

Biodiversity Research Projects

Phaius orchids



1. Introduction

This report provides a concise summary of the results of a baseline study undertaken focusing on the *Phaius* genus in Redland City, in particular the native species; *australis* and *bernaysii*. The report provides a brief description of the plants and their characteristics. The results of a review of current literature and consultation with an orchid expert at the Queensland Herbarium provide the report's background information. Local knowledge was used to locate *Phaius* in Redland City. These known locations were mapped and additional known sites were added to produce a comprehensive map of all known and ground-truthed *Phaius* locations. Threats to *Phaius* were identified and the report recommends further management actions.

There is debate surrounding the nomenclature of the *Phaius* genus. According to the National Herbarium (Australian Plant Name Index), the *Phaius* genus has two separate species; *Phaius australis* and *Phaius bernaysii*. However, according to the Queensland Herbarium, these two species are varieties of the same species; *Phaius australis* var. *australis* and *Phaius australis* var. *bernaysii*. Regardless of the nomenclature, both organisations are referring to the same plants. *Bernaysii* is the yellow coloured variety, and *australis* is the pink coloured variety. To add to the confusion, there are also internet references which incorrectly refer to *P. australis* as *P. tancarvilleae*. This is incorrect as *P. tancarvilleae* is not native to Australia. For the purpose of this report, the current nomenclature standard as determined by the National Herbarium is used; *Phaius australis* and *Phaius bernaysii*.

2. Description


Phaius are terrestrial orchids with broad leaves with a pleated appearance. Leaf bases and flower stems are fleshy. Leaves and flowers stem from a pseudo bulb at the ground. Stems can have up to 20 flowers and are up to 2m tall. *P.australis* and *P.bernaysii* flower between August and December (photo 1). *P. australis* flowers have 4-7 petals which are white on the outside and brown with white or yellow veins on the inside. The tongue of the flower is pink with a yellow centre. *P. bernaysii* flowers are similar in form however the colours are different - yellow on the inside and white on the outside. Following flowering, seed pods form (photo 2). *Phaius* tend to grow in clumps (photo 3).

3. Background Research

There is a lack of research on the native *Phaius* species. Most literature regarding *Phaius* is written for orchid lovers and focuses on the exotic species and how to keep them in a greenhouse or garden. The majority of information regarding the native *Phaius* species in a natural environment setting is local knowledge held by people in the community. This is true of the Queensland Herbarium too.

The Qld Herbarium has not published any research, however a significant amount of knowledge is held by one particular officer, Wayne Harris. An information gathering interview conducted with Wayne provided this report with much of its background information and a number of GPS points of known *Phaius* locations.

South Stradbroke Island Management Plan Flora Survey (June 2006) found *P.australis* in localised patches throughout the groundcover layer of RE12.2.7 – Broad-leaved paperbark (*Melaleuca quinquenervia*) forest on coastal sand. The link between *Phaius* and RE12.2.7 is common throughout the current literature. However, as the results of this study will show, *Phaius* are not limited to this Regional Ecosystem. It can be assumed that there is the potential for *Phaius* to exist where RE12.2.7 is present; however its potential existence also lies outside of that particular RE.



Redland Shire Council's Hilliards Creek Waterway Management Plan states that *P.australis* is "known to occur" and *P.bernaysii* "may occur but never officially recorded". No further information is included. *P.bernaysii* is only known to exist on North Stradbroke Island.

The *Environmental Protection and Biodiversity Conservation Act* (1999) lists *P. australis* and *P. bernaysii* as endangered; however no threat abatement plan currently exists.

There is little known about the reproductive/propagation processes of *Phaius* orchids. It is suspected *P. bernaysii* is self pollinating. From observations, it is suspected that once *Phaius* orchids flower, they re-shoot and the original plant dies. It then takes longer than one year for the new plant to reach the maturity to flower. This explains why plants do not flower every year.

4. Identification

Species of *Phaius* were not identified in this project due to a lack of time to be able to collect flower specimens for all known plants and send to the Qld Herbarium for identification. All *Phaius* observed appeared to be in a healthy condition.

Twelve maps have been produced based on Queensland Herbarium records of *Phaius* locations and ground-truthing local knowledge of locations. Due to current research linking RE12.2.7 to *Phaius* existence, an overlay showing that regional ecosystem has been included. In addition, in order to attempt to find common features between locations, a geology overlay has also been included.

As a result of ground-truthing and mapping, the following features of known *Phaius* locations have been identified:

- *Melaleuca quinquenervia* wetlands, RE12.2.7 (see appendix for full description). As demonstrated by the maps, *Phaius* are found in areas within and outside of RE12.2.7 (see maps 5, 8 & 11). However, it can be assumed that where RE12.2.7 exists, there is a high potential of *Phaius* presence but they are also found in areas not described as RE12.2.7.
- Very dense understorey to 1.5m.
- Low-lying swampy areas or within close proximity of a water.
- Brackish or fresh water swamps.
- Soil type varies however at most sites it was found to consist of quartz sand tending towards basalt (see maps 6, 9 & 12 and appendix for full geological descriptions).

These features can be used to identify sites where *Phaius* could potentially exist; however the features are still quite broad and further research is required to specify the features and narrow the scope.

5. Impacts

- Illicit removal. *Phaius* orchids are prized by orchid lovers and as a result are sometimes illegally removed as a whole plant or cut flowers. This occurred at one of the Macleay Island sites in the 2007 flowering season.
- Fire. The impact of fire on *Phaius* is unknown. It is suspected that it may be beneficial, although this is unconfirmed.
- Suppression by understorey weeds. The undergrowth of weeds at some sites is very dense, yet *Phaius* are well established. However, *Phaius* could potentially be out-competed if the weed density continues to increase.

- Fire ants. It is suspected that the presence of fire ants may impact pollinators of *Phaius*, although this is unconfirmed.
- Insect attack. About 20 percent of the *Phaius* inspected had dark blemishes on their foliage (photo 4). The overall effect of this on the health of plants is unknown. The cause is suspected to be insect attack.
- Changes in natural drainage.
- Sand mining.
- Land clearing.
- Feral pigs. The risk is unknown due to a lack of information on feral pig presence/movement in *Phaius* habitat.
- *Phaius* mistaken for Cocos palm seedlings and sprayed or manually removed. This almost occurred at one of the mainland sites.
- Human trampling. When not in flower, *Phaius* are inconspicuous and therefore easily trampled by bushwalkers. At one site on North Stradbroke Island, an informal track had been actively created through the understorey. As a result, a number of *Phaius* were trampled and covered by removed vegetation (photo 5). At the same site, human recreation activities were impacting on the *Phaius* present (photo 6). Similarly, bushland management can damage *Phaius* if the people undertaking the work are unaware of their presence. This occurred at one of the Macleay Island sites, however more extensive damage was prevented due to the contractor having local knowledge about *Phaius* (photo 7).

6. Response

Recommendation	Priority
Interview the community widely and compile local knowledge regarding the <i>Phaius</i> genus and locations. Ground-truth all locations and identify species – identification requires sending a sample flower to the Qld Herbarium.	High
Educate council crews and contractors about <i>Phaius</i> and how to distinguish from Cocos palms.	High
Annual <i>Phaius</i> population monitoring.	High
Protect potential <i>Phaius</i> habitat. Where <i>Phaius</i> exist in suitable undisturbed areas, they flourish. As a result there is a need to focus not on protecting plants, but rather on protecting potential habitat. The initial re-introduction of <i>Phaius</i> in these potential areas may be beneficial – further study is required to determine this.	Med
Control feral animals in habitat areas especially pigs.	Med
Weed control in known <i>Phaius</i> locations.	Med
Conduct research into the impact of fire on <i>Phaius</i> .	Low
Research into <i>Phaius</i> morphology.	Low

Appendix

Photo 1 – *Phaius* flowers



Photo 2 – *Phaius* seed pods



Photo 3 – *Phaius* tend to grow in clumps



Photo 4 – Possible insect attack



Photo 5 – Informal track through a *Phaius* location on north Stradbroke Island



Photo 6 – Recreational activities can impact upon *Phaius*



Photo 7 – *Phaius* damage due to contractor bushland management works





Description of RE 12.2.7 as per the Environmental Protection Agency

Melaleuca quinquenervia or *M. viridiflora* open-forest to woodland. Other species include *Eucalyptus tereticornis*, *Corymbia intermedia*, *E. bancroftii*, *E. latisinensis*, *E. robusta*, *Lophostemon suaveolens* and *Livistona decora*. A shrub layer may occur with frequent species including *Melastoma malabathricum* subsp. *malabathricum* or *Banksia robur*. The ground layer is sparse to dense and comprised of species including the ferns *Pteridium esculentum* and *Blechnum indicum* the sedges *Schoenus brevifolius*, *Baloskion tetraphyllum*, *Baumea rubiginosa* and *Gahnia sieberiana* and the grass *Imperata cylindrica*. Occurs on Quaternary coastal dunes and seasonally waterlogged sand plains usually fringing drainage system behind beach ridge plains or on old dunes, swales and sandy coastal creek levees.

Major vegetation communities include: 12.2.7a: Palustrine wetland (e.g. vegetated swamp). *Melaleuca quinquenervia* low woodland with *Gahnia sieberiana* shrub layer. Occurs on Quaternary coastal sand dunes fringing swamps. 12.2.7b: Palustrine wetland (e.g. vegetated swamp). Whipstick *Melaleuca quinquenervia*. Occurs at base of frontal dunes on Quaternary coastal dunes and beaches. 12.2.7c: Palustrine wetland (e.g. vegetated swamp). *Melaleuca quinquenervia*, *Eucalyptus robusta*, *Melicope elleryana* open forest with understorey of *Todea barbara*. Occurs along watercourses on Quaternary coastal dunes and beaches and seasonally waterlogged sand plains. 12.2.7d: Palustrine wetland (e.g. vegetated swamp). *Eucalyptus bancroftii* woodland. Other canopy species include *Lophostemon suaveolens* and *Melaleuca quinquenervia*. A shrub layer may occur with frequent species including *Melaleuca nodosa*, *Hakea actites* and *Melaleuca pachyphyllus*. The ground layer is sparse to dense and comprised of heath species. Minor wet depressions sometimes occur and sedges dominate these areas. Occurs on Quaternary coastal dunes and seasonally waterlogged sand plains.

Geological Types at Phaius Locations

Geological Map Legend Symbol	Soil Type
Qpd/1	Pleistocene dune; quartz sand
Qhcw	Holocene coastal swamp; quartz sand, peaty quartz sand
DCf	Mudstone, shale, arenite, chert, jasper, basic metavolcanics, pillow lava, conglomerate
RJbw	Quartzose sandstone, siltstone, shale conglomerate, coal
Td>Tpd	Duricrusted old land surface; ferricrete silcrete & indurated palaeosols at the top of a deep weathering profile on Petrie Formation basalt
DCy	Slate, phyllite, arenite, metabasalt
Qhct	Tidal flats; sand, mud, grades offshore into Qhms
Tv	Mainly basalt flows
Qhd/3, Qpd/e	Holocene parabolic dunes; quartz sand
Qpd/2	Pleistocene dune; quartz sand
Qhd/2	Holocene parabolic dunes; quartz sand