

# Bright-eyed Brown

*Heteronympha cordace wilsoni* (Burns)



## Interesting Aspects

This pretty butterfly belongs to a generic group of very interesting endemic satyrs.

The genus contains species such as the highly evolved [Common Brown](#) (*Heteronympha merope*) to the Bright Eyed Brown that retains some very primitive characters, and which is a more isolated member of the genus. Each species in the group has a number of unique but divergent morphologies.

Both sexes of adult *H. cordace wilsoni* are similar in appearance, and difficult to tell apart. The females often have a very small ocelli (eye-spot) in the apical (anterior) portion of the hindwing, the tornal (posterior) ocelli is better developed and usually present on the underside, and sometimes there are 1-2 small white spots in the underside hindwing postmedian area between the ocelli. The males do not have sexmarks on the wings that are present in the males of other species of *Heteronympha*. In other subspecies of this butterfly the wing ocelli are large and well developed, particularly the hindwing ocelli, and this feature has given rise to its common name. The local subspecies *wilsoni* has very pale coloured hindwing undersides with nil or poorly developed ocelli. The pale colour has probably developed as a thermoregulation feature as the butterfly lives in a much warmer habitat situation than the elevated cold mountain areas of the Great Dividing Range and Tasmania where the other subspecies occur. Like most satyrs, the wing undersides are cryptically camouflaged and it is sometimes difficult to detect these butterflies when they are settled with wings closed and erect, owing to their close resemblance to dead leaf and plant debris.

Both sexes usually remain close to the hostplant, but periodically they will disperse long distances in an attempt to find new habitat or their opposite sex. Early in the day they spend much of their time settled with wings fully open to absorb the warmth of the sun, but once warm they seek out low growing nectar flowers for food. The males then begin to attempt to seek out new females for mating. The females start to look for places to lay eggs late in the morning after they are warmed and fully fed. The adults have a slow flight below 1 m, either just above their tussock *Carex* hostplants or they meander in amongst the hostplants, settling frequently.

The butterflies are easy to approach, and if disturbed usually only fly a short distance before resettling.

In the field, this butterfly can be easily confused with the common, similar sized butterfly *Geitoneura klugii*, particularly worn females of the latter, which have a similar slow fluttery flight. The Bright Eyed Brown can be distinguished by having a much more prominent ocelli spot in the tornal part of the hindwing and the prominent yellowish ground-colour of the hindwing underside (normally grey in *G. klugii* but sometimes females can also be yellowish, although never as prominent as *H. cordace wilsoni*).

# Life History

How a butterfly grows into an adult. How a butterfly grows into an adult.

## Larval Food Host

## Eggs

## Larvae

## Pupae

## Flight Period in South Australia

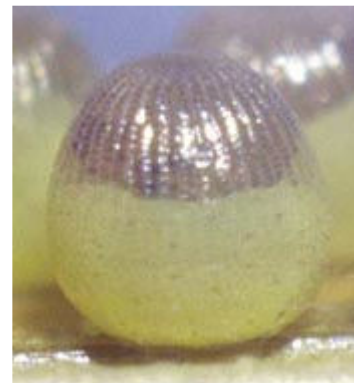
## Distribution

## Habitat

## Conservation Status in South Australia

## Threats

## Conservation Strategy



Further more determined surveys for this butterfly in southwest Victoria (where the remnant *Carex* swamps are more extensive) are urgently required to determine if the butterfly still exists in that area. A conservation strategy is required between South Australian and Victorian Threatened Species authorities to protect the probable last known remaining population area of the butterfly, and to instigate a repopulation of the butterfly into known secure areas of habitat. Such areas need to be secured from future degradational impacts. Dedicated areas revegetated to the *Carex* hostplant may be required to secure this butterfly. The butterfly is adaptable to small areas of habitat. The control of mosquitoes in remaining broad-acre wetlands through the use of broad spectrum insecticides needs to be judiciously controlled, but preferably should cease, as it can be a major cause of fauna destruction.

Interestingly, this butterfly has recently made an amazing recovery, from the belief that it was likely extinct, yet during 2005 it suddenly reappeared at its old fragmented haunts in both western Victoria and southeast South Australia, although its numbers during 2007-2008 have again severely declined!

## Larval Food Host

Documented natural hostplants are *Carex* species including *C. appressa* (tall sedge), *C. fascicularis*, *C. gaudichaudiana* (Cyperaceae). In captivity, immature larvae prefer to eat **wetland grasses** (Poaceae) including *\*Ehrharta erecta* (panic veldt grass), *Microlaena stipoides* (weeping rice-grass) and *\*Poa pratensis* (Kentucky blue-grass). However, even though the larvae will eat grasses, limited observations suggest a diet solely of grass is ultimately toxic to the larvae, just as some grasses may be less toxic than others. The presence of *Carex appressa* may be a necessary obligatory stimulus for egg laying even though the larvae may not always eat the plant.

## Eggs

Small, pale greenish yellow, subspherical, flattened basally, shiny but with numerous (35-40) indistinct, very fine, vertical ridges in the upper portion. The lower portion is very finely dimpled with irregular facets. The top of the egg is free of ridges and is very finely dimpled with five or six sided facets. The small, circular micropylar area at the extreme top of the egg is smooth with a raised edge. Eggs are usually laid singly, but sometimes also in small groups of two to five, usually on the undersides of the hostplant leaves, but also sometimes on dead leaf debris within the hostplant. The eggs have poor adhesive properties and tend to eventually drop off. Some females may just drop the eggs loose down into the base of the hostplants, which would be detrimental to the eggs if the plants have water around their bases. Eggs dropped intentionally by the females may be intended for multiple hostplants.

Larval development within the egg commences immediately after being laid, and larvae emerge after about 9-11 days in late summer. The eggs require moisture and humidity for development, without which the eggs will often dessicate. This may be the reason the eggs have loose adhesive properties, as the basal parts of the hostplant clump has much better humidity. When ready to emerge, the larva incompletely cuts out a circular area at the top of the egg, leaving a small uncut portion, and then pushes the top out like a hinged lid. The egg shell is then usually eaten by the larva.

## Larvae

The first instar larvae are about 3 mm long, cylindrical shaped, initially pale greenish yellow, but after eating the green leaves of the hostplants the larvae acquire a green colour, with darker dorsal and subdorsal lines. The head is shiny, large, round and dimpled, with some short white setae. Initially the head is brown to dark brown but it gradually becomes darker as the larva grows and is black by the end of the first instar. There are scattered short, black simple setae along the body that are not knobbed at their ends. The posterior end of the larva is not divided in the first instar.

The second instar is green with longitudinal yellowish dorsal, subdorsal and lateral lines, and black lateral spiracles. There are some pale, simple, secondary setae, that are bent and pointed, and the posterior end is weakly divided. The head is round, with a very fine granular surface, with some very short bristly pale setae. It is dark brown coloured approaching black in some specimens, with the odd white dot, and there are a prominent dorsal pair of white triangular marks. The third instar is similar to the second instar, except there is dark sublateral line along its posterior part. The head is flattened on top, brown with pale lateral dorsal and lateral markings, and the posterior end is noticeably divided and pink or brown coloured.

The fourth instar is either green, greenish brown or pinkish brown, with pronounced darker dorsal and subdorsal longitudinal lines, the head is brownish green or brown with paler markings.

The mature fifth instar larvae are cylindrical shaped, tapering anteriorly and posteriorly, slightly flanged laterally, about 25 mm long. The body is without long hairs, but bears numerous short pointed secondary setae imparting a rough scabrous appearance. The larvae occur as various colour polymorphs, being either green, greenish brown, or brown, with a darker dorsal line and finer dark subdorsal lines, and a blackish lateral line. The dorsal areas are usually paler than the lateral areas. The head is large, dark reddish brown coloured with paler markings, very finely rugose, and slightly concave dorsally with a pair of vestigial horns. The rear end has a short fork.

The immature larvae nibble the leaf edges of the hostplants, but later instars devour entire leaves. Larvae generally hide around the base of the hostplant during the day, hiding within the leaves or within debris caught within the plant, coming out at night to feed. The latter

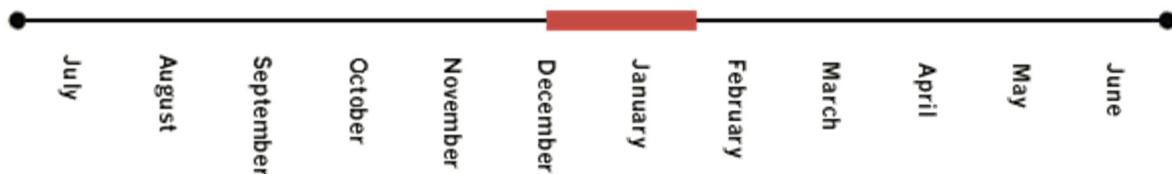
larvae emerge soon after sunset to climb the hostplant, and move very slowly. If disturbed while feeding, the larvae may release their hold on the grass and drop to the ground, remaining rigid for some time in whatever position they were in at the time of the disturbance. This can be terminally dangerous for the larvae as during winter the hostplants are often standing in shallow water. If the hostplants have a few dead leaves, then both green and brown larvae are extremely well camouflaged on the hostplant and very difficult to detect. The larvae pass quickly through the first three instars during late summer and autumn, then grow slowly through winter as the fourth instar. Pupation takes place at the end of the fifth instar in late spring and early summer.

### Pupae

Short, stout, nearly smooth, about 13 mm long, generally rounded anteriorly and posteriorly, although the head is wedge shaped anteriorly and slightly concave without horns, there is an indistinct thoracic keel, and the pupa is slightly ridged laterally at the thorax-wing junction, the wing joints are protuberant, and the cremaster is short and spinose. Green coloured, with pale yellowish wings, cryptically marked with black spots, especially on the head, wings and lateral ridge, and there is a series of subdorsal black spots on the abdominal segments edged posteriorly with white, and the dorsal keel is outlined with white. The pupa is suspended head downwards by the cremaster, and pupation usually takes place within the congested lower parts of the hostplant, but sometimes on adjacent plants or objects. The pupal duration is variable, being generally longer in the cooler months or areas, and varies from 25-38 days.

### Flight Period in South Australia

Only one brood a year, with a normally short flight period from mid December to early February, although there are also single records for mid November and early March. Like most single brooded satyrid butterflies, the males start flying earlier in the season than the females.



### Distribution

In South Australia, this butterfly is known to occur only in the extreme southeast corner of the Lower Southeast Region of the state. Historically, its distribution may have been more extensive before the clearance and degradation of its *Carex* habitat. *Carex* is actually widespread in its distribution in South Australia, but the early stages of the butterfly require moist, cool temperate conditions for survival, being limited to areas with annual rainfall in excess of 600 mm. The local subspecies of the butterfly also occurs in the adjacent parts of western Victoria, in the *Carex* bogs and swamps associated with the pristine portions of the Glenelg River drainage basin. Elsewhere on the Australian mainland, the butterfly occurs as the nominate subspecies and exists throughout the cooler, damp areas of the Great Dividing Range in Victoria, and extending through the ACT as disjunct elevated populations to northern NSW. Three other subspecies occur in Tasmania.

The species is morphologically variable, and in the eastern state localities the disjunct butterfly populations can have different wing-pattern morphologies.



### Habitat

The butterfly occurs in *Carex* wetlands that are fed either by permanent freshwater springs, or in low lying areas having permanently high water tables, or associated with the Glenelg River and its tributaries. The adults cannot tolerate very hot open areas, and need shade during hot days. It often flies with the moth [Chrysolarentia conifasciata](#), which is recognised as requiring sub-alpine habitat! In South Australia, this race is therefore essentially restricted to a combination of *Carex*, *Gahnia clarkei* and reed wetlands with peripheral *Melaleuca* and tea-trees (*Leptospermum lanigerum*), a habitat that provides guaranteed moisture and shelter. The presence of *Carex* provides enough open-ness for the growth of grasses, the likely primary hostplant of the butterfly. This habitat is also required by other rare or threatened butterfly species in the region, particularly satyrs, such as [Hesperilla idothea](#), [Oreixenica kershawi](#), [Oreixenica lathoniella](#) and [Tisiphone abeona](#).

### Conservation Status in South Australia

The local subspecies *wilsoni* is Endangered **and forms part of the Butterflies on the Brink group (Geyle et. al. 2021) which have the potential to become extinct in the next 20 years**. A small colony of the butterfly was **observed** during the 2004-2005 flight season (Haywood & Natt, 2006), prior to **this** it had not been **observed** since 1976. This colony is maintaining a precarious presence in South Australia where only one small colony is still known to exist. It was last documented in western Victoria in 1980, **however encouragingly observations have occurred more recently in this region** Other subspecies are locally common in the eastern states and Tasmania where its preferred habitat is more extensive.

### **References**

Geyle, H. M., Braby, M. F., Andren, M., Beaver, E. P., Bell, P., Byrne, C., Castles, M., Douglas, F., Glatz, R. V., **Haywood, B.**, Hendry, P., Kitching, R.L., Lambkin, T. A., Meyer, C. E., Moore, M. D., Moss, J. T. Nally, S., New, T. R., Palmer, C. M., Petrie, E., Potter-Craven, J., Richards, K., Sanderson, C., Stolarski, A., Taylor, G. S., Williams, M.R., Woinarski, J. C. Z., and Garnett, S. T. (2021). Butterflies on the brink: identifying the Australian butterflies (Lepidoptera) most at risk of extinction. [Click here](#) for *Austral Entomology* article.

Haywood, B. T. and Natt, V. (2006). First confirmed observation of *Heteronympha cordace wilsoni* Burns (Lepidoptera: *Nymphalidae*: *Satyrinae*) in South Australia. Australian Entomologist, **33** (1), pp5-7.

### Threats

In the southeast of South Australia, nearly all the *Carex* bogs and swamps have long ago been cleared, drained and degraded. *Carex* swamps still occur in the adjacent parts of Victoria, but they have become severely fragmented, and a terminal degradation of any *H. cordace* population in any of these swamps by either burning, poison spraying, clearing or stock overgrazing can no longer be repopulated by normal dispersal of the butterfly.

The mouth of the Glenelg River has periodically been allowed to silt up, causing the water level of the back reaches of the river to become higher and causing the *Carex* habitat along the edges of the river to become flooded, to the detriment of the early stages of the butterfly. The Glenelg River is in a miserable condition, due to past farming and urban practices that have allowed the banks and adjacent areas of the river and its tributaries to become severely degraded. Many *Carex* swamps are adjacent to timber plantations and are therefore subject to poisonous spray drift from the aerial applications of insecticides and herbicides used to protect the plantations during the early stages of their growth. Historically these swamps were also used to graze stock and usually such areas were drained and periodically burnt off to promote succulent vegetal regrowth for the stock, all to the detriment of the butterfly.

Small fragmented areas of *Carex* can also be colonised by the Spiny Spider (Jewel Spider) (*Austracantha minax*). These small spiders live together in communal groups that can sometimes be very large, having the ability to construct overlapping webs that can completely enshroud the tops of the *Carex*. Without animal activity, either stock or kangaroo, these webs can create a terminal death-trap for a *H. cordace* population should it occur or attempt to recolonise.

### Conservation Strategy

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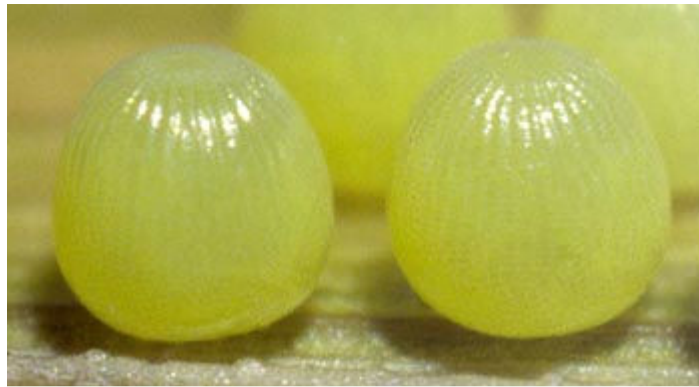


# Gallery

Check out how butterflies look like at different stages.



*Adults*



*Eggs*



*Larvae*

