



Pterostylis gibbosa

R.Br.

Illawarra Greenhood Orchid

The following information is provided to assist authors of Species Impact Statements, development and activity proponents, and determining and consent authorities, who are required to prepare or review assessments of likely impacts on threatened species pursuant to the provisions of the *Environmental Planning and Assessment Act 1979*. These guidelines should be read in conjunction with the NPWS *Information Circular No. 2: Threatened Species Assessment under the EP&A Act: The '8 Part Test' of Significance* (November 1996).

Survey

Pterostylis gibbosa is a cryptic species whose leaf rosettes can be easily confused with those of other *Pterostylis* species that grow in similar habitats.

Survey is recommended during the flowering period (September to October) as the presence of flower stalks makes the species easier to locate and flowers enable positive identification. Survey undertaken in August is acceptable (as flower stalks will be present on mature individuals) provided that the locations of any leaf rosettes discovered are marked for positive identification during the flowering period.

Surveys earlier in the year (May to July) are acceptable only if undertaken by an orchid expert who is familiar with the species. Survey during this period is however recommended for population size assessments, as it is during this time that leaf rosettes are in greatest abundance. When undertaking population size assessments, mature plants are regarded as plants with three or more leaves.

Survey for the species should not be conducted during or following prolonged dry spells as plant numbers and flowering rates will be affected.

A nearby known site should be checked immediately prior to a planned survey to ensure that the species is above ground and/or flowering in sufficient numbers to enable an effective survey to be undertaken.

Given the cryptic nature of *P. gibbosa*, random meander searches are not considered to be an appropriate survey technique. In potential habitat for the species, transects should be walked at 6 metre intervals, searching within 3 metres on either side.

Where new sites are located, population details regarding habitat and location should be recorded and forwarded to NPWS.

Life cycle of the species

The ecology of *P. gibbosa* is described in the Recovery Plan and summarised in the species profile. Proposals that are likely to impact upon the life cycle of the species include those that contribute to the following:

Loss of individuals

The significance of a particular activity that physically destroys individual plants will require an examination of the number of mature plants to be destroyed in relation to the size of the population and a discussion of how recruitment, gene flow and the overall health of the population will be affected.

Fragmentation of habitat

As the breeding system of *P. gibbosa* is not understood, the effects of loss and fragmentation of its habitat are not known. Total destruction of habitat will place a local population at risk of extinction.

Modification of habitat

Urban development (including road construction) in close proximity to *P. gibbosa* sites is likely to cause modification of habitat through altered

hydrological conditions and soil pH, soil nitrification, weed invasion, potential introduction of plant pathogens and altered fire frequency. Subsequent increases in pedestrian and/or vehicular traffic through sites may result in trampling, soil compaction, soil erosion and the dumping of fill material and rubbish.

Regular disturbance as a consequence of grazing, slashing, vehicular access and fire will also contribute to habitat modification. Such disturbances can favour the growth of environmental weeds and disturbance dependent native species (including *Imperata cylindrica* and *Pteridium esculentum*) which can outcompete *P. gibbosa*.

The exclusion of disturbance (including fire) for extended periods may also modify habitat for the species by promoting the growth of a dense understorey. This in turn will effect fecundity rates and recruitment of the species.

Disturbance frequency and timing:

The relationship between disturbance frequency and the rates of recruitment and fecundity in *P. gibbosa* remains poorly understood. It is clear however, that the impact of disturbances (including grazing, trampling, slashing, and burning) is greatest during the period that the species is present above the ground.

Frequent disturbance may impact upon the species by:

- modifying its habitat;
- preventing juveniles from developing an underground tuberoid that is capable of withstanding a subsequent disturbance;
- preventing mature individuals from replenishing food reserves stored within their underground tuberoid; and
- reducing levels of flowering and seed production.

Damage to the soil seedbank

Disturbances that will destroy or prevent germination of *P. gibbosa* seed (and the survival of its tuberoids) include the dumping of fill material, removal of topsoil, and spraying with residual

herbicides that are capable of killing seeds in the soil.

Threatening processes

There are four key threatening processes listed in Schedule 3 of the NSW *Threatened Species Conservation Act 1995* (TSC Act) that are potentially relevant to *P. gibbosa*. These are:

- *Anthropogenic climate change.*
- *Clearing of native vegetation;*
- *Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.); and*
- *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition.*

Other threatening processes include weed invasion, cattle grazing, uncontrolled vehicular/pedestrian access to sites and collection by orchid enthusiasts (NPWS 2002).

Viable local population of the species

The viable population size for *P. gibbosa* is unknown. In the absence of a detailed assessment demonstrating otherwise, all populations should be assumed to be viable.

A significant area of habitat

Assessment of habitat significance for *P. gibbosa* requires consideration of the following:

- Number of mature individuals present;
- Location in relation to the current distributional limits of the species and proximity to the nearest reserved population;
- Uniqueness, size, condition and connective importance of the habitat; and
- Management potential including the likelihood of ameliorating any existing threatening processes.

The NPWS considers all viable populations as occupying a significant area of habitat until such times as adequate and representative examples are conserved across the species' range

Isolation/fragmentation

P. gibbosa habitat has been fragmented by vegetation clearance for agriculture and residential development across its range. The distance between populations that will create genetic isolation is unknown as potential pollen and seed dispersal mechanisms are poorly understood. The clearing of interconnected or proximate areas of habitat for the species (or its pollinators) is clearly undesirable as this may expose populations to an increased risk of genetic isolation and subsequent decline.

Regional distribution of the habitat

The known distribution of *D. sp. C* 'Illawarra' is confined to the Sydney Basin Bioregion as defined in the Interim Biogeographic Regionalisation of Australia (Thackway & Cresswell 1995).

For Further Information contact

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References

Thackway, R. & Cresswell, I.D. (1995). *An Interim Biogeographic Regionalisation for Australia: A Framework for Setting Priorities in the National Reserves System Cooperative Program*. Version 4.0. Australian Nature Conservation Agency, Canberra.

NPWS (2002) *Pterostylis gibbosa Recovery Plan*. NSW National Parks and Wildlife Service, Hurstville.

Limit of known distribution

The known distribution of *P. gibbosa* extends from Milbrodale in the Hunter Valley to Worrige Nature Reserve, near Nowra.

Adequacy of representation in conservation reserves or other similar protected areas

P. gibbosa is not considered to be adequately represented in conservation reserves. One site has been recorded from Worrige Nature Reserve.

Critical habitat

Critical habitat has not been declared for *P. gibbosa*.

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