

Rare moth under threat in Canberra

A mysterious moth so rare that it does not even have a common name has been making headlines in Canberra. And, while one of its last known breeding habitats is under threat, it has some powerful allies... including the Royal Australian Navy.

Synemon plana is a brown, orange and black moth with a wingspan of about 3-5 cm. According to Mr Ted Edwards, a researcher with CSIRO's Division of Entomology, it is also a distinctly peculiar creature.

S. plana belongs to the family Castniidae (at present, the family includes only one Australian genus) whose unusual distribution indicates a very ancient Gondwanan origin. About 160 species inhabit tropical regions of central and South America, where their larvae feed on bromeliads and orchids. A further 40 or so species live in tropical and temperate mainland Australia, restricted to seasonally dry grassland habitats where their larvae feed on sedges and *Danthonia* sp. (wallaby grass). The family is most diverse in south-western Western Australia.

Photos: E. D. Edwards



The male *Synemon plana* (left), an active flyer, is cryptically coloured to make it harder for predators to spot. The female (right), which rarely flies, uses her orange hindwings to attract males.

In the 1870s, *S. plana* was collected from Bathurst, N.S.W., to the Grampians, Vic., and Bordertown, S.A.; since then, however, its habitat has been gradually whittled away and the species is now known only as a small population in western Victoria and a remnant population in Canberra. Grazing of *S. plana*'s habitat by sheep did little damage, since the moth spends most of its life as an underground larva (we know so little of the species' biology that this period could be 1, 2 or 3 years), but chemical fertilisers and introduced pasture plants have destroyed the plant community on which it depends.

Like butterflies — although it is quite unrelated to them — *S. plana* is active by day and has antennae with butterfly-like clubbed tips. Males are cryptically coloured (camouflaged) and rapid, energetic flyers. Females, which have a long, extensible ovipositor to insert their eggs (all of which are fully developed when the adult female emerges) deep inside tussocks, have smaller wings than males and rarely fly: they prefer to 'lie in wait' for a male, flashing their bright orange hindwings in an irresistible sexual signal.

Neither males nor females have functional mouthparts, and do not feed or drink as adults: they emerge from pupae ready to mate, lay their eggs and die within 24 to 48 hours. (Some other Australian species of *Synemon* can eat... but



Photo: E. D. Edwards

Mowing and grazing have protected the Belconnen habitat of a rare and little-known moth... but for how long?

one is only known to occur in a 100-m-long patch of grass beneath power lines in Kosciusko National Park!

The *Danthonia* grasslands of Canberra were heavily grazed last century, but escaped replacement with improved pastures. Subdivision for residential areas has restricted *S. plana* to a handful of remnant sites. Four of these are so small (an average of 20 m × 30 m) that the moth has no long-term chance of surviving there and, while most of the others are somewhat larger, the species has only one real breeding site — the RAN communications station at Belconnen, in Canberra's western suburbs. The naval station, which covers many hectares, has been well maintained by the RAN with limited public access, high mowing and light grazing by sheep, providing ideal conditions for *S. plana* and for the plant community on which it depends.

Previous *S. plana* habitats in Canberra have been less fortunate. Since little is known about their ecology, grasslands are often dismissed as 'waste land': one such site has been used as a road-construction depot; another was used to dump landfill from the new Parliament House; and others for the dumping of rubbish, for parking areas and so on.

And, as Canberra's population expands, so does the need for residential land — so the RAN will eventually move from its Belconnen site to make room for housing development. But it is possible for the land to be developed in such a way that at least some of it can be set aside, not only for the conservation of such mysterious animal 'residents' as *S. plana* but also for the long-term study of how this, and other, species interact with their as-yet-poorly understood environment.

As Mr Edwards points out, *Synemon plana* is of great scientific interest: it was once common throughout south-eastern Australia and is resistant to grazing, to mowing and possibly to fires. Although insects have previously been little used as environmental indicators, a large, day-flying and conspicuous moth such as *S. plana* provides an ideal 'tool' (and one of more fundamental importance than, say, mammals) for scientists eager to learn more about the health of a chosen environment and the strategies its plant and animal members use for survival.

Unfortunately, however, *S. plana* is confined to a remnant environment that is vulnerable to modern agriculture and to human settlement. Despite this, the species has the potential to serve as a 'figurehead' for an entire plant and animal community: even if its extinction cannot be prevented, we have an opportunity to study how such extinctions take place and to gain knowledge that may prevent similar tragedies.

Carson Creagh

Belconnen naval station harbours endangered moth. E. D. Edwards. *National Parks Association A.C.T. Bulletin*, June 1990, 16–17.

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