

NATURA Far South Coast

Observing and understanding the flora and fauna of Bermagui/Wallaga Lake's forests and shorelines

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Greetings all! Another month, another newsletter albeit with a name change necessitated by the Montreal Goldfield Committee's persistent suggestion that I shift my observational focus away from the goldfield. It would appear that, by drawing attention to the ecological value of the site and by expressing concerns over the damage recently inflicted, I am hampering their "vision" for the goldfield as a regional asset. Although disappointed with this outcome I am also excited by the prospect of sharing with you my floral and faunal observations from our broader local area ... who knows what delights await over the days and months ahead? Despite this shift in focus I will, of course, also continue to report from Montreal Goldfield because, as negative as these past few months have been, I now also see great opportunity to observe and understand how vegetation, habitat and species populations, especially of invertebrates, recover from such impacts. Such an understanding could prove invaluable when addressing similar issues both here in our local area and further afield. As they say in the classics onwards and upwards.

Although the species may vary from month to month as seasonal migrations take place birds continue to be a constant in our forests and gardens. This month I have particularly enjoyed watching small flocks of **Red-browed Finches** feeding gregariously and the occasional **Grey Fantail** that has not travelled north for the winter. A recently learnt fact about fantails (apparently, even at my age, every day's a school day!) – when flitting amongst the trees fantails are constantly fanning and flicking their tails to disturb insects into the air so they can be caught in flight. I can also happily report that the **Glossy Black Cockatoos** are continuing to feed on the Montreal Goldfield with a bonded male and female favouring one particular *Allocasuarina littoralis* tree for their first feed of the day. I have seen the pair quietly crunching together on several occasions. Mid-month I was privileged to witness the arrival of a large flock of **Pied Currawongs** that had travelled down from the mountains to overwinter in our milder climate. The flock of perhaps twelve birds landed in the large *Angophora floribunda* (Rough-barked Apple) tree in my yard but, although I enjoyed listening to their melodic calls, the resident magpies and wattlebirds were less than impressed with their arrival and quickly moved them on. Also this month, whilst working with the Beauty Point Landcare Group to remove weeds along the creek running between Beauty Point and the Big 4 Caravan Park, I was enchanted by the musical pinging of **Bell Miners** as they darted overhead in the tree canopy and constantly dipped in and out of the creek. At right is a photo of the birds taken on the day. Although the Bell Miner, or Bellbird as it is commonly known, is endemic to eastern and south-eastern mainland Australia the bird is



causing a great deal of concern because of its somewhat aggressive and territorial nature and its feeding habits which have caused widespread dieback of eucalypt forests within its range. Bell Miners feed extensively on the dome-like, sugary lerps of the psyllid bugs that feed on the sap of eucalyptus leaves. In order to maintain a

constant food supply the Bell Miners rarely kill the actual psyllid, and actively protect the small insects by driving out all the other birds that might eat them. They also kill any psyllid predators such as spiders, wasps and other invertebrates that may threaten their food supply.

The NSW Office of Environment and Heritage has described the birds' behaviour as akin to "farming" because of their tendency to feed only on the lerp rather than the insect itself, thereby allowing the insect to thrive and breed. Eucalypt dieback occurs, especially in areas where Bell Miner numbers are large, because under the bird's protection psyllid populations can reach unnaturally high numbers and feed, unchecked and in abundance, on the sap of the trees' leaves. Over time, and as psyllid populations grow, the life is literally sucked out of the trees by the tiny insects until eventually the affected trees die. Flooded gums, blue gums, ironbarks, red gums and grey gums are the main species affected by such dieback.

Bell Miner Associated Dieback (BMAD) was listed by the NSW Government as a key threatening process as far back as 2008. The main concern associated with BMAD is the impact on ecological communities, especially in areas where once mixed eucalypt forest has been reduced to just one or two remaining tree species such as brush box and turpentine. In the worst affected areas where the balance of biodiversity has been altered completely, almost total collapse of ecosystems have been recorded with 39 species of threatened animals (including koalas) and 9 threatened plants now living precariously in forests experiencing dieback spread by the Bell Miner. BMAD has prompted the Federal Government to fund a \$1 million program targeting the Bell Miner in the hope of saving a further 2.5 million hectares of forest from destruction. Much of this money has been spent on the removal and control of lantana, an introduced weed species which the Bell Miners use extensively for nesting. According to the NSW Local Land Service (LLS), areas where a dense lantana understory is present are far more prone to the effects of BMAD. The LLS is trialling various methods to control lantana including broad-scale herbicide treatment, more refined bush regeneration with less herbicide and burning of lantana without herbicide use. (Source – ABC Rural – Wed 3 Feb 2021)

The short days and cooler temperatures of early winter have seen the usual seasonal drop in invertebrate and reptilian activity although I did, somewhat surprisingly, cross paths with two **Red-bellied Black Snakes** at Long Swamp last week. Both snakes were basking in the winter sunshine and were probably somewhat



irritated to be disturbed by me and my size 8 boots on their patch of turf. Neither snake seemed inclined to move although one did lift his head and gave me a sideways baleful look ... I was more than happy to give both the space they needed. Closer to home, on my back verandah, I watched a juvenile huntsman spider - *Isopeda brachyseta* - feeding on a large moth ... possibly *Oxycanus dirempta* although several other local moths look similar and are frustratingly difficult to definitively identify as they are all variable in their patterning. (Apparently, the only way to confidently ID them to species level is through close examination of their antennae – clearly something I did *not* do in this instance!) Whichever species this particular moth is it definitely belongs to the Hepialidae family of moths ... more on them a bit later.

Isopeda brachyseta is a species of huntsman spider found exclusively in coastal regions of south east NSW with a distribution extending from Batemans Bay in the north to Eden in the south. Previously identified as the long-standing species *Isopeda villosa* (Grey Huntsman) which was first described by Ludwig Koch in 1875, *Isopeda brachyseta* was described as a new and separate species by the Australian arachnologist David Hirst in 1992. It is the huntsman spider species I most regularly encounter in our local forests. At right is a photograph of a juvenile I took on the Montreal Goldfield in March 2022. Because of its pale colour I suspect that this small individual had recently moulted and was resting, motionless, as it waited for its new "skin" to harden.



Below is a much larger *Isopeda brachyseta* individual I photographed in Bermagui State Forest in October 2021. If you look closely you will see the dense brushes of pale scopulate hairs on each of the last two leg segments that give these, and all other huntsman spiders, such exceptional gripping power on vertical surfaces.



Now, from eight legs back to six Hepialidae moths. Commonly and collectively known as **Ghost and Swift Moths**, the Hepialidae family contains some of the largest moths in Australia. Although the moths fly from late summer through autumn and into early winter their flight typically coincides with autumn rainfall. It is not unusual for them to emerge in surprisingly large numbers after these seasonal rain events, and hundreds of these moths are frequently observed appearing on one single wet night when none, or few, have been seen on either the preceding or the following night. After emergence the moths may gather in large numbers on

trees, either before or after their nuptial flights. These gatherings can include moths of several different species and sizes. Observers of such gatherings have reported that a single tree could be festooned with dozens of moths and likened the scene to an Aladdin's Cave of jewels as the raindrops on the moths' wings sparkled in their torchlight. Unusually, and unlike most moths, ghost and swift moths generally do not rest on flat surfaces but hang, suspended by the strong tarsal claws on their forelegs, from vertical surfaces. If you hold one of these moths in your hand, or try to remove one from your jumper or trouser leg, you will realise just how strong these moths' claws are!

The majority of the 158 Australian species are endemic (i.e. found only in Australia) but several species can also be found in New Zealand, New Guinea and New Caledonia. Most of the Australian swift and ghost moths are various shades of brown or grey with often striking patterns of black white and silver, but moths in the genus *Aenetus* are largely various shades of green, and are often strikingly bright in colour. In many species the base of the hindwing is suffused in pink, red or mauve but this colour fades quickly after death. Although all moths in the Hepialidae family are considered large the size range between species, and even male and female moths of the same species, can vary greatly. Across the entire family wingspans can range from as little as 15 mm for the smallest males and up 250 mm for the biggest females.

The Hepialidae family is considered to be a very primitive moth family with its members exhibiting a number of structural differences to most other moths. These differences include very short antennae, forewings and hindwings that are of a similar shape, and the lack of a frenulum (a row of bristles along the leading edge of the hind wing that couples the fore and hind wings together so that the two wings can work in unison, and more efficiently, when in flight). Moths in the Hepialidae family also lack a functional proboscis which means that, as adults, they cannot feed. Because they cannot feed or drink, most adult ghost and swift moths only live for one day.

Female Hepialidae moths produce vast numbers of eggs – over 20,000 in some species – which are scattered on leaf litter or grass while the female is in flight. All Hepialidae larvae are burrowers which begin life as small caterpillars but grow into large, robust grubs. Very young caterpillars feed on fungi and vegetation in leaf litter before moulting and transitioning to a new mode of life. Some burrow directly into the ground, either feeding on fine roots underground or coming to the surface at night to feed on foliage and grasses. Others bore into, and feed on, the roots and stems of trees and plants. Common host plants of these tree borers include Eucalyptus, Melaleuca, Callistemon, Leptospermum and Acacia. Before pupating, the larvae make a vertical tunnel which can be up to 10 cm deep and has an exit close to the ground surface. Pupation takes place in this tunnel. The pupae are equipped with dorsal spines and moveable ventral plates which allow them to be quite mobile and able to move up or down the tunnel as needed to adjust to temperature changes or flooding events. Before the adult moth emerges, the pupa moves to the top of its tunnel and protrudes half way out of the ground surface to allow the moth an easy release. Even if no moths have been observed, the empty pupal shells can often be seen protruding from the ground. Because they are so tough these pupal cases can persist long after the moth's demise, and may remain in place for days or even months.



Now that we know about ghost and swift moths, let's look at some of the local species you are most likely to encounter. The moth shown at left is a male *Elhamma australasiae* (no common name). This species is the smallest and most commonly encountered Hepialidae moth in our local area. Both the male and female moths have brown forewings, often with pale or dark speckles, but only the male has a pale-edged wavy line along each forewing. This wavy line is clearly obvious in the photo.

The hindwings and abdomen of this moth can be yellow or pale red in colour. Males of the species have a wingspan of about 40 mm. Females are slightly larger with a wingspan of 40 to 60 mm. The larvae of *Elhamma australis* feed on the roots of various grasses. Like many Hepialidae species these moths, and in particular the males, are attracted to house lights at night and may turn up in good numbers, especially in February and March. There are only 4 species of moth in the genus *Elhamma*, making it the second smallest genus in the whole Hepialidae family here in Australia. Only one genus, *Zelotypia*, is smaller with just one species – *Zelotypia stacyi* (Bent-wing Ghost Moth). This species is found in Queensland and northern NSW and can have a very impressive wingspan of up to 250 mm. It is an extraordinarily beautiful moth. Of the four *Elhamma* species only one, the one pictured here, is found in Australia with a range that extends down the eastern seaboard from the Sunshine Coast, through NSW and Victoria and across to Tasmania. It is occasionally found as far west as Mt. Gambier in South Australia. All other 3 *Elhamma* species are endemic to New Guinea.

Below – a Common Splendid Ghost Moth (*Aenetus lignivoren*) that I found, unfortunately dead, on an external windowsill at my house in Beauty Point. This moth is also known as the Smaller Green Wood Moth. Although this individual looks rather battered it had died not long before I found it as its colours are still bright and have yet to fade, and it's highly likely that it died from a *Badumna* (House Spider) bite (there are many living around the window frames where the moth was found ... I tend to leave the spiders undisturbed so they can operate effectively as an eco-friendly pest management system). Note the rosy pink colouring on the hindwings that is common in many Hepialidae species. The pictured individual is a female and has a wingspan of 70 mm. The males are smaller with a wingspan of 50 mm and look quite different to the females. As seen above, the females have brown wings with variable green patches on the forewings. Males have green wings with a series of white diagonal stripes. Such differences between males and females of the one species is known as sexual dimorphism. Unlike many Hepialidae moths that emerge following autumn rain, the Common Splendid Ghost Moth flies in late spring or early summer ... the above moth was found in October 2017. The larvae of Common Splendid Ghost Moths bore horizontally and then downwards to make a tunnel in the stem of the food plant on which they are living. They then cover the opening and surrounding stem with a bag of wood fragments, emerging at night to feed on the bark under the bag. The larvae feed on a range of plants including, but not limited to, *Acmena*, *Acacia*, *Callistemon*, *Dodonaea*, *Eucalyptus*, *Leptospermum*, *Olearia* and *Pomaderris*. Despite an abundance of these plant species in our local areas the moths are rarely seen - this dead specimen is the only one I have found.



The moth shown at right is a **Bardi Moth** (*Abantiades atripalpis*). With a wingspan of between 160 mm (males) and 230 mm (females) it is one of the biggest Hepialid moths in Australia. This moth is found right across southern Australia in woodland areas alongside creeks and gullies, especially near eucalyptus trees. These moths are famous for being able to predict rain. In some areas, in autumn, the moths appear on only one night each year, often in droves and always just hours before a major downpour in that area. For this reason they are often called “Rain



Moths”. Although the reason for their infrequent and sporadic appearance in large numbers before rain is not fully understood it is thought that the moths may be using the rain to help disperse and wash the female’s scattered eggs into crevices in the ground. It is also possible that the moths are gaining benefit from the rain as it encourages dormant seeds to germinate ensuring that, after the eggs hatch, the young caterpillars can easily find roots on which to feed. Young larvae initially feed on fungi and fine roots but later bore into the soil to feed on the outsidings of eucalypt roots. Larger, more mature larvae of the Bardi Moth are known as Bardi Grubs and are highly sought by fishermen as bait. I encountered this moth species several times whilst living at Wandella, always between late March and early May. The above photo was taken in May 2016.

In May 2013, whilst living at Wandella, I witnessed a mass emergence of Hepialidae moths for myself. The “event” continued across three nights after the first autumnal rain and is something I will never forget. On each night dozens of large moths covered every external surface of my house including walls, fly screens and furniture, and each morning a hundred or more moth bodies littered the ground. Over the course of the event I observed several different moth species that, in total, numbered in the hundreds. I was not the only who enjoyed and appreciated this mothy spectacle as my resident Peron’s Tree Frogs had a grand old time gorging themselves on the large and juicy morsels. Some of the frogs even took to launching themselves from the vertical panes of my windows to catch moths in mid-air. The sight of a single frog falling through the air from a height of a metre or more whilst trying to hang onto a large moth was amusing. The sight of several frogs all falling to the ground at the same time was hilarious! The situation became even more bizarre and ludicrous when, on more than one occasion, there were so many frogs falling simultaneously that it literally looked as if it was raining frogs. Of course, not every “air-strike” was successful. On the occasions when a frog *did* miss its target it would simply fall to the ground then climb back up onto the window pane to wait for the next passing moth. This “wait for the next one” approach was rather reminiscent of peak hour public transport when I was living and working in Sydney. The entertainment did not end with the falling frogs. With their meal caught the frogs now had to try and stuff the struggling moths, which were just as big if not bigger than the frogs themselves, into their mouths there were legs and wings waving and flying in all directions! Such was the number, size and allure of the moths that at least two owls were also tempted to come to my house and feed. The owls flew in under the verandah eaves repeatedly to pluck moths from both the air and the house walls before withdrawing to nearby trees and fence posts to eat. It never took them long to return for another moth. I was surprised at just how adept and precise the owls were, not only in catching the moths but also in evading the myriad of frogs. I do, however, suspect that more than one frog may have been taken by owl, possibly through an error of judgement or, just as possibly, with intent. Needless to say I spent many, many hours watching this seemingly endless and fascinating “show”... when presented with such natural wonders who needs TV? Below is a group of photos showing a few of the tens of dozens of Hepialidae moths that converged on every external surface of my house during the mass emergence event.



All of these moths bar one – the large black and white one in the bottom left corner which is a **Bardi Moth** (*Abantiades atripalpis*) - are *Oxycanus* species. At least three, and possibly four, different *Oxycanus* species are represented in this montage. *Oxycanus* species such as those shown can be difficult to identify because many of them, although similar in size, can be very variable in both their colouring and forewing patterning. For this reason I am loath to identify any of these moths beyond genus level ... if the lepidopterists are unable to identify them by photo alone what hope does a lay person such as myself have??? Adding to the *Oxycanus* identification woes, there is a great lack of understanding regarding the morphology of the genus, and much work is needed to gain a greater understanding of both the species and their biology. It's worth mentioning

that the bottom left photo showing a Bardi Moth and an unidentified *Oxycanus* moth side by side is an excellent indication of some of the size variation of species within the Hepialidae family.

Two final photos taken over the three day moth event in May 2013. The first photo shows one of my Peron's Tree Frogs, poised on a window and ready to launch itself at the next passing moth. I love the look of concentration and serious intent on his face, don't you? The second photo shows yet another (!) *Oxycanus* colour/pattern variation. If you look closely you can see the strong tarsal claws on the forelegs that ghost and swift moths use to hang from foliage, tree trunks, walls or, in this case, outdoor furniture.



So, that was June. We had birds. We had spiders. We had moths. I wonder what July will bring?

If you are a new reader and would like to receive future copies of *Natura Far South Coast* via your email inbox or if any reader, new or old, has a query or perhaps even their own observations they would like to share, you can contact me via email at deb_taylor142@hotmail.com. If you would like assistance with the identification of something you have found either locally or further afield please also feel free to contact me – to this end photos would be helpful if you have them. Please do bear in mind that I am *not* an expert – I am however an enthusiastic and passionate amateur with a good knowledge base of our local species, especially of invertebrates.

Until next month, stay warm and be kind to each other and the environment,

Deb

Postscript - A note for those of you who may be wondering – No, I have not given up on my belief that the biodiversity of Montreal Goldfield deserves, and is in need of, our protection and preservation. I have simply withdrawn my support from a committee that had seemingly engaged me to demonstrate to Council that they were meeting their requirement to “conserve environmental heritage” and “conserve remnant vegetation”. Clearly neither of these 2 things are high on the Committee’s list of priorities and I refuse to facilitate apparent compliance to such requirements when it is obvious that the Committee has no real intent or interest in meeting either.