Action statement No.261

**Flora and Fauna Guarantee Act 1988**

White Star-bush *Asterolasia asteriscophora* subsp. *albiflora*

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Cover photo: Neil Creek (neilcreek.com) Compiled by: Judy Downe

ISBN: 978-1-74146-777-2 (pdf)

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White Star-bush *Asterolasia asteriscophora* subsp. *albiflora*

# Description

The White Star-bush (*Asterolasia asteriscophora* subsp. *albiflora mole*), also known as the Emerald Star-bush, is a slender upright shrub growing to

1.5 metres tall with dark green obovate to almost circular leaves, reaching 30 x 10 mm in size. The upper surface of the leaves have a few stellate hairs, while the lower surface is densely covered with rusty coloured stellate hairs. The flowers are usually white (occasionally pale lemon), star-shaped with 5 petals and 10 showy protruding stamens, often alternating long and short . The sepals are reduced to scales at the base of petals. The flowers are borne in umbels of 3 to 5, on stalks (pedicels) 6 to 15 mm long which are supported on a common stalk (peduncle), which is up to 5 mm long . White Star-bush typically flowers from early October to late November (Walsh & Entwisle 1999, Mole *et al.* 2002).

# Distribution

The White Star-bush is restricted to the Dandenong Ranges, Victoria where it grows in small clusters in undisturbed vegetation on private and public land, including road reserves. It grows predominantly in the Emerald area where the two largest populations occur at the Emerald Quarry Reserve and Lawsons Road Reserve (DSE 2007). A medium sized population occurs at the Selby Conservation Reserve and on adjoining private land (the Belgrave South/ Belgrave/Selby junction) (J. Hick, pers. comm. 2013). Other populations occur elsewhere in Belgrave South, Selby, Menzies Creek and The Patch.

White Star-bush (John Hick)

# Habitat

White Star-bush forms part of the diverse shrub layer usually found within Shrubby Foothill Forest (Ecological Vegetation Class (EVC) 45) and is occasionally associated with Damp Forest (EVC 29) ecosystems located within the Highlands - Southern Fall Bioregion.

Shrubby Foothill Forest occurs on ridges and southern and eastern slopes in moderately fertile, well drained soils (mostly loam and clay loam), with an average annual rainfall of 700-1100 mm (DSE 2004). Damp Forest occurs on well-developed soils, on a variety of aspects and extending from sea level to montane elevations (DSE 2004).

# Life History and Ecology

There is little published information on the biology and ecology of the White Star-bush. Yugovic (2007) noted that recruitment of White Star-bush seedlings occurred following trial burns at Emerald Quarry Reserve. Plants are usually found in undisturbed areas, however J. Hick (pers. comm. 2011) has observed seedlings growing along track edges and excavated batters at the Emerald Quarry Reserve and roadsides at The Patch and Selby indicating

that recruitment may be stimulated by mechanical soil disturbance. It is assumed that a minimum

fire-free interval of five years is needed to allow the soil seed-bank to be replenished between fires (N. Walsh, pers. comm. 2011).

Distribution in Victoria (DELWP, 2015)

# Conservation status

## National conservation status

White Star-bush is not listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

## Victorian conservation status

White Star-bush is listed as threatened under the

*Flora and Fauna Guarantee Act 1988* (FFG Act).

White Star-bush is considered endangered in Victoria according to the Department of

Environment, Land, Water and Planning (DELWP)’s

*Advisory List of Rare or Threatened Plants in Victoria*

*– 2014* (DEPI 2014).

# Threats

The greatest threat to individual populations is the destruction of plants by landholders controlling fuel loads to manage the threat of fire. This threat is compounded because the majority of known

populations occur in populated and semi-rural areas (R. Jones, pers. comm. 2014).

Other major threats include the removal and degradation of habitat. Habitat loss occurs following clearing of vegetation and inappropriate fire regimes. Degradation of habitat results from competition with weed species (in particular creeping or climbing species), competition with native species, roadside slashing, trampling and illegal dumping of rubbish. Accidental removal of plants, due to mis-identification, by uninformed landholders also results in the loss of individual plants or small populations.

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| **Standard threat** | **Source of threat** | **Explanation** |
| Competition | Invasion by environmental weeds | White Star-bush is impacted by different weed species at various locations. The following serious weeds have been recorded in the reserves - Blackberry (*Rubus fruticosus* spp. *agg.*), English Ivy (*Hedera helix*), Japanese Honeysuckle (*Lonicera japonica*), Periwinkle (*Vinca major*), Spear Thistle (*Cirsium vulgare*), Paspalum (*Paspalum dilatum*) and Phalaris (*Phalaris aquatica*) (N. Walsh, pers. comm. 2011).  Native species have also been observed competing with White Star-bush at the Emerald Quarry Reserve site.  For example, in the unburnt areas bracken (*Pteridium esculentum*) is abundant and in the burnt areas dense regeneration of *Pultenaea* spp. and Dusty Miller (*Spyridium parvifolium*) has occurred.  Also at the Lawsons Rd site, in particular, the invasive Paddys River Box (*Eucalyptus macarthurii*) is present which has caused considerable closing of the canopy, and while not documented, by implication, alteration of understorey conditions (T. Entwisle pers. comm. 2014). |
| Inappropriate fire  regimes | Fire – frequency | The optimal fire regimes (frequency and intensity) to promote seed production and germination of White Star-bush are  not known. A minimal fire-free period of five years has been suggested (N. Walsh, pers. comm. 2011). An inappropriate fuel reduction program may adversely affect survival of the species. Also the condition and structure of the habitat may be altered by frequent fuel reduction burns. |
| Habitat damage or  loss | Vegetation  clearance | Habitat loss occurs when vegetation is cleared, primarily for development or primary production. |

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| Habitat damage or  loss | Land use changes  - residential/ commercial development | Development proposals on private land may impact on known individuals and populations. |
| Trampling | White Star-bush populations at some sites may be subject to trampling resulting in damage to mature plants and possible destruction of seedlings. Soil compaction may also occur, resulting in reduced germination and regeneration. |
| Human disturbance | Dumping - rubbish | Rubbish dumping is an ongoing problem at the reserves  where White Star-bush occurs. |
| Vegetation  clearance | Accidental or deliberate destruction of plants by landholders results in the loss of undocumented populations. |
| Vegetation control activities (including spraying, slashing and mowing) | Slashing of native vegetation on both public and private land (to manage fuel loads) may be detrimental to White Star-bush because it prevents plants from flowering and  producing seed, which affects recruitment. Roadside spraying of herbicides may also impact on undocumented populations of White Star-bush. |

# Important locations

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| **Catchment** | **Location name** | **Land manager** | **Bioregion** |
| PORT PHILLIP AND WESTERNPORT | Bellbird Crescent,  Emerald | Cardinia Shire | Highlands - Southern Fall |
| Emerald Quarry Reserve | Cardinia Shire | Highlands - Southern Fall |
| Lawsons Road Reserve | DELWP | Highlands - Southern Fall |
| Macclesfield Road, Avonsleigh | Private Land | Highlands - Southern Fall |
| Maisey Road, Emerald | Private Land | Highlands - Southern Fall |
| Selby Conservation Reserve and adjoining private land (Belgrave South/Belgrave/Selby border) | Private Land, Yarra Ranges Shire, Parks Victoria | Highlands - Southern Fall |

**Past management actions**

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| **Action** | **Result explanation** |
| Negotiate voluntary acquisition or exchange of land | Negotiations have occurred to transfer Lawsons Rd Reserve from freehold land to DELWP. The reserve will be managed by a Committee of Management for Conservation. |
| Manage environmental  weeds | The roadside (top of the banks) at Emerald Quarry Reserve is slashed regularly for weeds and fire protection. |
| Apply ecological  burning | The CFA completed a burn of half of Lawsons Rd Reserve in April 2011. Cardinia Shire Council completed a burn in Emerald Quarry Reserve in April, 2005. |
| Prevent habitat loss | An extension of the Emerald Quarry Reserve has been accepted by Cardinia Shire Council and the Council intends to place a covenant on the title (R. Jones pers. comm. 2014). |
| Erect/maintain signs to restrict or discourage access | Cardinia Shire has commenced a roadside signage program. |
| Liaise with stakeholder groups | A stakeholder meeting in 2010 between the then Department of Sustainability and Environment (now DELWP) and representatives from the Shire of Yarra Ranges, Cardinia Shire, Parks Victoria and Friends Groups was held to discuss important issues, including optimal management actions for reserves and prevention of accidental damage from roadside maintenance (J. Hick pers. comm. 2015). |
| Develop, provide input to or implement park, reserve or land management plan | In 2005, Biosis Research prepared a Biodiversity Management Plan for the Lawsons Road Reserve, as part of the Emerald Secondary College extension area. The Emerald Quarry Reserve was assessed in October 2006 by Biosis Research.  DELWP and Cardinia Shire have reviewed fire management protocols for Em- erald Quarry Reserve and Lawsons Rd Reserve. |
| Undertake detailed population monitoring and collect demographic information | Biosis Research recorded over 200 individuals in the Lawsons Road Reserve in 2005. Biosis Research found 1951 mature plants in the Emerald Quarry Reserve in 2006. |
| Assess threats | Key threats to White Star-bush have been determined at Emerald Quarry Reserve and Lawsons Rd Reserve. |
| Maintain *ex situ* plant  collections | The Royal Botanic Gardens have established White Star-bush plants in cultiva- tion. Nurseries (Southern Dandenongs Community nursery and Friends of the Helmeted Honeyeater nursery) and private enthusiasts have well established plants in cultivation and cuttings are used from these plants for revegetation works in the Emerald area (J. Hick pers. comm. 2013). |
| Store reproductive  material | The Victorian Conservation Seedbank has four small unvouchered seed col- lections (totalling more than 600 seeds), for long term storage (J.Jeanes pers. comm. 2015). |

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| Collect reproductive  material | Seed was collected from White Star-bush populations in 2007 and 2008 and sent to the Victorian Conservation Seedbank at the Royal Botanic Gardens Melbourne (RBGM). Germination trials carried out at the RBGM, have had no success in germinating White Star-bush (M. Hirst pers. comm. 2013). Germina- tion of seed in nurseries and by private individuals has also been unsuccessful, so currently all revegetation work is by vegetative means (J. Hick pers. comm. 2013). |
| Undertake periodic surveillance monitoring of populations | The area of occupancy of some populations of White Star-bush was mapped in 2010 by the Department of Environment and Primary Industries (now DEL- WP) during the flowering season.  Cardinia Shire Council in conjunction with the Emerald Star Bush Community Partnership (ESBCP) have been monitoring populations and have identified 42 sites where White Star-bush is known to exist. These are made up of private and public properties including roadsides. This information has been periodi- cally forwarded to DELWP. |
| Develop, publish and distribute educational, technical or publicity material and/or displays. | ESBCP has promoted awareness and encouraged conservation programs, through the development of a land management education sheet and the establishment of a website. They are liaising with community to improve awareness of the species and to encourage conservation land management. Cardinia Shire has developed a species identification sheet |

**Conservation objectives**

## Long term objective

To ensure that the White Star-bush can survive, flourish and retain its potential for evolutionary development in the wild.

## Objectives of this Action Statement

* To increase the number of populations or individuals
* To maintain or improve condition of habitat
* To secure populations or habitat from potentially incompatible land use or catastrophic loss
* To increase knowledge of biology, ecology or management requirements
* To maintain or increase community awareness and support

# Intended management actions

The actions in this action statement have been developed taking into consideration relevant social and eco- nomic matters, as required under the FFG Act.

These actions are designed to support the conservation, management or control of flora and fauna and the management of potentially threatening processes, which will assist in mitigating any impact of climate change on White Star-bush, and will have no impact on greenhouse gas emissions.

The intended management actions listed below are further elaborated in DELWP’s Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

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| **Standard objective** | **Objective explanation** |  |
| **To increase the number of**  **populations or individuals** | Seed to be collected at least biennially according to Seed Collection protocols and stored at the Royal Botanic Gardens Melbourne in the Victorian Conservation Seedbank.  Established plants to be grown in cultivation to support the reintroduction or reinforcement of existing populations.  Protocol for translocation of cuttings and seedlings of White Star-bush to be prepared and implemented. | |
| **Standard action** | **Details** | **Responsible agents** |
| Collect reproductive material | Collect seed from most populations at least biennially (September to December). Method of seed collection to follow ‘Seed Collection Protocols’ of the Victorian Conservation Seedbank (i.e. up  to 10% of seed from up to 50% of plants within a population). Seed to be stored in the Victorian Conservation Seedbank. | RBGM, DELWP |
| Maintain *ex situ* plant  collections | Maintain established plants and bring new stock into cultivation for revegetation. Provenance information should be retained for all cultivated plants. Produce cuttings from these plants for revegetation works. | RBGM, DELWP |
| Prepare a plan for reintroduction/ reinforcement/translocation | Develop a protocol for translocation of cuttings and seedlings. | DELWP |

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| **Standard objective** | **Objective explanation** |  |
| **To secure populations or habitat from potentially incompatible land use or catastrophic loss** | All known populations on public land to be protected in secure reserves. All potential roadside habitats to be signposted to discourage disturbance and accidental damage. Liaison to occur between all stakeholders to determine optimal management actions in reserves and on public land. | |
| **Standard action** | **Details** | **Responsible agents** |
| Amend Crown land reservation | Finalise the transfer of Lawsons Road Reserve from freehold land to DELWP. Determine the appropriate reservation and management responsibility. | DELWP |
| Develop, provide input to or implement park, reserve or land management plan | An integrated management approach to be implemented by all stakeholders to ensure populations of White Star-bush are suitably managed and secured. | DELWP, Cardinia Shire, Yarra Ranges Shire |
| Erect/maintain signs to  restrict or discourage access | Significant roadside signage to be erected to discourage disturbance in areas of potential habitat for White Star-bush. | Cardinia Shire,  Yarra Ranges Shire |

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| Liaise with Melbourne Water | Conduct targeted White Star-bush survey within Cardinia Reservoir and where required develop conservation plan to ensure protection | DELWP, Melbourne  Water |
| Liaise with government agencies | Liaise with land managers to determine optimal management actions for the reserves and ensure there is no accidental damage from roadside maintenance or fire management actions | DELWP |
| Review conservation status | Review conservation status and nominate White Star-bush for listing under the EPBC Act. | DELWP |

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| **Standard objective** | **Objective explanation** |  |
| **To maintain or improve**  **condition of habitat** | To achieve a significant increase in the habitat condition of known populations. Optimal fire frequency and intensity to be determined. Abundance of weeds to be reduced. | |
| **Standard action** | **Details** | **Responsible agents** |
| Manage environmental  weeds | Undertake weed control at known sites and potential roadsides and reserves, as viable soil- stored seed may be present and, in suitable conditions, be able to expand naturally if the habitat is not compromised by weeds. The presence of *Eucalyptus macarthurii* in the overstorey (T. Entwisle pers. comm. 2014) and creeping and climbing weed species are of particular concern at Lawsons Road Reserve. CFA and DELWP to manage weed infestations and restrict access following ecological burns so that regeneration of White Star-bush is optimised | DELWP, Cardinia  Shire, CFA |
| Maintain vegetation  structure | Carefully manage potentially competitive native species, in particular, Bracken, *Pultenaea* spp. and Dusty Miller (*Spyridium parvifolium*) following ecological burns, to maximise growth and flowering of White Star-bush. | DELWP, Cardinia Shire |
| Apply ecological burning | Undertake integrated fuel reduction and ecological burning according to DELWP Fire Management Prescriptions, which will ensure that burns are suitable for regeneration of the species and maintain the diversity and structure of the  habitat. Avoid adverse effects on species from fuel reduction and fire prevention activities. | Country Fire Authority (CFA), DELWP |

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| **Standard objective** | **Objective explanation** |
| **To increase knowledge of biology, ecology or**  **management requirements** | Monitoring protocols to be developed and implemented. Optimal fire regimes to be determined to maximise regeneration of White Star-bush. Knowledge of requirements for seed germination to be increased. |

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| **Standard action** | **Details** | **Responsible agents** |
| Develop detailed population  monitoring protocols | Complete population monitoring protocols | DELWP |
| Assess threats | Assess threats to White Star-bush at all locations (completed at Emerald Quarry Reserve and Lawsons Road Reserve). | DELWP, Cardinia Shire, Yarra Ranges Shire |
| Identify disturbance regimes to maintain habitat or promote regeneration and recruitment | Establish a post-burn monitoring program to determine optimal fire regimes (frequency and intensity) to promote seed production and germination and provide additional information about the response of White Star-bush to fire over time. This information will help to determine the overall effect of the fuel reduction program | DELWP, Cardinia Shire, Yarra Ranges Shire |
| Undertake detailed population monitoring and collect demographic information | Monitor populations in Spring (flowering time) to determine population size, demographics and condition. | DELWP, Cardinia Shire, Yarra Ranges Shire |
| Undertake research to identify key biological functions | Investigate germination cues for White Star-bush, as germination trials carried out at the Victorian Conservation Seedbank, have had no success in germinating White Star-bush (M. Hirst pers. comm. 2013). | RBG, DELWP |

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| **Standard objective** | **Objective explanation** |  |
| **To maintain or increase community awareness and support** | Increased community awareness and support for private landowners | |
| **Standard action** | **Details** | **Responsible agents** |
| Liaise with stakeholder groups | Liaise with the CFA to ensure management directions on private land achieve multiple land management outcomes that include maintaining a diversity of habitat. | DELWP, Cardinia Shire, Yarra Ranges Council and CFA |
| Liaise with private landowners | Liaise with private landowners to raise awareness  and promote protection on private properties. | DELWP |
| Promote awareness of item through communication with local community | Provide landholders with White Star-bush on their properties with education sheet and access to the website developed by ESBCP.  ESBCP to continue providing information to the local community by attending local markets and promoting the importance of White Star-bush in the area. | DELWP, Cardinia Shire, Yarra Ranges Council, ESBCP |

# Personal Communications

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Rob Jones, Natural Resource Planner, Cardinia Shire, Pakenham, Victoria

Tim Entwisle, Director and Chief Executive, Royal Botanic Gardens Melbourne, Victoria

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