

# NSW SCIENTIFIC COMMITTEE

## *Dodonaea stenozyga* F.Muell. (Sapindaceae)

### Review of Current Information in NSW

December 2008

#### **Current status:**

*Dodonaea stenozyga* is not listed under any other state or Commonwealth legislation. The NSW Scientific Committee recently determined that *Dodonaea stenozyga* meets criteria for listing as Critically Endangered in NSW under the *Threatened Species Conservation Act 1995* (TSC Act), based on information contained in this report and other information available for the species.

#### **Species description:**

*Dodonaea stenozyga* is described by West (1984) as follows: "Dioecious erect, rounded and compact shrub, 0.5-1.5 m high. *Branches* erect; *branchlets* angular, often 4-angled, glabrous. *Leaves* paripinnate, sometimes terminated by a very small tooth or lobe, including the petiole (0.9-) 1.5-3 (-3.8) cm long; petiole (9.5-) 12.5-20 (-24) mm long, terete, glabrous; rhachis to 1 mm broad, terete; leaflets 2-6 (-10), opposite or irregularly alternate, linear, iterete or concave or channelled above, often falcate or sometimes flat and straight, (8-) 9-13.5 (-25) x 0.5-1(-2) mm, coriaceous, viscous, with flat glands, glabrous, not restricted at the base, margin entire, apex obtuse, often recurved, midvein visible above, obscure below. *Inflorescence* usually a diad or triad, rarely a monad, axillary. *Flowers* unisexual; pedicels (4-) 6-7.5 (-8.5) mm long, glabrous. *Sepals* 4, oblong-lanceolate in female flowers, ovate in male flowers, (1.5-) 2-3 (-3.2) x 1-1.3 (-1.8) mm, usually smaller in female than in male flowers, acute to acuminate, viscous, caducous, outer surface with flat glands, glabrous, inner surface villous; at anthesis in female flowers valvate and slightly recurved at the apex. *Stamens* 7-8, shorter than the sepals; filament 0.2-0.4 (-0.5) mm long; anther 1.8-2 (-2.5) x 0.7-1 mm; apical appendage triangular-acute, sometimes obtuse and lobe-like, incurved, to 0.2 mm long, glabrous; *in female flowers* rudimentary stamens sometimes present. *Ovary* 4-carpellate, oblong-obovoid, 1-1.2 x 0.9-1.1 mm, glabrous; stylar elements 4, 3-4 (-5) mm long, glabrous, free over distal 0.2 mm. *Capsule* 4-winged, broad-elliptic or broad-obovate in lateral view, ( 8.5-) 10.5-13.5 (-14.5) x (10-) 11.5-14 (-17) mm, glabrous, purple-brown or red to black at maturity, base cordate, apex obcordate; pericarp on body of carpel coriaceous; wing extending (3-) 3.5-6 (-6.5) mm beyond body of carpel, extending from base to apex of carpel, coriaceous; dehiscence septifragal. *Seeds* 2-4, lenticular, 1.7-2 x 1.6-1.8 mm, black, shiny; aril absent. *Seedling* glabrous or rarely sparsely puberulent; hypocotyl 6-10 mm long; cotyledons linear, (7.5-) 9-12.5 x 1.5 (-2) mm, acute, glabrous; epicotyl 0.5-1 mm long; the first 2-6 leaves imparipinnate with 3-5 oblong-obovate leaflets, otherwise as in mature leaves."

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## Taxonomy:

*Dodonaea stenozyga* (Desert Hop-Bush) was first described by FJH von Mueller (1859) from a specimen collected on the Darling River NSW by J. Dallachy and TH Goodwin, pre 1859 (West 1985).

*Dodonaea stenozyga* is closely related to *D. concinna* and can be distinguished by its longer leaves, with petioles greater than 9 mm long and smaller number of leaflets (West 1984).

## Distribution and number of populations:

First collected along the Darling River before 1859, this species was presumed extinct until 1998 when it was recorded at Nanya Station, north-west of Wentworth, in far south-western NSW.

This species is widespread in southern Australia, from southern Western Australia, through South Australia to western Victoria (West 1985).

Nanya station is privately owned by University of Ballarat. The species is not known to be protected within a formal conservation reserve within NSW.



**Figure 1:** Location of *Dodonaea stenozyga* in NSW

## Surveys conducted:

*Dodonaea stenozyga* has not been recorded elsewhere in NSW despite an extensive vegetation survey within the Scotia area, including Nanya Station as well as a large area of apparently suitable habitat (Westbrooke *et al.* 1998).

The Royal Botanic Gardens conducted surveys around the same area in 2000, and previously in the 1980s and also found no other specimens (expert advice).

The University of Ballarat regularly undertakes ecological studies on Nanya station and it has been advised that no other individuals have been found in the area (Nov 2008).

No other surveys have been conducted (expert advice, Nov 2008).

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## Ecology:

### Key habitat requirements

*Dodonaea stenozyga* is found in semi-arid mallee scrub or open eucalypt woodland, often on sandy soil (West 1984, West 1985, Walsh & Entwisle 1999). Throughout its range, *D. stenozyga* grows on a variety of soil types and with a number of different dominant species. In NSW, the species was recorded growing in *Eucalyptus oleosa* shrubland in a sandy swale, with *Acacia colletioides*, *Eremophila glabra*, *Eremophila ecoparia*, *Maireana pentatropis*, *M. pyramidata*, *Olearia muelleri*, *O. pimeleoides*, *Grevillea huegelii*, *Eragrostis dielsii* and *Senna* spp (NSW Herbarium Records; Porteners & Robertson 2003).

*Dodonaea stenozyga* has been recorded in populations as occasional small shrubs, dense undershrubs, locally abundant and frequent. A single plant 2 m high was recorded at the NSW site (NSW Herbarium Records; Porteners & Robertson 2003).

### Life history:

*Dodonaea stenozyga* produces flowers and mature capsules in spring to early summer (September to December) (West 1984). Fruits are dark red and winged.

Studies on the effects of fire and edaphic factors on the germination of *Dodonaea viscosa* revealed that seeds were killed by hot, slow-burning litter fires but germination was somewhat enhanced following cooler fire treatments (Hodgkinson & Oxley 1990). The fire response of *D. stenozyga* may be similar but has not been investigated.

*Dodonaea* species in the arid zone reach maturity at an age of four to eight years and may live for several decades (expert advice). *Dodonaea viscosa* ssp. *angustissima*, a common species which occurs in the area, is known to live up to around 30 years. It is thought that *D. stenozyga* lives for a similar time (expert advice). Accordingly, the 'generation length' (IUCN 2008) of *D. stenozyga* is estimated to be 15-25 years.

## Number of mature individuals:

Despite survey efforts in suitable habitat only one individual plant has been recorded in NSW since the original collection in 1859. Hence the number of mature individuals of the species is possibly one and almost certainly less than 50.

## Threats:

- Browsing by goats. Feral goats are periodically abundant within the region. While the palatability of *Dodonaea* species may be limited, soil disturbance associated with goat activity may limit seedling recruitment of this and other plant species. A protective fence has now been constructed around the plant. This fence is checked regularly (about every two months) and as there is no water within the vicinity, the likelihood of animals (native fauna or goats) trying to get through the fence is minimal (expert advice). 'Competition and habitat degradation by Feral Goats, *Capra hircus*' is listed as a Key Threatening Process in NSW under the TSC Act.

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- Clearing. Further clearing is unlikely to occur on Nanya Station while under management of the University of Ballarat. *Dodonaea stenozyga* is only likely to occur in NSW in the Scotia Mallee area (expert advice). There are six properties covering this habitat, four of these are under some form of conservation agreement (owned by Australian Wildlife Conservancy, Uni of Ballarat or a Nature Reserve). However, the other two properties are privately owned, and so if unrecorded populations of *D. stenozyga* exist on these properties, they may be susceptible to vegetation clearing for sand mining or pasture development. 'Clearing of native vegetation' is listed as a Key Threatening Process in NSW under the TSC Act.

- Potential changes in fire regimes. Like other *Dodonaea* species, standing plants of *D. stenozyga* are likely to be killed by fire with post-fire regeneration occurring only from seed. Consequently, the species may be susceptible to short or very long intervals between successive fires. 'High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition' is listed as a Key Threatening Process in NSW under the TSC Act.

- Due to the small population size and extent of this species, the species is susceptible to stochastic events. The only individual known in NSW is thought to be around 20 years old (expert advice). As this species is thought to live to about 30 years it is most probable that this species will die of natural causes (given the protective measures and minimal other threats) in about ten years time. When this does occur, and when any associated soil seed bank decays, this species will become extinct in NSW, unless other individuals are located.

## **Extreme fluctuations:**

There is no information/evidence of this species experiencing extreme fluctuations.

## **Population reduction and continuing declines:**

Habitat (mallee in dune swales) areas may have been cleared in the past in NSW, especially along the lower Darling River. As a woody species with a superficial resemblance to *Eremophila sturtii* (Turpentine) and *Dodonaea viscosa* (Narrow-Leaf Hopbush), *Dodonaea stenozyga* may be mistaken for 'woody weed' and exposed to mechanical or chemical control measures (Porteners & Robertson 2003). It is possible that this species was more widespread in the past, but there is no quantitative data available on its prior distribution.

The only known plant in NSW has an enclosure fence around it, to protect it from macropod and goat browsing and grazing cattle.

## **Extent of Occurrence (EOO) & Area of Occupancy (AOO):**

The entire distribution of the species falls within a single 2 x 2 km grid cell, the spatial scale recommended for estimation of AOO by IUCN (2008). Both the EOO and AOO are estimated to be less than 4 km<sup>2</sup>.

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## Severe fragmentation:

This species at the edge of its distribution in NSW. As the remaining population is extremely small and isolated from other populations in South Australia, it is likely that *D. stenozyga* has become severely fragmented. Habitat clearing may also have resulted in some fragmentation of the population, however large areas of mallee vegetation persist in dune swales in south-west NSW.

## References:

- IUCN (2008) 'Guidelines for using the IUCN Red List Categories and Criteria. Version 7.0.' (Standards and Petitions Working Group of the IUCN Species Survival Commission Biodiversity Assessments Sub-committee: Switzerland)  
(<http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf>).
- Hodgkinson KC, Oxley RE (1990) Influence of fire and edaphic factors on germination of the arid zone shrubs *Acacia aneura*, *Cassia nemophila* and *Dodonaea viscosa*. *Australian Journal of Botany* **38**, 269-279.
- Mueller FJH (1859) *Dodonaea stenozyga* F. Muell. *Fragmenta Phytographiae Australiae* **1**, 98.
- Porteners M, Robertson G (2003) 'Threatened Plants in Western New South Wales: Information Review.' NSW National Parks and Wildlife Service, Hurstville.
- Walsh NG, Entwisle TJ (1999) 'Flora of Victoria; Volume 4, Dicotyledons Cornaceae to Asteraceae.' (Inkata Press: Melbourne)
- West JG (1984) A revision of *Dodonaea* Miller (Sapindaceae) in Australia. *Brunonia* **7**, 1-194.
- West JG (1985) *Dodonaea*. In: 'Flora of Australia' (Ed AS George) pp 114-153. (Australian Government Publishing Service: Canberra)
- Westbrooke ME, Miller JD, Kerr MKC (1998) The vegetation of the Scotia 1:100 000 map sheet, western New South Wales. *Cunninghamia* **5**, 665-684.

## Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au) .

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation

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Act 1995. A summary report on the review of selected species” which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) *Dodonea stenozya* Review of current information in NSW. December 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.