



Butterfly

Susan Brown¹

AS BUTTERFLIES GO, THE BROWN AWL isn't much of a marvel to look at. But the same once couldn't be said for its behaviour, as twice a year millions of Brown Awls darkened Queensland skies migrating 2000 kilometers between Cape York and central Queensland. Around eight years ago scientist Peter Valentine was just getting around to celebrating the migrations as one of Australia's natural wonders when they stopped. They haven't happened since and although Valentine had his suspicions the pieces didn't fall into place until last year.

1. Susan Brown is an international policy analyst for the World Wildlife Fund based in Switzerland

Valentine heads up the Tropical Environment Studies and Geography Department of James Cook University but spends much of his time responding to calls from globally exotic places requiring specialist advice on natural wonders of world heritage significance. He is also a butterfly expert calling them the “key” to unlocking ecological puzzles.

But butterflies may have even more significance, as what Valentine calls “a giant alarm bell” for what we are doing to the sometimes dimly understood workings of our environment.

It turns out butterflies have many advantages apart from spending satisfactory amounts of time head first in a cup of nectar, being able to indulge in loving dalliances on the wing and not getting up much before nine am.

As a generally good looking lot, they attract the attentions of a loyal band of collectors and scientists concerned with their welfare or, at the very least, their continued availability.

And, as a family, they are surprisingly robust for delicate looking creatures. When they do start disappearing, say Valentine and others, we should start worrying. Something major is going on ecologically.

“It can be fairly easy to knock out a mammal which has a much more limited range and needs a definite set of requirements, but butterflies can have an extensive range.

They are very mobile and find it easier to survive with habitat fragmentation.”

Valentine paused, then “If we lose butterflies now, then we have really done it bad. It is hard to stuff up a butterfly.”

But numbers of some butterflies have been dropping and only part of the blame can be fixed on drought.

And then there is the emerging story of the Brown Awl. “Millions and millions and millions of these would swarm through in great black clouds, right down the coast of Queensland over December” said Valentine.

“They would breed in the forests west of Rockhampton and the young would swarm back again to over winter all the way up the Cape.

“This is a tiny creature, an inch long and it would do it every year”. Valentine marveled at the migrations and when the migrations just stopped in the mid-90s he was “afraid something dreadful had happened”.

Something dreadful had happened. Ecologist Paul Sattler, has tramped through most of Queensland's regional ecosystems over the last 30 years and co-ordinated the landmark 1999 study which counted them, classified them and evaluated their conservation status.

Back in 1982 he was alarmed at the assault being mounted by farmers on remnants of the already depleted brigalow belt. He presented a paper to the Royal Society of Queensland saying the yellow wood forests of central Queensland were poorly reserved, vulnerable to clearing and together with the brigalow needed urgent protection. “The need for total preservation of the remaining (brigalow and yellow wood) was indicated,” he said then.

The response was deafening silence from Government while the deafening roar of bulldozers continued. Sattler redid his report in 1999 showing most of the brigalow and yellow woods gone, with very little in national parks and very little remaining on private land. Tiny pockets remaining are seriously threatened.

Does the timing stack up? It does. It was the yellow woods that were critical to the Brown Awl and in the delicate words of one public servant they had been “hammered to death” by the mid 1990s.

In what might be a rare case of journalism alerting science, Sattler's tale was related to Valentine who is now trying to more formally assess the association. “It seems a likely explanation,” he said.

Not all butterfly scientists are as enamoured of journalists. When I first called Myron

Zalucki, Professor of Entomology at Queensland University, there was a long pause after I had stated my business before a laconic voice noted, “a journalist. My least favourite species”. This from a scientist who habitually dealt with the creepiest of crawlies certainly put me in my place. Zalucki on better acquaintance is the sort of academic whose boyish enthusiasm and enthralling tales makes you want to drop everything and join the class. His preoccupation with bugs and butterflies turns out to be more about practicalities than flights of fancy.

“I wanted to study animal population ecology – essentially the abundance and distribution of a species,” he said. “Zoologists generally choose furrries, featheries, scalies and slimies.

“But insects, particularly butterflies, are good for answering those questions. They are around during the day, easy to spot and catch and you don’t need a microscope.

“Vertebrates, well, you need all sorts of permits to molest them. Nobody cares about insects. There is an entire industry set up to murder them.”

Zalucki notes that there are fewer numbers of some species to be seen around lately. Some species weathered the big dry in our lovingly watered urban gardens.

The Common Crow, a big black and cream butterfly which feeds off new oleander growth and some natives, was noticeably slow to appear in numbers last season.

The big orange and black Monarch butterflies were also down in numbers.

Gardening is afflicting the imposing green and yellow Richmond Birdwing. It needs to lay its eggs on a *Pararistolochia* vine – more commonly known as a Dutchman’s Pipe. However, gardeners have been replacing native varieties with an extravagantly flowered import from South America, which contains toxins that kill the larvae.

A rescue attempt is underway with experts urging gardeners to uproot the imports and

replace them with native *Pararistolochias*. Zalucki calls the butterflies which survive in urban settlement the “tramp creatures”.

“They are the species that can survive well with clearing and exotic plants.”

Less noticeable are the loss of species numbers and species types where habitats have been cleared, and it is this that concerns the experts.

“It is a straight numbers game” said

Zalucki. “The chances of extinction get higher with habitat loss. If there are only two places left and one gets burnt and the other gets bulldozed, or if you only have 5 butterflies left in an area and a bird eats three, then it becomes catastrophic. This is the problem with subdivision and urban development, the habitats get smaller and smaller and when the last of it goes, well that’s it folks.”

The Darling Downs Jewel butterfly faces this reality of ultimate extinction every day. Extensive clearing of everywhere else has left this delicately pretty creature now confined to just two or three tiny locations.

The Australian or Laced Fritillary preferred to flit about wetlands populated by a particular form of native violet. As Zalucki puts it, the wetlands were drained and settled for urban development, violet populations shrank to nothing and so did the Fritillary.

“Our amateur friends say there might be two populations left, but we haven’t had any hard evidence” he said.

Clearing of coastal paperbarks has endangered the yellow and red delicately filigree Apollo Jewel Butterfly which is fast losing the host plant it needs for laying its eggs.

In terms of insect species Valentine says “perhaps we can lose a species here and there with little observable impact but it is a bit like the rivets on a plane, how many can you lose before it falls out of the sky?”

Valentine thinks more studies would document more butterfly disappearances, but the problem is, “we just don’t know how many species there are because there aren’t the

resources to find out”.

In these hard headed scientific days, money pours into research which will help industry make money, open up new markets, or bring in university consulting fees. There just isn't a lot of funding for butterfly science.

It is different in the United States where butterfly research can be linked to planning conservation outcomes. A small, relatively non-descript blue butterfly in California was able to re-route a major highway proposal which would have flattened one of its last habitats.

While the general public might think a threatened species declaration is basically a matter of science, the reality is more that it is a matter of politics. Listing a species can be highly embarrassing to the governments that have allowed some developments despite advice to the contrary. It puts an onus on authorities to prepare management or recovery plans to protect the species. There is often a huge behind the scenes brawl whenever a species is listed, which often means it is listed too late.

“To me that is a pathetic exercise which just denies the science” says Valentine. Having nothing to lose - being already lower than roach status - I asked Zalucki, “Are butterflies.... useful for anything?” He groaned “Does everything have to have a purpose for us?” he asked.

“They are useful for pollinating plants and feeding birds. But they are an indicator species and tell us much about the changing shape of our environment. When their numbers drop or disappear, something is changing in the habitat.

“The point is the rest of the biodiversity, the slimies, scabies, furries and featheries are the trivial bit. Insects make up at least 70% of all the animals in the world. That includes ‘honorary’ mites. It could be up to 90%. Insects are a large slice of what is out there, and if you talk about biodiversity, they are most of it.”

For instance, butterflies illuminate many universal questions on mating behaviour, putting new meaning on playing hard to get. Courtship rituals in order Lepidoptera are many and varied, but most of them boil down to very choosy females and very often frustrated males.

Take the Common Crow. The male hangs around a host plant waiting for a female, who, when she spots him will take off in some other direction, but fairly slowly. His task is to fly in front of her and provoke her interest by brushing her with around 43 volatile chemicals from two “hair pencils” or feather duster like protrusions from his abdomen. After enjoying the chemicals for however long takes her fancy, the female will stop flying and let the male hover over her. And then, 99 times out of a hundred, she flies off just at the point of consummation and the whole aerial dance starts all over again.

Repeat scenario any number of times over the next few hours. Either the frustrated male goes away or he might eventually be successful, in which case they copulate for eight to 24 hours. If they are disturbed the male takes to the air, carrying the female in celestial ecstasy .

In reality, however, the male Common Crow has it easy.

The male Monarch has to loiter with intent around a milkweed patch. Incoming females, who have excellent vision extending into the UV range, can be expected to take high speed evasive manoeuvres leading to a chase up to 40kms per hour. Naturally, 99 times out of a hundred to use the Zalucki observational yardstick, the female Monarch usually wins “catch me if you can”, often slipping through the twigs and branches and leaving her erstwhile mate fluttering lost on the other side of a tree. “Or she takes a power dive” said Zalucki “zooming down vertically and at the last second before the ground she veers off horizontally and gets away. The male will

become confused and meander around for a bit before trying his luck elsewhere. Success, for the male, involves "an aerial take down manoeuvre".

You don't want to go into details.

You do? Butterfly experts are in some disagreement on what happens after the female is brought to ground but it is not necessarily what a court would call consensual.

"The question arises, who is choosing who, and why are females so choosy anyway" said Zalucki. "This is something that engenders lots of debate as it is common for animals and humans as well".

Another topic of vital interest is the relationship between butterflies and other species. The Mangrove Ant-blue Butterfly in its caterpillar state is attended by ants, who take it as an egg to their nest. It hatches, produces an ant like smell to trick its hosts and then feeds off their brood, making it not the sort of guest one would normally bring home. Or perhaps the ants find the sugars and amino acids secreted by the caterpillar adequate compensation for some of the kids.

However, Mangrove Ant-blue like the mangrove areas favoured for canal estates, resorts and golf courses. Fogging of mangroves near residential areas for mosquito and midge control has taken care of most of the rest of this species and its unusual living arrangements.

Some migratory butterflies may play a crucial role in more than one habitat by migrating. Scientists have been tagging butterflies and finding out, for instance that some of the Monarchs in the Sydney basin have flown up from northern Victoria. This deserves respect. It is not easy to find a tagged butterfly that has travelled 900kms. Take butterfly colours also. Even scientists describe them as "magical". Valentine explains their colours change as they move around because of the colour combinations in pigments in the wings which refract sunlight.

"The sun reflects different colours off different angles which change rapidly as the butterfly flits about". It also changes as the wings open and close and the darker underside of the wing is visible then the top side of the wing. The whole combination means we see "flashes of brilliant colour" which shift and change.

But consider this - if butterflies are the insect we know most about, we know sod all about the insect world in terms of what is in it, what they do and what the effect of them not doing it might be.

In Australia, we could be losing hundreds, maybe thousands, maybe tens of thousands of insects before we even know them. And Mr Zaluki is right. This is a tragedy.

Even for us lower than roach sorts.