

Diamond Sedge Skipper Butterfly (*Antipodia atralba*) Coastal mini-Management Plan



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Summary

Coastal Management Plan

This Coastal mini-management plan supersedes the *Diamond Sedge Skipper Butterfly (Antipodia atralba) Coastal mini-management plan Report,* prepared for Green Adelaide Board, South Australia, Ento Search, May 2022.

The plan has been developed to safeguard the long-term survival of the Diamond Sedge Skipper butterfly (*Antipodia atralba*) in the Adelaide metropolitan and Fleurieu coastal regions.

Species Status

The Diamond Sedge Skipper butterfly (*Antipodia atralba*) 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 occurrence, unique larval host plant use and the disjunct distribution in the coastal metropolitan and Fleurieu coasts deem this species as locally vulnerable.

Distribution and Habitat Requirements

Antipodia atralba has a fragmented and restricted coastal distribution from Marino Conservation Park to Newland Head Conservation Park. This coastal habitat has incurred substantial reduction due to urbanisation and agricultural use with further threats posed by human recreational impacts in metropolitan areas.

Coastal colonies of the butterfly are found in heath habitats that support healthy *Gahnia lanigera* stands, its larval host plant.

Action Management

- Monitor specific populations and habitat.
- Increase habitat protection for specific populations.
- Increase habitat size at specific population sites.
- Identify and develop interconnectivity between population sites.
- Establish new colonies by translocations
- Provide information and advice to land managers

Introduction

The assessment of the Diamond Sand Skipper (*Antipodia atralba*) populations, their distribution and habitats across the Adelaide metropolitan and Fleurieu coasts was undertaken in 2021 (Stolarski 2021).

A. atralba is restricted to areas supporting Gahnia lanigera, the butterfly's exclusive larval host plant in the coastal range. A. atralba is found present in variable population densities and occupies patchy distributions across its range from Marino Conservation Park to Newland Head Conservation Park. The plant is now restricted to coastal 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 intra-site use of *G. lanigera* plants by *A. atralba* larvae is variable and subject to larval plant quality. The inter-site connectivity is limited and in some areas absent due to habitat alterations and urban developments.

The limited and disjunct *G. lanigera* habitats in the coastal metropolitan and Fleurieu coasts deem this species as vulnerable and in need of intervention for long term population sustainability. *G. lanigera* habitat management strategies will ensure *A. atralba* persistence in the coastal areas.

Description and Life History

The Diamond Sedge Skipper (*Antipodia atralba*) is a small butterfly in the family *Hesperiidae*. Male butterflies have an average wingspan of 30mm and females 35mm (Fig 1 & 2). The adult butterfly is dark brown with several white spots on upperside of each fore wing. There is a suffused cream patch on each hind wing. Both sexes look very similar in their pale grey undersides. Males differ from females on the upperside with the presence of a sex band on each forewing.



Figure 1. Female upperside. Photo: Matt Endacott



Figure 2. Female underside. Photo: Matt Endacott

The egg is large, 2mm, pale green in colour, spherical but flat at the base and is very finely ribbed from base to the depressed micropylar area at top of egg. Larval development within the egg requires approximately 14 days before emergence.

Larval development involves 5 instars and requires approximately 6 months for completion. Mature larva range between 30-35mm in length and approximately 4mm in width. The larva body is green with a darker brownish green dorsal line and a green brown head. Larvae construct teepee tent like shelters open at the base and completely sealed on top with the larval head directed downwards. Larva is nocturnal and feeds on selected leaf tips in close proximity to the shelter.

Pupation occurs in the final shelter and requires approximately 30 days for development. The pupa is usually dark brown and also directed downwards within the shelter.

Adults are present in two distinct flight periods, spring and autumn and last for two to three weeks at any one site. Flight periods between sites are variable and subject to environmental factors. Adults are most active during sunny periods with activity subsiding under cloud cover. Adults are often encountered nectaring on flowers especially Pincushion (*Scabiosa atropurpurea*). Adults tend to be restricted to colony areas, however dispersal has been observed but limited in distance. Populations within and between sites fluctuate in densities as a response to the availability of fresh *G. lanigera* leaves on which the butterfly's larvae feed. The butterfly is very responsive to post fire plant growth and often attains large population numbers following such events.

Further information and photographic presentation is available in Diamond Sedge Skipper & Desert Saw-sedge Information Sheet (Appendix 2).

Distribution and Abundance

The coastal range of *A. atralba* is disjunct along the southern half of the metropolitan coastline from Marino Conservation Park to Moana South and Fleurieu Peninsula from Carrickalinga north to New Headlands Conservation Park. Throughout its range *A. atralba* is found in areas where *G. lanigera* stands occur. Some sites with abundant *G. lanigera* stands do not support the butterfly and this is attributed to adverse coastal effects and resulting poor plant quality.

Abundance of the species is associated with the habitat quality and not quantity and can be measured by means of larval shelters present. Colony sizes at times are heavily parasitized by wasps and with variable degree of affect between sites.

Habitat

A. atralba is found present in coastal cliff heaths supporting *G. lanigera,* its larval host plant. These coastal heaths are open windswept habitats periodically subjected to salt spray. The presence of adult butterflies is usually widespread within the colony areas however breeding sites are mainly restricted to less exposed coastal areas.

Reasons for a management plan

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

Historically *A. atralba* was more widespread and continuous throughout its range. Habitat destruction and alteration has resulted in fragmented remnant habitats restricted to nine known coastal sites. Five of these disjunct sites occur within coastal metropolitan areas and four on the Fleurieu coast. Sites are fragmented due to coastal developments, mainly urbanization and agricultural uses resulting in the inability of *A. atralba* inter-site movements.

The risk of butterfly colony collapses is high at some sites due to low volumes of suitable *G. lanigera* stands and habitat pressures with no possibilities of natural recolonization.

Management plan strategies

The strategy for the management of *A. atralba* is based on ensuring protection of populations in remnant habitats by managing, improving and interconnecting *G. lanigera* stands where possible.

Monitoring of current populations and habitats sites for seasonal variability and adverse effects and the provision of information to equip land managers with management tools for on ground works are key management strategies (Appendix 1).

The development of successful *G. lanigera* propagation techniques are necessary to deliver habitat improvement and interconnectivity outcomes. Successful propagation techniques are yet to be developed.

Action management

The assessment of the Diamond Sand Skipper (*Antipodia atralba*) populations, their distribution and habitats across the Adelaide metropolitan and Fleurieu coasts was undertaken in 2021 (Stolarski 2021).

Eight colony sites were identified as supporting the butterfly populations at that time with additional survey identifying further colonies on the Fleurieu coast. All sites supporting the butterfly are in need of action management to ensure long term species survival at coastal sites 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) Identify and develop interconnectivity between population sites
- 5) Establish new colonies by translocations
- 6) Provide information and advice to land managers

1) Monitor specific populations and habitat

The five metropolitan sites; Marino CP, Hallett Cove CP, Hallett Cove Headland, Port Stanvac and Moana South all supporting *A. atralba* colonies have been identified as in need of regular monitoring due their coastal positions and habitat pressures (Fig. 3). These are remnant fragmented sites containing *G. lanigera* plants present in variable health conditions and intra-site distributions. This variability of *G. lanigera* plant quality at sites directly affects the *A. atralba* population densities.



Figure 3. Metropolitan sites.

The five Fleurieu Peninsula sites; Myponga Beach, Carrickalinga North, Cape Jervis, Land's End and Newland Head CP have been identified as lower priority monitoring due to their habitat size and *A. atralba* population densities (Fig. 4). These sites are in areas not subject to immediate habitat threats. However, monitoring should be undertaken periodically to evaluate any potential changes including; over grazing by native and domestic stock animals in the Carrickalinga North and Myponga Beach areas, excessive revegetation activities in the Cape Jervis and Land's End areas and fire management activities in Newland Head CP.



Figure 4. Fleurieu Peninsula sites.

2) Increase habitat size at specific population sites

A. atralba population and distribution survey report (Stolarski 2021) identifies three metropolitan sites: Hallett Cove Conservation Park, Hallett Cove Headland and Tingira Reserve as low *A. atralba* populations. These findings are attributed to low intra- site distribution and densities of quality *G. lanigera* plants. *A. atralba* within these sites are found as either low in population density occupying the entire site or restricted to and highly concentrated in suitable *G. lanigera* areas within a site.

These three sites contain areas where habitat improvement can occur through additional *G. lanigera* plantings in adjoining areas of existing plant stands. The increased *G. lanigera* plantings within sites will create strengthened intra-site connectivity of habitats and increase *A. atralba* security.

3) Protect habitat at specific population sites

Two metropolitan coastal sites; Moana South and Marino Conservation Park have been identified as in need of specific habitat protection. These two sites are situated within suburban development confines and are isolated. This isolation prohibits natural recolonization of *A. atralba* post adverse events such as fire and requires protection. The main threats identified to *A. atralba* at these sites are human impacts, weed invasion and to a lesser extent kangaroo grazing and trampling at Marino CP.

Moana South area is another stronghold *A. atralba* metropolitan population site. However, *G. lanigera* is present in areas exposed to human interference that may be detrimental to the survival of the colony. Immediate threats of habitat degradation are apparent with recently increased housing developments abutting this colony (Fig. 5).

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 5. Moana South heath area.

Marino Conservation Park supported a strong population presence until a fire in December 2019 removed most of the prime heathland containing the colony. This adverse activity has shown the vulnerability of isolated populations with unburnt areas located to the north and south within this heathland supporting the remnant population (Fig. 6).

A. atralba is very responsive to post fire plant growth and will recolonize the burnt

areas. *G. lanigera* regrowth rates will determine *A. atralba* recolonization rapidity of the area. Until such time as plants attain suitability for butterfly use, the remnant areas require protection from further disturbances.



Figure 6. Marino Conservation Park heath area.

A third site, Port Stanvac coastal heath area, surveyed in April 2023, supports the largest *G. lanigera* stands along Adelaide's metropolitan coast resulting in the largest *A. atralba* population (Fig. 7). The site supports both remnant and post disturbance regrowth vegetation with high quality *G. lanigera* stands.

The restricted access to site has seen low human impacts resulting in weed free *G*. *lanigera* stands providing high quality habitat for the butterfly.

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



Figure 7. Port Stanvac coastal heath area.

4) Identify and develop interconnectivity areas

Known population sites are severely isolated by suburban development with no possibilities of creating expansive connectivity. Only small limited suitable metropolitan coastal sections exist for interconnectivity works from Hallett Cove Conservation Park through to Hallett Cove Headland and onto Tingira Reserve, O'Sullivans Beach. Limited localised areas provide suitable soil parameters for *G. lanigera* habitat establishment.

The coastal section between Hallet Cove Headland and Port Stanvac supports a small number of *G. lanigera* plants with previous use of *A. atralba* found present, however this area is small and permanent population establishment is unlikely. The butterfly's use of this area provides evidence of coastal movements between population sites and provides an opportunity to develop solid interconnectivity habitats within this coastal strip (Fig. 8).

The Fleurieu coast offers suitable soil parameters for *G. lanigera* habitat establishment with large parcels of coastal areas in the Carrickalinga and Myponga Beach areas as well as localised sites at Cape Jervis. It is recommended that these areas are further investigated for the possibilities of habitat enhancement.



Figure 8. Site interconnectivity potential.

5) Establish new colonies by translocation

Kingston Park cliff face currently supports limited *G. lanigera* stands and has been identified as suitable for translocating *A. atralba* subject to habitat enhancement through additional *G. lanigera* plantings and removal of encroaching vegetation on existing stands.

Aldinga Beach cliff face sections along the Esplanade have been identified as possible translocation sites. These areas support significant *G. lanigera* stands, however are highly exposed to coastal elements with limited sheltered habitats.

Information package for land managers

The Diamond Sedge Skipper & Desert Saw-sedge Information Sheet forms part of this mini management plan and is available as a separate attachment in Appendix 2. The distribution of this information should be provided to all relevant land managers to assist in supporting the localized management strategies.

References

Stolarski A., (2021). Antipodia atralba population & distribution survey, Adelaide Metropolitan and Fleurieu Coast Report. Prepared for Green Adelaide Board, South Australia, Ento Search, June 2021.

Stolarski A., (2022). *Diamond Sedge Skipper Butterfly (Antipodia atralba) Coastal mini-management plan Report*. Prepared for Green Adelaide Board, Ento Search, South Australia, May 2022.

Stolarski A., (2022). *Chequered Copper Butterfly (Lucia limbaria) Carrickalinga North & Myponga Beach areas Survey November 2022 Report*. Prepared for Green Adelaide Board, South Australia, Ento Search, November 2022

Stolarski A., (2023). *Port Stanvac Coastal Reserve Butterfly Survey Report*. Prepared for Green Adelaide Board, South Australia, Ento Search, April 2023.