

Guidelines for the protection of Heath Fringe Blue Butterfly (*Neolucia agricola agricola*)

Coastal Metropolitan Adelaide



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Summary

Species status:

Neolucia agricola agricola (Heath Fringe Blue Butterfly) occurs widely across the southern regions of South Australia, from Eyre Peninsula to the Victorian border.

The butterfly is not listed under Australia's *Environment Protection and Biodiversity Conservation Act 1999* or under *South Australia's National Parks and Wildlife Act 1972* and subsequently has no formal protection. However, its localised occurrences, larval host plant use, habitat threats, disjunct distribution with no interconnectivity in the Coastal Metropolitan Adelaide deem this species as locally vulnerable.

Distribution and habitat requirements:

Neolucia agricola agricola has a fragmented and restricted coastal distribution within the Metropolitan Adelaide region, recorded from Hallett Cove Conservation Park to Moana South. The coastal colonies are isolated with no interconnectivity between coastal populations and Adelaide Hills populations.

The coastal habitat has incurred substantial reduction and alteration through urbanisation and agricultural use with further threats posed by human recreational impacts in metropolitan areas.

Colonies of the butterfly are found in remnant coastal heath habitats that support sufficient densities of *Eutaxia microphylla* (Common Eutaxia) and *Pultenaea tenuifolia* (Slender Bush-pea), its larval host plants.

Actions:

To safeguard the long-term survival of the species along the Metropolitan coast it depends on, protection of existing habitats and the development of habitats and interconnectivity through the provision of the larval host plants.

The following actions are recommended;

- Monitor specific populations and habitat.
- Increase habitat size at specific population sites.
- Protect habitat at specific population sites.
- Develop interconnectivity between population sites.
- Develop site specific N. a. agricola management plan.
- Provide information and advice to land managers.
- Identify the potential for translocations of the butterfly.
- Establish new colonies by translocations.

Introduction

The assessment status of the *Neolucia agricola agricola* (Heath Fringe Blue Butterfly) populations, their distribution across the Adelaide metropolitan is compiled from surveys, iNaturalist observations and Atlas of Living Australia records. Habitats and larval host plant observations were also undertaken during surveys of various butterflies across coastal sites and are included here (*per. obs.* M. Endacott & A. Stolarski 2020-2024).

N. a. agricola can be observed in coastal areas supporting *Eutaxia microphylla* and *Pultenaea tenuifolia* present in sufficient densities. *N. a. agricola* is found present in variable population densities and occupies patchy distributions across its range from Hallett Cove Conservation Park to Moana South.

E. microphylla and *P. tenuifolia* are now restricted to coastal gullies and cliff top fringes and in many sites the growing position is found highly exposed to coastal elements impeding the plant use by the butterfly. The inter-site connectivity is limited and in some areas absent due to habitat alterations and urban developments.

The limited and disjunct *E. microphylla* and *P. tenuifolia* habitats in the Coastal Metropolitan Adelaide deem this species as vulnerable and in need of action management for long-term population sustainability. The habitat and larval host plants management strategies will ensure the butterfly's preservation in the coastal areas.

Description and Life History

Neolucia agricola agricola (Heath Fringe Blue Butterfly) is a small butterfly in the family *Lycaenidae*, commonly referred to as *"Blues"*. Male butterflies have an average wingspan of 20mm and females 21mm. The upperside of the adult butterfly is bronzy brown with scale fringes chequered brown and white. Both sexes look very similar in their pale grey undersides (Fig. 1 & 2). For a small butterfly their flight is fast, especially the males, however close observations can occur during nectaring from various flowering plants especially *Calytrix tetragona* (Common Fringe-myrtle).

The butterfly relies on small pea shrub species (Fabaceae) as larval hosts, however on the Adelaide metropolitan coast it uses *Eutaxia microphylla* (Common Eutaxia) and *Pultenaea tenuifolia* (Slender Bush-pea) (Fig. 3 & 4).

The egg is small, initially pale green in colour then turning white and flattened in appearance (Fig. 5). The eggs are laid on singly in bark cracks or in branchlet divisions. The eggs remain dormant over summer, autumn and winter and hatch to coincide with the budding and flowering of the larval hostplants in spring the

following year. This unique egg dormancy makes the species quite vulnerable to loss through adverse environmental events, should the destruction of eggs occur.

The mature larvae measure approximately 12mm and are multi-coloured displaying colours of green to various shade of orange and brown (Fig. 6). This colouration makes the larvae cryptic, blending in with the leaves, flower buds, flowers and stems of the hostplant, such that the larvae are difficult to detect. Feeding occurs on the flower buds and flowers with the larval stage taking about four weeks to pupation. The larvae have no obligate relationship with ants, however, sometimes are attended by small ants.

Pupation occurs either on the plant or other vegetation near the host plant. The pupae are small averaging 9mm in length and display varying shades of brown. The duration of the pupal stage varies between 10-19 days. The entire life cycle takes 12 months for completion.



Figure 1. Male upper side. Photo: Matt Endacott



Figure 2. Male underside. Photo: Matt Endacott



Figure 3. Eutaxia microphylla, larval host plant.



Figure 4. Pultenaea tenuifolia, larval host plant.



Figure 5. Egg. Photo: R. Grund



Figure 6. Mature larva. Photo: R. Fischer

Distribution and Abundance

The coastal range of *N. a. agricola* is disjunct along the southern half of the metropolitan coastline recorded from only four sites; Hallett Cove CP, Port Stanvac coastal heath, Tingira Reserve and Moana South coastal heath (Fig. 7). Some sites with stands of larval host plants such as Hallett Headland Reserve, Marino Conservation Park and Aldinga Beach area do not support the butterfly.

Abundance of the species is associated with the habitat quality and larval host quantity and can be measured by the number of adults during the flight period.



Figure 7. Neolucia agricola agricola, Metropolitan Coastal sites.

Habitat

N. a. agricola is found present in coastal cliff top heath and gullies supporting its larval host plants, *Eutaxia sp.* and *Pultenaea sp.* These coastal heaths are open windswept habitats periodically subjected to salt spray. The presence of adult butterflies is localized, restricted to the colony areas with breeding occurring in areas of reduced coastal exposure.

The availability of nectaring plants at sites enables the butterfly to survive for longer periods of time and allows for increased probability of breeding during years of low population numbers.

Actions

The assessment of the *Neolucia agricola agricola* populations, their distribution and habitats across the Adelaide metropolitan coasts was undertaken (Stolarski 2022-2023).

The butterfly has no state conservation status, however its localised occurrence, unique larval host plant use and the disjunct distribution within coastal Metropolitan Adelaide deem this species as locally vulnerable.

Historically *N. a. agricola* was widespread and continuous throughout its range both in coastal areas and inland populations through means of interconnectivity corridors. Habitat destruction and alterations have resulted in fragmented remnant vegetation restricting the butterfly to four metropolitan coastal sites.

The risk of butterfly colony collapses is high at some sites, especially Moana South coastal heath, due to low volumes of suitable larval host plants and habitat pressures with no possibilities of natural recolonization.

The recommended strategy for the management of *N. a. agricola* is to be based on ensuring the protection of populations in remnant habitats by safeguarding, enhancing and developing interconnecting vegetation where possible.

Monitoring current butterfly populations and habitat sites for seasonal variability, adverse effects and the provision of information to equip land managers with the guidelines for on ground works are key management strategies.

The development and provision of a *N. a. agricola* fact sheet is recommended.

Four coastal sites support *N. a. agricola* populations and two sites are likely to with habitat enhancement and translocations. All coastal sites supporting the butterfly are in need of action management to ensure long term species survival which is to;

- 1) Monitor specific populations and habitat.
- 2) Increase habitat size at specific population sites.
- 3) Protect habitat at specific population sites.
- 4) Develop interconnectivity between population sites.
- 5) Develop site specific *N. a. agricola* management plan.
- 6) Provide information and advice to land managers.
- 7) Identify the potential for translocations of the butterfly.
- 8) Establish new colonies by translocations.

1) Monitor populations and habitat

The four metropolitan sites; Hallett Cove CP, Tingira Reserve, Port Stanvac coastal heath and Moana South coastal heath all supporting *N. a. agricola* colonies have been identified as in need of regular monitoring due their coastal positions and habitat pressures. These are remnant fragmented sites containing *E. microphylla* and *P. tenuifolia* plants present in variable health conditions and site distributions. This variability in plant quality at sites appears to directly affect the butterfly's population densities.

2) Increase habitat size at population sites

Surveys of coastal heaths identified two metropolitan sites; Hallett Cove CP and Moana South coastal heath as low *N. a. agricola* populations. These findings are attributed to low densities of quality larval host plants.

Suitable areas exist within these two sites allowing for habitat improvement through additional *E. microphylla* and/or *P. tenuifolia* plantings.

Both larval host plant species are easily propagated and readily available from native plant nurseries.

3) Protect habitat at population sites

The four metropolitan coastal sites; Hallett Cove CP, Port Stanvac coastal reserve, Tingira Reserve and Moana South coastal heath have been identified as in need of specific habitat protection. These four sites are situated within suburban development confines and are isolated. This isolation prohibits natural recolonization of *N. a. agricola* post adverse events such as fire and requires protection.

The main threats identified to the butterfly at these sites are human impacts, weed invasion and to a lesser extent kangaroo grazing and trampling at Port Stanvac and Marino CP coastal heaths.

Hallett Cove Conservation Park

The site supports patchy distributions of *E. microphylla* and *P. tenuifolia* with the presence *N. a. agricola* population (Fig. 8). The site supports both remnant and some post disturbance regrowth in areas of revegetation.



Figure 8. Hallet Cove Conservation Park heath areas.

Port Stanvac coastal heath

The site surveyed in 2022 & 2023, supports the largest *E. microphylla* and *P. teunifolia* stands along Adelaide's metropolitan coast resulting in the largest *N. a. agricola* population (Fig. 9). The site supports both remnant and some post disturbance regrowth of high-quality larval host plants.

The restricted access to site has seen low human impacts resulting in reasonably weed free larval host plant stands providing high quality habitat for the butterfly.

It is recommended that the site access restriction continues to minimize human impacts.



Figure 9. Port Stanvac coastal heath area.

Tingira Reserve

The site semi connected to Port Stanvac coastal heath through a narrow coastal cliff connection (without larval hosts) supports sufficient larval host plants and sustains a strong *N. a. agricola* population (Fig. 10). The site visited annually during the adult flight period since 2021 continues to support good population numbers (M. Endacott *pers. comm.* 2024).



Figure 10. Tingira Reserve coastal heath area.

Moana South coastal heath

The site supports *N. a. agricola* however, some larval host plants are invaded by exotic grasses and with some areas exposed to potential human interference that may be detrimental to the survival of the colony. Habitat degradation is apparent with unrestricted creation of tracks from bikes and foot traffic across the landscape. These habitat threats are further compounded by recently increased housing developments abutting this site (Fig. 11).

Threats from human impact such as recreational use and fire pose a significant possibility of attributing to colony diminishment. Whilst fire may not be prevented, the creation of restricted access areas and development of designated paths for recreational use will help to minimize these impacts.



Figure 11. Moana South coastal heath area.

4) Develop interconnectivity areas

Known population sites are severely isolated by suburban development and with no possibilities of creating expansive connectivity. Only small limited suitable metropolitan coastal sections exist for interconnectivity works from Hallett Cove Headland reserve through to Port Stanvac Coastal heath, including a small section of the lower Field River Reserve.

The coastal section of Cove Point between Hallet Cove Headland Reserve and Port Stanvac contains a small number of larval host plants but no presence of *N. a. agricola* found. Localised areas within this stretch of coastline provide suitable soil parameters for larval host plant establishment and solid interconnectivity habitat development (Fig. 12).



Figure 12. Site interconnectivity potential.

5) Establish new colonies by translocation

Hallett Headland Coastal Reserves

This narrow clifftop area with isolated pockets of remnant heath vegetation supports limited larval host plants. The potential exists for habitat and interconnectivity enhancement of this site situated between Hallett Cove CP and Port Stanvac coastal heath allowing for new colony establishment through natural connectivity or translocation of female butterflies.

Marino Conservation Park

The butterfly is currently not present at Marino CP; however, the site supports a good number of larval hosts especially in the post fire regrowth area and has been identified as potential for translocating the species. Further habitat enhancements are possible through the provision of larval host plants in the revegetation areas.

Aldinga Beach Coastal Face

Sections along the Esplanade supporting limited *E. microphylla* and *P. tenuifolia* plants are highly exposed to coastal elements with both plant species displaying typical windswept characteristics. The site is deemed unsuitable for translocations of the butterfly.

References

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