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

Conservation Advice

Ornduffia calthifolia

mountain villarsia

Conservation Status

Ornduffia calthifolia (mountain villarsia) 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 restricted extent of occurrence, low population size and continued declines in the number of mature individuals.

Description

The mountain villarsia is an erect, semi-succulent perennial herb growing to 40 cm high when not in flower and up to 75 cm when flowering. The stem and leaf stalks are grooved, the former up to 1 cm wide. The leaves, which have toothed margins, are round except for a slit on one side of the stalk, and are shaped like a shallow funnel or cup. Erect, many branched stems bear numerous flowers, each 1 cm long, including the protruding style. The flowers are yellow with 5 broad sepals and 5 petals, which are united at the base and 5 stamens that are fused to the petal tube. The flowers are borne on long, leafless stalks. Capsules are 1cm long and open at the top into 4 valves to release the seed (Brown et al., 1998).

Ornduffia marchantii is a similar but much smaller species that occurs in seasonally wet loams on mid-slopes below populations of the mountain villarsia. Hybrids between the two species occur in the overlap zone (Robinson and Coates, 1995).

Distribution

The mountain villarsia is restricted to the granite peaks, outcrops and upper drainage lines of the Porongurup Range. According to WA CALM (2004), most of the 16 known populations occur at altitudes above 400 m. The species occurs in moist sheltered positions in rock crevices and under rock overhangs in total or partial shade. The shallow soils in which the species occurs consist of sandy loams with accumulated organic material. In winter these locations are very wet, with water constantly percolating through them. Although moisture is normally retained in the crevices and peat during summer, periods of drought may dry the soils out causing some plants to die (Dixon and Pate, 1981; Robinson and Coates, 1995; Brown et al.,1998; Paczkowska and Chapman, 2000).

The species occurs in the 'Porongurup granite community' which contains several other threatened plant species including *Sphenotoma drummondii*, *Acacia heteroclita* subsp. *valida*, *Degelia flabellata*, *Stylidium corymbosum* var. *proliferum*, *Asplenium aethiopicum*, *Brachysema subcordatum* and *Hibbertia porongurupensis*. *Apium prostratum* subsp. *phillipii* occurs in drainage lines downslope from the mountain villarsia (WA CALM, 2004).

Given that the mountain villarsia is listed as endangered, all populations are considered to be important populations that are necessary for the species' long-term survival. Similarly, any habitat where populations are known to occur is considered habitat critical to the survival of the species (WA CALM, 2004).

Threats

The main threats to the mountain villarsia are habitat degradation and population declines resulting from weed invasion. Potential threats to the mountain villarsia are habitat degradation and population declines resulting from fire, recreational activities and overgrazing of the species by the herbivores, as discussed below (WA CALM, 2004).

Weed invasion

A combination of historical land-use and good quality soils has resulted in an extensive distribution of a large number of weed species in the Porongurup National Park. Weed invasion is a threat to most populations that occur in disturbed habitats (including post-fire) in open positions receiving full sunlight and on deeper soils. Weeds suppress early plant growth by competing for soil moisture, nutrients and light. They also exacerbate grazing pressure and increase the fire hazard due to the easy ignition of high fuel loads that are produced annually by many weed species. Specifically among granite outcrops, weed growth is most substantial in habitats and where the soil has been disturbed. It is least abundant where a dense shrub layer or low forest of native woody perennials persist (Hopper et al., 1997).

Encroaching upslope into the mountain villarsia habitat are blackberry (*Rubus fruticosis*), red valerian (*Centranthus ruber*), taylorina (*Psoralea pinnata*), dolichos (*Dipogon lignosis*) and forget-me-not (*Myosotis sylvatica*) (Barrett, 2002). The first four of these weed species pose the greatest threat to the mountain villarsia.

Fire

It is considered that fire may enhance germination (Ornduff cited in WA CALM, 2004) and occasional fire may be necessary for recruitment. However, information on the response of the species to fire of varying intensity and frequency is limited (WA CALM, 2004). While the death of mature mountain villarsia following 100% leaf-scorch has been recorded (Keighery cited in WA CALM, 2004), a small number of mature plants have been observed to resprout after a wildfire in 2003 (Barrett cited in WA CALM, 2004). Post-fire seedling establishment has been observed in most populations (Barrett cited in WA CALM, 2004) and Keighery (cited in WA CALM, 2004) noted numerous seedlings in the Devils Slide population following a wildfire and high rainfall in the subsequent winter. Nevertheless, inappropriate fire regimes may affect the long-term viability of mountain villarsia populations. Frequent fires which destroy regenerating or juvenile plants before they have reached maturity and have replenished the seed bank in the soil are likely to result in the loss of populations (WA CALM, 2004).

Recreational activities

Recreational activities undertaken by people, most commonly bushwalking, may have an impact on mountain villarsia populations occurring on or near tracks or footpaths. On the Devils Slide Track, a number of plants have been trampled. Populations at Nancy Peak/Hayward Peak and Castle Rock are situated close to frequently used tracks. While the construction and maintenance of footpaths decrease the likelihood of populations being trampled, the potential threat still exists where pedestrian traffic is great and people stray from paths.

Overgrazing by herbivores

A number of grazed plants were observed at three populations in 2003. Foliage has been known to be partially to completely removed on some plants as a result of grazing. It is unknown which herbivore had grazed on the abovementioned plants but both rabbit and western grey kangaroo dung were present nearby. The impact of rabbit browsing may have a detrimental effects on the mountain villarsia where high numbers occur.

Conservation and Management Actions

Weed control and habitat restoration

- Develop and implement a specific weed management plan for Porongurup National Park which prioritises weed species and areas for weed control based on threats to Declared Rare Flora, including the mountain villarsia, the invasiveness of the weed species, the size of infestations, historical controls and the effect of disturbance on weed distribution (red valerian, taylorina, dolichos and blackberry, in particular, are considered priority weed species requiring control within Porongurup National Park).
- Identify and implement appropriate weed control methods for the species based on scientific trials.
- Control invasive weeds by hand removal and/or spot spraying around mountain villarsia plants when weeds first emerge.
- Monitor and report on the success of the treatment on weed death and the tolerance of mountain villarsia and associated native plant species to the treatment.

Population and habitat restoration

- Restore degraded habitat in which populations known using best-practice bush regeneration techniques.
- Continue to collect and store seed and propagate cuttings from all known mountain villarsia populations / for the potential future restoration of those populations.
- Restore and maintain areas of suitable habitat which may be suitable for translocations or linking known populations.

Fire hazard reduction

- Develop and implement a fire management strategy for the mountain villarsia based on research of the species' fire ecology. Prescribed burning should not be undertaken until the species' fire ecology and all weed management impacts are fully understood.

Minimise the impact of recreational activities

- Install and maintain Declared Rare Flora markers at all known mountain villarsia populations to alert recreational users of the park to the presence of the species.
- Continue to construct and maintain footpaths along popular bushwalking tracks to encourage recreational users of Porongurup National Park to keep to the track and avoid damaging the species and its habitat in those areas.
- Install and maintain educational signage at all known mountain villarsia populations to inform recreational users of the park of the need to keep to the track or constructed footpath and avoid damaging the species and its habitat in those areas.

Stakeholder Management

- Continue to update information materials about the mountain villarsia.
- Continue to train interested stakeholders in survey techniques and identification of the species.
- Continue to identify and seek the input and involvement of any Noongar (indigenous) groups that have an active interest in the species.

Survey and Monitoring priorities

- Continue to regularly monitor known mountain villarsia populations to assess:
    - any change in population sizes
    - habitat degradation, including weed invasion
    - regeneration in previously degraded populations, and
    - the health of populations including recruitment and longevity of plants, seed production and abortion, and the degradation of plants due to herbivory.

- Continue to establish and monitor study plots at populations burned by wildfire to determine the optimal fire regime for the species.
- Conduct further surveys for the species in suitable habitats to locate undiscovered populations.
- Encourage volunteers from wildflower societies, naturalist clubs and the local community to be involved in mountain villarsia surveys.

Information and research priorities

- Research the biology/ecology of the mountain villarsia, including pollination, factors affecting the production of viable seed and germination, and the species' response to various forms of disturbance.
- Determine the susceptibility of the species to the range of weed management techniques.
- Research the fire ecology of the species: determine the effect of fire regimes (frequency and intensity of fire) on the survival and regeneration of the species through the use of monitoring plots, as mentioned above.
- Conduct research to determine which herbivorous species is consuming foliage of the species.
- Investigate options for enhancing populations or establishing additional populations.

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WA CALM (Department of Conservation and Land Management) (2004). Mountain Villarsia (*Villarsia calthifolia*) Interim Recovery Plan 2004-2009. Available on the Department of Parks and Wildlife website at: http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/198-approved-interim-recovery-plans (refer to *Ornduffia calthifolia*).