

BUTTERFLIES

AND MOTHS OF NEW ZEALAND



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FOREST RINGLETS

Now living the high life

ALSO IN THIS ISSUE:

- Gardening with Jane Carver – Buddleias for butterflies
- Of lichens and mosses – Brian Patrick talks about moths
- Monarch tagging stories from around New Zealand
- Saint Kentigern's amazing butterfly garden

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From the GUEST EDITOR



Last month I was particularly delighted to have witnessed my swan plants deliver their very first Monarch butterfly this season and, more excitedly, without my help. This was particularly special as last summer my plants didn't play host to a single caterpillar. Due, I believe, to the abundance of predating wasps.

However the plants didn't entirely escape their job as a food source though. A friend gave me three wee caterpillars which I raised on a fresh bouquet of swan plant cuttings in a vase on my mantelpiece.

This method of raising caterpillars caused more than its share of amusement by visiting friends and family. Upon spying a vase with greenery rather than your more usual colourful display they would go over to investigate. They would find, particularly in the later stages, the bouquet supported three very big and chubby caterpillars. Needless to say, I was both delighted and saddened when eventually each of my caterpillars went through normal pupation stage and then flew away as butterflies.

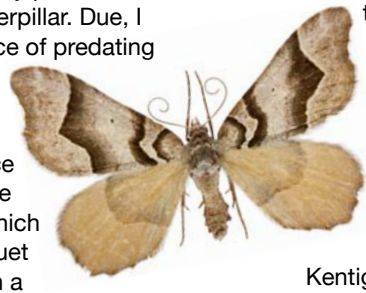
So observing a garden swan plant give rise to an adult Monarch butterfly was particularly special for me. There is nothing quite as delightful as seeing nature doing what nature does best.

With lower Monarch numbers last nationwide this was reflected in the number of tags issued as part of our Monarch tagging programme. In this issue we have an article about what actually happens with the tagging

data we collect and the importance of this project nationally. We have a great article about the beautiful Forest Ringlet which is unique in its habit of flying in forests. Also in this issue we update you about Buddleia and, in particular, its status with regards to the National Pest Plant Accord (NPPA). We also introduce you to the Geometridae family of moths; the larvae of certain species feed on moss and lichens. Part 2 of our article on the challenge in finding nectar sources for butterflies and moths (and bees) and what's been happening at St Kentigern School, as well as the successful open day held at Lincoln's organic Biological Husbandry Unit (BHU) to celebrate the diversity of NZ's moths and butterflies.

If you're looking for some ideas for a Christmas gift, we have some fabulous ideas on our back page. Lastly, we will be marking our ten year birthday in June next year and like all birthdays we intend to celebrate! More will be revealed early next year. In the meantime, sit back and enjoy this summer edition of the 2014 magazine.

– **Rebecca Bibby**



– **Rebecca Bibby**



BHU open day

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Cabbage White PROJECT

Recently the MBNZT was approached by Sean Ryan, a graduate student from the University of Notre Dame, Indiana, USA. A citizen science project (<http://pierisproject.org>) involves collecting Cabbage White butterflies (*Pieris rapae*) from all over the world.

The research team is looking for genes involved in local adaptation to climate and also hopes to reconstruct the invasion of the small Cabbage White, finding out its origins. They hope to find out if it has invaded some countries multiple times and/or from multiple locations by sequencing the genome and measuring the morphology from contributions worldwide. YOU can help!



Sean Ryan

"In short, this research will help us learn about how species respond to environmental changes, such as climate change, and also better understand the role evolution plays in species invasions," said Sean.

If you can help by sending samples to Sean, please check out the website <http://pierisproject.org> or email Sean at pierisproject@gmail.com.

White Admiral Update

Landcare Research has recently released over 40 Honshu White Admirals (*Limenitis glorifica*) in the Waikato region to control Japanese Honeysuckle, and hopes to release some in Auckland soon.

The butterflies are being reared by Landcare Research in containment, and as they emerge from pupation are taken to specific sites for release.

"We will be checking to see that fertile eggs are laid at these sites," said Lynley Hayes, who is a programme leader in Biocontrol at Landcare Research. "All going well, the butterflies will establish at these field sites and we will then be able to redistribute them to all regions."

If any members of the MBNZT are interested in helping with the releases at other sites, please register your interest by sending an email to trust@monarch.org.nz, subject "Honshu White Admiral" and detailing your experience in raising butterflies/insects plus whether you are close to areas of Japanese Honeysuckle growing as a pest plant.



Honshu White Admiral (*Limenitis glorifica*). Photo by Quentin Paynter.

Opunake Butterfly Club

Recently the Opunake Butterfly Club was nominated for a 2014 South Taranaki Youth to Work Award recently. As you will have read in an earlier issue, John Smith has been working with disadvantaged youth locally on a riparian and Monarch butterfly planting project under the Mayor's Taskforce for Jobs.



John Smith

positive results. I was really motivated to take this further by the inspirational Te Waka McLeod who was the keynote speaker."

John said that Te Waka has a passion for working with young people and exploring the influence a positive community can have on their lives. At the

event the Butterfly Club received a certificate in the category of Education and Training Provider.

As Opunake is celebrating 150 years as a community next year, John is keen to host a display in local libraries or schools during the festivities. The MBNZT will support his initiative.

"The importance of the butterflies and the effect they have on our lives is being elevated to another level," said John Smith. "One of the main messages that came through from the evening was that positive relations provide

From time to time the MBNZT sends out email updates – news of events or special offers. If you're new to the internet, and not receiving these, you can sign up for the email list so you don't miss out: <http://www.monarch.org.nz/monarch/wp-login.php?action=register>

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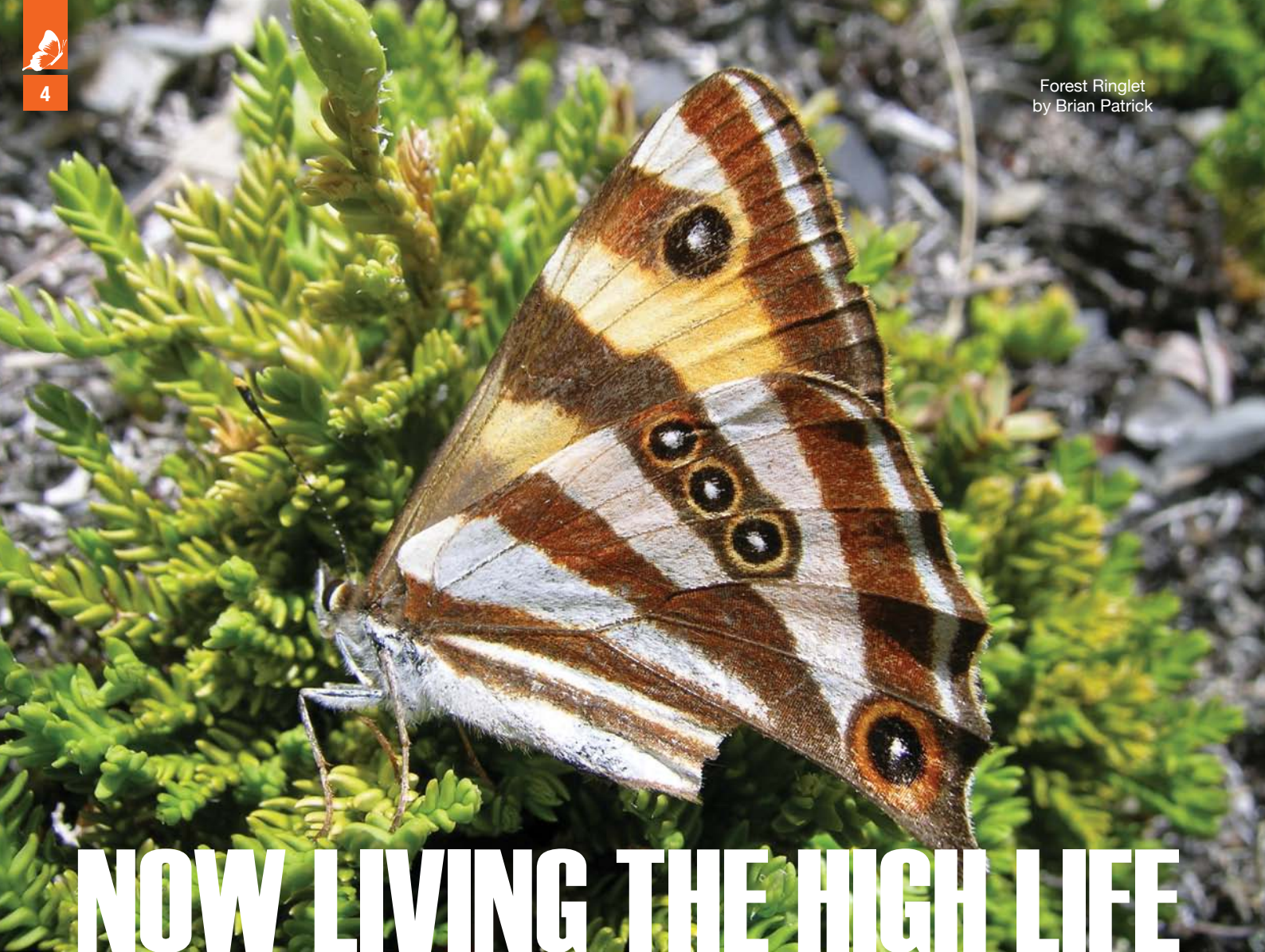
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NOW LIVING THE HIGH LIFE

By Brian & Hamish Patrick

Perhaps NZ's most beautiful and enigmatic butterfly, the Forest Ringlet with a wingspan of between 44-50 mm, has always intrigued and captivated entomologists. Discovered too late to be included in NZ's first book on butterflies by Castle Hill runholder John Enys in 1880 (*Catalogue of the Butterflies of New Zealand*), it was first recorded in the Paparoa Ranges between Greymouth and Westport a year later in 1881 by beetle collector Richard Helms and described by Christchurch lawyer Richard Fereday in 1883. Fereday described and figured it in the *Transactions of the New Zealand Institute*, the main scientific journal of the time. Interestingly it appeared as "Genus (?) - *helmsi*, n.sp." – a species name with no genus with Fereday humbly stating that he did not know what genus it belonged to.

"...the genus of the insect I do not venture to determine, not having access to the descriptions of the various genera of the family to which it belongs".

For some this makes his description invalid, but for us his intention is clear, his honesty admirable and we have forgiven this lapse and accepted his

species name. Considering the times it is forgivable and the journal editors bear some responsibility too.

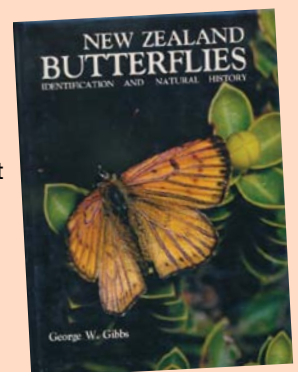
Later (1884) Englishman Arthur Butler re-described the species and erected the new monotypic genus *Dodonidia* for it. He followed Fereday and used the species name *helmsi* but with a double "i". We have chosen to respect Fereday's original spelling with the single "i" in the combination *Dodonidia helmsi*.

It is surprising that it took so long to be discovered by entomologists as the

butterfly is (or was) distributed widely from Northland south to Lewis Pass in inland North Canterbury and the southern end of the Paparoa Range on the West Coast. It is truly a forest butterfly, being found in forest glades from near sea-level to above treeline. Its habit of flying into forest is unique in NZ butterflies and probably explains why adults often have such a ragged appearance.

Its closest known relatives are a suite of butterflies found high up in

George Gibbs in his fine book on NZ butterflies (1980) traces the source of Butler's *Dodonidia*. Apparently he chose it because of the superficial resemblance of the Forest Ringlet to a group of Indian butterflies in the genus *Dodona* (Riodinidae). But the name is appropriate as Dodona was an ancient city in northwest Greece where a grove of oak trees had extraordinary powers of prophecy and the Dodonides were the priestesses who interpreted and delivered the oracles. Possibly it was the rustling of bronze objects hanging from these trees that were consulted from time to time when important events were imminent. This was an important site consulted by many peoples from about 2000 BC until the spread of Christianity caused the demise of the site about 400 AD when the Romans cut down the last ancient oak. The modern town of Dodoni marks the area.



The Forest Ringlet has an interesting feeding strategy with its choice of larval foodplants. In the North Island its eggs are laid on the tall sedge *G. pauciflora* in the lowlands and shorter *G. procera* at higher altitude in both North and South Islands. While in the South Island two tall grasses *Chionochloa cheesemani* and *C. conspicua* are utilised in addition to a sedge as a larval hostplant, providing a much larger possible area of occupancy. In the lowlands a single generation of butterflies is produced each year, but at higher altitude it takes at least two years for the lifecycle to be completed. This disparity has exasperated the decline of the species with no annual butterflies appearing in the extinct lowland populations and the isolated and generally inaccessible upland populations only appearing every 2-3 years, it is easy to see why it appears to have disappeared completely. But they are still out there. We have visited Lewis Pass regularly over the past twelve years and in some years on perfect days we find none, while in other years we have observed up to 26 butterflies a day! We have found the same situation on Mount Ruapehu in the North Island.



Forest Ringlet larva on *Gahnia* by Brian Patrick

the mountains of New Guinea. There six species of elegant butterflies in the genus *Erycinidia* have been described but are poorly known in terms of their distribution and ecology. Between 1500-2700 metres, in the high altitude forests of New Guinea there are many familiar insects and plants including the closest relatives of our Copper butterflies,

familiar beech forests and tree ferns. Both our Coppers and Forest Ringlet have no close relatives in Australia.

Sadly the Forest Ringlet has suffered a major decline in both numbers and range over the past 70 years, disappearing from almost all of its low altitude sites and now only numerous in upland areas relatively free of human disturbance and introduced predators that parasitise or predate its caterpillars. The Forest Ringlet has two natural parasitoids

which can't be implicated in its demise, but it is a completely different story with the introduced wasps. Introduced predatory vespid wasps (and possibly paper wasps) are probably the culprit in its demise at low altitude as apparently suitable habitat complete with abundant larval foodplant is still widespread. So while habitat degradation and clearance will have had an impact on the species, the suite of introduced wasps present is unsustainable for the species.

Fortunately many upland parts of both North and South Island (600-1200 metres) still hold viable populations of the Forest Ringlet but this needs monitoring as its many predators are still on the move. And global warming may hasten this process and provide no safe haven for this gorgeous and enchanting

butterfly. We have recent records from 18 places where populations of the butterfly persist, stretching from the far north of the North Island south to Lewis Pass in the South Island. Based on its documented decline and disappearance from so many familiar places the Department of Conservation in its 2014 list of about 200 threatened NZ

Lepidoptera has ranked the Forest Ringlet as "At Risk, Relict".

We were surprised in 2012 while helping out with Forest & Bird's Denniston Plateau BioBlitz to locate a colony of Forest Ringlets in small forested gullies at 600-850 metres. The larval foodplant *Gahnia procera* was abundant there too and showed tell-tale signs of caterpillar damage. This was a new record for the species and interestingly is not far from where the butterfly

was first discovered by Helms. We have returned to the general area and found larvae surprisingly common over the early spring on the *Gahnia* under the shrubland canopy from 600-700 metres on range tops.

While there are records of the adult butterfly emerging as early as October the many upland places that we know it from have adults emerging between mid-January and early March with a peak in early February. This is probably an artefact of upland populations emerging much later than the former lowland populations. But there is some hope for the future – a reliable entomologist spotted one in North Shore City within the last few years, so maybe they are making a comeback in some areas and re-claiming some of their former haunts.



Forest Ringlet habitat by Brian Patrick

THREAT RANKINGS

The Department of Conservation (DoC), in line with international organisations such as the International Union for the Conservation of Nature (IUCN), maintains, updates and regularly publishes comprehensive lists of all threatened and at risk species across all taxonomic groups from bats to beetles, and liverworts to lilies. Small groups of specialists meet regularly to assist DoC in this massive process to re-assess the previous rankings and add additional taxa that now meet the criteria. A phase of re-assessment is occurring right now and the first new lists will be published individually by DoC this year.

The ranking we use in this essay for the Forest Ringlet is from the 2014 Lepidoptera list that has not yet been published but will be soon. We are allowed to share it with you because Brian Patrick is on the Lepidoptera Panel and has permission to share it here.

Here is a summary of the rankings:

- **Extinct;** self explanatory
- **Data Deficient;** strongly suspected to be threatened but not enough data available to rank them at present. Examples are species never recollected since the original collection that led to them being described
- **Threatened:** these three categories have precise numerical thresholds that I only summarise here
 - Nationally Critical;** very small to small population size, area of occupancy less than 10 ha, and predicted decline in population of 50-70% or greater
 - Nationally Endangered;** small to moderate population size, area of occupancy less than 100 ha, and predicted decline of population 10-70%
 - Nationally Vulnerable;** moderate to large natural population size, area of occupancy less than 10,000 ha, and small increase (10-50%) in decline in population or 30-70% for large populations
- **At Risk:**
 - Declining;** slower rate of decline compared to threatened species and starting from a large population base
 - Recovering;** at least 10% increase in population or area of occupancy over next ten years or three generations following a documented decline
 - Relict;** taxa that have undergone a documented decline within the last 1000 years and now occupy less than 10% of their former range
 - Naturally Uncommon;** taxa confined to a naturally small area, or habitat that is naturally scattered and small in extent, that is not the result of human disturbance

Gardening

With Jane Carver

BUDDLEIAS for butterflies



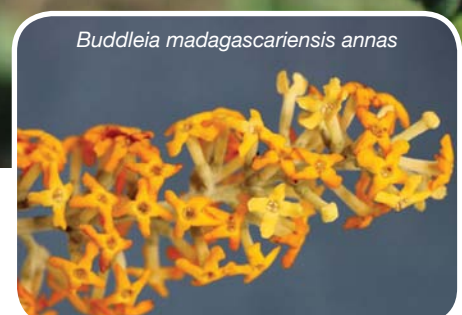
Buddleia davidii 'Pink Delight'



Buddleia weyeriana 'Goldenglow'



Buddleia lindleyana



Buddleia madagascariensis annas



Buddleia weyeriana 'Rainbow'



Buddleia auriculata

Growing Buddleia species

Buddleias have an extraordinary attraction for butterflies during the day and moths at night. I have noticed that many butterflies will ignore plants that are usually visited, if there is a Buddleia in flower nearby. At night it is fun to go out with a torch and see how many moths are taking part in the nectar party.

Buddleias are easy to grow (some say too easy), and in the case of *B. davidii* have become a terrible pest in many of our dry river basins in some parts of NZ. If you intend to grow *B. davidii* hybrids remember to check with your local regional council to find out if this is permissible, and to cut them right back in autumn/winter so that the shrub will remain low enough to dead-head the flowers thereby preventing them seeding in unwanted areas. If you can commit to this routine, you will thoroughly enjoy growing Buddleias.

Propagating Buddleias

Buddleia are rarely offered by nurseries but easy to find on TradeMe or from willing sharers on the MBNZT forum. Buddleia are so easy to root from cuttings and these can be taken at any time of the growing season. Stick them directly into gritty soil and keep watered. Otherwise place in any well-drained soil in pots and use bottom heat to assist root formation, but it is not necessary. Ensure they do not go to seed as this is usually how they become an environmental nuisance.

Buddleia auriculata

From South Africa. Evergreen. Very valuable **winter flowering** species, fragrant. Hardy to -5°C. Can grow very large in NZ conditions, so keep new growths trimmed back each year to prevent *B. auriculata* from becoming a giant that could overshadow your house.

Buddleia weyeriana

From Asia. Lower growing to 2.5m. Yellow to buff apricot in colour, some flowers with an attractive lilac cast. Flowers begin later than *B. davidii* types. Do not require such intensive pruning. Winter hardy.

Buddleia madagascariensis

As the name suggests, from Madagascar. Very unusual starry panicles of yellow to orange flowers beginning early season in August/September and flowers continue in many places through until autumn.

Buddleia lindleyana

From China. Semi-deciduous. Has fine leaves and finer flowered than other varieties but only has a few flowers at a time. Hardy to -10°C.

Buddleia crispa

Comes from the mountains of Afghanistan. Requires a very well drained soil. Flowers from spring through into autumn. Unusual greyish tomentose (furry) leaves. Hardy to -5°C.

Buddleia fallowiana

Comes from the Himalayan mountains, does well in dry rocky places. Flowers February/March. Fast growing and smaller than *B. davidii* but equally attractive to butterflies. Hardy to -10°C.

Buddleia 'Lochinch'

Hybrid between *B. fallowiana* and *B. davidii*. A compact shrub much like *B. fallowiana*. Very hardy and flowers February/March. Hardy to -15°C.

Buddleia nivea

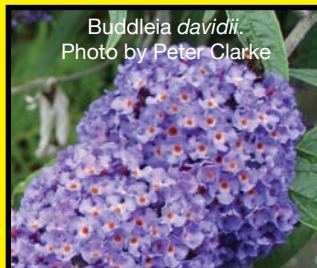
Comes from the Himalayan Mountains. A narrow flower spike. Tolerates dry conditions well. Flowers January/February Hardy to -15°C.

Buddleia globosa

From the mountainous regions of South America Flowers are a round globe/

WARNING

Buddleia is currently not listed on the National Pest Plant Accord, (NPPA) which was developed in 2001 as a co-operative agreement between the Nursery and Garden Industry Association, regional councils and government departments with biosecurity responsibilities. It identifies plants that are unwanted organisms under the Biosecurity Act 1993. Then throughout the country each regional council has developed its own Regional Pest Management Plan to cover flora and fauna species that are problems, and it is advised to check with your



Buddleia davidii.
Photo by Peter Clarke

regional council on the status of *B. davidii*.

Dr Imogen Bassett, Biosecurity Advisor at the Auckland Council advised that *B. davidii* is a Surveillance Pest Plant in the Auckland region, which means that it is illegal to offer it for sale or exhibition, or to propagate, distribute, breed or multiply it.

"If you already have an existing Buddleia plant in your garden, though, there is no legal requirement to remove it. However, we still encourage people to replace Buddleia with a plant such as Hebe which is good for the butterflies and the wider environment."

At the Auckland Council they are currently in the early stages of the

development of the new Regional Pest Management Plan (RPMP) and the MBNZT hopes to work with the Biosecurity team as a stakeholder, as the Buddleia is such a significant plant for nectaring butterflies. It would appear to those who have cultivars of *B. davidii* that these are not invasive, although the original specimen with the pale purple flowers certainly is.

In the Northland region the Council (NRC) supports community initiatives to get rid of Buddleia plants for ecological reasons.

Buddleia was on the original NPPA in 2001 but removed in 2006 as it was seen as too widespread. A beetle, *Cleopus japonicus*, was introduced as a biological control in 2006 and have had some success in limiting the spread of *B. davidii*.

ball shape in panicles that are usually yellow/orange. Not such an attraction to butterflies as the other Buddleia species. Hardy to -10°C.

Buddleia alternifolia

From China this has quite a different appearance to the other species. Small leaves and long drooping flower panicles in November/December. Good in dry conditions. Prune after flowering as next years flowers appear along previous

years shoots! Hardy to -20°C.

Buddleia officinalis

From China. Rarely seen in NZ. Tender evergreen shrub with pink flowers in late winter or early spring; August/September likes a sunny position...does well in dry soils. Hardy to -5°C.

Buddleia alata

From China. Flowers in mid-summer and does well on dry soils. Not seen often in NZ gardens.

Buddleia davidii

The favourite and most common species...there are so many colour varieties to choose from, each of us has a preference. Personally I like one called 'Dark Knight' which is a luminous dark purple. Does not do so well in the warmer regions, most varieties flower during February and March when pruned in the spring. Hardy to -15°C degrees.

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OF LICHENS

and Mosses

By Brian Patrick

NZ has a spectacular moth fauna in the Family Geometridae with at least 320 species making it our richest family. Many are day-flying colourful species while others are moss-green inhabitants of our evergreen forests. While the generally sombre-coloured adults of the genus *Helastia* are inconspicuous, their larvae are distinctive and intriguing with numerous protrubances and colours to perfectly match their surroundings.

The Geometrid genus *Helastia* contains 18 described species according to a recent revision of the genus (1986) and a further four recently discovered species making a total of 22, all of which are endemic to this country. Twenty of these species are found in the South Island with the other two are confined to the North Island and Chatham Islands. Most are grey and white species most often found in drylands on rock outcrops, grasslands or shrubland, or in moister forests. Where known the larvae feed mainly on mosses or possibly lichens also, but appear to supplement this with feeding on dead leaves and some herbs or low-growing shrubs.

Only the small and common *Helastia cinerearia* and less common *H. mutabilis* appear to have a nationwide distribution with the rest having discrete distributions in the South Island (*H. christinae*, *H. scissa*, *H. angusta*, *H. expolita*, *H. clandestina* and four undescribed species), or shared between North and South Island in western montane areas (*H. plumbea* and *H. alba*). One attractive species, *Helastia triphragma*, is widespread in dry rocky areas from the Wellington coastline south to Otago in the eastern South Island, whereas the similar but smaller *H. siris* is also a resident of the Wellington coastline but occurs on the Chatham Islands as well. Two similar-looking species *H. semsignata* (North Island) and *H. corcularia* (South Island) are our most common species of this genus and along with *H. cinerearia* are the only species that could be

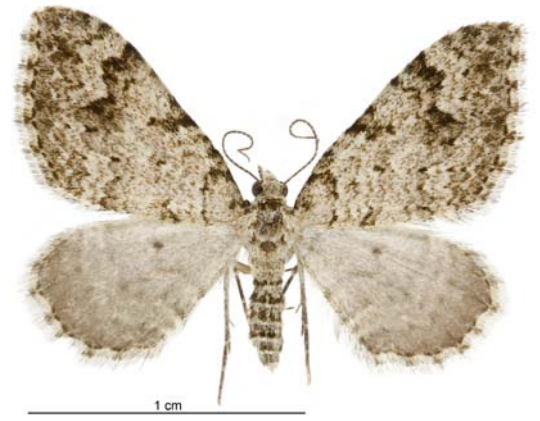
regarded as backyard species. Like *H. cinerearia*, *H. mutabilis* and *H. christinae* their larvae are known from rock faces where they have been seen to feed on mosses. But interestingly their larvae also feed on such plants as *Pimelea* in open dry areas. I do not know *H. farinata* described from Wellington.

Another species pair of *Helastia* species involves *Helastia cymozeucta* (North Island and northern half of South Island) and *H. cryptica* (southern South Island). Both have attractive adults that are found in forest and shrubland habitats. The larvae have rarely been found but appeared to be associated with lichens, dead leaves perched on shrubs or mosses.

The recent observation by Rod Morris of a gorgeous *Helastia* larvae on *Weymouthia mollis* – the hanging moss - in forest at Makarora in western Otago is likely the larvae of *H. cryptica* and matches observations by John Dugdale in the upper South Island of likely *H. cymozeucta* larvae feeding on the same moss.

Two species (*H. ohauensis* and *H. salmoni*) are strictly alpine and are found in small parts of the South Island mountains with the former in the mountains of the central South Island to 1740 metres and the latter in the alpine zone of Fiordland and western Otago from 1250-1850 metres.

Much remains to be learned of this fascinating genus including what are the larvae of *Helastia triphragma* doing on the shrub *Helichrysum lanceolatum*? Adults appear to be closely associated with this shrub but young larvae will not feed on its leaves! My current theory is that the larvae of *H. triphragma* and the closely related *H. angusta* and *H. expolita* (and probably *H. siris* and *H. clandestina* too) feed on the flowers of *Helichrysum* shrubs (*H. depressum*, *H. intermedium*) and perhaps later feed on mosses or lichens growing on nearby rock faces or shrubs.



Above from top:

Adult *Helastia cinerearia*, a species typical of rock faces where the slender and cryptic larvae feed on mosses such as *Grimmia*.

Helastia cryptica

Helastia triphragma

Above three images courtesy of Landcare Research Ltd. Photos by Birgit E. Rhode. Note scale bar is 1 cm.



Above: Larva of *Helastia cryptica* on hanging moss *Weymouthia mollis* at Makarora, western Otago (photograph by Rod Morris)



THE MAGIC OF NECTAR (part 2)

By Jacqui Knight. Photos by Sally Phillips

A Monarch on Dahlia (above) and on Salvia (below).

In the last issue I wrote of what I'd learned about nectar in plants for butterflies.

In a study at the University of Kentucky a few years ago one heirloom Zinnia proved to be a butterfly magnet. Lilliput, a cultivar developed in the 1890s, attracted nearly 20 butterflies, while other Zinnias got fewer than half that number.

It would be exciting to know the secret this Zinnia holds.

To please the market plant growers try to solve 'issues' with plants. Everyone loves blackberries (fruit) but no-one likes the thorns – hence the thornless blackberry. Similarly breeders emphasise specific traits in flowering plants: perfume, flower colour, size and shape, disease resistance and habit being examples. But has the quantity and quality of nectar been overlooked or ignored? After all, bees and butterflies don't have money to spend.

Dr Keith Hammett, thinks so. "I seriously doubt that any breeding is undertaken to increase nectar in any plant," he said. "But while flower size and colours are easy traits to breed for, things like scent, nectar production and disease resistance are much harder and are difficult to see or appreciate at point of sale."

Mary Parkinson of Te Puna Quarry Park Butterfly Garden was a member of the International Plant Propagators Society for several years when the family were growing fruit tree seedlings in the Bay of Plenty. She thinks some plant breeders consider nectar an important value to retain when they are breeding new varieties.

Mary and I had an interesting experience while we were in the USA. On a back country road we came across a woman selling plants, mostly annuals. We were surprised to see how many butterflies were enjoying the *Celosia plumosa*... and yet we had never seen a butterfly near the same species here in NZ – even though the plants look identical. We suspect that what we saw was an heirloom plant. Possibly the NZ equivalent has been modified and consequently lost its nectar value. That's why heirloom plants and wildflowers are so important for butterflies.

While a lot of work, research and development goes into making plants appeal to humans, wouldn't it be great if all

breeders had nectar production high on their lists of values!

This discussion is covered in our Create Butterfly Habitat course on line. In the meantime, if you are looking for more plants for your butterfly garden or habitat, don't look for a list or specific plants. Here are my recommendations:

1. Look around your immediate community for flowers on which butterflies are nectaring. Not just resting but enjoying a feed of nectar from the flowers. If these plants have been grown for a long time in the one locality they have already adapted to the climate and soil conditions and may out-produce modern cultivars. Keen gardeners are usually happy to share plants with you – whether it is cuttings, seedlings or seed.

2. Appreciate the value of weeds. If they're not a danger or illegal in your garden then let them be. You don't have to follow the trends in gardening; the survival of the planet is more important than being fashionable.

3. Look for stockists of wildflowers and heirloom varieties of plants. Remember that flowering fruit and vegetables also offer nectar for butterflies and bees too.

Three excellent sources are Kings Seeds (www.kingsseeds.co.nz), Koanga Institute (www.koanga.org.nz) and Wildflower World (www.wildflowerworld.co.nz).

and Wildflower World (www.wildflowerworld.co.nz).



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WHAT'S HAPPENING WITH THE *tagging data*

By Cheryl Krull
Photo by Anna Barnett



Many of our members have been involved with the Monarch butterfly tagging project over the last nine years. This project aims to find out about the Monarch's dispersal, movements and overwintering behaviour.

Monarchs are tagged by placing a numbered sticker on the central discal cell of one of the hindwings. The details of the tagged and released Monarchs are then recorded on our online database. Butterflies that are recovered with a tag are also recorded through this database (by clicking on 'Reporting Butterfly Sighting'). If you log in to the MBNZT website and click on the 'Research' tab and then 'Tag Recoveries' you can see all the results for recovered tags for each year.

A Monarch tagging project in North America has been running since the 1930s and the majority of recovered tags from this project appear in Mexico. Early each year 'Monarch Watch' personnel visit the overwintering sites where they recover tags (at a price of approximately NZ\$7-8 per tag) from the Mexican locals who may spend hours searching for them. This data has enabled scientists to determine that the North American Monarch population has declined by 90 percent over the last two decades.

Facts like this have inspired the creation of a three-country task force between Canada, the United States and Mexico to save the Monarch and stop logging in the over-wintering habitat in Mexico (one of the greatest threats).

A small tagging project was undertaken here in New Zealand in the late 1960s by Auckland Museum entomologist Keith Wise. However, this project did not yield the results Keith expected and many questions still remain unanswered about the dispersal, migration and overwintering behaviour of this species.

The MBNZT has been trying to answer these questions through the tagging programme with the help of our dedicated members.

We are currently in the process of establishing a Masters student from Auckland University of Technology to analyse the extensive dataset that our citizen science project has produced. The student will specialise in GIS (Geospatial Information Studies) and as such have the skills required to accurately map the data that our members have obtained. We would like to use this information to answer a number of different questions:

Firstly, through the use of some complex statistical models we may be able to determine the population size of New Zealand Monarch butterflies and the fluctuation that may have taken place over the years tagging has been conducted. If we can obtain data from other institutions on wasp numbers, we may also be able to determine how wasp numbers have affected the Monarch population.

Monarch butterflies are considered an 'indicator species', due to their conspicuous nature and close

association with humans and their gardens. They can't be thought of as today's 'canaries in the coal mine'. Therefore, any negative impacts we observe occurring between wasps and Monarchs are likely to be occurring in other less conspicuous and possibly vulnerable invertebrate species. This data could be particularly useful in highlighting the threat invasive wasps pose to all native invertebrate communities.

Lastly, we can also use the tagging data to determine movement patterns and distance and direction of Monarch dispersal. This data would give us a clearer picture of Monarch movement behaviour in New Zealand. We could use this data incorporated with weather and vegetation information to model Monarch dispersal around the country, highlighting areas that are optimum habitat for Monarchs.

Using this data we may also be able to determine the most likely overwintering spots for Monarchs in New Zealand by accurately mapping and modelling the movements of overwintering individuals. These results could be used to ensure the protection of key Monarch habitat and overwintering areas.

The Trust thanks all the dedicated members who've been involved to date and would welcome the participation of more individuals and classes – check out the website. We hope to be able to update you in the next couple of years with exciting results. Keep up the good work!

Tagging stories from around NZ

There are a wide variety of people up and down NZ tagging Monarch butterflies each Autumn. Mary is based at Te Puna Quarry Park in Tauranga and each season lets thousands of tagged Monarchs go. Maureen has used Monarchs during her eight years as a Reading Recovery Teacher at a North Shore primary school to motivate students in their oral, reading and written language. The children have benefited immensely from being able to have real life experiences with all stages of the Monarch's development. "Children get to choose a newly hatched caterpillar from the butterfly house or school grounds, name it and keep it in the classroom for their daily Reading Recovery session," she said. "Often children are unable to verbalise a story prior to writing but with the caterpillars in residence they have no trouble describing what 'Johnny' or 'Stripy' were doing. Their science understanding increased and they are often able to tag their butterfly before releasing it. The first thing my students

"The first time is a bit nerve-wracking," said Margaret. "Using your fingers in a scissor grip works well."

do each day is to rush up to their caterpillar to check its progress."

John, a retired entomologist in Gisborne, allows pupae to emerge in his office and gives them three hours to dry. "Then I pick them up carefully and tag them," he said. "We release them on a hanging Impatiens plant outside no matter what the weather is. They stay there until they take off at their leisure." Xanthe said that students from the college help her tag. "They are quite nervous at first, but after one or two tries they become quite proficient." Jennifer said that a man in his 90's who lived nearby has been releasing butterflies in early winter for years. "We share plant material and caterpillars when the going gets tough because of overlying or plants damaged and so on." She raises her last instar caterpillars in a collapsible, mesh-sided plastic box

Anne in the Hawkes Bay is another teacher tagging. "I got into tagging Monarchs purely by accident, when my class read a School Journal story about it. To keep the students enthused I signed up so they could have a go. They loved it, but as a result I got hooked! She spent many a happy afternoon chasing butterflies with a net and found it really exciting when some kept coming back, even weeks later. "My husband and grown up children also became interested." Tagging butterflies was easy once you have tagged a few and got into a system.

from Payless Plastics. "I tape the leaf that the caterpillars have "J-ed" on onto sticks. I can easily rear 100 pupae per box." Margaret says "I love putting my finger in front of a Monarch and have them happily walk onto it. So trusting. So beautiful. I personally think the Monarch chrysalis with its golden dots is one of the most beautiful sights in nature." Most people find it easy entering the data but you do need to be computer savvy. One woman without a computer does the physical tagging and then gives the data to her daughter to enter

Continued on page 13

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Saint Kentigern College is an Independent Presbyterian day and boarding school with girls and boys in Years 7–13 attending (ages 11–18). The college has a large campus in Pakuranga, 16 kilometres from the centre of Auckland. Students enjoy a park-like setting bordering the waters of the Tamaki Estuary.



SAINT KENTIGERN COLLEGE

and the butterfly lady By Xanthe-Jane Noble

When I was five I found a caterpillar in the garden, put it in a music box and forgot about it. It was Christmas day when I next opened the box – out fluttered a butterfly... pure magic.

Listening to students in assembly talk passionately about 'leaving a legacy' I wondered what we could achieve in our educational arena that would incorporate a love of butterflies and their desperate plight in the world today. Something that

might make a difference.

We have created a 'Butterfly Garden' at the College over the last three years – with a five-year plan to gain certification from the MBNZ. There are some wonderful species here in NZ and with a 95% decline in Monarch butterfly numbers we all need to take action!

Over the last three summers the gardens have been filled with the signature orange and black Monarch butterflies and their green and gold chrysalises. We have protected and released over 300 first generation butterflies which have enjoyed the protection the College gardens have given them and the perfect summer weather we have been experiencing.

Students have cleared areas of land in the Horticultural area and planted over 300 milkweed, four different species including swan plants. We have also planted nettles for the Admiral butterflies and parents and friends have supported us to interplant the beds with nectar-producing flowers. Signs have been made and created by students to provide an outdoor learning environment for visiting classes, especially from the pre-school. The children have named me the 'Butterfly Lady'. Japanese students have made origami butterflies and our Librarian has created a website and supplied beautiful books.

Little did I realise what a huge undertaking the gardens were and how fulfilling the results would be. In America

there is a national Monarch Watch programme which uses thousands of 'citizen scientists' to track the migration routes and discover why the population is down by 95%!

At Saint Kentigern, Duke of Edinburgh students have become citizen scientists, tagging butterflies and weeding the garden beds in their lunch breaks as part of their service to others. Big containers have appeared in the staffroom for collecting coffee grounds and the Technology department has made planters and benches from timber supplied by a local merchant.

We hope to make a difference here at Saint Kentigern, to raise awareness and encourage students to get involved in the national research project concerning Monarchs in NZ. We even have three caterpillar castles in the Science Lab and Year 7 classrooms, and swan plants being grown to give to students to take home this summer. The butterfly gardens are here to stay...It's been a busy few years and my thanks go to everyone who has helped and contributed!

The future? It's a bit of a legacy in the making.

We must remain committed to the conservation of these fragile creatures and their threatened habitats – Felipe Calderón, President of Mexico.

Mrs Xanthe-Jane Noble is teacher in charge, Lepidoptera Club and Trustee, Moths and Butterflies of NZ Trust.



Main Pic: Preschool visit.

Above top: What it was like when we started.

Above: Three years on the gardens are well established.

Tagging stories continued

From page 11

it on her computer. It's important to do it straight away so that if someone sees your butterfly soon afterwards, the correct information is generated to create a map showing where and when your Monarch started out and ended up. "You will then get a surprise when you get a computer generated email telling you all about where your butterfly was found," said Thomas. "Sometimes the sighting is a few hours later – but it can be several months."

In Carterton this year one Monarch returned to the same neighbourhood over seven months (224 days) later so presumably overwintered somewhere nearby! And one butterfly flew from Pukawa Bay as far north as Whangarei, a distance of 500 kilometres over three weeks.

Many taggers are also thrilled to see butterflies they've tagged come back again and again to visit their garden. Jennifer in Dunedin said that it was always interesting when tagged Monarchs were found, 'even if only across the street'.

Xanthe said that the close up encounter and knowledge that you are a

citizen scientist participating in a national endeavour was one of the best things.

Margaret agrees. "Tagging gives you a sense of satisfaction. "...that you are doing your little bit in a practical way to assist nature, playing your part in protecting the environment."

In North America where tagging first began taggers still record their data on paper and when a tagged butterfly is found the information is then put into the computer. However, the MBNZ system has always been internet-based and the program is always being enhanced from its simple beginnings seven or eight years ago. Charlotte was disappointed that she hadn't been told when one of the tagged Monarchs is found, or how many people are tagging in her area. "It's important to be kept up to date with the data," she said.

Jennifer hopes that as more people become aware of the project it will lead to the identification of overwintering sites. "But not enough people are

tagging in Dunedin yet," she said. We know the sites are there. Monarchs have already been seen in Mosgiel this year before November." And they have been seen further south at Owaka too, so they must be overwintering further south.

Jennifer says it is good fun and interests all callers. They love to see the newly pupating "Js" wriggling in their

bright green new coats and the final metamorphosis is also eagerly watched. "It spreads the message."

Anne got some odd reactions at first "...but when people realised what I meant they were very impressed! They wanted to know how the tagging was done, and why, and were interested in where they went in Winter. Nobody knew that some survived over Winter to start the cycle over again in Spring."

The project is free and more taggers are encouraged so if you're thinking about joining us... sign up now on the website. "Get involved and start tagging," said Xanthe.

Beverley enjoys explaining to people what she does, how she does it and why. "If any of these people should find a tagged butterfly they will know what to do and hopefully report it," she said.

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BUTTERFLY DAY AT LINCOLN

a flapping success

By Steve Wratten

Over 400 people visited Lincoln's Organic Biological Husbandry Unit (BHU) to celebrate NZ's moth and butterfly diversity recently. Many people within the BHU and beyond it gave up many hours to prepare for this event.

On the day, a TV One News crew arrived and the story on the event was broadcast that evening.

Visitors were able to follow a Discovery Trail around the grounds, learning as they walked, and were enthralled by living Monarch butterflies which were later released by children. They went away armed with prizes donated by the MBNZT.

Brian Patrick's ceremonial emptying of a moth light trap which had been running at the BHU over a few preceding nights had everyone spellbound. Brent Richards (Lincoln University) had grown a wide range of potted annuals, the



People were keen to buy seedlings for nectar and as insect hosts



Brian Patrick sharing his knowledge



Trustee Steve Wratten (left) inspires the crowd

nectar of which was ideal for butterflies. Gerard Martin of Kings Seeds produced packets of 'Butterfly Bouquet' seeds especially for the event and, like the plants on sale were avidly snapped up by the visitors.

The whole day epitomised the joy of celebrating insect diversity and left a lasting impression on many.



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Photography Tip

From Angela Moon-Jones

In the wild, it can be so very difficult to photograph a butterfly without shadows, sticks and leaves cluttering your image. Be patient and keep taking photos as you follow your subject, being very mindful of the background, until you capture an uncluttered image with the butterfly being the hero of your photo... not the background!



Above: Copper with cluttered foreground and background. Right: Copper with an uncluttered background.



DID YOU KNOW?

NZ has between 2,000-3,000 species of wasps and bees, most of them being native. Some are very tiny and play an important part in our biodiversity. But when people say “wasps” we tend to think of a big problem: invasive species of social wasps – ‘social’ because they make a nest.

German wasps (*Vespula germanica*) are native to Europe and were first found here in the 1940’s. Common wasps (*V. vulgaris*) arrived about 1978 and rapidly spread, almost completely displacing German wasps from beech forests in the upper South Island. An average German wasp nest produces 11,000-13,000 workers. In 1963 one nest 3.7 metres long and nearly 2 metres in

diameter was found at a Waimauku farm.

Australian Paper Wasps (*Polistes humilis*) and Asian Paper Wasps (*P. chinensis*) get their name because the honeycomb nests are papery – they look a little like the head of a shower. The wasps are easily identified because of the long dangly



German Wasp – (*Vespula germanica*)

legs which hang behind them when flying. Wasps scrape wood fibre off trees to make their nests. Worker wasps will usually range less than 150 metres in search of food – so if you have a wasp problem

can be in underground cavities or holes in trees, in roof voids or subfloors of buildings. There is almost always only one entrance/exit. In Spring and throughout the Summer wasps are

working on nest building and looking for protein (e.g. caterpillars). When the young are old enough the diet of both adults and young changes to nectar – but this is not until late in the season.

ACTION – make wasp traps and dispose of the dead wasps, instructions are on our website. While this may not reduce wasp numbers it will spare your caterpillars while you look for the nest. If you find a nest treat it with a Carbaryl poison (from hardware/garden stores) or call a pest control expert. There are good ideas in the forum on our website too. Visit www.monarch.org.nz/monarch/species/pests/



Polistes humilis. Photo courtesy of Landcare.

and can’t find the nest, talk with your neighbours. Nests of German wasps

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A. incarnata

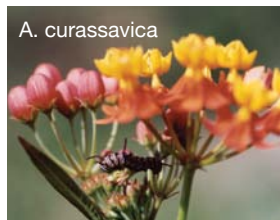
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the onslaught of the caterpillars, much more resilient than the Swan Plant (*G. fruticosus*).

• *Asclepias curassavica* or Tropical Milkweed is a native milkweed from America. Monarchs will lay eggs on it – and it makes an attractive addition to the garden, very popular as a nectar source. – specify Gold or Scarlet (scarlet-orange petals, gold centres)



A. curassavica

• *Asclepias incarnata* is Swamp Milkweed also comes from America. There are two varieties – one has white flowers, one has pink. We have the variety with pink flowers.

• *Urtica incisa* or Pureora is also known as scrub nettle. It is a host plant for Red and Yellow Admiral butterflies. It is native to New Zealand and SE Australia.

Calendar

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Artwork is by Brian Hargreaves, and text by George Gibbs. Scientific names are used according to Fauna of New Zealand 14 Lepidoptera pp 135 -139, by JS Dugdale. Only \$15 each, postage included. Great for Christmas presents!

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