

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this Conservation Advice on 16/12/2016.

Conservation Advice

Genoplesium vernale

East Lynne midge-orchid

Conservation Status

Genoplesium vernale (East Lynne midge-orchid) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) effective 4 October 2001.

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

The main factors that are the cause of the species being eligible for listing in the Vulnerable category are the species' low population size and the impact of a number of threats such as construction and maintenance of roads, and forestry activities.

Description

The East Lynne midge-orchid is from the group of orchids known as midge-orchids. The species is a ground-dwelling herb which produces an underground tuber (NSW NPWS 2002). The East Lynne midge-orchid produces a single flowering stem which grows up to 25 cm tall, and bears 10 – 25 flowers in a densely crowded spike at the top of the stem. The flowers are a dark purple-black colour and are each 3.5 – 4.5 mm in diameter. The species produces a single leaf, which is 10 – 18 cm long and 0.15 – 0.3 cm wide, and is dark green in colour with a reddish base (Jones 2001).

Distribution

The East Lynne midge-orchid is known from only a narrow belt (approximately 12 km wide) of predominantly dry sclerophyll forest on the south coast of New South Wales (NSW), from approximately 17 km south of Batemans Bay to 24 km north of Ulladulla (NSW NPWS 2002).

For three years following its discovery in 1995, the East Lynne midge-orchid was only known from East Lynne, a small town located approximately 17 km north of Batemans Bay. However, surveys in the 1998 and 2000 flowering seasons recorded the orchid from 28 additional sites, although several of these sites are separated by distances of less than 300 m (NSW NPWS 2002). The survey conducted in 2000 found a total of 436 individuals across all 28 sites (NSW NPWS 2002). This number, however, is likely to be an underestimate of the total population size, as all suitable habitat within the species' geographic range has not been surveyed and some known populations have not been thoroughly counted. The species appears to occur at low densities at all known sites. In 2001, one additional site was also reported in Booderee National Park in Commonwealth Territory (NSW NPWS 2002).

The locality of the population at East Lynne occurs across two land tenures. One is owned by the Shoalhaven City Council, the other is within Booderee National Park. Twelve of the known sites occur within NSW *National Parks and Wildlife Service* reserves, representing 48 percent of the total number of East Lynne midge-orchids counted in the 2000 survey. Most of the other known sites occur in State Forest. There are known areas of suitable habitat on private land, however these have not yet been surveyed.

Relevant Biology/Ecology

The East Lynne midge-orchid grows in dry sclerophyll woodland / forest. It is confined to areas with good drainage and shallow, low fertility soils. Most sites have a 'sandy-clay' soil, usually with associated quartzite gravel. Individuals are usually found where the groundcover is sparse and there is little competition for light. Sites are usually dominated by *Eucalyptus consideriana* (yertchuck), *E. piperita* (Sydney peppermint), *E. globoidea* (white stringybark) and *E. sieberi* (silvertop ash), with one site dominated by *E. pilularis* (blackbutt). Other associated species include *Corymbia gummifera* (red bloodwood) which is present in the majority of sites, *E. agglomerata* (blue-leaved stringybark) and *E. scias* (large-fruited red mahogany) (NSW NPWS 2002).

Very little is known about the biology of the East Lynne midge-orchid (NSW NPWS 2002). Midge-orchids in general die back to a dormant tuber over the winter. During spring they produce a single erect leaf. The leaf and flower spike develop simultaneously with the flower emerging through the leaf near the apex (Jones 1988). Midge-orchids will not necessarily flower every year, often skipping years. The proportion of a population that flowers appears to vary from year to year and may be dependent on previous seasonal conditions (NSW NPWS 2002). The East Lynne midge-orchid flowers from mid November to late December. Observations at known sites indicate that, as with other midge-orchids, only a proportion of the population of the East Lynne midge-orchid will flower in any one year (NSW NPWS 2002). Very little is known about the age structure of plants in known populations, nor the longevity of individuals or recruitment rates. While the pollination biology of the species is not known, most midge-orchids are pollinated by vinegar flies, although some are self-pollinating (Jones 1988).

The East Lynne midge-orchid has been found growing on various previously disturbed sites, including old forestry snig tracks and old log dumps, firebreaks and also mounds left following gravel extraction. It is not known whether the plants growing in these situations have arisen from existing tubers that survived these soil disturbances or have re-colonized the areas from seed dispersed from elsewhere (NSW NPWS 2002). Sites where the species grows are not prone to frequent fire, however they may burn occasionally. Fire may assist the species by opening up the ground cover and reducing competition for light, however fire could also kill the orchid tubers (NSW NPWS 2002).

Threats

The East Lynne midge-orchid is at risk from a combination of threats across its range. Risk posed by each of these threats may vary depending on geographical, environmental, biological and sociological factors.

Table 1 – Threats impacting the East Lynne midge-orchid in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Habitat loss and fragmentation		
Land clearance for rural and urban development	Suspected past and known current	In the past, the clearing of vegetation for farming and other developments may have removed suitable habitat. Clearing of vegetation for development is known to have impacted on the population at East Lynne (NSW NPWS 2002).

Construction of roads, forestry tracks and utility easements	Known past and current	Construction of roads, forestry tracks and utility easements have destroyed habitat and individuals in the past. For example, road works and the laying of a communication cable directly impacted on the population at East Lynne (NSW NPWS 2002).
Forestry operations	Suspected current	Of the known sites occurring within State Forest, 41 % occur in non-harvesting areas and 59 % of known sites occur in timber harvesting areas. However, the terms of the <i>Integrated Forestry Operations Approval</i> (IFOA) for the Southern Region (and any species-specific management plan that may arise under the auspices of that approval) should help to ensure the long term protection of the East Lynne midge-orchid where it occurs within State Forests on land designated as timber harvesting areas (NSW NPWS 2002).
Fire		
Too frequent burning, or burning during flowering season	Suspected current	Sites where the species grows are not prone to frequent fire, however they may burn occasionally. Fire is likely to have a short-term impact on the East Lynne midge-orchid if the habitat is burnt whilst the species is in flower or fruit. Such a fire event would destroy a season's reproductive effort and perhaps weaken the tubers by reducing the photosynthetic period for the growing season, possibly resulting in reduced flowering the following season (NSW NPWS 2002).

Conservation Actions

Conservation and Management priorities

Habitat loss disturbance and modifications

- Protect the species and its habitat from clearing and disturbance.
- Ensure development and infrastructure disturbance in areas where the East Lynne midge-orchid occurs does not adversely impact known populations.
- Advise relevant local government agencies and the Roads and Traffic Authority (RTA) of any East Lynne midge-orchid sites occurring on roadsides owned/managed by these agencies and provide advice on the appropriate management of these sites. Erect signs along all sections of roadside vegetation that contain the East Lynne midge-orchid to identify the vegetation as significant and instruct that work should not to be undertaken within the vegetation without formal approval.
- Develop appropriate management strategies for populations occurring within State Forests through a species-specific management plan. The management plan should establish the types of activities that are appropriate for each site, and the area of protection required around each site.

Fire

- Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of the East Lynne midge-orchid, that they support rather than degrade the habitat necessary for the species, that they do not promote invasion of exotic species or increase impacts of grazing.
- Ensure that prescribed fires occur only within the species' habitat during the dormant phase of the threatened species life cycle and do not increase the frequency of fire that may result in habitat degradation or ecosystem alteration.
- Physical damage to the habitat and individuals of the East Lynne midge-orchid must be avoided during and after fire operations. Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the species.

Stakeholder Engagement

- Prepare a pamphlet describing the species and its management. Distribute this pamphlet to land managers with populations of the species on their property and to other interested parties.
- Provide opportunities for landowners and community groups to be involved in conservation efforts for this species, which may involve detecting when the species begins flowering, and participating in survey and monitoring work.

Seed collection, propagation and other ex-situ recovery action

- To preserve genetic diversity, seed of the orchid is to be collected and stored along with samples of the symbiotic fungus in appropriate institutions. Collections should aim to sample and preserve the maximum range of genetic diversity possible.
- Ex situ propagation should be undertaken to develop seed production capabilities as well as prepare approaches for translocation of the species for reinforcement plantings and introduction to secure sites.

Survey and Monitoring priorities

- Mark site localities and potential habitat onto planning maps.
- Undertake counts of flowering plants within known populations to more accurately determine the size and geographic range of known populations.
- Monitor known sites to increase the ecological knowledge of the species and establish the extent of year to year variation in the size of the observable population. Intensively monitor some sites to determine the conditions which induce flowering and the proportion of the population that flowers each year, how long individuals live and the percentage of flowers that produce seed.
- Undertake surveys in additional sites of potential habitat to locate additional populations and determine the limits of the species' range. To be confident about the presence or absence of the East Lynne midge-orchid on a site of potential habitat it is essential to undertake the survey at the correct time of year, and as such, surveys should be conducted in seasons when recorded populations are known to have many individuals

flowering. An assessment of ecological requirements and any threats operating at any new populations should be made during this process.

- Monitor the size and structure and reproductive status of populations at different stages in the fire cycle, taking opportunities to monitor after planned and unplanned fires (where they occur) and improve understanding of the fire response of the species.
- Precise fire history records must be kept for the habitat and extant populations (confirmed and suspected) of the East Lynne midge-orchid.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Information and research priorities

- Assess the impact of browsing through a monitoring program. Should the monitoring program reveal that browsing is a common occurrence, undertake an investigation of recruitment and mortality rates under browsed and unbrowsed conditions.
- Further investigate the effects of fire frequency to identify optimal fire regimes for regeneration, and response to other prevailing fire regimes by undertaking appropriately designed experiments in the field and/or laboratory.
- Improve understanding of conditions that affect flowering, seed production and recruitment of the orchid.

References cited in the advice

Jones, D. L. (1988). Native orchids of Australia. Reed Books. Frenchs Forest NSW.

Jones, D.L. (2001). Six New Species and a New Combination in *Genoplesium* R.Br. (Orchidaceae) from eastern Australia. *The Orchadian* 13(7), 304-307.

NSW National Parks and Wildlife Service (NSW NPWS) (2002). Recovery Plan for the East Lynne Midge Orchid (*Genoplesium vernale*). NSW National Parks and Wildlife Service. Hurstville NSW.