

# Golden Sun Moth

The Golden Sun Moth is a threatened species that occurs in south-east Australia. In Bangerang language it is called Yurrnga Ganbina. It has unique colouration and the sexes can be distinguished by their wing colours with only the females having the characteristic golden hindwings.

The habitat of the Golden Sun Moth includes native temperate grasslands, which were made and maintained by Aboriginal people over countless generations. Less than 1% of these grasslands remain and as a result populations of the Golden Sun Moth are highly reduced and fragmented.



Female Golden Sun Moth

### Acknowledgements

We acknowledge the Traditional Custodians of the grassland and grassy woodland habitats of the Golden Sun Moth. We recognise their continuing connection to Country and pay our respects to their Ancestors and Elders past, present and emerging.

Artwork by Bangerang and Gunditjmarra woman Rebecca Atkinson (Nurratj Galnya Koorie Art) depicting male and female Golden Sun Moths, with the background representing their life cycle. The bottom section is the ground where the larvae develop and feed on the roots of the grasses. The next section is the grassland and includes detail of the Wallaby Grass seed. The top section is the sun and the blue section is the sky, where the males patrol the grassland looking for females.

Photos by Will Ford, Trust for Nature

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Golden Sun Moth

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### Identification

The Golden Sun Moth (*Synemon plana*) is a threatened species that occurs in south-eastern Australia. It is a medium-sized, day-flying moth with green eyes and clubbed antennae.

The species has a wingspan of about 3 - 3.5 cm and a tapered abdomen with males being slightly larger than females. It has unique colouration and the sexes can be distinguished by their wing colours with only the females having the characteristic golden hindwings.

In the female, the upper side of the forewing is dark grey with patterns of paler grey scales, and the hindwing is bright orange with black spots along the edges of the wings. The underside of both wings are white with small black spots along the edges of the wings. In the male, the upper side of the forewing is dark brown with patterns of pale grey scales, and the hindwing is bronze-brown with dark brown patches. The underside of both wings are pale grey with dark brown spots.



Male and female Golden Sun Moth



Male Golden Sun Moth

### Distribution and ecology

Historically the distribution of the Golden Sun Moth corresponded with native temperate grasslands, which covered approximately 2 million hectares of south-eastern Australia. Less than 1% of these grasslands remain and as a result populations of the moth are highly reduced and fragmented.

Golden Sun Moth larvae live underground where they feed mainly on Wallaby Grasses (*Rytidosperma* species) and sometimes Spear Grasses (*Austrostipa* species). Suitable habitat generally contains more than 40% Wallaby Grass cover, however the moth has been known to feed on non-native *Nassella* species including Chilean Needle-grass and Serrated Tussock.

Adult moths can emerge from the ground between mid-October and early January, but usually emerge between mid-November and late December. The flight period lasts up to eight weeks with moths emerging continuously throughout that period. They are more active:

- On warm-hot days that are over 20°C by 10 am with a daily maximum of 26-32°C.
- During the warmest part of the day, between 10 am and 3 pm.
- On sunny days with low-moderate wind.

Adults only live for one to four days and they have no functional mouthparts to feed. Females are reluctant to fly and males will not fly more than 100 metres away from suitable habitat.

After mating, the female lays up to 200 eggs at the base of a grass tussock, which hatch three weeks later. The larvae then burrow underground where they feed on grass roots for 2-3 years before digging a tunnel to the surface. The pupae remain here until the adult moths emerge to start the breeding cycle again.

### Habitat management

There are many threats to the Golden Sun Moth, including habitat destruction and modification, environmental weeds and predation.

Golden Sun Moth habitat including native grasslands and grassy woodlands are some of the rarest ecosystems in Victoria. They are finely balanced systems that have been carefully managed by Traditional Owners for thousands of years through the use of regular burning.



Golden Sun Moth habitat at Bobinawarra in North East Victoria

Excessive accumulation of grass growth or biomass can negatively impact the Golden Sun Moth. High levels of biomass can make it difficult for moths to emerge, for males to locate females, and for females to reach the base of grass tussocks to lay eggs. Management of biomass by burning or slashing at the appropriate time can benefit the Golden Sun Moth.

In addition to this, weeds such as Phalaris and Paspalum can outcompete Wallaby Grass, which is an important food source for the Golden Sun Moth. Weeds should be carefully monitored and controlled to promote native grass growth.

Encroachment of woody vegetation (native and non-native) into grasslands can also be problematic. Dense tree and shrub growth can outcompete native grasses and provide perches for birds that prey on the Golden Sun Moth.

Another factor to consider is soil disturbance and soil compaction by vehicles. These can adversely affect the Golden Sun Moth by damaging native vegetation and larvae.



Wallaby Grass is an important food source for the Golden Sun Moth

It is important to carefully time activities such as burning, slashing and weed control. Minimising habitat disturbance during the flight period and throughout the following month will allow the species to successfully emerge from the ground, find a mate and lay eggs. It will also allow the larvae to hatch and burrow underground, supporting the next generation of Golden Sun Moths.



Burning can be used to manage biomass in native grasslands

### Habitat protection

In Victoria, 62% of land is privately owned and has some of the most intact natural areas in the state - essential habitat for threatened species.

Trust for Nature permanently protects Victoria's unique plants and animals, and the diverse habitats they need to survive. It is a not-for-profit charity and Victoria's only organisation empowered by law to place conservation covenants on private land - protecting it forever.

Conservation covenants are voluntary agreements that are similar to establishing a national park on private land. Placing a Trust for Nature covenant on your property is the single most important thing you can do to protect native plants and animals in Victoria.

Find out more at [trustfornature.org.au](http://trustfornature.org.au)



### Community involvement

The community can make a valuable contribution to the protection and management of Golden Sun Moth habitat. Recording your observations of plants and animals, particularly threatened species, helps to inform their management by building a better understanding of species distribution and abundance.

Apps like iNaturalist allow citizen scientists to record their observations and share them with a worldwide community of naturalists. Verified records then contribute to the national biological database - the Atlas of Living Australia.



Male Golden Sun Moth

### Caring for Country

**Uncle Dozer Atkinson – Bangerang Elder, Wangaratta**

I would like to pay my respects to Elders past, present and emerging. I extend that respect to other Traditional Owners and allies across south eastern Australia that are looking after the Golden Sun Moth and its habitat.

In Bangerang language we call the Golden Sun Moth Yurrnga Ganbina. It is one of the many animals of our native grasslands, which once covered vast swathes of our most productive Country. Our Ancestors made and maintained these grasslands using fire over countless generations. Their traditional ecological knowledge and intimate understanding of Country enabled them to manage the land in a way that promoted diversity and abundance. Yurrnga Ganbina would have been common in those times, but now their habitat areas are small and fragmented. Many of the plants and animals that rely on grassland habitat are threatened and some have disappeared entirely.

On Bangerang Country there is a small patch of native grassland where we have rediscovered Yurrnga Ganbina. Unlike its cousin the Bogong Moth, Yurrnga Ganbina doesn't travel far so we know it has always been living here in this grassland. This understanding connects us to our Ancestors who cared for this Country.

Our kinship systems are very important in the context of caring for Country. They define our roles and responsibilities and our relationships with each other and creation. Moiety and totems are important foundations of kinship.

Everything is split in half according to moiety, including people and Country. The two halves must come together to understand the whole. We have Wonmirr (Eagle) and Wakirr (Crow) moiety names which are patrilineal, being inherited from the father's side. If you share the same moiety as someone else you are considered siblings and have a duty to support one another.

A totem is a natural object, plant or animal that is inherited by members of a clan or family as their spiritual emblem. We can have three or more totems which represent our Nation, clan and family group, as well as a personal totem. Nation, clan and family totems are predetermined, however personal totems are individually assigned at a young age by an Elder or family member. In traditional days there were enough people in the Bangerang Nation to ensure the plants and animals were properly represented through our totem system.

People have caretaking responsibilities for their totems. Clan members with a Yurrnga Ganbina totem for example were responsible for looking after its grassland habitat by burning at the right time, in the right place and in the right way. They would make sure Yurrnga Ganbina was protected at important times such as when they are emerging from the ground, mating and laying eggs. Totems are part of a complex land management system that maintains healthy Country for all animals.

Despite the impacts of colonisation and dispossession, many of our mob still feel a deep obligation to care for Country. Animals like Yurrnga Ganbina might seem small and insignificant but they form part of the fabric of our identity. When we lose a particular species we lose a part of ourselves.

We need to connect and listen to Country in order to understand how to read and care for Country. Today much of our Country is sick and that is reflected in the continued decline of threatened species and the ecosystems that support them. Whilst this saddens us it also presents us with an exciting opportunity to walk side by side with the broader community to heal the Country together, and in doing so, help to heal our people.

