

The Western Australian Adopt an Orchid Project (ADORP)

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With an estimated 7000 plant species the south-west corner of Western Australia is globally recognised as one of the planet's major biodiversity hotspots. It is one of only five Mediterranean-type ecosystems to be listed as globally significant and is one of the few hotspots found in a developed country. The importance of its biodiversity is also recognised by the Government of Australia with five of the 15 national biodiversity hotspots located within the Region.

The climate is characterised by winter rains and dry summers. The vegetation is predominantly eucalyptus woodland, mallee heath and shrubland with nearly 70 per cent of the plants endemic to the Region. Native plants, including orchids, have evolved over time to adapt to the nutrient-poor, sandy and lateritic soils.

Unfortunately, this corner of Australia has been subject to extensive change which threatens the survival of many unique plant species. Since European settlement in 1829, large areas of land have been cleared for agriculture and urban development. Today, throughout the Wheatbelt Region, over 80% of the natural vegetation has been cleared for agriculture, while many parts of the coastal vegetation between Geraldton and Albany have been cleared to cater for urban expansion and agriculture. The remaining bushland is fragmented and degraded, being surrounded by grazed areas and cleared pasture, rendering it vulnerable to further human influences. In many areas, stock and feral animals have destroyed habitat by trampling, over-grazing and introduction of exotic weeds. Clearing of the vegetation has led to rising groundwater levels, resulting in increased soil salinity, destroying the low-lying habitats which are favoured by some plant species. Terrestrial orchids are particularly susceptible. One of the biggest threats has been the spread of the root-rot fungus *Phytophthora cinnamomi*, commonly known as dieback, which has the potential to kill up to 40 per cent of native plant species. On top of all these problems, global climate change causes uncertain weather conditions and increasing periods of drought which threaten to overturn the delicate balance for survival for many plants.

In the face of these threats it is not surprising that many orchid species once considered common are now becoming rare. An example is *Caladenia huegelii*, one of the state's largest and most attractive spider orchids which was probably once abundant in the mixed *Banksia* and jarrah woodland of the Swan Coastal Plain between Perth and Bunbury but is now restricted to a few mostly small bush remnants, isolated by residential areas and farmland. Other orchid species may have always been naturally rare due to specialised habitat but, following clearing, are now close to extinction. It is possible that some of these may already be extinct without ever having been documented and formally recognised.



Threatened and Priority Flora

Under Western Australian legislation, the *Wildlife Conservation Act 1950* provides for the protection of plant and animal species which are under threat of extinction, are rare or are in need of special protection. The term Declared Rare Flora (DRF) is applied to threatened flora and the State Minister for the Environment can declare a species as “Rare Flora” if it fulfils the criteria. Such a plant may not be removed or collected from anywhere (including private land) without the permission of the Minister. As at 22 May 2017, 424 plant taxa, including 37 orchids, are listed as threatened flora. The threats faced by these taxa are regularly reviewed and prioritised by a scientific panel according to International Union for Conservation of Nature (IUCN) Red List criteria. Once listed and ranked as either Critically Endangered, Endangered or Vulnerable, resources and expertise are directed to the conservation of the taxon. The State Department of Parks and Wildlife develops a species-specific plan, called an Interim Recovery Plan (IRP) which identifies the threats faced and recovery actions required. IRPs run for an initial period of 5 years at the end of which the objective is to either downgrade the threatened status of the species (that is, the plan has been successful) or revise and re-implement the plan for a further 5 years (further recovery work is required).

While Parks and Wildlife resources are understandably geared towards conservation of threatened flora, there are still many species which are known from only a few collections or sites, but have not been fully surveyed to assess their conservation status. Such plants may be rare or threatened, but cannot be declared as rare flora until proper assessments have been undertaken. These species are listed by Parks and Wildlife as Priority Flora. The Western Australian Herbarium’s Florabase currently lists 3145 plant taxa, including 58 orchids, as Priority Flora. Priority flora are ranked in five categories.

- Priority 1 taxa are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are: very small and are on lands not managed for conservation, or are otherwise under threat of habitat destruction or degradation. Taxa may be included if they do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such taxa are in urgent need of further survey.
- Priority 2 taxa are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation. Taxa may be included if they do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such taxa are in urgent need of further survey.
- Priority 3 taxa are known from several locations that do not appear to be under imminent threat, or are from few widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
- Priority 4 taxa are adequately known and include (a) rare taxa which have been adequately surveyed, or for which sufficient knowledge is available, and are considered not currently threatened or in need of special protection, but could be if circumstances change; (b) near threatened taxa which have been adequately surveyed and that do not qualify for Conservation Dependent status, but that are close to qualifying for Vulnerable; or (c) taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
- Priority 5 taxa include conservation dependent taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

The ADORP project

The task of protecting such a large number of threatened and priority flora is huge. In view of the limited resources available to Parks and Wildlife, which is necessarily focussed on implementing recovery programs for threatened plants, it is unsurprising that less time and effort is available for the 58 priority orchid species. Never the less, the need for help in assessing the conservation status of these priority orchids has been recognised and Parks and Wildlife duly undertook to collaborate with volunteers from the Western Australian Native Orchid Study and Conservation Group (WANOSCG) to obtain better and up-to-date population, threat and survey information. In 2011, the *Adopt an Orchid Project* (ADORP) began, with groups of volunteers adopting a species or group of species to undertake monitoring and surveys. The project covers priority 1 to priority 3 taxa, that is, those species with very little information or are possibly most at risk.

Nominated Parks and Wildlife and WANOSCG co-ordinators, in cooperation with Parks and Wildlife regional staff, oversee the project by managing small groups of volunteers (no more than 6 individuals per group) who have the task of collecting information for their adopted orchid species. Prior to registration, group members agree to adhere to ADORP and Parks and Wildlife protocols and guidelines, agree to provide report forms on at least an annual basis, and agree to contact relevant Parks and Wildlife District Flora Conservation Officer who will help plan the trip(s) and discuss hygiene matters and precautions when entering sensitive (dieback) areas. Following registration, each group or individual is provided with an information pack which contains: a general introduction to the project, a Threatened and Priority Report Form and field manual, contact details for the Parks and Wildlife District Flora Conservation Officer, information on identifying the orchid(s), including photographs, descriptions, life cycle information (flowering time, fruiting), known locations of the species, type(s) of habitat to survey, and threats to the plants to be identified. At each site, the group fills out a Threatened and Priority Report Form with precise co-ordinates of the location, information on the number of flowering, vegetative and fruiting plants, associated species (if known), habitat details, and threats observed. Digital images are taken of the site, of each orchid plant (to aid confirmation of identification) and any threats that are observed. All sites are surveyed and reported, regardless of success or failure in locating the orchid. The reports, images and additional information are sent to the WANOSCG co-ordinator, who then forwards them to the Parks and Wildlife co-ordinator for distribution to relevant Parks and Wildlife staff and entry in the Threatened and Priority Flora database. Parks and Wildlife staff review the information and implement recovery actions where possible.

When the project began in 2011, there were 21 participants in 10 ADORP groups covering 11 species. At last count, there are 58 participants in 22 groups covering 31 species, stretching from Kalbarri in the north of the Region to Esperance in the south-east. In the six years that the project has been running, over a 150 priority orchid populations have been monitored and many new populations have been located.

Examples of two orchids covered by the project are Crystal Brook star orchid (*Thelymitra magnifica*) and Lake Muir blood spider orchid (*Caladenia erythrochila*). An update on their current status is as follows:

Crystal Brook Star Orchid (*Thelymitra magnifica*) Sun orchids are divided into several complexes of related species with Crystal Brook star orchid one of seven species in the *Thelymitra fuscolutea* complex. Members of this group are characterised by their yellow to red brown flowers (with or without blotches) and their broad flattened leaves which are often found in clumps. Crystal Brook Star Orchid produces 10 to 35cm tall flower spikes, each carrying two to ten red/brown flowers 3 to 6cm wide that are often marked with yellow.

The species, which can be found flowering from late September to mid-October in a small area along the western edge of the Darling Scarp east of Perth, was named by Jeff Jeanes in 2006 from specimens he collected at Crystal Brook in October 2000. The scientific name *magnifica* alludes to its noble, eminent, stately, splendid appearance. Crystal Brook Star Orchid bears a high degree of similarity to Star Orchid (*Thelymitra stellata*) which can be distinguished by its slightly later flowering period (late October near Perth), slightly smaller, less open flower, less pronounced apical projection to its column and its preference for lateritic, rather than granitic soils.

Crystal Brook star orchid usually occurs in the vicinity of white gums (*Eucalyptus wandoo*), often in dense heath next to Balga (*Xanthorrhoea preissii*) and two-leafed hakea (*Hakea trifurcata*). The orchid often grows below granite outcrops or on sloping granitic soils.

2016 ADORP survey

In 2016 nine sites were monitored by WANOSCG volunteers with six sites, when combined, yielding 78 flowering plants. This was a small increase on the 76 seen in 2015. However, since nine flowering plants were seen at sub-locations where no plants had been previously recorded this represents a 9% reduction in the number of plants flowering at locations previously surveyed. Sixty five vegetative leaves were recorded in 2016, which was 28% less than seen in 2015 and 13% less than seen in 2014.

Threats to the survival of Crystal Brook star orchid

Recruitment of new plants in known Crystal Brook star orchid sites is unknown. However, based on the very limited data collected during the study to date, recruitment is likely to be low since there appears to be little seed set. Failure to set seed could be due to loss of pollinators and or changed climatic conditions.

All sites of Crystal Brook Star Orchid are under threat due to their close proximity to the Perth Metropolitan area. People and orchids often have conflicting needs. Much of the former Crystal Brook Star Orchid habitat in the Darling Range has been lost to quarries and residential development and a variety of current human activities threaten existing orchid sites.

For example, clearing and unplanned fires (particularly arson) close to known Crystal Brook Star Orchid sites have increased the likely hood of weed infestation. Fuel reduction burns during winter and early spring, at a time that is safest to nearby residential areas, coincides with the growing, flowering and seed set of Crystal Brook star orchid and are likely to be detrimental to the orchids survival. Inappropriate recreational uses of bush reserves, including trampling and erosion caused by off road vehicles (bicycles, motorbikes and cars), also impacts on orchid habitat. Grazing by rabbits and kangaroos is also a problem.

This raft of negative environmental factors together with the trend towards a dryer climate, suggest that this magnificent orchid may struggle to survive if its remaining habitat is not closely managed.



Lake Muir blood spider orchid (*Caladenia erythrochila*) is a rare species with one or two small, blood-red flowers 50 to 60mm across. Flowers are distinguished by their long, wispy petals and sepals and small, blood-red, often white marked labellum. The orchid was first recognized as new by the late Harry Winfield and formally named in 2001 by Stephen Hopper and Andrew Brown from specimens collected north of Lake Muir by Bill Jackson in October 1995.

As indicated by its' common name this species is mostly found near Lake Muir between Manjimup and Mt Barker. Habitat near Lake Muir is jarrah (*Eucalyptus marginata*) woodland on low lateritic hills.

2014 ADORP survey

In 2014 four sites were monitored by WANOSCG volunteers with three sites, when combined, yielding 74 flowering plants

Surveys included a tentatively recorded site near Lake Muir. This site was initially dismissed as it was thought to have probably been an incorrect identification given the habitat was quite different to that of the known populations. The visit to the site did nothing to dispel that assumption as no plants were found. However, this view may be revised following a plant being found by other searchers in habitat that is not that dissimilar.

During the surveys only nine plants were found to have developed seed capsules, this equating to 8.41% of the 106 plants located or 12.15% of the 74 flowering plants seen. All nine plants in seed were found at the one site.

One of the problems in finding the orchid is the small window of opportunity to see it in full flower. The orchid was in good flower on the 26th September, about 70% in fair flower on the 29th September but most finished by the 1st October.

Threats to the survival of Lake Muir blood spider orchid

Threats to Lake Muir blood spider orchid include unseasonal fire, grazing from native animals and trampling of habitat by over eager enthusiasts searching for the orchid.

Summary

The ADORP project is proving to be a very important source of data on otherwise poorly known orchid species which enables the Parks and Wildlife to better understand their conservation status and undertake any corrective or recovery actions as appropriate. For the participants, the experience has been fun and rewarding, by seeing rare orchids in the wild and working as a team with other dedicated orchid enthusiasts and conservationists. This collaborative program is immensely valuable, enabling the public to make significant contributions to conservation efforts in partnership with government, which ultimately benefits the entire community.

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