

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

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

Conservation Advice

Acacia volubilis

tangle wattle

Conservation Status

Acacia volubilis (tangle wattle) 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 continuing decline in the area, extent and quality of habitat and continuing decline in the number of mature individuals resulting from road maintenance, weed invasion, inappropriate fire regimes, broadleaf herbicide application and grazing (Brown et al., 1998).

Description

Tangle wattle is a small dome-shaped shrub 40 cm high by up to 1 m wide. It has small, twisted branches with parallel ridges running their length. Tangle wattle has flattened leaf stalks that resemble leaves, and are widely separated, 9 mm long and 1 mm wide, and resemble the shape of its branches. The leaf stalks are straight or only shallowly curved. Tangle wattle produces bright yellow blossoms in June and July.

Distribution

Tangle wattle is endemic to the Cunderdin-Tammin area of Western Australia where it occurs over a range of approximately 15 km². In 2003 there were 11 populations and four subpopulations observed together totalling 88 plants (Harris & Brown 2003). Two subpopulations are located on private property, one within a fenced remnant and the other on the edge of a disused sandmine where there is reasonably intact native vegetation. All other populations occur on degraded linear road reserves bordered by mostly cleared farmland. Habitat is shrubland over laterite or sheet granite in disturbed mallee shrublands or heath. Soils where the species occurs vary from brown loamy-clay to red-brown sandy loam to yellow-white sand or white-grey sandy-loams.

Threats

The threats operating on tangle wattle include road maintenance, grazing, weed invasion, degraded habitat and, perhaps consequently, poor recruitment. Herbicide drift and fire have been identified as potential threats to this species. The following table lists key threat factors with supporting evidence:

Threat factor	Threat type	Threat status	Evidence base
Road maintenance	known	present	Road maintenance threatens all road reserve populations. Threats include grading, chemical spraying, construction of drainage channels and the mowing of roadside vegetation. Several of these actions also encourage weed invasion (Harris & Brown 2003).
Weed invasion	known	present	Weed invasion is a major threat to all populations. Weeds suppress early plant growth by competing for soil moisture, nutrients and light (Harris & Brown 2003).

Grazing	known	present	Grazing by rabbits (<i>Oryctolagus cuniculus</i>), kangaroos or domestic stock is a threat to some populations. In addition to grazing, rabbits also impact on populations by encouraging invasion of weeds through digging, erosion, the addition of nutrients and introduction of weed seeds. The high levels of palatable weeds near these populations and in adjacent farming properties attract herbivorous animals that are often unselective of species when grazing (Harris & Brown 2003).
Degraded habitat	known	present	Degraded habitat represents a threat to the species. The lack of associated native vegetation makes it more likely that pollinators will be infrequent or absent. Only two of the 15 populations and sub-populations occur outside narrow linear road reserves (Harris & Brown 2003).
Poor recruitment	known	present	Poor recruitment threatens most populations with few juvenile plants being observed (Harris & Brown 2003).
Inappropriate fire regimes	potential	future	May affect the viability of populations through the destruction of its seeds. The species has been observed to germinate following fire. The soil seed bank would therefore be rapidly depleted if fires recurred before regenerating or juvenile plants reached maturity and replenished the soil seed bank. Regeneration from root suckers has been recorded, and this may help to buffer the species from the impacts of too frequent fire. However, it is likely that occasional fires are needed for reproduction of this species from seed (Harris & Brown 2003).
Herbicide drift	potential	future	The impact of herbicide spray drift on to individuals of the species is unclear (Harris & Brown 2003).

Conservation Actions

Conservation and Management Actions

Habitat loss, disturbance and modifications

Road maintenance

- Prevent disturbance, damage or loss of individuals during road maintained activities. Declared Rare Flora (DRF) markers have been installed at all road reserve populations. The markers alert people working in the vicinity to the presence of declared rare flora, and the need to avoid work that may damage vegetation in the area. The significance of these markers is being promoted to relevant bodies such as Shire councils and Main Roads WA.
- Assess impact of any on ground action (clearing, firebreaks, roadwork etc) in the immediate vicinity of the species. On-ground works should not be approved unless the proponents can demonstrate that they will not have an impact on the species, its habitat or potential habitat or on the local surface hydrology such that drainage in the habitat of the species would be altered.

Degraded habitat

- Rehabilitate habitat through the re-introduction of plant species native to the site, potentially widening the road reserves (for roadside populations), rehabilitating surrounding land to create a buffer zone against threats and maintaining fences to prevent further damage. Methods of improving the security of populations and their habitat within private property should be investigated in association with land managers.

- Implement a process to regenerate native vegetation using smoke and disturbance trials. Monitor rehabilitation to determine success, and guide future work in restoring the habitat of this species.

Herbicide drift

- Prevent herbicide from drifting onto any individuals of the species by implementing correct herbicide application processes and spray drift management for the sites.
- Any weed control undertaken as a recovery action for tangle wattle will be followed by a report on the method, timing and success of the treatment, and the effect on tangle wattle and associated native plant species.

Invasive species (including threats from grazing, trampling, predation) and domestic stock

- Manage sites by implementing appropriate rabbit control strategies for particular sites in consultation with relevant land managers.
- Identify and remove weeds that are a threat to the species. Weed control undertaken in consultation with relevant land managers will be by hand weeding or localised appropriate and risk managed application of herbicide. Any weed control will be followed by a report on the method, timing and success of the treatment, and the effect on tangle wattle and associated native plant species.
- Fences to be placed/maintained around populations to deter grazing and damage to remnant vegetation by vehicles and trespassers.
- Reduce the impact of grazing by domestic stock of populations on private land and roadside verges by developing and implementing appropriate strategies in consultation with relevant land managers. Strategies will be determined by the location of populations and will include fencing populations and targeted low stock grazing.

Ex-situ conservation

- Preserve germplasm to prevent extinction if the wild population is lost. Seed and cuttings to be collected for storage and to propagate plants for translocations.
- Monitor any translocation efforts undertaken.

Fire

- Many Australian species of *Acacia* are highly adapted to surviving fires, which are a regular occurrence in most Australian habitats. Germination of *Acacia* seed is often stimulated by fire, but it is worth noting that fire can also adversely affect germination depending on factors such as the intensity of the blaze and the depth of the soil seed bank. Although no trials have been undertaken to establish the response of tangle wattle to fire, it has been found that burn trials undertaken on another species *Daviesia cunderdin* in the same habitat as one of the tangle wattle populations, resulted in germination of tangle wattle seedlings.
- In consultation with relevant experts, authorities and land managers, determine appropriate fire control measures, timing, intensity and fire frequency for the species to inform an appropriate fire management strategy.

Stakeholder Management

- Inform relevant stakeholders including Shire councils and private property owners about tangle wattle and wherever possible engage them in management strategies for populations of tangle wattle that occur on lands that they manage. This will help prevent accidental damage or destruction of the plants. Input and involvement will also be sought from any indigenous groups that have an active interest in areas that are habitat for tangle wattle.
- Install and maintain roadside markers which alert people working in the vicinity to the presence of threatened species, and the need to avoid work that may damage vegetation in the area. Continue to promote these markers to relevant bodies such as Shire councils and

Main Roads WA through posters, dashboard stickers and other promotional materials that illustrate the markers and explain their purpose.

- Produce materials to inform stakeholders about the species, including:
 - An information sheet that describes tangle wattle and its habitat.
 - Photographs of the species and also detachable tabs with local phone numbers to encourage the local community to provide information on any further sightings.
 - Posters, dashboard stickers and stubby holders that illustrate markers and explain their purpose.

Survey and Monitoring priorities

- Undertake monitoring of sites in association with land managers to determine the extent of species decline and habitat degradation, including weed invasion, salinity and plant diseases, population stability (expansion or decline), pollination activity, seed production, recruitment, longevity and predation.
- Encourage volunteers from the local community, wildflower societies, naturalist clubs and other community-based groups to be involved in surveys for tangle wattle. Surveys should be undertaken during the species' flowering period (June and July).

Information and research priorities

Improved knowledge of the biology and ecology of tangle wattle will provide a better scientific basis for its management in the wild. Some of this information can be obtained while monitoring the results of methods used for rehabilitating habitat. An understanding of the following is particularly necessary for effective management:

1. Soil seed bank dynamics and the role of various disturbances (including fire), competition, rainfall and grazing on germination and recruitment.
2. The pollination biology of the species.
3. The requirements of pollinators.
4. The reproductive strategies, phenology and seasonal growth of the species.
5. The population genetic structure, levels of genetic diversity and minimum viable population size.
6. The impact of herbicide treatments on tangle wattle and its habitat.

References cited in the advice

Brown, A. & Harris, A. (2003) Tangle Wattle (*Acacia volubilis*) Interim Recovery Plan 2003 – 2008, Western Australia: Department of Conservation and Land Management

Brown, A., C. Thomson-Dans & N. Marchant, eds. (1998). *Western Australia's Threatened Flora*. Como, Western Australia: Department of Conservation and Land Management