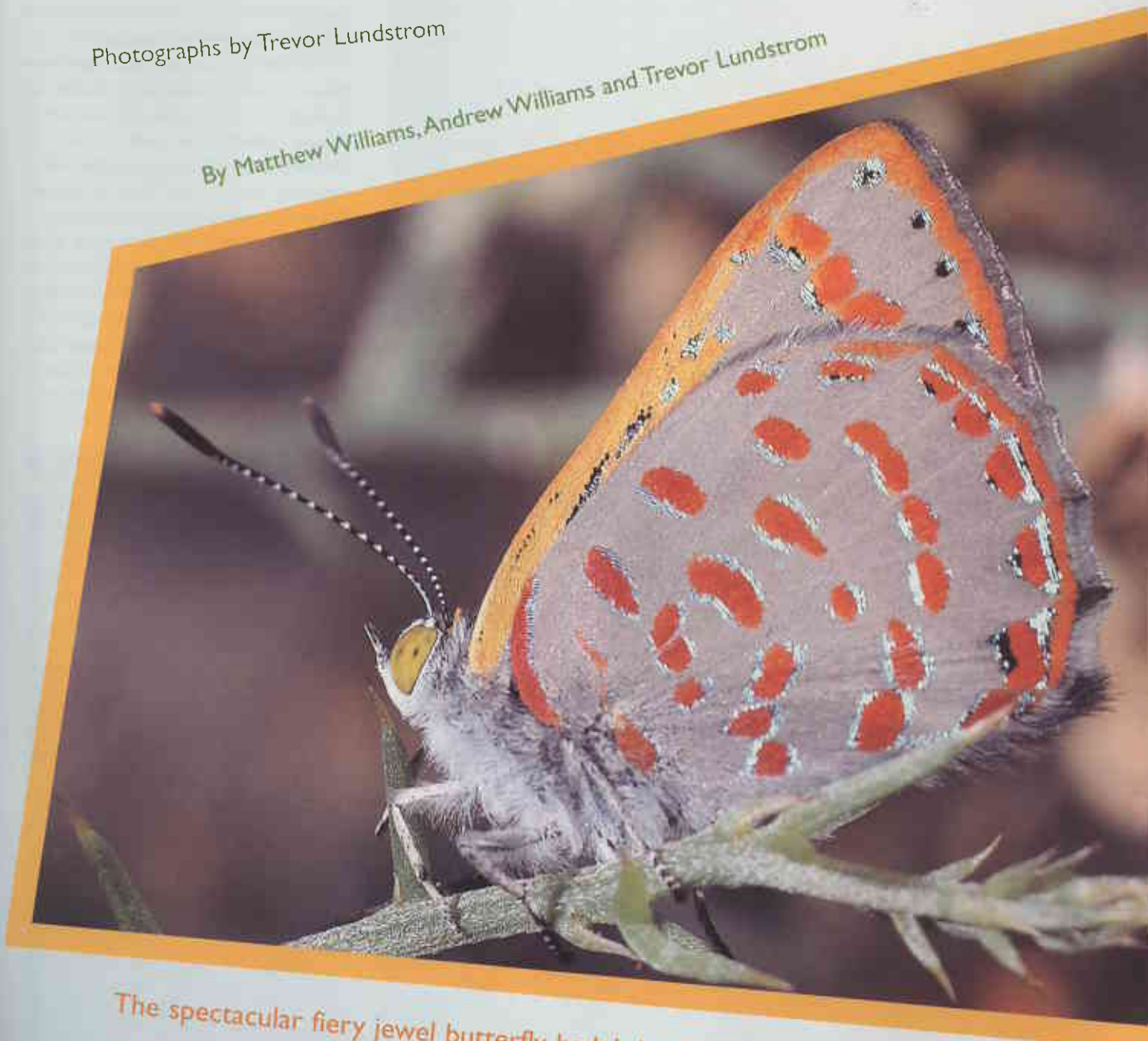
JEWELS OF THE WEST

Photographs by Trevor Lundstrom

By Matthew Williams, Andrew Williams and Trevor Lundstrom



The spectacular fiery jewel butterfly hadn't been seen in Western Australia for more than 50 years, and was presumed extinct until some clever detective work unearthed a population in Watheroo National Park. Here, those responsible for the rediscovery tell their tale.

As their name suggests, jewel butterflies are brightly coloured, usually in brilliant metallic green, blue, purple or orange, often with lustrous red or gold markings on the under surface of their wings. They are members of the genus *Hypochrysops*, and occur from Thailand through Malaysia, Indonesia and New Guinea to Australia. Eighteen species are found in Australia and two occur in the south-west. One of these is the western jewel (*Hypochrysops halyaetus*); the other occurs as two distinctive subspecies, the fiery jewel (*H. ignitus ignitus*) and the dingy jewel (*H. ignitus olliffi*).

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The fiery jewel is currently known from only one site in Western Australia, in Watheroo National Park. The upper surface of the wings is iridescent purple in males, and bright metallic blue in females.

Below: Caterpillars of the dingy jewel attended by coconut ants in Stirling Range National Park. As the caterpillars climb their foodplant to feed each evening, the ants often ride on their backs.

THE FIERY JEWEL

Within Australia, the fiery jewel is uncommon but widespread. It occurs in eastern and South Australia, with two other subspecies, *Hypochrysops ignitus chrysonotus* and *H. i. erythrinus*, occurring in the north and north-west. A few specimens had been collected from Perth and Fremantle in the early part of this century, but as there were no subsequent records, it was presumed extinct in Western Australia.

Like so many discoveries, the fiery jewel find in Watheroo National Park in September 1993 was a chance encounter. At the time, we were searching for another rare butterfly, the large brown azure, a single specimen of which had been collected in the area in the 1950s (see 'Bring Back the Butterflies', *LANDSCOPE*, Autumn 1994). We didn't actually see any fiery jewel butterflies, but our attention was drawn by some large ants' nests at the base of coojong shrubs. The caterpillars of some butterflies have a symbiotic relationship with ants, and these caterpillars almost always feed on plants in the pea or wattle families. We investigated these ants' nests, and our suspicions were rewarded—a few butterfly pupae were found within.

At first, we assumed that these were pupae of the icilius blue (*Jalmenus icilius*), a fairly common butterfly whose caterpillars often feed on coojong. However, closer examination revealed them to be those of a jewel butterfly—although it was not until a week later when they emerged from their pupae that we realised we had located a population of the formerly presumed-extinct fiery jewel.

A couple of specimens were later sent to entomologist Robert Fisher at the South Australian Museum, who

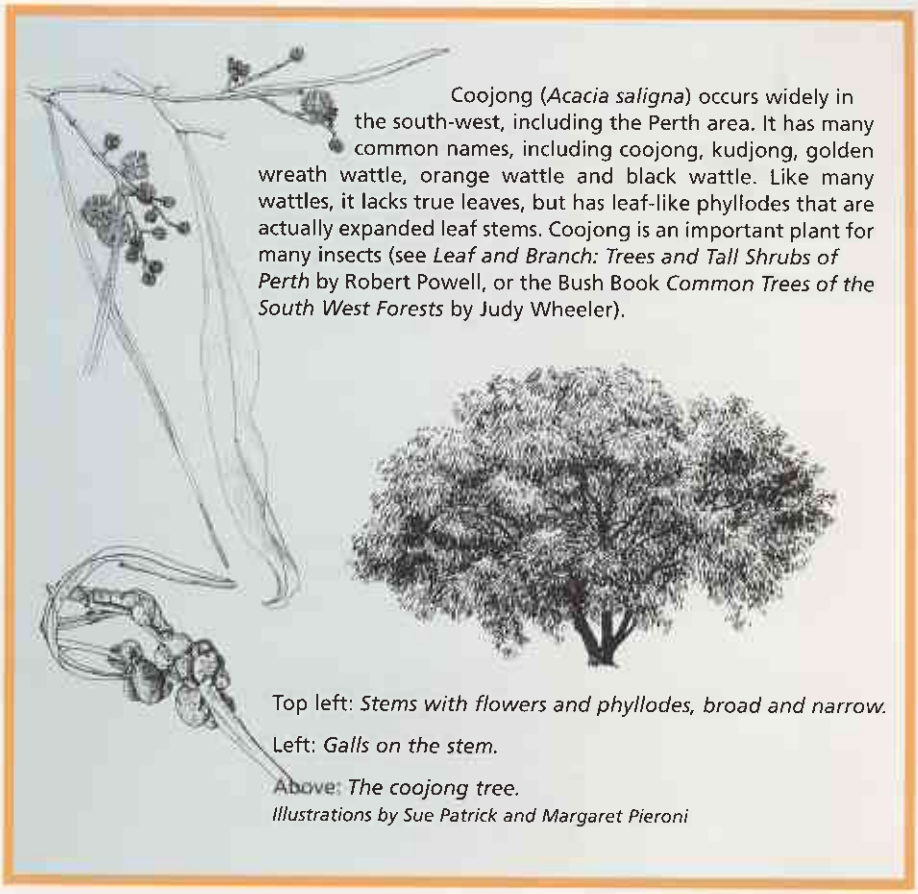
compared them with South Australian fiery jewels and confirmed our identification. Although the Western Australian population is currently considered to be part of the fiery jewel subspecies, detailed genetic studies are needed to better understand the relationships within and between these four subspecies.

In the following years we returned to Watheroo National Park during the butterflies' October flight period. With the help of volunteers, the size of the population was assessed and surrounding areas searched for other populations of this rare butterfly, which persists as a single breeding colony of perhaps a few hundred individuals in only a few hectares. These searches have yet to locate any further populations.

Observations in Watheroo National Park have shown that the female butterfly, having found a coojong shrub with a nest of the coconut ant (*Iridomyrmex nitidus*) at the base, lays her eggs on the trunk near ground level. The coconut ant is so named because it produces a strong smell, reminiscent of coconut, that persists on one's skin and clothes. Butterfly egg cases from past generations can often be found at the base of the shrubs, showing that the same plants are used each year. After hatching, the caterpillars feed on the leaf-like phyllodes each night, resting by day within the ants' nest. The life cycle takes a full year to complete, a fact that we verified by rearing butterflies in captivity from eggs collected in the wild.

The fiery jewel butterfly presents something of a puzzle. There seems little reason for it to be so restricted in Western Australia, since both coojong and coconut ants are widespread in the south-west. It is even unlikely that the coojong is essential as a foodplant for the caterpillars: unlike most other jewel butterflies, the fiery jewel has adapted to introduced foodplants. In eastern Australia the caterpillars have been recorded feeding on camellia, plum and blackberry, as well as more than twenty species of native plant. It is one of very few Australian butterflies whose caterpillars are able to feed on eucalypts, and it is the only Australian butterfly species whose caterpillars are known to feed on banksias. The only restricting factor in its distribution seems to be that fiery jewels occur only where the coconut ant is present.

The fiery jewel is by no means the rarest butterfly in Western Australia: at the time of its discovery at least two others were rarer. The butterfly *Jalmenus aridus* was known from a single small colony of fewer than a hundred individuals breeding on a single wattle shrub near Kalgoorlie. When that shrub died, what was our rarest butterfly disappeared for a while too. However, more foodplants and a new population have since been found. Currently the rarest of our butterflies, the large ant-blue (*Acrodipsas brisbanensis*), is known from only two small hilltops in remnant bushland



Coojong (*Acacia saligna*) occurs widely in the south-west, including the Perth area. It has many common names, including coojong, kudjong, golden wreath wattle, orange wattle and black wattle. Like many wattles, it lacks true leaves, but has leaf-like phyllodes that are actually expanded leaf stems. Coojong is an important plant for many insects (see *Leaf and Branch: Trees and Tall Shrubs of Perth* by Robert Powell, or the Bush Book *Common Trees of the South West Forests* by Judy Wheeler).

Top left: *Stems with flowers and phyllodes, broad and narrow.*

Left: *Galls on the stem.*

Above: *The coojong tree.*

Illustrations by Sue Patrick and Margaret Pieroni

Above: A coconut ant attends eggs of the fiery jewel at the base of a coojong (*Acacia saligna*) in Watheroo National Park.

near Yanchep. Here, the butterflies feed at the flowers of a few *Melaleuca* shrubs, but the location of their breeding area is unknown. The major problem in estimating just how rare these butterflies really are is finding the time and resources to conduct comprehensive surveys; most of the searching and recording of information undertaken relies on the assistance of enthusiastic volunteers.

THE WESTERN JEWEL

The western jewel occurs predominantly in coastal and near-coastal areas from Perth's northern suburbs to Cape Range. There are a few inland populations, such as in Alexander Morrison and Watheroo National Parks, and a record from near Kellerberrin in 1912. Formerly found in the Perth suburb of Yokine, the southernmost remaining populations occur in Warwick and Koondoola. Increasing urbanisation and the associated destruction and degradation of habitat is causing the gradual disappearance of these southern populations. It remains to be seen how long the western jewel can persist in the metropolitan bushland remnants where it still occurs.

In the southern part of their range, western jewels can be seen flying from late October through to mid-December. Farther north, they fly much earlier: from early September until early November around Carnarvon. They usually fly rapidly, so it is only when they land, perhaps to feed on a nectar-rich flower such as pineapple bush (*Dasypogon bromeliifolius*), that they can be easily observed and identified. Trying to photograph a western jewel, or any other jewel butterfly, requires both considerable skill and infinite patience.

The males are much more active than the females, appearing in flight as bright blue flashes. They will often be seen flying along firebreaks or in other clear areas, establishing territories in which to court females. The males spend much of their time chasing away interlopers, such as other butterflies, that dare to enter this territory. The females fly more slowly and are seen less often. After mating, they spend their time feeding at flowers or seeking sites at which to lay their eggs. The female western jewel will only lay at the base of a plant on which the caterpillars can feed. Suitable plants include various species of pea-plants and wattles (*Jacksonia, Daviesia* and *Acacia*), but an essential requirement is that they have at their base a nest of one particular ant species—in this case a tiny ant, *Crematogaster perthensis*. During their growth as caterpillars the western jewels live within the ants' nest, emerging at night to feed.

THE DINGY JEWEL

Despite its name, the dingy jewel is, in reality, brightly coloured. It occurs along the south coast between Windy Harbour and Cape Arid, with an inland population in the Stirling Range National Park. Dingy jewels fly between November and January and are often found on hilltops. Males of many

Above left: A western jewel, its wings outspread to collect the warmth of the sun.

Left: Pupae of the fiery jewel amidst coconut ants, Watheroo National Park. The pupae occur inside the ants' nest where they are safe from predators.

different kinds of insect congregate around hilltops; these places could be described as the 'singles clubs' of the insect world, where females can be assured of finding a mate.

The only foodplant presently known for the dingy jewel is sour bush (*Choretrum glomeratum*)—also the foodplant of another butterfly, the small brown azure (see 'In search of ...', *LANDSCOPE*, Autumn 1989). However, the butterflies are known to occur in some areas where no sour bushes are present, so other foodplants must be used. The ants attending the caterpillars of the dingy jewel are the same coconut ants found with the fiery jewel in Watheroo National Park. The caterpillars feed at night on the bark of the sour bush; if disturbed they will head back to the ants' nest, often with coconut ants hitching a ride on their backs.

The unfortunate common name of this butterfly may soon be remedied. A project being undertaken by the Australian National Insect Collection proposes to rationalise the common names used for all Australian butterflies, so it is likely that in future the dingy and fiery jewels will share the common name of 'fiery jewel'.

These three spectacular jewel butterflies can be seen on the wing for only a month or two each year. For the rest of the year their caterpillars live below the ground, protected by their ant hosts, emerging only at night when they feed. These 'jewels of the west' rank among our most fascinating and spectacular insects.

The male western jewel has iridescent blue markings on the upper surface of the wings, with gold and metallic green striping on the under surface.

Inset: Specimens of the western jewel male, female and underside.

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Over the past seven years, both Matthew and Andrew have been documenting the distributions, life histories and conservation status of Western Australia's butterflies, usually with the help of a small group of dedicated volunteers.

Trevor Lundstrom is a volunteer with the project and a naturalist with an interest in photography. He may be contacted on (08) 9291 8559. All three are members of the Western Australian Insect Study Society.

LANDSCOPE

VOLUME THIRTEEN NUMBER 3, AUTUMN 1998

CALM's fight against feral cats gathers ground on Peron Peninsula with the development and testing of a cat bait. See 'Approaching Eden' on page 28.

Roadside vegetation often provides vital links between remnant habitats. See our story on page 23.

What attracted early pioneers to this barren corner of Western Australia? Find out in 'Eucla Pioneers' on page 35.

A new CALM book gives bushwalkers a host of short and longer walks in Western Australia's south-west. See page 10.

Fire is an important part of Western Australia's environment. Scientists continue to discover just how important. See page 17.

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COVER

The splendid fairy wren was one of many birds collected by John Gilbert, whose collections of specimens have been fragmented over the past 100 years or so. Now, they are being tracked down in museums around the world, and a more complete picture of their original distributions is emerging from Gilbert's original notes and labels. See story on page 40.

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