

Technical Bulletin # 10

Orange sun-moth (*Synemon nais*) survey in the Victorian Mallee



Above: Basking orange sun-moth at Quinn's Tank Bushland Reserve. Photo: Fabian Douglas.

This bulletin summarises the findings of a survey undertaken in October 2011 on the distribution, habitat requirements, biology and potential threats to the orange sun-moth (*Synemon nais*) within the central Mallee area of north-western Victoria.

Background

The orange sun-moth belongs to the family Castniidae. With their broad wings, slender bodies and clubbed antennae, these often brightly-coloured, diurnal moths bear a strong resemblance to butterflies. The orange sun-moth is distributed in isolated populations from

near Mundrabilla in the far south-east of Western Australia, through the Nullarbor Plain in South Australia, to near Ouyen in Victoria. In Victoria, the species was first recorded near Sea Lake but was presumed to be extinct within state limits until it was rediscovered in 1988 by Dr M. F. Braby and Fabian Douglas at the Walpeup Bushland Reserve.

With an average wingspan of 2.7cm for males and 3cm for females, the orange sun-moth is one of the smallest of the nine sun-moth species that are now known to occur in Victoria.

At a glance

- Listed as a threatened species under the *Victorian Flora and Fauna Guarantee Act* (1988).
- Within Victoria, prior to the current survey, supposedly extant occurrences were only known from Quinn's Tank Bushland Reserve (south-east of Ouyen), Yetman's Flora and Fauna Reserve (south south-east of Patchewollock) and three small sites near Walpeup.
- During October 2011, a survey was conducted in north-western Victoria to locate new populations and to monitor the known occurrences. The species was found at all of the extant sites (from which it had been recorded during the past 10 years) and at two new sites near Danyo.



Above: Habitat of the orange sun-moth at Yetman's Flora and Fauna Reserve. Photo: Fabian Douglas.

The species' habitat is the grassy understory of open and often diverse woodland and/or mallee communities. It requires undisturbed open areas of native perennial grasses and its larvae are thought to feed in underground tunnels on the roots of bristly wallaby-grass (*Austrodanthonia setacea*).

The orange sun-moth is listed as threatened under the *Flora and Fauna Guarantee Act (1988)*. It is also recognised as critically endangered in the Department of Sustainability and Environment's Advisory List of Threatened Invertebrate Fauna in Victoria - 2009. This is entirely due to its severely restricted distribution, which in turn, was brought about by habitat loss as a result of the clearing of vegetation. As a result of the species' restricted distribution, it is now vulnerable to such threats as weed invasion, soil disturbance and ecological succession.

Project objectives

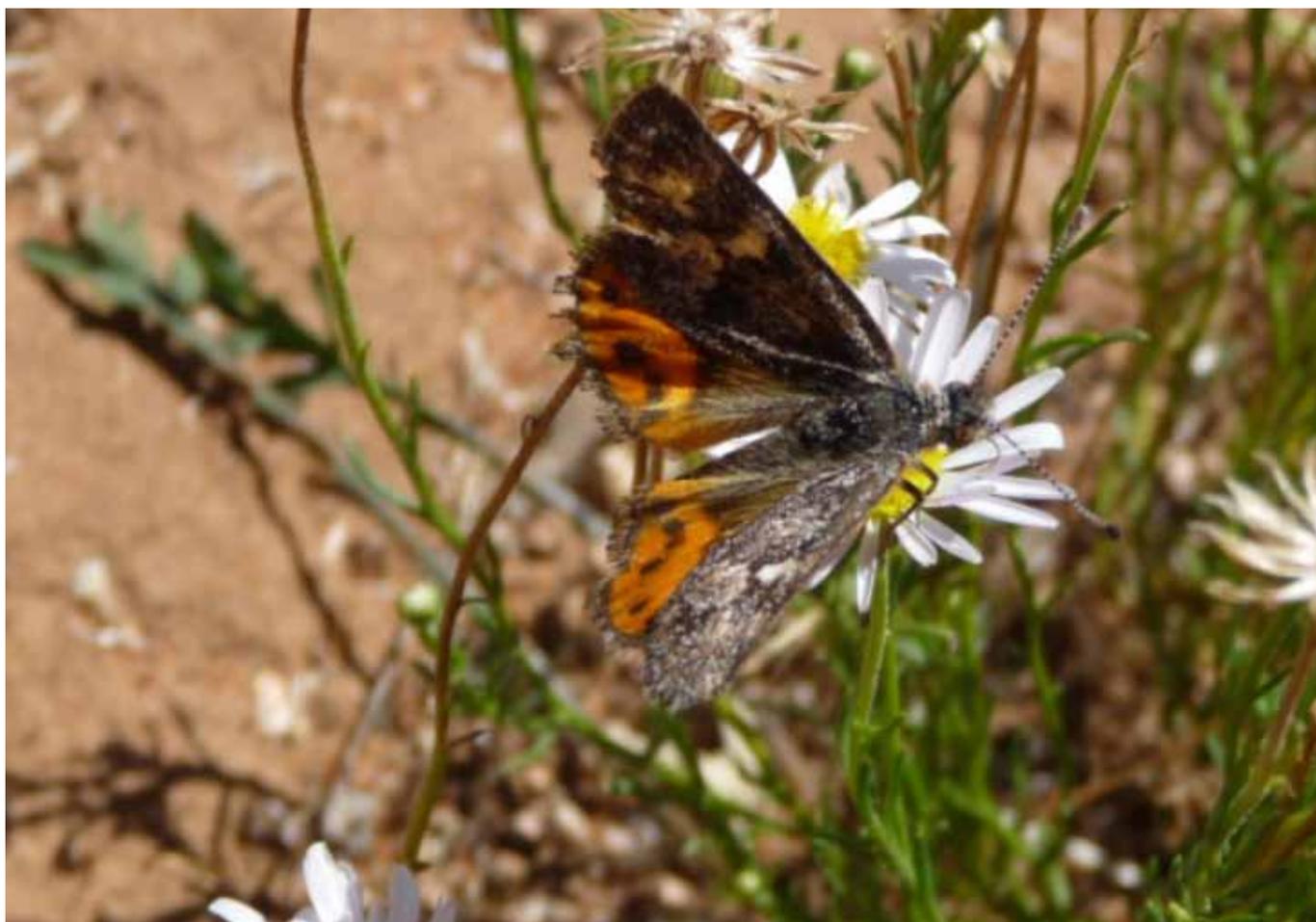
The primary objectives of the current project were to:

- Determine if the species had survived at the three small sites near Walpeup during the protracted drought that occurred in north-western Victoria between 1997 and 2009.
- Monitor the extant occurrences of the species at Quinn's Tank Bushland Reserve (south-east of Ouyen) and at Yetman's Flora and Fauna Reserve (near Patchewollock).
- Survey areas of apparently suitable habitat along the Ouyen Highway for occurrences of the species where it had not been recorded to date.
- Record and, if possible, photograph any aspects of the species' biology that were new to science.
- Identify and assess any threats to the species' potential to survive and prioritise the actions that are needed to mitigate any existing threats.

Method

Field surveys were undertaken from 11th to the 26th of October, 2011 during periods of largely suitable weather conditions (i.e. warm and sunny) so as to coincide with the peak of the adult orange sun-moth flight period. The areas selected for survey were either known sites (for monitoring purposes) or areas of apparently suitable habitat at which it was suspected that the species may occur. A total of 13 areas near Ouyen, Walpeup, Patchewollock and Danyo were surveyed.

Surveys were conducted by slowly walking through target areas with a hand-held butterfly net. This was to enable the brief capture (if necessary) of individuals to confirm specific identity, before immediate release at the precise point of capture. At each survey site, threats to the orange sun-moth were also qualitatively assessed.



Above: A male orange sun-moth presumably feeding on nectar. Photo: Fabian Douglas.

Results

The orange sun-moth was found at all five of the extant sites from which it had been recorded during the past 10 years. It was also located at two new sites close to Danyo but was not found in an additional six areas of potentially suitable habitat. The survey also determined that the protracted drought that occurred in north-western Victoria from 1997 to 2009 had not caused the extirpation of the species from the three small areas of occurrence near Walpeup.

Although no adult voucher specimens were collected in the course of the survey, live adults were photographed at two of the three sites near Walpeup, the site near Ouyen, the site near Patchewollock and at one of the two newly discovered sites near Danyo.

Management issues

The fragmented habitat of the orange sun-moth is vulnerable to weed invasion and soil disturbance. Of greatest concern

is introduced bridal creeper (*Asparagus asparagoides*). There is already a large incursion of this troublesome weed into the Walpeup Bushland Reserve and the species has also colonised much of the remnant bushland that abuts the western side of Ouyen; at the latter site, it has formed dense masses that have covered much of the native vegetation. If bridal creeper is allowed to proliferate similarly throughout the Walpeup Bushland Reserve, there will be serious consequences for the ecology of the area and all of the native species that occur there, including the long-term survival prospects of the orange sun-moth.

Regarding soil disturbance, at some of the orange sun-moth sites, there was evidence of significant collateral damage being caused to native vegetation during rabbit control works. Firstly, it appeared that heavy earth-moving machinery had been driven around sites in order to locate rabbit warrens. This practice should be abandoned. Instead, it is imperative that

the relatively small reserves within which the orange sun-moth occurs should be walked to locate rabbit warrens before heavy machinery is brought in to rip them. Secondly, it is recommended that significant native vegetation (such as large mallee eucalypts and rare plants) should be preserved during rabbit control works. In particular, although it is more labour intensive, it is strongly advised that if warrens are situated close to native vegetation, they should be poisoned and then filled in with a hand-held shovel.

It was also noted that there were an excessive number of tracks through the habitat of the orange sun-moth at Danyo Bushland Reserve. Upwards of 50% to 60% of these could be closed and allowed to regenerate without compromising access to this floristically diverse and important reserve.

Finally, another issue that concerns all of the orange sun-moth sites, but especially the Walpeup Bushland Reserve, is that of the dumping of rubbish.



Above: Perennial native grassland, optimum habitat of the orange sun-moth. Photo: Fabian Douglas .

Left: A pair of orange sun-moths mating on the bare ground. Photo: Fabian Douglas.

Management practices that discourage this accelerating practice should be instigated and refuse that is already in the reserve should be removed.

Key recommendations

Recommendations to assure long-term survival of the orange sun-moth include:

- Prevent weed encroachment. In particular, bridal creeper should be sought and destroyed annually at all of the orange sun-moth sites. Other weeds such as horehound (*Marrubium vulgare*), onion weed (*Asphodelus fistulosus*) and introduced grasses also need to be monitored and controlled as necessary.
- Rip rabbit warrens with heavy machinery only in areas that are already degraded and do not contain a significant amount of native vegetation. Heavy machinery should not be used to search for rabbit warrens in any of the areas where the orange sun-moth occurs.
- Close unwanted tracks within the Danyo Bushland Reserve.
- The eastern boundary of Quinn's Tank Bushland Reserve needs to be fenced, with access through two locked gates. This is recommended because there has been some off-road vehicle, trail-bike and rubbish dumping activity in this reserve.
- Remove rubbish from the reserves within which the orange sun-moth occurs and erect appropriate signage as a deterrent. This especially needs to be done at the Walpeup Bushland Reserve.
- When undertaking maintenance of firebreaks in Yetman's Flora and Fauna Reserve, ensure that any re-grading and brush-cutting occurs on exactly the same course as that done previously. This will avert further damage to the already limited habitat of the orange sun-moth.
- Undertake on-going monitoring at all of the sites at which extant colonies of the orange sun-moth are known to

occur. Surveys of population abundance and potential and existing threats to the species should be conducted every three years. Surveys for additional populations should also be undertaken when funding is available.

Acknowledgements

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Further information

The information for this technical bulletin has been taken from Douglas, F (2012) *The distribution and conservation of the orange sun-moth*, Synemon nais, Lepidoptera: Castniidae, in the Mallee area north-western Victoria. Unpublished report to the Mallee CMA (Mildura: Victoria).

For further information please contact the Mallee CMA on 03 5051 4377.

Project Partners



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