

Butterfly Breeding Guide

Bring back native butterflies to your garden, and beyond!

Aerial spraying, wasp predation and habitat loss has crippled the population of our native butterflies, however butterfly enthusiasts are bringing back butterflies to our cities through planting and pest-control efforts.

New Zealand has 20 native species of butterfly although new research is indicating that there could be considerably more.

And while many of them are still fairly widespread in natural areas, their numbers are declining due to elimination of their larval food plants which are often seen as weeds.

Many of these plants have been lost to aerial spraying for insect pests in the 80s and 90s. Admiral and copper butterfly populations have been hit particularly hard, and have declined especially in urban and modified areas.

In response, projects aimed at reintroducing them have gained enthusiasm, especially amongst older generations who remember the butterflies they used to see as children, and want to make that memory a reality for their children and grandchildren.

To learn more about our native butterflies and to discover what you can do to bring them back, read on.

<p>Native NZ Butterflies</p> <p>This section profiles some of our most threatened native butterflies, and gives you a simple guide to help identify them.</p>	<p>Planting Guide</p> <p>By planting larval food plants and nectar-plants for butterflies, you can cater for the needs of your butterflies throughout their various life-stages.</p>
<p>Projects in Auckland</p> <p>A handful of gardens, parks and schools have created butterfly friendly areas so that native butterflies can thrive. To find out more about these projects read on.</p>	<p>Threats</p> <p>Habitat destruction and parasitic wasps are two of the key threats to our native butterflies. Find out how you can help combat these two threats.</p>

For more information on New Zealand's native butterflies, visit:
<http://nzbutterfly.info/>.

THE BUTTERFLIES

Admiral Butterflies

Red Admiral/kahukura (*Vanessa gonerilla*)

The Red Admiral/kahukura is unique i.e. found only in New Zealand. There are two subspecies of the New Zealand Red Admiral: *Vanessa gonerilla gonerilla* (kahukura) which is found on the New Zealand mainland and the Chatham Island Red Admiral, *Bassaris gonerilla ida* which is found only on the Chatham Islands. The endemic New Zealand Red Admiral resembles the European red admiral (*Vanessa atalanta*). The Māori name, kahukura, means “red cloak” or “red garment”, likely referring to the striking red patches on its wings.

The Red Admiral is typically a forest butterfly, but can live in more open habitats wherever there are stinging nettles - a key food source for its caterpillars. Although seen almost anywhere, they are now common only on restricted parts of the South Island and North Island because of the removal of nettles. Adults disperse great distances and visit a variety of flowering plants including lacebark and different species of hebe.

Admirals lay their eggs between September and May, often adjacent to a stinging nettle hair for protection. Their black or reddish-brown caterpillars hatch after a little over a week. Like most butterflies, Admiral caterpillars shed their skin (moult) to grow five times before forming a chrysalis. They often change colour with each moult, mimicking the colours and lighting conditions of their environment, allowing them to remain camouflaged.

As they eat their way through nettle leaves, the caterpillars hide out in protective tents which they create by rolling up leaf-edges and securing them with silk strands. They have ravenous appetites, and can quickly strip all the leaves from a small nettle plant, leaving behind clumps of bare branches. They are about 44mm when fully grown.

Before Admiral caterpillars pupate (form the chrysalis in which they will transform into a butterfly), they spend up to two days hanging from the same spot on a leaf. They eventually emerge from their chrysalises as dark butterflies with vibrant red patches (which fade to orange with age).

Admirals hatch in spring, summer, and autumn, so they can be seen all year, although they are most common in summer. The butterflies have an erratic flight pattern that often begins with an almost vertical take-off. They love sun, and can often be seen soaking up its warmth with fully open wings.

Yellow Admiral/kahu kowhai (*Vanessa itea*)

Yellow Admirals/kahu kowhai are indigenous to New Zealand, but are also found in Australia, and on Norfolk and Loyalty Islands. They typically prefer to live in open areas, but, like the Red Admirals/kahukura, they will live wherever there are nettles on which to lay their eggs. Yellow Admiral butterflies are much more likely to be seen in urban areas than red admirals and they appreciate similar species of flowers. Their caterpillars are also completely reliant on nettle plants, but actually prefer exotic nettles to the native ones, although they are also quite fond of native New Zealand Scrub Nettles.

The lifecycle of Yellow Admirals is quite similar to that of the Red Admirals, except that they are less common in spring than the Red Admirals because half their population overwinters as larvae which then emerge as butterflies in the autumn.

Yellow Admiral caterpillars are paler than Red Admiral caterpillars when they emerge, although they too change colour as they moult to match their surroundings. Yellow admirals also have different wing patterns (most notably their yellow rather than red patches) and are slightly smaller with a 45-55mm wingspan as opposed to the 50-60mm wingspan of the Red Admirals. They also tend to have a less erratic flight pattern than their Red brethren.

Long-tailed Blue (*Lampides boeticus*)

In New Zealand, long-tailed Blues are self-introduced, naturalised butterflies. They are quite widespread worldwide and are also found in Europe, Africa, Asia, Australia, and various Pacific Islands. In New Zealand, they typically reside across Northland, and can be found on the northern South Island, especially around Nelson. They prefer open habitat, although they live wherever larval food plants (particularly various species of legumes including gorse) are growing.

Long-tailed Blue butterflies generally lay their eggs individually on unopened flower buds. When they first hatch, caterpillars are pale yellow, but they quickly turn green or pink-brown. The caterpillars burrow into and eat immature flower buds and seeds. They are opportunists and cannibals, and if they run out of food, they will either pupate early, or eat other caterpillars of their own kind. They are 13-16mm when fully grown. The caterpillars either form chrysalises or pupate inside seed pods. If they pupate in a seed pod, they must wait to emerge until the pod bursts—a wait that can last anywhere between 2 weeks to a year.

Long-tailed blue butterflies are considerably smaller than Admirals with an average wingspan of 28-30mm. Males look fairly different from females, sporting mostly blue upper-wings with brown edges as opposed to the female's predominately brown wings with blue colouring toward their bodies. Both males and females possess eyespots and tails which they move up and down when resting, creating the appearance of a false head which is thought to distract predators. They usually fly fairly high in the air (over 1m above the ground) and have a rapid, jerky flight pattern. Females generally hang out fairly close to their food plants, while males often venture further away.

New Zealand's other native Blue butterflies are the Common Blue and the Southern Blue. The endemic **Southern Blue** (*Zizina oxleyi*) occurs on the eastern South Island from North Canterbury south to Central Otago whereas the abundant Common Blue (*Zizina labradus*) is found along the West Coast, Nelson, Marlborough and throughout the North Island. The caterpillars of both species feed on legumes, especially the introduced clovers and medics, which grow along roadsides and on gravel wasteland and riverbeds.

Rauparaha's Copper/mokarakare (*Lycaena rauparaha*)

Rauparaha's Copper/mokarakare butterflies are New Zealand natives. They acquired their European name, Rauparaha, because they lived along the same coastal regions as Te Rauparaha, a rangatira (chief) and war leader of Ngāti Toa. They live mainly along coastal dunes, although they can be found wherever their food plants grow. Their caterpillars eat mainly Wire Vine/pohuehue and Creeping pohuehue.

Less is known about their lifecycles than some of New Zealand's other butterflies. They lay their eggs along the bottom edges of leaves. Their caterpillars are velvety green and move very slowly. Unlike most caterpillars, they pupate on the ground amongst dry leaf litter. They overwinter in a state of either diapause or quiescence which slows the insect's metabolic rate, allowing it to survive the colder weather. In Coppers, this is thought to be in part a means of adaptation to the seasonal unavailability of their partially deciduous food plants. Neither Rauparaha's Copper nor the North Island Glade Copper typically travels more than 20-50 metres from their larval food plants, making it particularly necessary to have plants that both the caterpillars and the butterflies eat near each other.

Rauparaha's Copper butterflies are about the same size as Long-tailed Blue butterflies with a wingspan of 25-31mm. Their wings are iridescent coppery-orange with black lines running along the wing veins. They usually fly close to the ground with a rapid, jerky flight pattern.

Coastal Copper

In the wild, Coastal Copper has only been recorded feeding on Pohuehue and Creeping Pohuehue (species of *Muehlenbeckia*). The coastal North Island Copper is extremely abundant and widespread in suitable habitat. It is found on sand-dunes and rocky coasts wherever large patches of *Muehlenbeckia* grow. They can be found on Waiheke Island, Bethells Beach, Bastion Point, Wenderholm and little Huia. They are abundant from late October through till April.

Glade Copper/Pepe Para Riki (*Lycaena feredayi*)

Glade Coppers/Pepe Para Riki are native New Zealand butterflies usually found in forest glades, gullies, and along waterways, but they will live wherever larval food plants are present. They range from South of Auckland to the Western side of the North Island, and can be found throughout the South Island. Their only recorded larval food plant is the Large-leafed Pohuehue (*Muehlenbeckia australis*) although it

is likely caterpillars will eat other species of Pohuehue as well. Like Rauparaha's Coppers, adult Glade Coppers don't typically travel more than 50 metres from their larval food plants.

When glade coppers hatch they are yellow-green, but quickly turn leaf-green with small white spots and reddish hairs. They grow up to 14mm. Glade Coppers eat the same partially deciduous food plants as Rauparaha's Coppers and are thought to slow their metabolic rate over winter. Unlike New Zealand's other species of Copper butterflies, Glade Coppers pupate in tents of leaves held together by silk rather than building a typical chrysalis.

They are about the same size as Rauparaha's Coppers but have broader black markings on their wings than do other coppers with a particularly distinctive triangle on their lower wings near their bodies. They are curious butterflies and will often abandon their posts on branches to investigate other butterflies that flutter past before returning to the vegetation.

There are two other native species of Copper Butterflies in New Zealand: The **Boulder Copper** and the **Common Copper**. The Boulder Copper is found throughout the South Island and on the central part of the North Island, while the Common Copper is found across the whole country.

THE PLANTS

The easiest way to attract native butterflies to your garden is to plant a variety of food plants for caterpillars and nectar plants for butterflies. The following plants are some of the best plants to attract Admiral, Blue, and Copper butterflies.

Plants for Caterpillars

It is best to place larval plants in clumps of at least three or four. Otherwise, voracious caterpillars may quickly eat all the leaves from one plant and end up stranded on an island of bare twigs.

Nettles

Admiral caterpillars require stinging nettles to breed. Three native kinds of nettles will attract red admirals: Tree Nettle or Onga Onga (*Urtica ferox*), Chatham Island Nettle (*Urtica australis*), Scrub Nettle or Pureora (*Urtica incisa*). *Urtica incisa* can be used to brew an herbal tea and is perhaps the most appealing nettle with small, heart-shaped leaves. But don't be fooled by its small stature! Like its larger relatives, *Urtica incisa* has a powerful sting, and must be approached with care.

Red Admiral caterpillars will eat most native and non-native nettles, but the eggs are laid almost exclusively (with the exception of a Scrub Nettle or two) on native Nettles. Yellow admirals prefer the non-native kinds including Common Stinging Nettle (*Urtica dioica*) and Annual or Dwarf Nettle (*Urtica urens*).

All of these nettles grow best in damp, semi-shady areas and loamy, nitrogen-rich soil. Chicken-coops, or farms often provide the high-nitrogen levels they need, so they're commonly found around these areas. Top dressing the nettles with sheep pellets from a nursery helps to create this high nutrient environment. Admirals locate nettles by following the trail of oils that they produce. For this reason, it is best to plant a patch of nettles (~4m² is a good size) that is free of any other butterfly plants because scents of other plants can overpower the volatile cues the butterflies follow.

TAKE CARE with these nettles: all of them have vicious stings, and it is best to wear thick gloves when handling or planting them.

A more comprehensive guide to nettles can be found here:

www.monarch.org.nz/monarch/wp-content/uploads/2009/10/a-beginners-guide-to-nettles.pdf

Legumes

Blue butterfly caterpillars are restricted to plants in the legume family (*Fabaceae*) including New Zealand Broom, Gorse, clover, and pea plants. All but one species (*Carmichaelia exsul*) of New Zealand Broom are native but most are without normal leaves and hence little use for butterfly caterpillars. Longtail blue caterpillars are normally found inside the flowers of non-native legumes including Peas (*Pisum sativum*), Sweet Pea (*Lathyrus odoratus*), Broad Bean (*Vicia faba*), Gorse (*Ulex spp*), Vetch (*Vicia spp*), Lupin (*Lupinus spp*), Tree Lucerne (*Chamaecytisus palmensis*) and members of the Rattlepod family (*Crotalaria spp*).

***Muehlenbeckia*/Pohuehue**

Pohuehue is a hardy, twining or climbing native plant with rounded leaves and small, white flowers. It grows best in full sun or semi-shade and grows well in dry, rocky areas and inclines. Common Copper caterpillars enjoy munching on 3 different species Pohuehue: Wire Vine or Pohuehue (*Muehlenbeckia complexa*) characterised by its small round leaves, Large-leafed Pohuehue (*Muehlenbeckia australis*) a climber with larger heart-shaped leaves, and Creeping Pohuehue (*Muehlenbeckia axillaris*) which has very small leaves and grows amongst loose shingle.

Nectar Plants for Butterflies

Hebe

Butterflies are attracted to flowers of Hebe, a genus of plants that is native to New Zealand.

Great Orme hebe, the Midsummer Beauty hebe, the Sapphire hebe, Purple Queen hebe, *Hebe salicifolia* and *Hebe stricta* (Koromiko) are all favoured by Red Admirals, Yellow Admirals and Coppers.

Hebes are evergreens that like sunny areas with some shelter from the wind.

Lacebark/Houhere

Admiral butterflies find Lacebark particularly tasty. Lacebark is a small native tree with green serrated leaves and elegant clusters of white flowers. It grows best in sun or semi-shade and well-drained soil. It is best if lacebark is germinated in autumn and grows in a shaded environment during its first winter.

Flowers in the non-native genus **Heliotropum** (heliotropes) are favoured by Admirals. The best varieties usually have purple flowers.

Other non-native species that are good for attracting butterflies include: *Buddleia* (Butterfly Bush), *Monarda* (Bee Balm), *Rudebeckia* (Black-eyed Susan), *Echinacea* (Corn Flower), *Solidage* (Goldenrod), *Eupatorium fistulosum* (Joe Pye Weed), Single petal varieties of *Tagete* (Marigold), *Tithonia* (Mexican Sunflower), *Phlox*, *Dianthus* (Sweet William), *Sedum*, *Verbena*, *Alyssum* (White Alyssum), *Zinnia*, and *Syringa vulgaris* (Lilac), and *Leucheria suaveolens* (Vanilla Daisy).

THREATS

Parasitism, predation, and habitat loss are the key threats to our native butterflies.

Habitat Destruction

Our native butterflies rely on key plant species for their survival during the larval stage, so the removal of certain plants can sound the death knell for certain species. Unfortunately, many plants that are appropriate food plants are also considered weeds. For example, *Muehlenbeckia*, which Copper caterpillars rely upon, was until recently commonly removed from urban areas because it was seen as a tripping hazard or an unsightly vine which sprawled over 'more attractive' shrubs. And nettles – which are essential for the survival of Admiral caterpillars – are distinctly unfriendly stinging plants to have in a garden or public place. Understandably, many of these have been removed, but the butterflies are suffering for it. Educating people about why these plants are important as well as planting them in safe places will allow native butterflies to thrive once again.

Wasps

Wasps can be serious predators of butterfly caterpillars. The yellow and black European wasps (*Vespula*) are widespread and especially common in the Nelson-West Coast region. The brownish Australian paper wasp (*Polistes humilis*) and the more recently arrived black and yellow Chinese paper wasp (*Polistes chinensis*) likewise feed regularly on caterpillars.

There are also at least three species of parasitic wasps and one species of parasitic fly in New Zealand that are a problem for native butterflies. The wasps infect their hosts by laying their eggs inside the caterpillars or. The caterpillar is eaten from the inside and usually dies when about to form its chrysalis.

The flies lay their eggs onto the leaves of their foodplant so that the caterpillars eat the fly eggs, eventually these fly larvae eat the caterpillars from within.

There is not a lot known about the parasitic fly, although a Tachinid fly of the genus *Pales* has been documented as a parasite of Glade Copper caterpillars. Two species of wasp, the Chalcid Wasps (*Pteromalus puparum*), and *Apanteles glomeratus*, that were introduced as a biocontrol agents to decrease numbers of the white cabbage butterfly, however they began to parasitize native butterflies too.

The White-spotted Ichneumon (*Echthromorpha intricatoria*) a self-introduced wasp species from Australia, parasitizes the chrysalis of Admiral butterflies and accounts for many deaths of these butterflies. Parasites are a natural and necessary part of any ecosystem, but coupled with habitat loss and the introduced wasps, parasitism can take a heavy toll on the already strained butterfly population.

Other Threats

Many of the native butterflies were also taken out by the aerial spraying that occurred in the 80s and 90s aimed at removing moths that were eating pine tree and timber crops.

WHAT YOU CAN DO

Native butterflies need their larval food plants. They cannot exist in places where the plants are missing. Thus, creating a butterfly-friendly district is easy.

It's simply a matter of planting key food plants, and encouraging your local authorities to do the same in nearby parks and gardens.

If you would like to create a butterfly friendly area, please contact Rob Jones at rob.jones@xtra.co.nz. He will get the plants to you for only a small koha.

It is also possible to protect some of the butterflies from parasitic wasps by building breeding boxes, removing wasp nests, or covering food plants to keep the caterpillars out of harm's way.

A good set of guidelines can be found here: <http://www.forestandbird.org.nz/get-involved/backyard-projects/how-breed-admiral-butterflies>.

Wasps are mainly active during late spring and early autumn, so it is best to bring older caterpillars or pupae indoors during this time. Winter broods can usually fend for themselves as wasp numbers are very low during the colder months.

If you are proud of your butterfly garden and would like to encourage others to establish butterfly habitat as well, you can have your backyard certified and receive a special plaque.

For more information please visit:

<http://www.monarch.org.nz/monarch/projects/certified-butterfly-gardenhabitats/>.

