The Minister's delegate approved this conservation advice on 01/10/2015

Conservation Advice

Eucalyptus impensa

Eneabba mallee

Conservation Status

Eucalyptus impensa (Eneabba mallee) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as Endangered as, prior to the commencement of the EPBC Act, it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main factors that are the cause of the species being eligible for listing in the Endangered category are its very low number of mature individuals, restricted extent of occurrence and area of occupancy and its predicted declines in population through slow seed recruitment (CALM, 2004).

Description

Eneabba mallee is a straggly mallee to 1.5 m tall. It has smooth stems which are coloured grey over pale copper. Mature leaves are pale green to yellow-green, and have short, stout stalks up to 1 cm long. Leaves are large and stiff, up to 14 cm long and 8 cm wide, and usually in opposite pairs. Pink flowers are held in the leaf axils, on a thick stalk up to 2 cm long. The bud has a hemispherical floral tube and beaked cap, which is slightly ribbed. Buds are up to 2.5 cm across and 5 cm long, including the stalk. Hemispherical fruits, up to 2.5 cm long and 6 cm wide have a conspicuous raised disc and 5 protruding valves. The brown seeds are an asymmetrical pyramidal shape. The large fruits are similar to those of *E. macrocarpa*, but *E. impensa* has leaves on short stalks, with no whitish bloom, and the plants are smaller than those of *E. macrocarpa* (Brooker and Hopper, 1993; Brown et al., 1998).

Distribution

Eneabba mallee restricted to six populations that occur south east of Eneabba over a range of about 3 km. Counts conducted over the period of the Interim Recovery Plan (2004 – 2009) suggest that the total number of mature plants increased from 36 to ca. 114 during this time. It inhabits very open shrub mallee over low heath, on grey gravelly sand on undulating plains and low breakaway slopes (Brown et al., 1998). Originally known from five populations occuring on a Nature Reserve, and a sixth on private property, further populations were discovered in 2005 and 2008, taking the total to eight Associated species include *Eucalyptus pleurocarpa*, *E. todtiana*, *E. macrocarpa* subsp. *elecantha*, *Hakea incrassata*, *H. conchifolia*, *Calothamnus quadrifidus*, *Xanthorrhoea* sp., *Kingia australis*, *Banksia* species and *Dryandra* species (CALM, 2004).

Threats

Individuals of the species are threatened by insect damage, inappropriate fire regimes, firebreak maintenance, and disease, while the species as a whole is threatened by the lack of recruitment of new individuals and the restricted range of populations (CALM, 2004). The following table lists key threat factors with supporting evidence:

Threat factor	Threat type	Threat status	Evidence base
Inappropriate fire intervals	suspected	future	Too frequent fire appears to be acting in concert with drought and insect damage to leave existing adult plants under great stress and reduce recruitment (CALM, 2004). The lignotubers may be

			depleted if fires recur before plants can re-establish reserves. Frequent fire is also likely to degrade the supporting ecological community, changing species composition as well as fostering weed invasion and erosion. This species may require fire for recruitment of new individuals, but the fire interval would need to be long enough to allow for the development of sufficient levels of soil-stored seed.
Poor recruitment	known	current	Has been apparent in all populations. The time taken to produce fruit after fire is not known. The amount of seed produced, and the viability of the seed are also not known. However, it seems likely that the fire interval populations of Eneabba mallee have experienced recently (7 to 10 years) is too short for effective seed production.
Firebreak maintenance	known	current	Maintenance including burning of buffer between double firebreaks has been identified as a threat to the species at two locations.
Disease	suspected	future	Some plants have been suspected to be affected by unknown disease that resulted in 30-40% of crown leaves affected.
Mining	potential	future	Mineral sands and other mineral commodities exist in this area. Most populations occur within a C Class Nature Reserve that does not provide a high level of protection.
Insect Damage	known	future	Insect damage is apparent at all populations that were monitored up to 2004. Some level of insect damage is natural, and the health of plants is not usually unduly affected. However, when plants are stressed by drought and relatively frequent fire, for example, it has been noted that the level of insect damage increases (CALM 2004).

Conservation and Management Actions

Prevent damage from frequent fire and inappropriate bushfire hazard reduction activities

- Minimise the occurrence of fires including bushfire hazard reduction activities in proximity to populations of this species.
- Where populations exist within or adjoining fire buffers in National Reseves, exclude from prescription burning by methods such as the laying of foam fire retardant 'breaks' around the populations at the time of burning (CALM, 2004). .
- Consult with land managers to determine appropriate fire control measures, and a recommended fire frequency and intensity (CALM 2004).
- Manage frequency of hazard reduction burns to minimise the potential of destroying soil stored seed and burning of stimulated saplings prior to recruitment (CALM 2004).

Ex-situ conservation

- Collect seedstore germplasm as a genetic resource, ready for use in translocations and as an *ex situ* genetic 'blueprint' of the species (CALM, 2004).
- In undertaking the above, collections of tissue culture material are required from *as* many (tagged and traceable) individuals as possible from all populations, to establish the best representation of the remaining genetic diversity of this species. Ensure the genetic

diversity of translocates is maximised to give any translocated population the best possible chance of survival in the long term (CALM, 2004).

- Translocations may be within the same Nature Reserve, but at some distance away, perhaps with a major road acting as a natural firebreak between natural and translocated populations (CALM, 2004, see also Vallee et. al., 2004).

Stakeholder Management

- Liaise with relevant land managers and landowners to ensure that populations are not accidentally damaged or destroyed.
- Identify and seek input from any Indigenous groups that have an active interest in areas that are habitat for Eneabba mallee.
- Promote awareness of the importance of biodiversity conservation and the need for the long-term protection of wild populations of this species through community engagement.
- Develop formal links with local naturalist groups and interested individuals to aid in monitoring of the species.
- Develop information sheets that include a description of the plant, its habitat, threats conservation actions and photos.

Survey and Monitoring priorities

- Survey the known locations of Eneabba mallee and maintain a map of known occurrences, sites and suitable/potential habitat (CALM, 2004).
- Survey for suitable/potential habitat for as yet undiscovered populations.
- Survey population for habitat degradation (including plant diseases such as *Phytophthora cinnamomi* and weed invasion), population stability (expansion or decline), pollination activity, seed production, recruitment, longevity and predation (CALM 2004).
- Monitoring of post fire regeneration including, plant size and reproductive data (flower and fruit timing and abundance) for known populations (CALM, 2004).
- Mark existing individuals of Eneabba mallee establish seed recruitment (CALM, 2004).
- At times of stress following fire or during dry times, monitor known individuals for impact pf disease on heavy insect infection. Determine if management actions are available or required.

Information and research priorities

Improved knowledge of the biology and ecology of Eneabba mallee will provide a scientific basis for its management in the wild. An understanding of the following is necessary for effective management (CALM, 2004):

- The identity of insect predators (CALM, 2004).
- Soil seed bank dynamics, including seed bank location and viability.
- The role of various disturbances (including fire), competition, rainfall and grazing in germination and recruitment.
- The pollination biology of the species.
- The requirements of pollinators.
- The reproductive strategies, phenology and seasonal growth of the species.
- The population genetic structure, levels of genetic diversity and minimum viable population size to inform decisions about *ex situ* conservation and potential translocations

References cited in the advice

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