Butterflies of the south-west

With spring upon us, more people find themselves spending time outdoors. The birds are calling and Western Australia's world-renowned wildflowers are coming into bloom. It's also a time when many of **south-western Australia's butterflies** start to appear.

by Matthew Williams and Andrew Williams

For most butterfly species in the south-west there is only one generation each year, and the adult butterflies appear in spring or early summer—so the only time they can be seen is between mid September and late December. Although several other species breed throughout the year and can appear in any season, these too are usually most abundant in spring. So now is the time to look out for them.

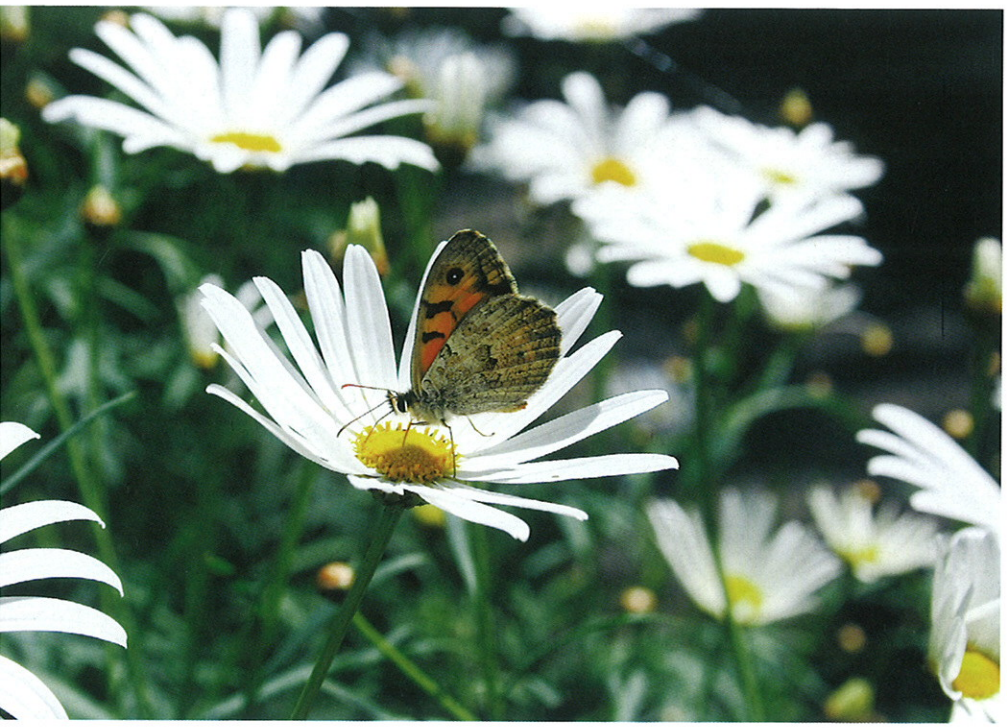
Butterflies are widely recognised as valuable indicator species—their diversity and abundance reflects the ecological health of the environment. This is because butterflies are very particular in their choice of food sources. Most species have caterpillars that will only feed on one or a few closely related species of plants (their food-plants), and the adult butterflies are important pollinators of native plants. Thus butterflies are closely tied to the diversity and health of their habitats.

Butterflies in Perth

Like other organisms, butterflies are increasingly dependent on remnant vegetation for survival. The urban and agricultural areas of the south-west are now disturbed landscapes, with the remnant vegetation comprising fragments of varying sizes and conditions. The intervening areas contain few resources for many butterflies and present a substantial barrier to their dispersal. The clearing of bushland for housing and agriculture has robbed many native butterfly species of their habitats and, sadly, most have been unable to adapt to the changed environment.

However, many butterflies still persist in remnant bushland and continue to thrive there. Recent surveys of butterflies and day-flying moths by the Department of Environment and Conservation (DEC) at more than 40 bushland sites in the Perth metropolitan area recorded 36 different butterfly species and more than 17,000 individuals. Some species were remarkably abundant—more than 5,000 Australian painted ladies (*Vanessa kershawi*) were recorded, and, for several species, more than 1,000 individuals were seen. Only five species of day-flying moths were seen, but the brightly coloured spring-flying sun-moth (*Synemon* sp.) was common in many Perth bushlands.

Sun-moths are a remarkable group of moths that look and behave very much like butterflies, and are often mistaken for them. This family of moths evolved in Gondwana more than 50 million years ago, and today there are about 150 species in South America (the giant butterfly-moths) and 45 in Australia (the sun-moths). Although the spring-flying sun-moth is still common round Perth and elsewhere in the south-west, the graceful sun-moth (*Synemon gratiosa*) is very rare and declared endangered. Historically it has only been recorded between Mandurah and Neerabup on the Swan Coastal Plain—a region now heavily impacted by clearing. Several sites where the graceful sun-moth was recorded in the past have since been converted to housing and other uses. During the surveys, it was recorded at five bushland sites in the northern suburbs, but in very low numbers. More studies to conserve this species are occurring.



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Main Common grass-blue.

Above Australian painted lady.
Photos – Geoff Walker

Left Western xenica on garden daisy.
Photo – Eleanor Williams

At some of the sites surveyed, remarkable numbers of butterflies were seen. More than 400 western xenicas (*Geitoneura minyas*) were recorded during two 90-minute visits to Bold Park, Floreat, in October 2003, with about half of these concentrated around Camel Lake. Similar numbers were encountered adjacent to the lakes north of Thomsons Lake Nature Reserve. These low-lying, shady areas with thick swards of grasses also favour other species such as the marbled xenica (*G. klugii*), western brown (*Heteronympha merope*), western grass-dart (*Taractrocera papyria*) and wedge grass-skipper (*Anisynta sphenosema*).

The most widespread species occurred in more than 80 per cent of the sites surveyed, including the Australian painted lady, yellow admiral (*Vanessa itea*) and marbled xenica, as well as the introduced cabbage white (*Pieris rapae*) and monarch (*Danaus plexippus*). Several sites had more than 15 species, and Koondoola bushland, a large bushland remnant in Perth's northern suburbs, topped the list with 27. Two main groups of species were identified—those that rely on native vegetation for breeding and are restricted to bushland, and a smaller group of species that have adapted to breed on introduced plants and so disperse widely throughout the landscape.

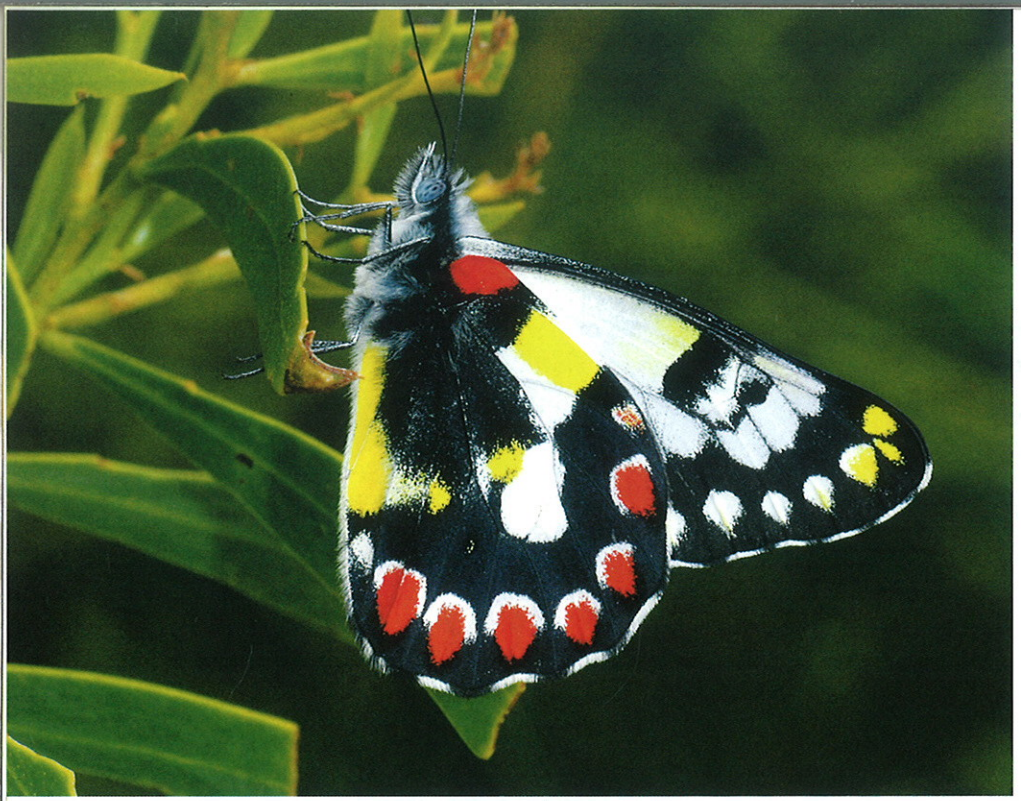
Top Western grass-dart.
Photo – Andrew Williams

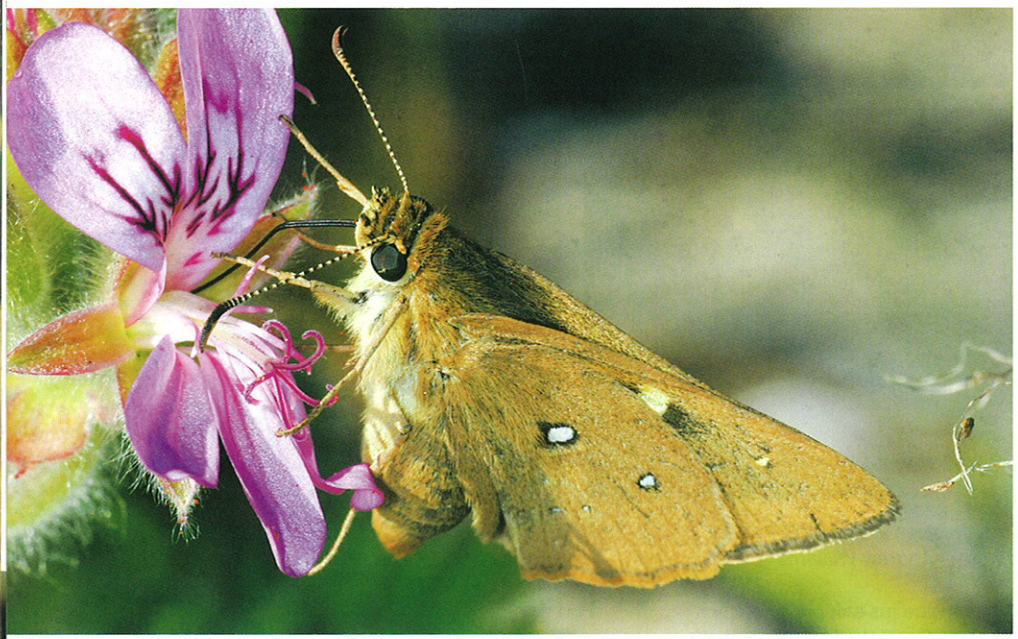
Above Blue iris-skipper.
Photo – Geoff Walker

Right Purple flag, a food-plant for the blue iris-skipper.
Photo – Andrew Williams

Those relying on native vegetation are often restricted to only a few bushlands, even though they can be quite common there. These species, such as the spectacular western jewel (*Hypochrysops halyaetus*), usually have very specific habitat requirements. This species breeds on the very common bushland plants stinkwood (*Jacksonia sternbergiana*) and rattlepods (*Daviesia divaricata*), so could be expected to be widespread. But the butterfly also requires the presence of a particular type of ant. The ants tend the caterpillars, which live inside the ants' nest during the day and only emerge at night to feed (see 'Jewels of the west', *LANDSCOPE*, Autumn 1998). As a result, the western jewel occurs in relatively few areas north of the Swan River.

Similarly, the blue iris-skipper (*Mesodina cyanophracta*) breeds on the very common purple flag (*Patersonia occidentalis*), but a high abundance of this plant is needed to sustain a





Above Spotted jezebel butterfly eggs, on a quandong leaf.
Photo – Robert Powell

Left Spotted jezebel (*Delias aganippe*).

Below left Large brown skipper (*Motasingha trimaculata*).
Photos – Geoff Walker

population. In many small bushlands there may be insufficient plants, causing the butterfly to die out. And, like almost all butterflies, the caterpillars live on the plant foliage and are killed by fire. In reserves that have been subjected to broadscale wildfire, the blue iris-skipper has been eradicated. In the past, these burnt areas would have been recolonised from surrounding populations, but in today's fragmented landscape the butterfly is unable to cross disturbed areas to re-establish populations in these sites.

Where to see butterflies

In general there are three sorts of place where butterflies are most common. One is where their particular food-plants grow. Females detect their food-plants, often by smell, and spend some time visiting to lay their eggs. Males, too, may frequent these sites.

Another place is where there are many nectar-producing flowers, in warm, sheltered spots, where the adult butterflies feed. Some of the nectar plants particularly favoured by butterflies include pimeleas, dasypogons and grasstrees (*Xanthorrhoea* spp.).

The third is hilltops. Male butterflies of many species establish territories on the tops of hills, where the females go to find their mates—this behaviour is called 'hilltopping'. Of the butterflies that hilltop, some favour hills close to where their food-plants are growing, whereas others, such as the spotted jezebel (*Delias aganippe*), go to the top of the highest hill in the general area. Some butterflies hilltop during the middle of the day whereas others, such as the yellow admiral and the Australian painted lady, normally do so in the mid or late afternoon.

Reabold Hill in Bold Park is one of the few places round Perth where the spotted jezebel is seen on a regular basis, because males congregate there in spring. It is generally uncommon on the Swan Coastal Plain, where its mistletoe food-plants are scarce. Elsewhere in the south-west, however, where the orange-leaved stalked mistletoe (*Amyema miquelii*) that grows in eucalypts is widespread, the jezebel is often quite common and seen around many hilltops.

Contributing to butterfly conservation

As a result of changes to the environment, many butterfly species are becoming increasingly scarce. Weeds in bushlands replace the native food-plants on which many butterflies breed, and fires can destroy or reduce butterfly populations. Global warming is influencing weather patterns and creating an increasingly dry climate in southern Australia, affecting the abundance, health and vigour of the plants on which butterflies breed. Sightings of butterflies are therefore all the more to be cherished.

Right Silver-spotted ochre (*Trapezites argenteoornatus*).

Below right Long-tailed pea-blue (*Lampides boeticus*).
Photos – Geoff Walker

We can help butterflies by growing their food-plants (see 'Butterfly gardening', *LANDSCOPE*, Winter 2004), and by managing bushlands to control weeds and wildfire. Many Perth bushlands have 'friends' groups that are involved in this task.

As much is still unknown about where butterflies occur and what plants they breed on, those interested in butterflies can make a valuable contribution to knowledge of these native animals by identifying and recording the species that occur in their local area. A collection of photographs of local butterflies is a valuable way to record them (and photographing them can be a challenge!). Photographs also make later identification possible. Monitoring the diversity and abundance of butterflies over longer periods can also identify undesirable changes or trends, enabling timely adjustment of management practices.

The new DEC Bush Book *Common Butterflies of the South-West* provides information on 31 of the most commonly seen species. It also includes one common example of a specialised group of day-flying moths found in WA, the sun-moths. These are often confused with butterflies because, like butterflies, they have clubbed antennae and fly in sunny conditions. The book describes and illustrates each species, with information on size, distribution, habitat, behaviour and flight times.

Rare species

It can also be fascinating to look out for rarer species, many of which are endemic. Among them are such splendid species as the laterite ochre (*Trapezites waterhousei*), which breeds on Basil's asparagus (*Xerolirion divaricata*). This plant only grows on a few decaying laterite and granite outcrops in the semi-arid zone. It's easy to find the butterfly if you go to sites where the *Xerolirion* food-plant grows. Still other intriguing species include lycaenid butterflies which have developed close

Above Ants attending larvae.
Photo – Peter Marsack/Lochman Transparencies

Below Blotched dusky-blue (*Candalides acasta*).
Photo – Geoff Walker

associations or symbiotic relationships with ants. In some cases the butterflies are entirely dependent on the ants for their survival!

Symbiosis with ants

One example of a fascinating ant–butterfly symbiotic relationship is with the arid bronze azure butterfly (*Ogyris subterrestris*), which was recently rediscovered in the north-eastern Wheatbelt. Now listed as critically endangered, the larvae of this rare species live entirely underground within the ant's nest, being fed by the ants, predating their larvae, or both.

Chemical signals released by the larvae convince the ants to accept them into the nest, ensure that they are well fed, and even protect them from predators. Typical of many subterranean species, the larvae are pure white. But they are not blind—when mature, they seek out the entrance to the nest and pupate nearby. This enables them to escape from the nest, as the adult butterfly that emerges lacks the chemical defences possessed by the larvae and is attacked by the ants.

The butterfly's escape from the ant nest is the final insult: as it emerges from its pupa, still within the ant's nest, with crumpled wings and unable to fly, it would seem to be at its most vulnerable. However, the butterfly is covered with a dense layer of powdery talc-like scales which are easily dislodged. The ants vigorously attack the butterfly, but these scales clog the jaws of the ants, disabling them for long enough to enable the butterfly to exit from the ants' nest, expand its wings, and fly away. In return for putting up with such behaviour, it's thought the ants may benefit from food that the larvae secrete.

Learning about these wonderful inter-dependent relationships gives us insight into the complexities of our extraordinarily diverse natural environment.

Butterflies and moths – the difference

People often ask about the differences between a butterfly and a moth. There are microscopic differences between the two groups (for example, all butterflies have a well-developed proboscis and often feed at flowers, while many moths do not have working mouthparts and are thus unable to feed), but these microscopic features aren't very useful without a microscope. Some 'rules of thumb' can be useful in distinguishing the two groups:

- *Butterflies fly during the day whereas moths fly at night.* While generally true, as the vast majority of moths fly at night, several other species only fly during the day.
- *Butterflies have antennae that end in a distinct club.* This is one of the best distinguishing features, as moths with clubbed antennae are quite unusual—more commonly the antennae are without a club or are feather-like.
- *Moths fold their wings flat.* While not true for all moths, this can still be a useful way of separating the groups in combination with other features.

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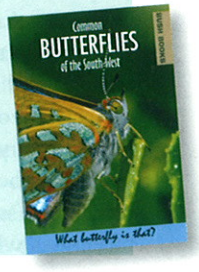
Information in this article is based on the new DEC Bush Book *Common Butterflies of the South-West*. The book is available for $6.50 from bookshops and tourist outlets, by phoning WA Naturally Publications on (08) 9334 0333 or by ordering online at www.dec.wa.gov.au/shop.



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