole trip. Along the way are large populations of *D. speciosa* and *D. serratuloides* with another of *D. no. 15* and, at a location where *D. no. 22* had been collected we found no less than 10 species. I was unsure about being able to spot *D. no. 22* from the vehicle but Anne saw it first. A plant growing on the edge of the road which had been graded was displaying its blue-grey new fish-bone foliage to perfection. The buds, covered in light brown furry bracts are almost spherical. This is a prostrate species with underground stems and we noted one plant which had died in the centre had three seedlings growing from seeds that had spilled from the capsules which had apparently opened because of the death of the inner branches. The other dryandras were:- *D. speciosa, D. shuttleworthiana, D. no. 9, D. no. 26, D. kippistiana, D. sclerophylla, D. vestita, D. no. 32, and D. bipinnatifida*.

For the time of the year there were quite a number of plants in flower especially in the Proteaceae and Epacridaceae families and meeting the local enthusiasts who were so eager to share their knowledge made our trip very successful and enjoyable. Many thanks to you all.

Margaret Pieroni

Stirling Range Update

Given our long hot summer, no autumn to speak of, and very late rain this year, a trip to the Stirling Ranges last week yielded some surprises. Most of the plants, not only dryandras, were at least a month late flowering which meant we saw more species in flower than expected but at least two vulnerable species of dryandra have been reduced dramatically, due in one case to, possibly, die-back disease plus drought and in the other fire plus drought. More of them later.

The trip from 10th-15th September was our annual bus tour with Kevin Coate organised by the Wildflower Society, based at the Stirlings in the excellent caravan park. The facilities are such that we were able to have slide shows and I showed slides of the 28 species that I have listed from the National Park.

A recent book "Mountains of Mystery" by Greg Keighery lists 22 dryandras though I would query three of them. I have never seen *D. erythrocephala*, *D. fraseri* or *D. preissii* there, though I'm not prepared to discount them. The latter, not for the first time may have been confused with *D. no. 3 aff. blechnifolia/calophylla* which occurs just inside the western boundary of the Park and is common in surrounding regions. Those not listed in the (separate) Flora List appendix are:- *D. armata*, *D. blechnifolia*, *D. brownii*, *D. nos. 12 (Bluff Knoll)*, 3 (aforementioned), 47 *aff. plumosa*, 48 "cactus" *aff. falcata* and 49 *aff. ferruginea*. These last two were the ones Keith Alcock and I re-discovered in 1986. This is approximately one quarter of all the Dryandra species.

For a good, comprehensive account of the dryandras in the Stirlings I recommend Keith's article in newsletter no. 12. This is an up-date with observations of those seen by our group last week.

D. arctotidis was in full flower. It occurs in many locations in the Stirlings but some of the best plants were seen in the caravan park surrounds and around the Ranger's house near the Bluff Knoll turn-off. Quite small plants had at least one "nivea" type inflorescence, some in shades of yellow and gold and others all clear bright yellow.

Many plants were flowering for the first time since the devastating fire of 1991 which swept through the western side of Chester Pass Road and burned right to the top of Bluff Knoll. One plant of *D. blechnifolia*, in particular, was spectacular with its large glowing golden flowers surrounded by velvety bracts at the base of its clumps of "pteridifolia-like" leaves. Also in this location *D. armata* was in flower and *D. sessilis*, which, in the Stirlings has larger brighter yellow flowers making it somewhat difficult to distinguish from *D. cuneata* with which it grows in some locations, also in full flower.

We left the Stirlings on our second day calling first at Kamballup, where the rare dryandra was not nearly ready to flower though the plants are looking healthy. It will be at least a month before they are flowering. The rest of the day was spent in the South Stirling area. *D. mucronulata* was seen, with some plants in late flower as well as *D. plumosa*, *D. tenuifolia* (finished) and *D. calophylla* with its buds still under the soil.

The following day we did the Stirling Range Drive, Red Gum Pass Road, Salt River Road circuit. Our first stop was on the Stirling Ra. Drive where there is a magnificent stand of *D. formosa* and several bright pink Isopogons- *I. latifolius* and *I. baxteri*. The inflorescences on the dryandras are twice as big as those usually seen in gardens, and the plants more open and not very tall- a very showy dryandra in a very colourful and interesting stop.

I was looking for *D. baxteri* but I have not yet found this in the Stirlings though I believe it occurs there. *D. mucronulata*, *D. plumosa* and *D. baxteri* are not easy to distinguish from a moving vehicle and safe parking spots are not frequent on this undulating, somewhat winding gravel road.

We did not leave the bus to see the "cactus" dryandra, *D. no. 48 aff. falcata*. It flowers in February-March and I did not want to be responsible for possibly spreading die-back on our shoes by walking to it. The view from the bus was of several plants remaining, they are taller than the surrounding vegetation, but all appeared to be dead. I have since heard that only 2 plants are alive. This species has never been on the Rare and Endangered list, though I and possibly others, brought it to the attention of the appropriate CALM officer years ago and again, when our newsletter featuring my list of vulnerable dryandras was published two years ago. It will probably be extinct in the wild very soon. Fortunately this species is growing well at Cranbourne- too well, because it is a large bushy shrub there and it has lost it's characteristic "saguaro cactus" form. Seeds have been collected by the Herbarium.

D. no. 49 aff. ferruginea, which I was afraid might not yet be in flower, was found to have a few plants with bracts open sufficiently to show the flowers inside but still in bud. Growing with this species above the car-park at Look Out Hill is *D. seneciifolia* and *D. drummondii*. *D. no. 10 aff. armata*, near the car-park had finished flowering.

At Baby Barnett Hill there were quite a number of young plants of *D. foliolata*, which is restricted to the Stirlings, *D. plumosa* and *D. mucronulata*. We also found *D. foliolata* later on a hill west of Red Gum Pass Road where we went to see *Darwinia macrostegia*, the Tulip Bell.

Mature plants of *D. foliolata* can be seen just west of the Baby Barnett car-park on the south side of Stirling Range Drive.

Still on the same road but near the junction with Red Gum Pass Road was a population of what appeared to be *D. armata* with large flowers and an upright habit, that was not *D. no. 10*. I wonder whether it is an intermediate one between the two?

Near the picnic ground on Red Gum Pass road I found the most magnificent plants of *D. brownii* with masses of red "nivea type" flowers. This species has, I think, the largest flowers in this large "nivea" complex and these were the biggest and most numerous I'd seen on any *D. brownii* plants.

Towards Salt River Road there were patches of *D. sessilis* and of *D. sessilis* and *D. cuneata* growing together. *D. falcata* was not yet flowering but 2 kilometres from

Salt River Road we found a population of *D. no. 10 aff. armata*- tall upright shrubs, in full flower, some of which were pink.

At the gravel pit 17 kms. east of Red Gum Pass, as we drove in, the view of the "rehabilitated" section was breath-taking. Laterite boulders have been replaced in one area and it resembles a magnificent rock garden. *D. no. 47 aff. plumosa* was not yet flowering but it is a wonderfully shaped columnar shrub and the blue-green leaves of *D. drummondii* were a beautiful contrast. *D. cirsioides* was in full flower and the perfect 1 metre columns of the uniformly-aged plants in this re-vegetated area were a spectacular sight. Petrophiles and Isopogons added yet more colour to the scene with the peaks of the ranges as a back-drop.

We visited Ongerup the following day where in a bush reserve on a private property south of the town I was interested to see forms of *D. tenuifolia*. At the western side occurs what we call the "cascading" form, a low-growing, sprawling plant with lobes on about 1/3 to half of the leaf unlike typical *D. tenuifolia*, a bushy shrub with lobes along the whole leaf. (This grows further west still.) On the eastern side, however is the completely prostrate form *D. no 53*, with trailing branches and almost entire leaves with a few lobes at the tip.

That evening at the Bluff Knoll car park I walked down the track to see what had, and had not recovered from the 1991 fire. Superficially everything looks very healthy and re growth is very dense. However, I was looking for plants of *D. concinna* which is a species killed by fire. I found quite a few seedlings, some about 10 and some about 20 cms high - all except one, dead! I guess the drought and the competition for the available water would have caused this, if not die-back disease. I wonder how many plants of *D. no. 12* on the top of Bluff Knoll there are? At least, if *D. concinna* disappears from this area, there are a few other populations in the Stirlings, but for how long...?

On our last day, driving towards Cranbrook on Salt River Road but still in the National Park we stopped to look at *Actinodium aff. cunninghamii* and I found that some very small plants of *D. tenuifolia* and *D. nervosa* had late-flowering blooms. I also found some plants of *D. conferta* which is a variety from the Stirlings and south of Nyabing and Ongerup, with a few late flowers. (*no. 55*)

I was keen to re-locate the *aff. mucronulata* with the small, narrow leaves and large flowers which I have only seen in cultivation. We have failed to find the location of Ken Newbey's collection, the plants from which seed was obtained years ago north of Tambellup have long since been cleared but Alex George had collected it in a reserve on Albany Hwy. north-west of Cranbrook. We all had a good search but unfortunately, in vain. It is a very large reserve and we couldn't spend too much time there. Dryandras that were there, were *D. fraseri*, *D. sessilis* and huge plants of *D. brownii*.

Postscript to the Stirling Range Trip

The week following our Wildflower Society tour Elizabeth George and I returned to Ongerup for the opening of the Ongerup Museum Wildflower Display. This is the 17th year of this excellent show which is always worth a visit. While visiting the property south of Ongerup mentioned in my previous article I was invited to return to see another part of the property where I was promised a gravelly area with more dryandras. It turned out to be a dryandra paradise. The soil contains laterite gravel in sandy loam and there is one dryandra which also grows in other habitats in the area, *D. cirsioides*. Others in profusion, are *D. cuneata*, *D. sessilis*, *D. armata*, *D. blechnifolia*, *D. mucronulata*, *D. plumosa* and *D. no. 38 aff. drummondii*.

In parts the vegetation is almost exclusively dryandras, though other genera in the Proteaceae, some equally prickly, are also present. I was amused when we were told that, though the area is not fenced, the sheep have never entered it. Perhaps only Dryandra fanciers could love it! *D. cirsioides*, *D. sessilis*, *D. cuneata*, *D. armata* were in full flower.

Owing to the late flowering season we were able to find specimens of *D. mucronulata* and *D. no. 38* which normally flower in winter, for the Wildflower exhibition. Together with the dryandras on the other reserves on the property, *D. arctotidis*, *D. aff. conferta* and *D. tenuifolia* (*prostrate no. 53*) we saw 11 different dryandras, or 12 if the intermediate "cascading" *D. tenuifolia* is included.

Margaret Pieroni

Copper Hairs among the Gold

In late August the Wildflower Society held its second "Spring Fling" exhibition. Your Study Group was represented with the photo display and a better than ever collection of flowering dryandras. The display was augmented by some beautiful large specimens brought in by Don and Joy Williams from their property.

Among other species I had, from Elizabeth George's garden as well as the Williams, the magnificent *D. no. 24 aff. nobilis*. The beautiful, spicy, orange-blossom scent of this one pervaded the marquee.

Recently I was asked to join a panel discussing dryandras at a field day of the Wildflower Growers Association of W.A. at Muchea. I went with Elizabeth who is a member, and we took a piece from her plant of *no. 24* to show them. I think it would make a good cut flower. It is not prickly and terminal flowers could be encouraged if picking was frequent, I should think. Then there's that perfume..!

On the wildflower farm we visited they are growing *D. stuposa* which is an excellent cut flower with a similar habit to *D. nobilis* and *no. 24*. It flowers mainly in summer but odd flowers may be found throughout the year. Unfortunately they are calling it *Dryandra Hewardiana*! Other species grown by the industry here are: *D. formosa*, *D. praemorsa*, *D. proteoides* (the flowers, borne on old wood have to be wired like everlastings), *D. polycephla*, *D. speciosa* and *D. quercifolia*.

The *D. formosa* flowers had apparently been selected for their colour as they all had rich coppery-brown hairs on the limb. Both Elizabeth's and my plants of *D. no. 24* have white hairs on the lower part of the limb and copper ones on the tips, so that each bud is two-toned. The darker, richer colour together with the golden styles in both these species makes for a more attractive inflorescence and, for cut flowers probably should be selected for.

I have been thinking about other dryandras which have this feature, also. In a given population plants can have flowers with either white or greyish hairs, light golden brown, rusty brown or copper. Some species, in particular many in the "nivea" complex also have different coloured styles, red or yellow, adding to the number of possible colour variations within a population.

These are some I have observed:-

<i>D. drummondii</i> , winter-flowering form,	<i>D. no. 38</i> and <i>D. Hi-Vallee</i>
	white, gold, copper.
<i>D. formosa</i>	gold, copper.
<i>D. "nivea"</i> forms	white, yellow, gold, copper.
<i>D. nobilis</i>	white, copper.
<i>D. praemorsa</i>	gold, copper.
<i>D. pteridifolia</i>	white, gold, copper.
<i>D. shanklandiorum</i>	white, gold, copper.
<i>D. no. 24</i>	white, copper or two-toned.

Margaret Pieroni

NEWS FROM MEMBERS

From Fred Rogers, Horsham, Vic.

I am currently doing a survey of my dryandras. Our area is hot and dry over summer and the heavy soils dry out and become very hard - a real test for growing them successfully, especially as I use very little artificial watering. However, many species are doing well and some are self-seeding while others have failed to set seed even though they are growing well.

D. fraseri is looking good in a sand area.

"*D. ashbyi*". I do not know the current thinking on this taxon but what was considered this is growing well in both sand and heavy soil which dries out in summer.

"*D. carduaceae*" reaches about three metres in height and I have several successful plants. Seedlings have come up near the parent plants. I lift these quite often and transfer them to other spots. (I would like to know if other members have had similar experiences with dryandra seedlings and which species most commonly produce seedlings - editor).

D. cuneata. Plants only grow to a one metre and suffer from lack of water during most summers as there is no artificial watering.

D. formosa. This is a surprise because of our dry summers. With several plants, I carried water in buckets over their first three summers. They grew rapidly and became large bushes with plenty of flowers. In the fourth summer, I left them to fend for themselves and they died. The plants which I watered only over the first summer and then left on their own are still alive after 8-9 years. As an added bonus, there are seedlings coming up near by.

D. nobilis is a very rewarding species. It soon reaches 3-4 metres high and wide and has masses of flowers on long branches. However, my plants are now old and straggly and will need replacing. I grew some seedlings from my own seed and will put them out in February or March, the time I prefer and which is usually successful.

D. obtusa grows well for me here. A plant on deep sand is about 2-3 metres across. It has never set seed.

From Lyndall Thorburn, Queanbeyan, NSW.

I have raised some plants from Study Group seed and now have a number of plants in the garden. We had a very severe winter in 1994 but had little damage to the dryandras in the garden. It was very dry - 15 mm of rain in three months and very cold. We had a string of nights down to -4 C and -5 C in August (our place is a little warmer than Canberra) and the average daily minimum temperature was -1.4 C. Unfortunately, the dryness or the frost damaged the flower buds on our *D. nivea* and it did not flower in spring. Our seedlings in an igloo managed quite well.

From Elizabeth Brett, Corowa, NSW.

We have had a very dry year, with hardly any rain after a wet summer. It seems to have suited most of my Australian plants, in spite of an extended period of heavy frosts (at one time, down to -5 C for three nights running). The dryandras are flourishing and some of the ones I have grown myself have flowered - *D. polycephala*, *subulata*, *calophylla*, *shuttleworthiana*, *arctotidis*, *brownii*, *obtusa*, *nivea* and *D. nervosa*. My main trouble is that I am fast running out of room and the ground is too hard and dry to dig this year. I hope the drought breaks.

From David Marriott, Competa (Malaga), Spain.

(I have reproduced an early letter from David describing the conditions under which he is apparently successfully growing Australian plants in Spain. And in case you think you have a really tough time, spare a thought for David contending with the summers he described in a letter to Margaret - editor).

In July, we have endured extremely hot temperatures which is a little unusual so early in the summer. We had two weeks with maxima over 40 C each each day and one day over 45 C in the shade! Add to this the driest spring in five years with only 69 mm of rain since March and you can see that the conditions are really harsh and difficult. Fortunately, most of the eucalypts I have planted seem to thrive in such conditions but until I have some effective shade cover and available leaf litter, it is difficult to establish smaller plants and shrubs, although as I said in my earlier letter, there has been some success with several proteas, leucadendrons, grevilleas and hakeas. I really look forward to trying my hand with dryandras as some of them look to be really beautiful in leaf and flower from the photographs I have seen. What makes it really exciting is that I've never seen any of these plants in cultivation, let alone growing wild.

From Max Ewer, Avenue Range, South Australia

We went away for a few days recently and mice got in and chewed up most of my dryandra seed! However, I did raise the following - *D. concinna*, *D. fraseri*, *D. plumosa*, *D. pulchella*, *D. subpinnatifida* and *D. "carduaceae"*. I am using PREVICUR as a fungicide and am very happy with the results. I used to lose quite a lot of my hakeas before using PREVICUR.

My major project for 1994, recently completed, was to plant 400 natives around my dam and cover the area with bark mulch. It should look something special in spring next year.

From Barbara Buchanan, Myrrhee, Victoria.

I seem to have been more successful this year with raising dryandras for myself even though Ray Purches and Elizabeth Brett (both study group members - ed.) have also supplied me with plants.

One seedling of *D. "carduaceae"* was bitten off by a rabbit in August, 1993. I found the bits and put in two cuttings. One died, but the other rooted and is now in the ground (July, 1994). I am trying to ensure that I have two or three of each species as insurance, and I am planting them in sunny spots as far as possible. Of course, the shade increases as the garden ages.

Rodger and Gwen Elliot were here to talk to our SGAP group and I asked Rodger about my plants that have done poorly and/or have died. I had been inclined to blame leaf disease as often the roots are sound and we do have long moist spells. Rodger confirmed this with *Hakea petiolaris* but suggested that we might have a trace element deficiency. (In the past, I have used "Minorels" and FTE 503 as trace element sources and they seem to work well. There are several others on the market - editor.) A lot of the Proteaceae develop yellow-orange spots on the leaves and become very unthrifty. I've pulled out a few (*Banksia media*, two plants) while a lot of the grevilleas are not worth keeping as they are. A couple of my largish and older dryandras, including two of the nivea group which I had grown from my own seed, upped and died on me this year. I've found borers in boronias and some other plants so I suspect that there are more that I don't recognise doing damage.

Our weather has been up and down this year. We had a wet spring (with floods) in 1993 followed by a promising start to summer but by the end of February, the rain stopped and we received nothing in autumn. It rained in June but what worried me were some heavy frosts which occurred both before and after the rains. However, the dryandras got through with no problems.

THE MEANINGS OF SOME DRYANDRA NAMES

At several of our get-togethers, people have sometimes been puzzled by the names given to dryandra species. Some are self-explanatory (if you know a little Latin or Greek and some of the terms used by taxonomists in describing plants) but others names refer to people or cannot be easily identified. Over the next few Newsletters, I propose to explain briefly some of the names already in use. However, there will be quite a number of new ones when the revision by Alex George is complete and I will continue with these also. Many of these plants names are listed or explained in C. Debenham's *The language of botany* and F.A. Sharr *Western Australian plant names and their meaning*.

Part 1 - Dryandras Named After People.

Dryandra baxteri R.Br. This was named by the Scottish botanist Robert Brown in 1830 in honour of the collector of the type specimen, William Baxter. Baxter was a gardener and plant and seed collector who visited Australia twice - 1823-25 and 1828-29. He collected at Kangaroo Island, Wilsons Promontory and extensively in Western Australia, around King George Sound, Lucky Bay and Cape Arid. In his venture during 1828-29, he was working on behalf of Charles Fraser and the Sydney Botanic Gardens as well as for the English nursery firm of Francis Henschman. Unfortunately, Baxter appears to have less than honest in the division of material and there was a violent dispute with Fraser before Baxter was forced to hand over the share for the Gardens. Nevertheless, Baxter was able to sell his seeds in England for £1500, an enormous sum in those days.

Baxter collected the type specimens of many Proteaceae, including seven species or varieties of *Grevillea*, numerous *Banksias* and *Hakeas* and of course, this species in the vicinity of King George Sound as well as at least seven other *Dryandras*.

Dryandra brownii Meissner. The type was collected by the German botanist Johann Ludwig Preiss in October 1840 and described by C.F. Meissner in 1845. It commemorates probably one of the most outstanding nineteenth century botanists, Robert Brown, naturalist with Matthew Flinders on the *Investigator* who spent three and a half years in Australia between 1801 and 1805. He collected approximately 3400 species, some 2000 of them new to science, and was responsible for naming several thousand Australian plants, including 24 *Dryandras*. In addition, either he or the gardener on the Flinders expedition Peter Good, collected eleven type specimens which Brown described. It is indeed fitting that this name, so long neglected, has been restored by Alex George and will remain to remind us of this outstanding botanist.

Dryandra drummondii Meissner. The Scottish-born James Drummond migrated to the then Swan River settlement in 1829 as superintendent of agricultural operations and botanist and naturalist for the colony. As his position was initially unpaid, he lived on the proceeds of the sale overseas of seeds and botanical specimens. A thorough and energetic collector (who unfortunately did not often detail his collecting localities very precisely), Drummond ranged over much of Western Australia, from the extreme south-west to the Moore and Murchison Rivers in the north and into the dry interior. He collected for or with such eminent botanists as W.J. Hooker, Charles Darwin, Karl von Hugel and Ludwig Preiss as well as John Gilbert and Georgina Molloy. He is commemorated in more than 100 species in many genera, this species being named after him by Carl Meissner in 1848. Drummond is credited with discovering the type specimens of no less than 30 *Dryandras*, not all of which are recognised as separate species or varieties today.

Dryandra fraseri R.Br. Charles Fraser was yet another Scottish-born botanist who arrived in Sydney in 1816 as a member of the 46th Regiment. Appointed soon after as Superintendent of the Sydney Botanic Gardens, Fraser was to

travel much in Australia, on Oxley's three expeditions of 1817, 1818 and 1819, to the Swan River in 1827 where he collected the type specimen of this species. He twice visited New Zealand and Tasmania and later established the Botanic Gardens in Brisbane. Fraser did excellent scientific work and is commemorated in more than 30 species of plants in many genera. Like Drummond, Fraser supplied seed overseas and was responsible for introducing a number of Australian plants into cultivation in Great Britain, often through Scottish Botanic Gardens. Robert Brown named this plant in his honour in 1830. Fraser also is credited with the type of *D. bipinnatifida* found on the Swan River in 1827.

Dryandra hewardiana Meissner. The specimen on which this name is based was collected by Drummond some time prior to July 1847 and was described by Meissner in 1856. It commemorates the relatively little known English botanist Robert Heward who was a friend and biographer of Allan Cunningham and maintained a herbarium of Cunningham's specimens. He was also closely associated with Kew and the famous English botanist George Bentham.

Dryandra kippistiana Meissner. This was another Drummond collection and was described at the the same time as *D. hewardiana*. Kippist was the librarian of the Linnean Society in England and seems to have proposed names for a number of new species (for Dryandras, *D. tortifolia* and *D. vestita*) although he does not appear to have prepared any descriptions.

Dryandra lindleyana Meissner. Ludwig Preiss collected the type specimen in July 1839 and it was named by Meissner in 1845, commemorating John Lindley. Lindley was for many years a powerful figure in English botany, first as assistant secretary of the Royal Horticultural Society and later as the first Professor of Botany at the University of London and later in the same position at Cambridge University. He took a keen interest in the Australian flora and named many species of Australian plants. He is probably best known in this regard for his "Sketch of the Vegetation of the Swan River Colony" published in 1840 in which a number of new species of proteacea were described.

Dryandra preissei Meissner. Ludwig Preiss was a German-born botanical collector who worked in Western Australia between 1838 and 1842. At various times, he worked in association with W.A. resident collectors such as Drummond, Gilbert and Georgina Molloy. He was a thorough and meticulous collector, well ahead of his time with the detailed descriptions of localities and even soils which he provided with his specimens, most of which were gathered in duplicate. It is claimed that he took more than 200,000 plant specimens to London with him in 1842, many of which were used by Meissner and others for preparing descriptions for the massive *Plantae Preissianae* of 1844-48. Preiss is commemorated in about 100 plant species and collected the types for 5 Dryandras although not all are currently accepted. (There is one discordant note. In a recent account of Georgina Molloy, it is claimed that he was very discourteous to her and "took much more than he gave", accepting her meticulously presented specimens and providing only a few second-rate specimens in return. He apparently also promised to identify many of her unnamed samples but never did).

Dryandra shanklandiorum R.P. Randall. This is the most recently named Dryandra, having been described in 1988 although it has been widely grown for many years. The type specimen was collected on the property of farmers Wally and Betty Shankland in the Dowerin District of Western Australia. They have agreed to preserve the population of these plants on their property.

Dryandra shuttleworthiana Meissner. Another Drummond collection, the specimen was gathered before the end of 1852 and described by Meissner in 1855. It commemorates Robert James Shuttleworth, conchologist and botanist, who was a correspondent of Meissner. Shuttleworth was a subscriber to James Drummond's collections and maintained a large herbarium which Meissner consulted. We know very little more about Shuttleworth beyond the fact that he spent a lot

of his life in both Switzerland and France, dying there in 1874.

Final comment. In any list of Dryandra names which includes the "authors", ie the person who prepared the description of the species, the name Meissner crops up no less than 35 times although not all of his names are currently accepted. Who was Meissner? Carl Frederich Meisner was Professor of Botany at the University of Basle and made a substantial contribution to the botanical literature over nearly 40 years. After 1861, he changed the spelling of his name to "Meissner" leading to much confusion as to how it should be written for plants he described before that date. He was a specialist in Proteaceae but also wrote monographs on a number of other genera and authored the substantial *Plantarum Vascularium Genera* over the years 1836-43. Many of his descriptions of the Proteaceae appeared in J.G.C. Lehmann's *Plantae Preissianae* of 1844-48 and in Augustus' and Alphonse de Candolle's monumental *Prodromus*, generally in the 1850s. Most of the Dryandras he described were collected by Drummond and Preiss, often held in herbaria such as those of Shuttleworth. Meissner often commemorated these people in his names so it is a matter of some surprise that there is no "Dryandra meissneri". He is surely worthy of it.

To be continued.

RARE AND ENDANGERED DRYANDRAS

by Margaret Pieroni

(As we have not had a survey of the rare and endangered Dryandras that members are growing since 1992, I have decided to reproduce this article by Margaret which appeared in Newsletter Number 22. As can be seen from two of Margaret's articles in this Newsletter, the status of some of these species has changed. Fortunately, in several cases, it is for the better and we can now take the following species off the list of rare and endangered Dryandras as recent surveys have shown that the number of plants in the wild is higher than previously thought:-

D. serratuloides (both)

Dryandra sp. H, ASG No. 20 (aff. *armata*)

Dryandra sp. ASG No. 23 (aff. *fraseri*)

Dryandra sp. ASG No. 42 (aff. *hewardiana*)

More good news is that a new and relatively large population (100+ plants) of *D. mimica* has been discovered near the already known population west of Mogumber. It is not on a formed road and the area may be declared a reserve. Hence, as Margaret says, it is now less endangered than previously thought. On the other hand, Dryandra sp. ASG No. 48 (aff. *falcata*) is possibly almost extinct in the wild. As Margaret notes in her article "Stirling Range Update", during a recent bus trip, all plants they sighted appeared to be dead and she has subsequently heard that there are only two known living plants. It is indeed fortunate that this species grows extremely well at Cranbourne and sets prolific quantities of seed, if you can brave the extraordinarily prickly leaves to collect it!

I have modified Margaret's original article to update the information she has given me and noted above. I have also included the survey form and would ask all members who are growing any of the species to complete it and return it to me - editor).

Dryandras gazetted as rare and endangered in the Department of Conservation and Land Management (CALM) publication, *Western Australia's Endangered Flora* (S.D. Hopper et al, The Department, Perth, 1990) are:-

D. serratuloides, *D. sp. nova* ASG 54 "Kamballup" and *D. sp. nova* ASG 12 Stirling Range National Park. All three are illustrated in the book.

Other taxa which are regarded as vulnerable are included on a Reserve List and include:-

VULNERABLE TAXA FROM THE CALM RESERVE LIST

TAXON	PRIORITY CODE
<i>D. aff. drummondii</i> ASG 38	1
<i>D. aff. erythrocephala</i> ASG 44 (yellow)	2
<i>D. aff. hewardiana</i> ASG 42	1
<i>D. sp. "D"</i> , ASG 16 (Hatters Hill)	3
<i>D. mimica</i>	1
<i>D. polycephala</i>	3
<i>D. sp. "B"</i> , ASG 7	1
<i>D. "Kulin"</i> , ASG 37	2
<i>D. aff. blechnifolia</i> ASG 22	2
<i>D. shanklandiorum</i>	2
<i>D. tortifolia</i>	3
<i>D. aff. hewardiana</i> , ASG 15, sp.	1
<i>D. conferta</i> ASG 32	2

Reserve List Code

Priority 1. Few poorly known populations on threatened lands.

Priority 2. Few poorly known populations on conserved lands.

Priority 3. Several poorly known populations, some on conserved lands.

A second list supplied by the Network for Plant Conservation and published in Report Number 15 of the Australian National Parks and Wildlife Service is as follows:-

TAXON	CODE
<i>D. mimica</i>	3E
<i>D. sp.</i> ASG 12	2EC
<i>D. aff. armata</i> , ASG20, sp. "H"	2E
<i>D. aff. fraseri</i> , ASG 25	2E
<i>D. aff. conferta</i> , ASG 31	2E
<i>D. "Kulin"</i> , ASG 37	2ECit
<i>D. aff. drummondii</i> , ASG 38	2E
<i>D. aff. calophylla</i> , ASG 41	2E
<i>D. aff. hewardiana</i> , ASG 42	2E
<i>D. aff. sclerophylla</i> , ASG 46	2E
<i>D. foliosissima</i>	3VC
<i>D. polycephala</i>	2VC
<i>D. serratuloides</i>	2V
<i>D. ASG 1</i>	2VC
<i>D. aff. ferruginea</i> , ASG 36	2V
<i>D. aff. falcata</i> , ASG 48	2VCi
<i>D. comosa</i>	2RC
<i>D. concinna</i>	2RCat
<i>D. foliolata</i>	2RCt
<i>D. horrida</i>	2RC

Distribution Code (Numbers)

Code 2. Species with a very restricted distribution. Geographic range less than 100 km.

Code 3. Range over 100 km but occurring only in small populations or restricted to highly specific habitats.

Conservation Status (Letters)

- Code E. Endangered species in serious risk of disappearing from the wild state if present land use and other causal factors continue to operate.
- Code C. Species known to be in a National Park or other proclaimed reserve.
- Code V. Vulnerable - not presently endangered but at risk in the long-term with changes in land use, etc.
- Code a. Adequately reserved i.e. at least 1000 plants.
- Code i. Inadequately reserved i.e. less than 1000 plants.
- Code t. The total population is within a reserve.

In view of the on-going surveys by CALM botanists and my own observations of plants in the wild, I have taken the liberty of modifying these lists somewhat. The Network for Plant Conservation data also includes two additional lists of "poorly known" taxa, none of which in my opinion are vulnerable at present. The "Kamballup" dryandra is not included on their list (probably because it was only recently discovered) but it is on the CALM one. There are two other species, however, which don't appear in either listing which I would consider threatened so I have compiled a list of endangered dryandras that I think we should be growing if we want to ensure their conservation through cultivation.

There are several of the un-named dryandras that have been given different "aliases" in the past so in order to reduce confusion, I have included Alex George numbers, Ted Griffin's species codes (B to J) and the collection numbers from the seed bank for those who have recorded them (S.G. nos.).

Brief notes on the individual species

Dryandra sp. nova No. 54 "Kamballup" - ASG 54.

This is the recently discovered species described briefly in Newsletter 14. So far it is proving relatively easy to grow in the garden. Some members may have obtained seed from Nindethana Seed Service as its discoverer, Peter Luscombe, is the proprietor of that company. I have a plant doing well in my garden and one given to Kings Park in 1990 is also thriving.

Dryandra sp. nova No. 12 - ASG 12; Sp. F; S.G. 421.

This species, although in a National Park, is in my opinion, extremely vulnerable. Plants which only grow on one or two locations on Bluff Knoll in the Stirling Ranges were affected by die-back (*Phytophthora cinnamomi*) and, since the "controlled" burn of last April I have not heard of their fate. Keith Alcock advised stratification of the seed but I have found that the seed germinates readily albeit slowly (13 weeks) when sown in the usual way in April. I have not succeeded in growing a plant in my garden - two have died during their first summers but a plant I gave to Kings Park in 1990 is doing very well so far in the Rare and Endangered garden in the shade of, of all things, a large camphor laurel tree and well mulched with casuarina needles.

Three other species which I consider to be vulnerable are also restricted to the Stirlings. Only one, *Sp. nova* ASG 48, is on the ANPWS list. I have brought the other two to the attention of the relevant CALM authorities as being worthy of close monitoring for various reasons. The two unlisted species are

15-

ASG 47 and ASG 49 and brief details of these three Stirling Range species are given below.

Dryandra sp. aff. plumosa No. 47 - ASG 47; S.G. 159.

This is a tall, column-like plant with leaves like *D. plumosa* but with larger, showier flowers which was described by Keith in Newsletter No. 12. As far as I know, it occurs in only one location - a gravel pit. Many plants have already been destroyed although it is regrowing where the gravel is no longer being removed. It remains to be seen whether the area will be completely restored and whether the dreaded die-back fungus will be introduced before the gravel pit is finally closed.

Dryandra sp. aff. falcata No. 48 - ASG 48; S.G. 247, 471.

This unusual dryandra has a tall, lean habit with leaves and flowers like *D. falcata*. It is known among Study Group members as the "cactus" dryandra because of the habit of the plant, with its branches, thickened at the base, protruding at right angles to the main trunk then very shortly afterwards turning to grow parallel to the trunk, reminiscent of a saguaro cactus. We only know of very few plants growing on the edge of a disused gravel pit where die-back has killed many other plant species. It is one of the worst affected areas I have seen. However, the species is growing well at Cranbourne and has flowered since 1986. It has large, woody seed capsules. (This one now seems to be the most endangered and rare *Dryandra* and may even at this stage be extinct in the wild).

Dryandra sp. aff. ferruginea No. 49 - ASG No. 49; S.G. 472.

Known only from one location in the Stirlings, this plant although locally common, is growing where a popular walking track crosses its habitat. It is a small shrub with very attractive ferruginea-like flowers. My plant, which is doing well and flowered profusely last spring was obtained from a nursery as "D. runcinata" (an old name for *D. ferruginea*). The seed probably came from Nindethana and some members may already have this plant if they've obtained seed from this source.

Dryandra mimica S.G. 202,495. (See cover).

There are only three known locations of this species in the wild (now four - see introduction) and three of these are not in reserves. I have a plant in my garden which flowered for the first time last Christmas (1991). It is growing well and seems to be quite hardy. A well-established plant at the W.A. Herbarium is also looking very healthy and has flowered but not yet set seed.

Dryandra sp. aff. armata Sp. H. - ASG 11 and ASG 20; S.G. 137 and 366 (11), S.G. 257 and 368 (20).

Two distinct forms of this species occur which will probably be split into two taxa. One of the most northerly dryandras, one form, No. 11, occurs near Kalbarri while the other, a taller, denser shrub to two metres, is found near Three Springs. (Now no longer considered rare - see introduction). Its most striking feature is the involucre of long bracts which are green-yellow contrasting with the bright yellow perianth and golden limb of the flower. The photograph in Ken Newby's *West Australian Wildflowers for Horticulture* Vol. 1 as *D. cirsioides* is probably this species as is the much-enlarged photo in Michael Morcombe's *Australia's Western Wildflowers* (page 28), showing the flower in bud.

Dryandra sp. aff. conferta No. 31 - ASG 31; S.G. 547.

This is probably a form of *D. conferta* but it is a very attractive one in cultivation. I have seen it growing in South Australian and Victorian

gardens. Only one population is known in the wild, near Corrigin. The plants are quite small, about one metre high, the leaves are blue-grey and the flowers are lemon-yellow.

Dryandra sp. nova "Kulin dryandra" - ASG 37; S.G. 480.

This is a prostrate species with large flowers at ground level. The flowers are surrounded by large, pointed, hairy bracts which do not appear to open out fully. They have a most offensive odour and are almost certainly pollinated by flies. The entire population of less than 100 plants grows entirely in a reserve near Kulin.

Dryandra sp. aff. calophylla/pteridifolia No. 41 - ASG 41; S.G. 465, 533.

A small, prostrate plant, this species has dusky pink flowers which surround the upright-leaved plant growing off underground stems. It grows near Woodanilling, most of the plants being in a disused gravel pit and adjacent flora reserve with other dryandras growing in pure laterite gravel. I have a plant which is growing slowly. An attractive feature of this species is the velvety purple-red new leaf growth which precedes the emergence of the flower heads from under the ground.

Dryandra sp. aff. sclerophylla No. 46 - ASG 46; S.G. 56, 503.

We know of only a few plants of this taxon in the Badgingarra area. It is probably a form of *D. sclerophylla*. However, I have only recently become aware, when comparing my drawings, that the size of the seed capsules and the length of the leaves fall mid-way between *D. sclerophylla* and *D. kippistiana*. No. 46 flowers later than *D. sclerophylla* but coincides with *D. kippistiana* with which it grows. I wonder whether it is a hybrid, albeit a stable one? (

Dryandra sp. aff. hewardiana No. 1 - ASG 1; S.G. 96, 332, 524, 528, 538. (

From west of Woodanilling and near Katanning, this is the species I referred to in my article on the trip to Albany in January. A bushy, spreading shrub to two metres with flowers similar to *D. squarrosa*, this has leaves similar in shape to *D. hewardiana* but much smaller and sticky when young. The species has been growing well for several years at Cranbourne, among the first plantings.

Another seemingly rare species (but not yet gazetted as such) is the plant called by Margaret "Little Darkin Swamp". The location and a brief description of this species is given in Newsletter 24 (Margaret's article "Third Time Lucky"). The plants resemble ASG No. 3 (*aff. calophylla*) in habit but the blue-green leaves, 30 cm. by 5 cm. with golden tomentose ribs, and golden flowerheads are closer to *D. blechnifolia*. We are not aware of plants in cultivation and the wild plants seem to set very little seed. The habitat of swampy heathland may be difficult to duplicate in a garden situation.

I have supplied seed of most of the above dryandras to Study Group members some of whom have grown several of them successfully. As several species are so vulnerable in the wild, it may be necessary in future to grow them "ex situ" for re-introduction to their natural habitats. The Australian Network for Plant Conservation has recently been formed with this possibility in mind. Many of our indigenous plants can be raised much more successfully far from their natural habitats as I was made aware of during my visit to private gardens in South Australia and Victoria in 1990.

I think it would be a very well worth while exercise if we could survey the results so far of members experiences growing these particular dryandras.

We are very short of, or completely out of, seed of some of the rare plants so if anyone has some to spare, it would be very much appreciated for the seed bank. If you'd like to grow some, just send a good strong envelope and

postage for the ones we do have in stock.

Meanwhile, we would be very grateful for your results in growing any of the endangered dryandras. A survey form is attached to this Newsletter. Please complete it and forward it to Tony Cavanagh. Even if you are growing only one or two of these species, send in the results. You may be the only one who has succeeded!

For leaf drawings of these species, see P. 19.

Growing Australian Plants in Spain

(This is a copy of a letter received from new member David Marriott in Spain. His conditions seem daunting but we wish him well in his venture and will be interested in how his dryandras survive - editor).

Always a keen gardener in the U.K. I settled here permanently four and a half years ago mainly in search of sun but also to get that plot of land I had always coveted but could never afford.

I rapidly learned that gardening here was different than I had ever imagined. Situated in the extreme south of Spain the climate and geology have more in common with North Africa than Europe. I live at an altitude of 705 metres surrounded by mountains rising to over 2000 metres but only 20 kilometres from the coast. The plot is a steep rocky slope (3:1) facing south-east (towards the sun) in an area with a mean rainfall of 350 mm. falling on less than 40 days in the year. In addition we are subjected to frequent gale force winds; hot, from the Sahara in summer and cold, from the snow covered mountains in winter. Temperatures range from 6°C (the lowest I've recorded) to 44.5°C (the highest) although the winter wind-chill factor probably reduces the temperature experienced by plants considerably in winter. Rainfall occurs mainly in early Autumn and mid-Spring with winter being mainly dry - despite the fact that we are actually situated on the Mediterranean. The land is basically old sandstone and shales with granite outcrops; severely degraded after centuries of vine cultivation and more recent indiscriminate use of herbicides and over liberal dosages of sulfate of ammonia. Although the area was at one time oak and pine forest there are scarcely any trees now except olive and almond as these constitute the other main crops in addition to vines for raisin production.

As if all this wasn't enough, we have no water supply - relying solely on rain collected into a 20,000 litre underground tank and supplemented on occasions by tanker deliveries of 7,000 litres a time. So irrigation is not a feasible option except on the basis of localised hand-watering to nurse young trees and shrubs through their first year. Clearly, if I was to grow anything it had to be plants that could adapt and even flourish in such conditions which is why I joined you and also researched plants of the fynbos in South Africa. Armed with the excellent "Plant Life of Western Australia" by Paul Beard and Denise Greig's "Wildflower Catalogue" I began to learn of plants I had never heard of let alone seen, to acquire seeds and to make a start. Although it is very early days I'm quite encouraged. From Cape Province there are several proteas and levcadendrons making good progress on the terraces I have created to maximise water retention and the superb

Leaf Drawings of Rare and Endangered Dryandras (P19)

1 = *D. serratuloides*, (a) capsule, (b) Mogumber form, (c) Badgingarra form; 2 = *D. No. 12*; 3 = "Kamballup" dryandra capsule; 4 = *D. No. 47*; 5 = *D. No. 48*, (a) juvenile leaf, (b) adult leaf; 6 = *D. No. 49*; 7 = *D. sp. H, No. 20*; 8 = *D. No. 23*; 9 = *D. No. 31*; 10 = *D. No. 37*; 11 = *D. No. 41*; 12 = *D. No. 42*; 13 = *D. No. 46*; 14 = *D. No. 1*.

2.

members of the iris family - freesias, ixias, sparaxis, synnotias cabicinas etc.- grow and self-seed quite luxuriantly. Of your Australian plants I turned initially to eucalyptus that are little known in Europe as well as those, such as camaldulensis and gunnii, that are widely grown. As a result, I have specimens of forrestiana, pyriformis, burracoppiniensis, erythronema, leucoxydon, stricklandii, macrocarpa, salubris, salmonophloia and gongylocarpa growing well - some fast and some slowly. There are also several melia ? that seem to be establishing and three grevillea robusta that have, as yet, made little progress but look healthy.

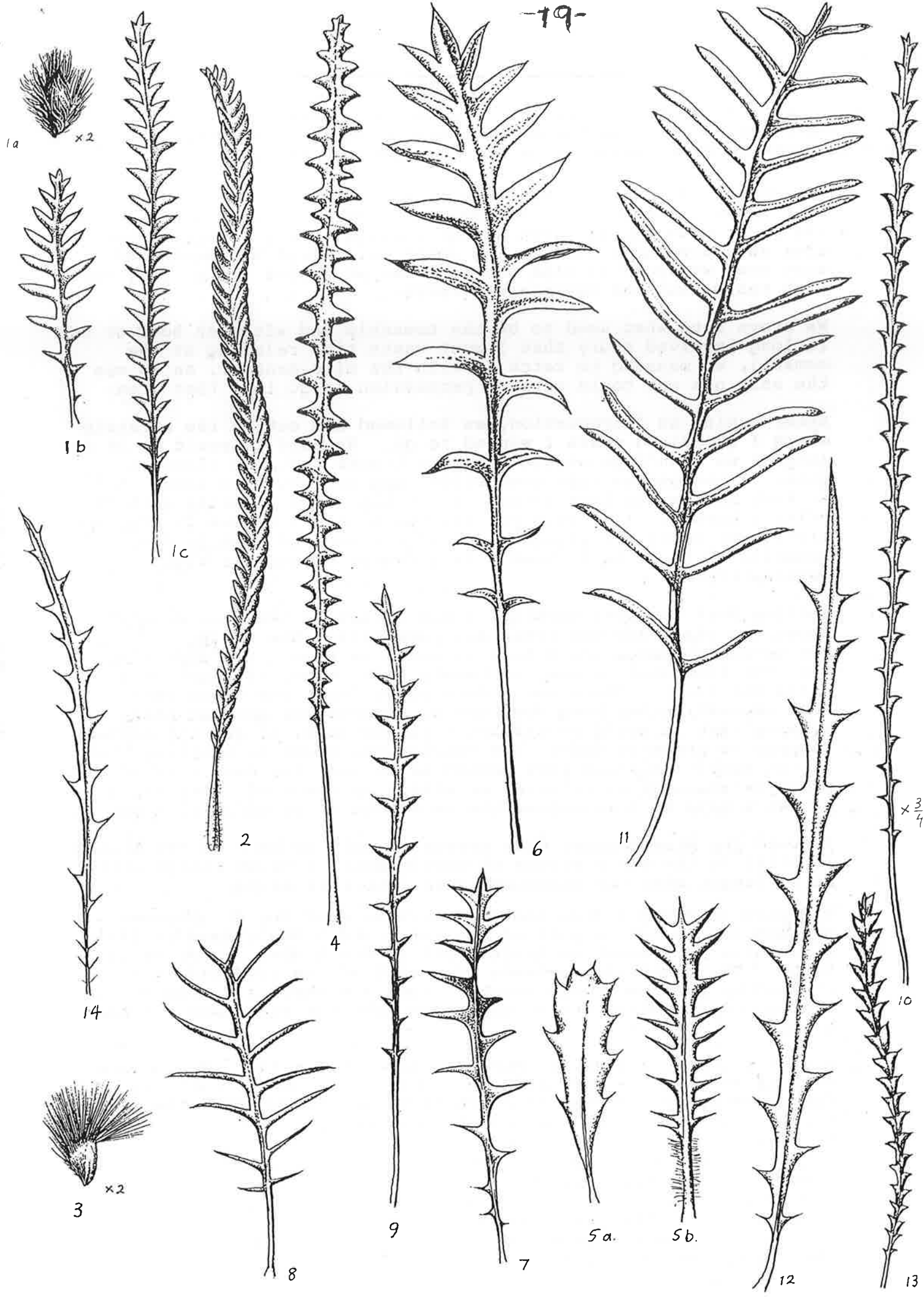
Of other plants, hakea orthorhyncha have grown superbly and I have hopes that they may flower in their second winter. Other sturdy young hakeas include coriacea, costata, minyma and trifurcata. Grevilleas petrophiloides and stenobotrya have grown away rapidly and synaphea steadily. With banksias there has been no joy. They rapidly succumb to chlorosis after an initial rapid start, due I imagine to iron deficiency in the soil and although I could try administering chelates to counteract this it would defeat the object of building a self-sustaining plant community. I do, however have one banksia attenuata that survived last year's 20 weeks summer drought and is still green so I have hopes. As I do of the three ptilotus rotundifolius that have grown just 2 centimetres in 18 months but continue to grow, leaf by leaf!

It is not my wish to bore you with a catalogue but I am now raising seedlings of two casuarinas, other proteaceae, melaleucas, verticordias and herbaceous plants. Other than encouraging progress there is nothing to show yet by way of flowers but my excitement and anticipation are enormous. Apart from the fact that many of these plants are unknown to me even by way of photographs I believe that many are rarely, if at all, grown in Europe so there may be much to show other gardeners here, eventually.

A dream of mine would be to visit Western Australia, to see some of these plants in the bush and talk to enthusiasts about my experiences and learn from theirs. Sadly I feel this will never be realised as my pension would never rise to the fare. But, if and when there are things to show I thought it might be of interest for me to offer a conducted tour round my garden by way of slides and comments for someone to deliver at one of your meetings. This would bring me closer in spirit if not in body. Thank you for the news letter and for "Australian Plants" both of which continue to add to my knowledge and interest. All power to your efforts to preserve your magnificent flora and remember that time is running out - if you want to see what can happen, without that care and concern just visit us! Anyone who cares to write to me out of interest is assured of a reply.

Sincerely,

(Signed) David Marriott



Dryandra arborea in the Wild

(This is from a letter to Margaret from Hartley Tobin. If anyone else is thinking of venturing into the area, please remember that it is a mining site and you must have permission from the mine manager to go in).

On Sunday, 14th August, we drove to Koolyanobbing in search of *D. arborea*. As we drove beside the airstrip towards where I knew the plant grew we came upon a sign warning us not to enter that area as there could be blasting going on. Meryl had mentioned that when we spoke to Olga and Ken Shaw at Wongan Hills, they said that the mining had recommenced there.

We drove into what used to be the township and after an hour or so (a long involved story that I won't waste time relating at the moment), we managed to catch up with the mine manager, as he was the only one who could give us permission to go into that area.

After making an introduction, we followed him out to the airstrip where I explained where I wanted to go. He said it would be OK as long as we didn't go on the two main tracks that had signs on them. I managed to take some slides and collect some seed. Not as much as I would have liked, but it was quite a battle with the prickly bushes. I'll send you the spare when I remove it from the old flower heads. I thought I would try to send some to David Randall, as he seems to have a fair degree of success with germination.

Getting back to Koolyanobbing, I had a chat to the mine manager about the plant and was there any possibility the whole Koolyanobbing Range would be eliminated in time. His answer was 'No' but from what we saw, in twenty years time, it might be a different story. There was a face on at least one slope where some excavation had been done and *D. arborea* was growing there. Knowing that it could be difficult (impossible) to get the mining company to preserve (save) the vegetation, I got to thinking that, if the Herbarium/Kings Park wanted to collect and save some of the plant material of *D. arborea*, or others in the area, they would probably have to investigate the situation at an official level.

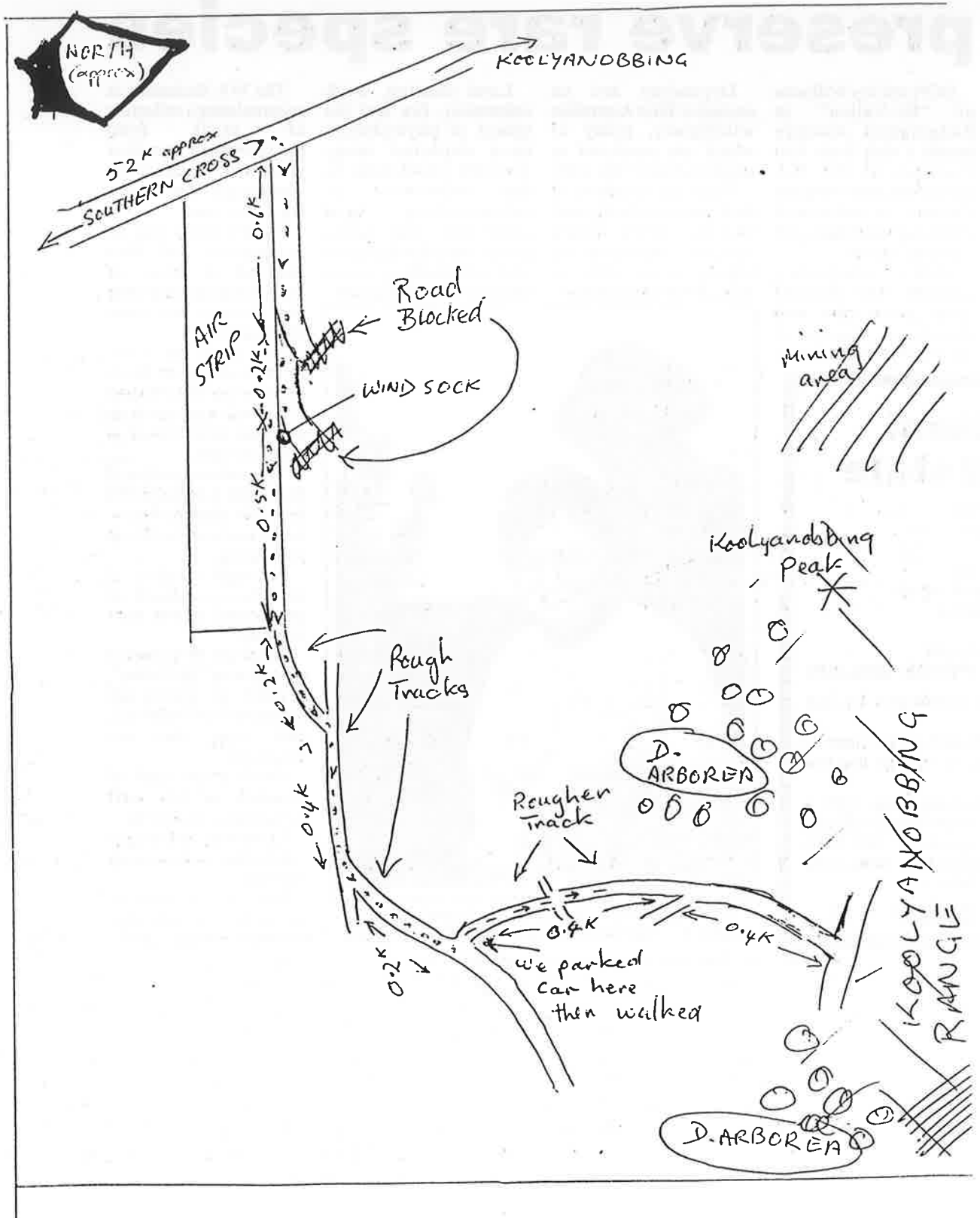
I found the mine manager easy enough to talk to but, as the mining is still in the early stages of development, I think things will be different when the operation gets into full swing.

Enclosed is a map I drew showing where we went for *D. arborea*. The map covers only a part of the range and I would imagine that *D. arborea* is present on quite a bit of the higher slopes of the range. The vegetation extends over most of the area and is criss-crossed by numerous rough tracks. Some are obviously used by the mining company while others appear to have not been used for some time.

One or two plants (trees) seemed to have fallen over as a result of land movement or just getting too big for a decent foothold on the rough slopes. From these plants it was easier to collect seed than upright plants as most of the seed-bearing flower heads tend to be high in the plants. If the seed I collected is mature, then, from the appearance of the capsules I collected, I would say August or September would be a good time to collect seed. My thoughts are, that if the *D. arborea* plants are going to be knocked down as the mine develops, it might be possible ???????? to arrange to have some of the seed collected at that time before the vegetation is buried, burnt, or whatever.

Back home, there has been one of the coldest, driest winters for decades. There were frosts, more numerous and heavier than the 'old-timers' can remember. Quite a few plants suffered, including most of the young ones I still had in pots. As well, I think I have lost *D. 'Kamballup'*.

On the brighter side, some of the seed I had planted back in February and I had regarded as lost, has germinated and I have now potted into 50mm. tubes. With a bit of warm weather, these plants could be looking good by summer. I'll include all the details in my annual report.



And finally. The newspaper cutting concerning Don and Joy Williams, Dryandra Study Group members, was supplied by Hartley Tobin who saw it in the *Moora Central Districts Gazette* of August 3, 1994. Anne Cochran is also a member and is doing valuable work on germination of many of the rare and endangered dryandras. It is great to see people like the Williams preserving our native flora, especially those which are threatened or with restricted habitat.

...ing too, they also beat their own goal.

Herbarium aims to preserve rare species

DON and Joy Williams of "Hi-Vallee" in Badgingarra recently hosted a visit from Ann Cockran, of the WA Herbarium and Margaret Pieroni, a renowned wildflower illustrator and dryandra expert.

Under Margaret's guidance, Ann collected seeds from rare and threatened species of dryandras in the local area.

Dryandras are an exclusive West Australian wildflower, many of which are restricted to small pockets of the state.

They are members of the Proteaceae family and, like the closely related banksias, dryandras are highly susceptible to dieback (phytophthora).

Land clearing, weed infestation, fire and the spread of phytophthora have depleted many dryandra populations in the south-west so precautionary seed collection and plant protection in Badgingarra and surrounding areas have been implemented.

The WA Herbarium is accumulating a collection of seeds from phytophthora sensitive plants to ensure the rapidly spreading disease does not wipe them out.

Stored seeds can be germinated and then planted in areas of previous devastation once the disease has been eradicated.

The seeds are taken from dead flower heads or by the use of a seed trap if the individual seeds on a flower head mature at different rates.

The moisture content of each seed is reduced and then the seed is frozen. Seeds can be stored for up to 50 years.

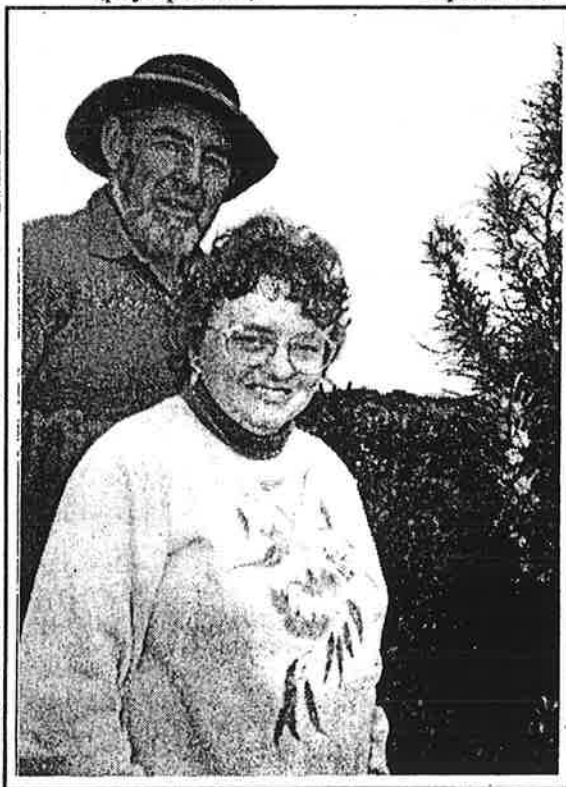
A small number of seeds from each batch are germinated to test their viability.

There are 19 species of dryandra on "Hi-Vallee", several of which are threatened and restricted, and some that are unnamed.

These plants seem to flourish in this well protected environment.

Visitors are welcome at "Hi-Vallee" and tours are available.

Ann Cockran hopes to revisit the farm later this year to collect more seeds.



DON and Joy Williams of "Hi-Vallee" look at some the species of dryandra on their property

Real Estate

ome
des

ars)
and trees
stem)

school
PRICE \$89,000

en instructed by our

offered on an area of
area is one of the few

framed fibro with a
ctras include 2 refriger-
ed gardens, BIR main
duced to \$90,000
5,000

h (096) 51 1713.

Dr. P. B. = UA

MOORA CENTRAL DISTRICTS GAZETTE
AUG. 3rd '94

DRYANDRA SURVEY

Record in the spaces provided, details of all dryandras you are growing, or can provide adequate information on from friend's gardens. If you have species you can't name, give it a number on the form and send a labelled specimen(s) off to me with the form.

Name and address of grower, or locality grown :-

.....
.....

Details of topsoil :- State depth, what type of soil/sand, whether it has been built up, or amended. Also describe subsoil

.....
.....

Name of species	HxW Metres	Age Yrs.	Mulch	Moisture Win. Sum.	Drain	Sun	Flw	Set Seed

Height and Width to nearest 1/10th metre
 Mulch :- Depth and type - sawdust, gravel, cover plants, etc.
 Moisture :- W = Wet, D = Dry, M = Moist
 Drainage:- G = Good, M = Moderate, P = Poor
 Sun :- 1/4, 1/2, 3/4, Full
 Flowered / Set Seed :- Y = Yes, N = No
 Record any other information, eg. light or heavy frosts, exposure to high humidity in summer, or to salt laden winds.

.....
.....
.....

RARE AND ENDANGERED DRYANDRAS SURVEY

Return to:
Tony Cavanagh
16 Woodlands Drive
OCEAN GROVE 3226

NAME..... ADDRESS.....
(not for publication)

GENERAL LOCATION OF GARDEN (eg Perth metropolitan area, Bellarine Peninsula Vic
.....

SOIL TYPE.....

CLIMATE, RAINFALL.....

ANY SPECIAL MODIFICATIONS MADE FOR DRYANDRAS (eg built-up beds, watering etc)
.....
.....

ANY OTHER RELEVANT NATURAL CONDITIONS (eg frost, salt, wind etc)
.....
.....

DRYANDRA	SEED GERM. (good, poor)	NO. OF PLANTS (pots, garden)	CONDITION OF PLANTS (vigorous, slow, poor)	CULTIVATION flowered, set seed (yes/no) (yes/no)
No. 54 "Kamballup"				
No. 12 sp. F				
No. 47 aff. plumosa				
No. 48 aff falcata				
No. 49 aff. ferruginea mimica				
No. 31 aff. conferta				
No. 37 "Kulin"				
No. 41				
No. 46 aff. sclerophylla				
No. 1				

Date: