



Whites and yellows

(Pieridae)

7

White Migrant

Catopsilia pyranthe (Linnaeus, 1758)



Plate 56 Canberra, ACT
Photo: Richard Allen



Plate 57 Canberra, ACT
Photo: Stephanie Haygarth

Distribution

This species is represented in the study region by the subspecies *C. pyranthe crokera* (W. S. Macleay, 1826). It occurs widely in the region, mostly in areas that receive less than 1,300 mm mean annual rainfall. It is particularly common in the semi-arid zone, but less common in the northern parts of the range (north of latitude 14°S). It is rare in the north-western coastal areas of the Top End (Dundee Beach–Darwin–Gunn Point), where it occurs very irregularly during migration/temporary range expansion (Braby 2014a). The putative native larval food plants (*Senna* spp.) occur widely in the semi-arid areas of northern Australia, and their combined spatial distribution corresponds well with the geographic range of *C. pyranthe*. Outside the study region, *C. pyranthe* occurs widely from India, southern China and South-East Asia to eastern Australia.

Habitat

The breeding habitat of *C. pyranthe* has not been recorded in the study region. Adults have been collected mainly in savannah woodland and they undoubtedly breed in this habitat.

Larval food plants

**Senna occidentalis* (Fabaceae: Caesalpinioideae); probably *Senna planitiicola* and *S. venusta*, which are two native food plants in Queensland (Braby 2000). The native food plants have not been

recorded in the study region, but the immature stages have been reared on cultivated *S. occidentalis* at Berrimah Farm near Darwin, NT (M. Neal), and on an undetermined species at Tennant Creek, NT (C. Materne).

Seasonality

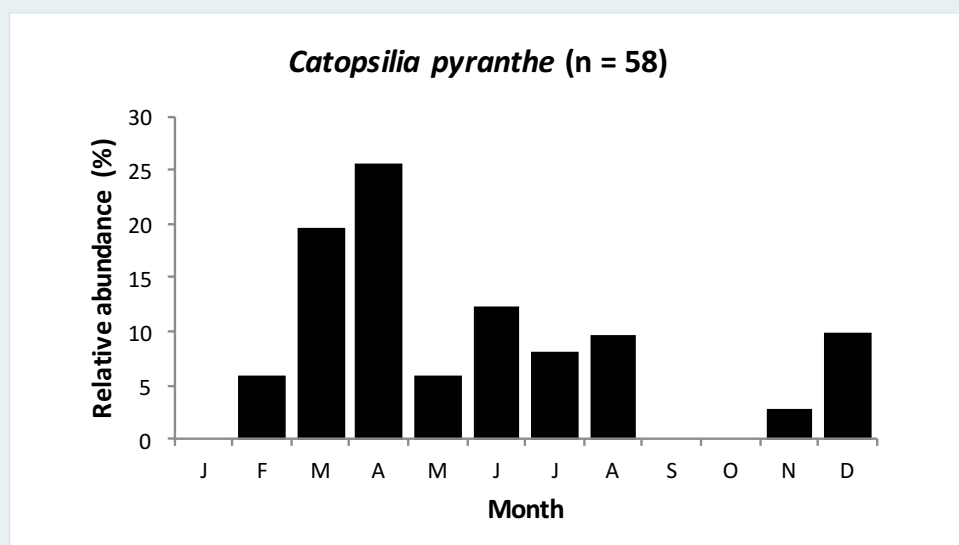
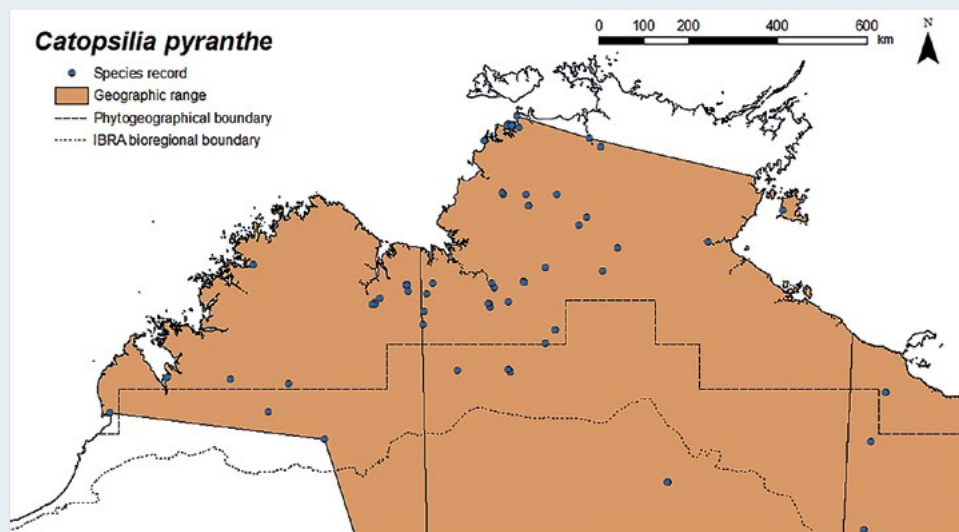
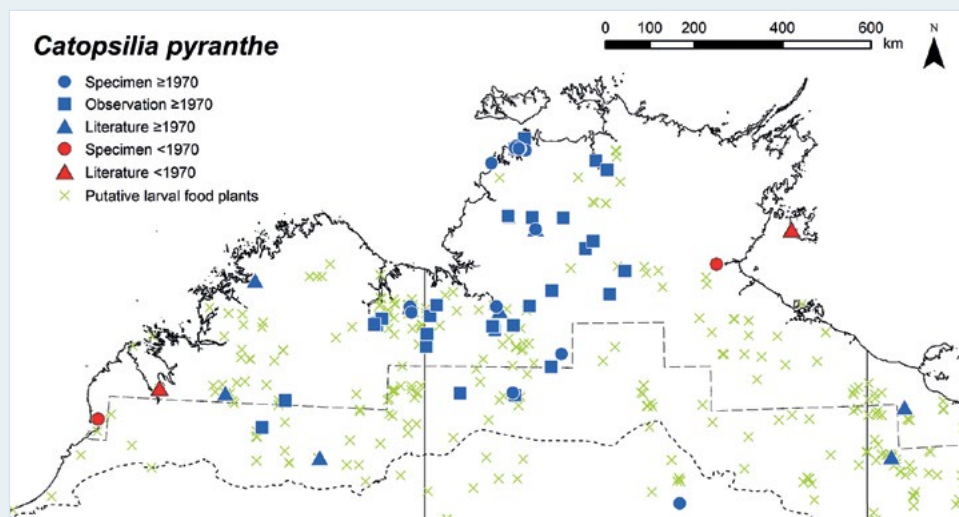
Adults have been recorded sporadically during the year, but they are most abundant during March and April following good wet seasons of average or above average rainfall. The breeding phenology and seasonal history of the immature stages have not been recorded, but it is possible the species breeds seasonally. In the Darwin area and nearby locations—a region in which the species is normally absent—*C. pyranthe* is a rare seasonal visitor, with influxes likely to occur during March and April and less frequently from June to August and in December (Braby 2014a).

Breeding status

This species is assumed to be resident in the study region, but populations appear to be temporary in the northernmost areas of the range.

Conservation status

LC.

[illegible]

Lemon Migrant

Catopsilia pomona (Fabricius, 1775)



Plate 58 Herberton, Qld
Photo: Don Franklin

Distribution

This species occurs very widely in the study region. It extends from the Kimberley, through the Top End to the western Gulf Country, and from moist coastal areas to drier inland areas of the semi-arid zone, as well as the arid zone of central Australia beyond the southern boundary of the study region. The putative native larval food plants (*Senna* spp.) occur in the semi-arid areas of northern Australia, and their spatial distribution corresponds well with the geographical range of *C. pomona*. Outside the study region, *C. pomona* occurs widely from India, southern China and South-East Asia, through mainland New Guinea and adjacent islands to Australia, where it occurs throughout the northern half of the continent.

Habitat

The natural breeding habitat of *C. pomona* has not been recorded in the study region. The species frequently breeds in suburban parks and gardens where the introduced larval food plants are propagated as ornamental trees. Elsewhere, adults have been recorded in a wide variety of habitats in which they undoubtedly breed.

Larval food plants

**Cassia fistula*, **C. siamea*, **Senna alata*, **S. occidentalis* (Fabaceae: Caesalpinioideae); probably *Senna magnifolia* and *S. venusta*, which are two food plants in Queensland (Braby 2000). The native food plants have not been recorded in the study region, but the immature stages are frequently found on introduced *C. fistula* and *C. siamea* in suburban areas.

Seasonality

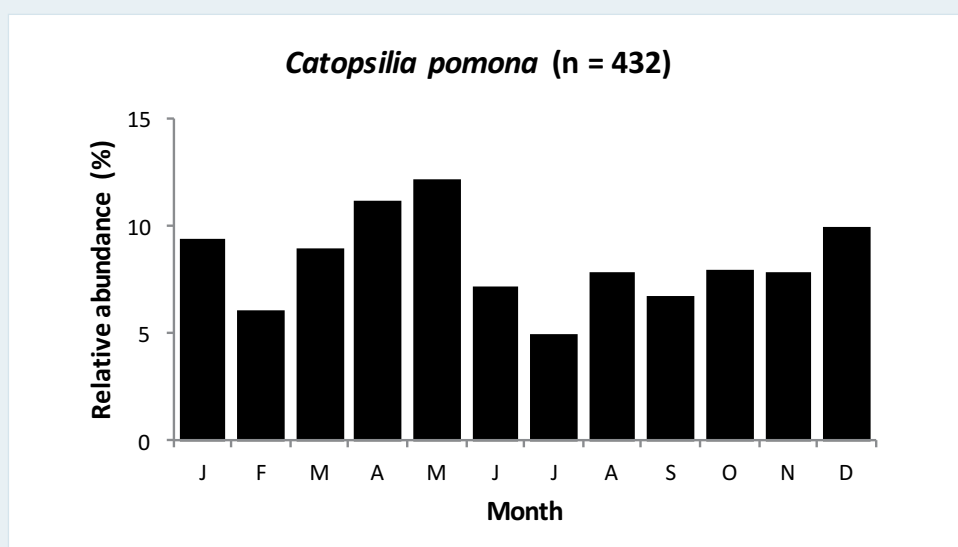
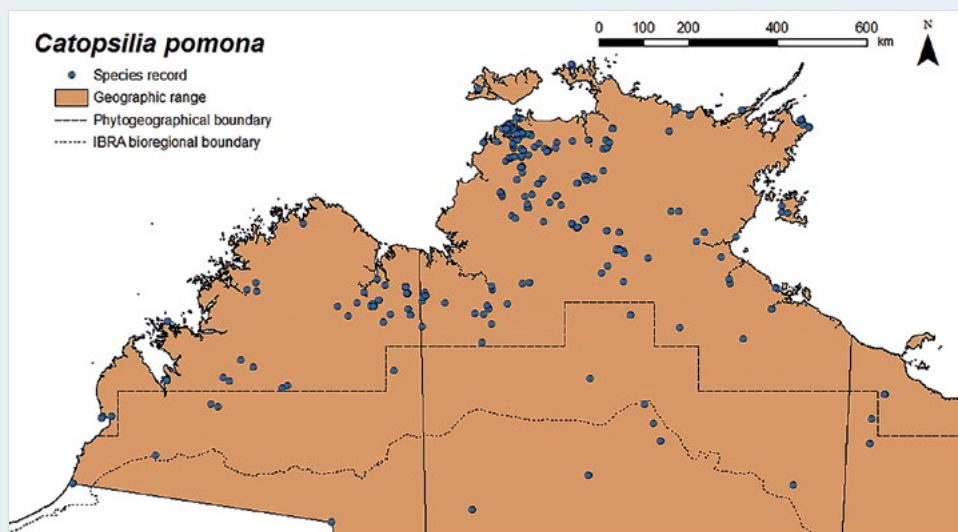
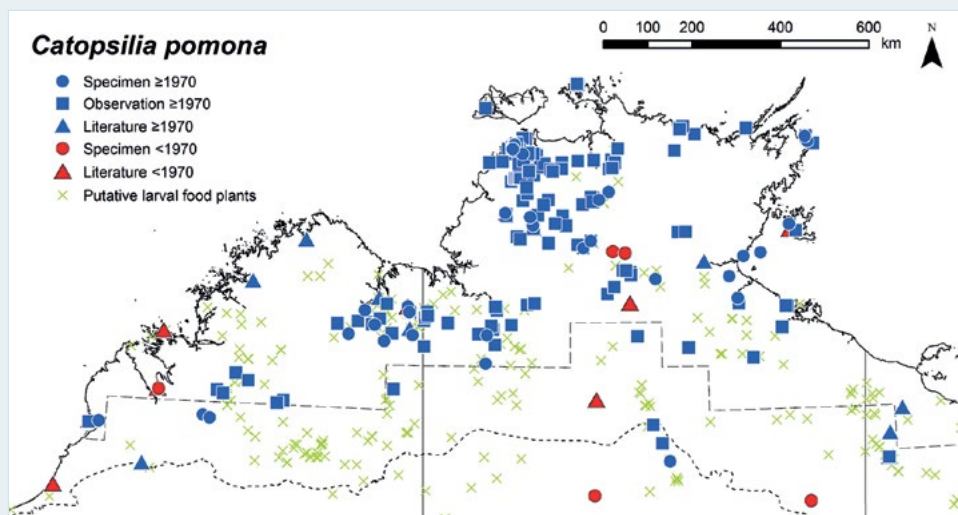
Adults occur throughout the year. They appear to show little seasonal variation in abundance, although they tend to be more numerous after the wet season (April and May) and least abundant during the cooler mid dry season (July), but they are also abundant during the wet season (December and January). Franklin (2011) found similar trends near Darwin, NT, based on quantitative studies conducted over 14 months during 2008–09. At Darwin, NT, the immature stages (eggs or larvae) have been recorded only during the warmer, more humid months (October–April), when the larval food plants produce flushes of new leaf growth. Presumably, the species breeds seasonally and females remain in reproductive diapause during the dry season (May–September), similar to populations in northern Queensland (Jones 1987). Although *C. pomona* a well-known migrant (Smithers 1983b), we have no records of migratory flights in the study region.

Breeding status

This species is resident in the study region.

Conservation status

LC.



Month	J	F	M	A	M	J	J	A	S	O	N	D
Egg			Yellow							Yellow		
Larva		Green								Green		Green
Pupa		Blue					Blue					
Adult	Orange											

Orange Migrant

Catopsilia scylla (Linnaeus, 1763)



Plate 59 Wanguri, Darwin, NT
Photo: M. F. Braby

Distribution

This species is represented in the study region by the subspecies *C. scylla etesia* (Hewitson, 1867). It occurs widely in the region, extending from moist coastal areas to drier inland areas of the semi-arid zone, as well as the arid zone of central Australia beyond the southern boundary of the study region. Its geographic range closely corresponds with the spatial distribution of its larval food plants. There are no records of *C. scylla* from Melville Island and Groote Eylandt, although the food plants occur on these islands; thus, further field surveys are required to determine whether *C. scylla* is present in these areas. Outside the study region, *C. scylla* occurs from South-East Asia, through mainland New Guinea and adjacent islands and central, north-eastern and eastern Australia to Fiji.

Habitat

Catopsilia scylla breeds in a variety of habitats. In coastal areas, it breeds in monsoon vine thicket on laterite or sand dunes where the larval food plant (*Senna surattensis*) grows as a shrub, but in inland areas it breeds in woodland, often on sandstone, where alternative food plants grow as perennial understorey shrubs.

Larval food plants

Senna leptoclada, *S. oligoclada*, *S. surattensis* (Fabaceae: Caesalpinioideae). *Senna surattensis* is the main food plant in coastal areas, but *S. oligoclada* and sometimes *S. leptoclada* are used in the more inland areas.

Seasonality

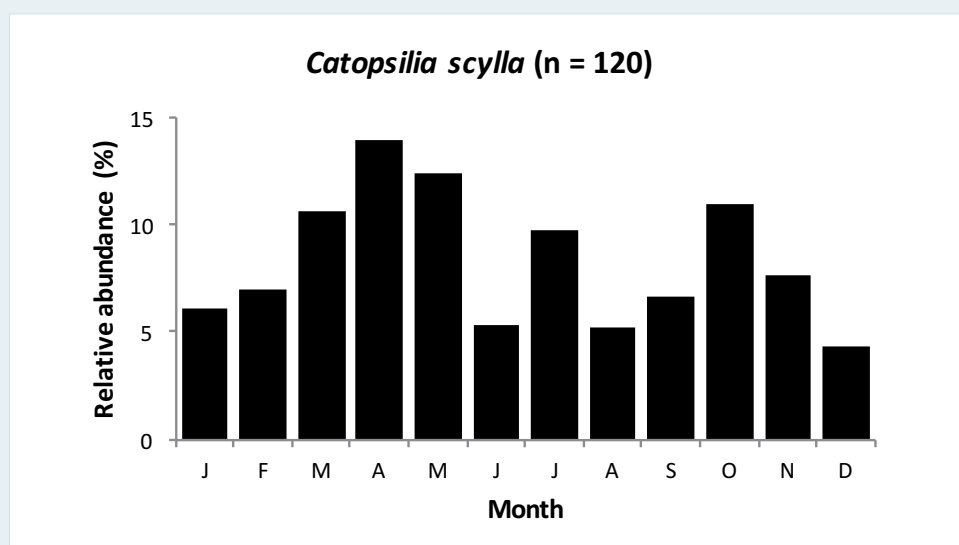
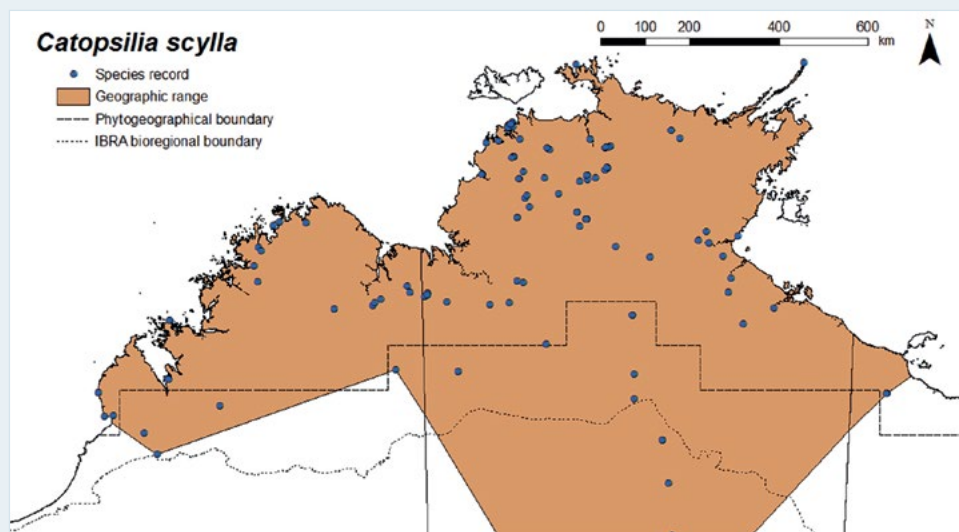
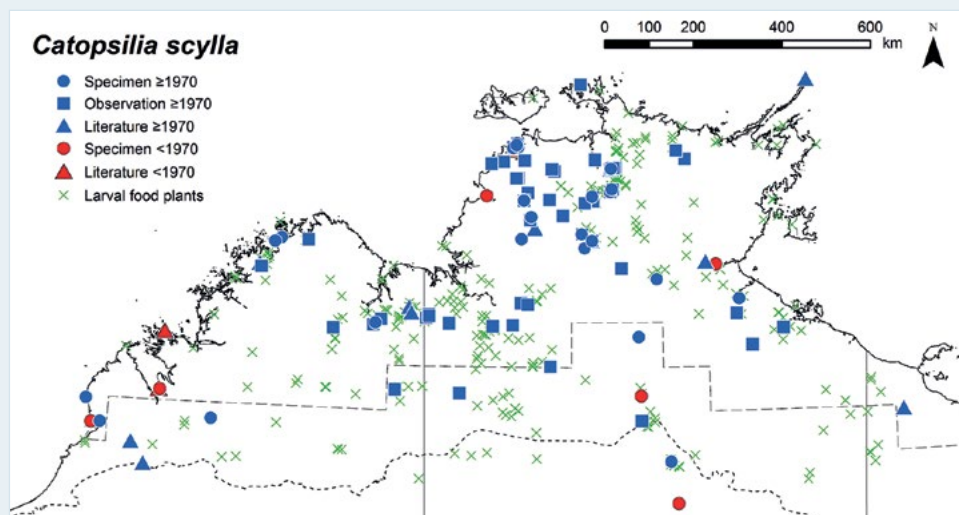
Adults occur throughout the year, but they are most abundant from March to May and again in October, usually after rainfall. At Darwin, NT, breeding is seasonal, with the immature stages (eggs and larvae) recorded mostly around these two periods (i.e. March–May and September–November). Meyer et al. (2006) also noted that the species was seasonal in Darwin, with adults recorded only during the period March–May. It is not clear whether the species breeds at other times of the year, remains in reproductive diapause or the population disperses to breed elsewhere. There appear to be no previous reports of migration or movement patterns for *C. scylla* in Australia. However, on several occasions in the Top End and Northern Deserts, directional flights in which adults were flying rapidly in a constant direction (north, north-east or east) have been observed during April and May (Braby 2016b). Its regular seasonal appearance in Darwin also suggests the arrival of migratory populations.

Breeding status

This species is assumed to be resident in the study region, but populations appear to be nomadic and are possibly temporary in many areas.

Conservation status

LC.



No-brand Grass-yellow

Eurema brigitta (Stoll, [1780])



Plate 60 Big Mitchell Creek, Qld
Photo: Frank Pierce

Distribution

This species is represented in the study region by the subspecies *E. brigitta australis* (Wallace, 1867). It is known from only a single worn female specimen collected from the Wessel Islands (Rimbija Island) in the north-eastern corner of the Top End by E. D. Edwards (Braby 2014a). The putative larval food plant (*Chamaecrista nomame*) occurs widely in the Kimberley and Top End. Outside the study region, *E. brigitta* occurs widely from Africa, India, southern China and South-East Asia, through mainland New Guinea and north-eastern Australia to New Caledonia and Fiji.

Excluded data

Previous records for Darwin (Waterhouse and Lyell 1914; Meyer et al. 2006), Pine Creek (Angel 1951) and Daly River (Hutchinson 1978), NT, are considered to be erroneous (Braby 2014a). Waterhouse and Lyell's (1914) published record for 'Port Darwin' was based on F. P. Dodd's material, but examination of these historical specimens (and additional material from Groote Eylandt by N. B. Tindale) in the AM revealed that several catalogued under the name *E. brigitta* had been misidentified and were actually *Eurema laeta*.

Habitat

The breeding habitat of *E. brigitta* has not been recorded in the study region.

Larval food plants

Not recorded in the study region; possibly *Chamaecrista nomame* (Fabaceae: Caesalpinioideae), which is one of the food plants in eastern Australia (Braby 2016a).

Seasonality

The seasonal abundance and breeding phenology of this species are not well understood. The single specimen was collected on 18 January 1977.

Breeding status

Eurema brigitta does not appear to have become permanently established in the study region. It remains to be determined, however, whether it breeds temporarily on the Wessel Islands or the single individual was a vagrant that dispersed from Cape York Peninsula, Qld, across the Gulf of Carpentaria to north-eastern Arnhem Land.

Conservation status

NA.

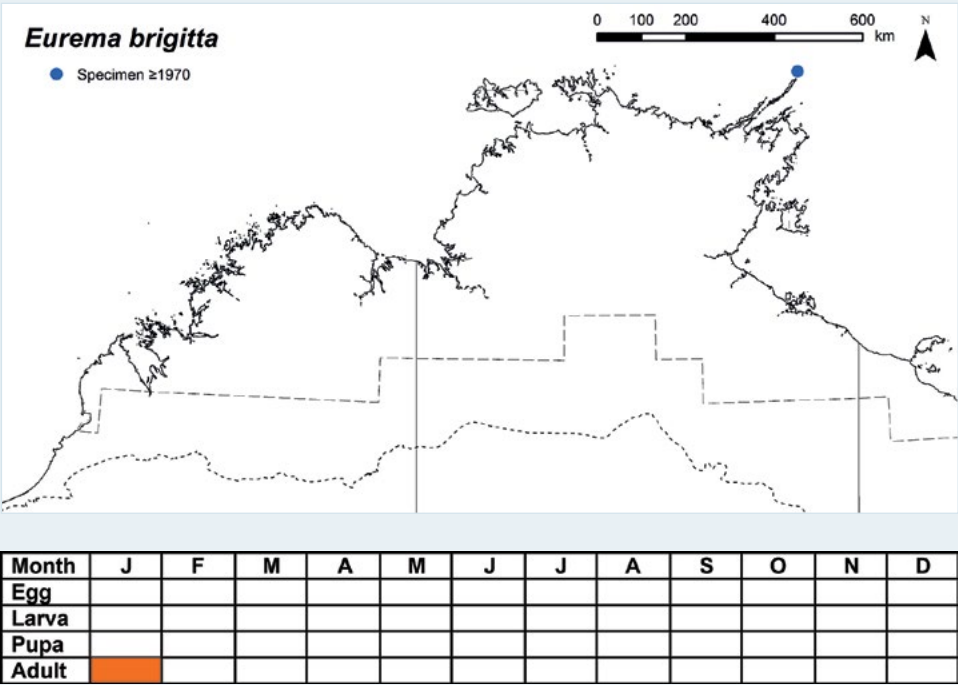


Photo: Dhurputji Gove Peninsula, NT, M.F. Braby

Lined Grass-yellow

Eurema laeta (Boisduval, 1836)



Plate 61 Herbert Lagoon, NT
Photo: Deb Bisa

Distribution

This species is represented in the study region by the subspecies *E. laeta sana* (Butler, 1877). It occurs widely in the Kimberley, Top End and western Gulf Country. It extends from moist coastal areas to drier inland areas of the semi-arid zone (c. 700 mm mean annual rainfall), reaching its southernmost limits in the Buccaneer Archipelago at Koolan Island in Yampi Sound (Koch and van Ingen 1969; McKenzie et al. 1995) and El Questro Wilderness Park (Pentecost River crossing) (Braby 2012b), WA; Judbarra/Gregory National Park (Limestone Gorge) (Braby and Archibald 2016) and Bessie Spring (Dunn and Dunn 1991), NT; and 60 km north-west of Doomadgee, Qld (Puccetti 1991). The putative larval food plants (*Chamaecrista* spp.) are widespread in northern Australia and their overall extent includes the geographic range of *E. laeta*. Outside the study region, *E. laeta* occurs widely from India, southern China, Japan and South-East Asia (although it is absent from the Malay Peninsula, Borneo and parts of Indonesia), through mainland New Guinea to north-eastern Australia.

Habitat

The breeding habitat of *E. laeta* has not been recorded in the study region. Adults occur in a wide variety of habitats, especially savannah woodland, in which they undoubtedly breed. During the dry season they typically aggregate in the ground layer of moister habitats, such as riparian woodland, paperbark forest and monsoon vine forest along the banks of creeks and rivers or in semi-deciduous monsoon vine thicket on rocky outcrops and breakaways.

Larval food plants

Not recorded in the study region; probably *Chamaecrista* spp. (Fabaceae: Caesalpinioideae), which are the food plants in eastern Queensland (Braby 2000, 2016a).

Seasonality

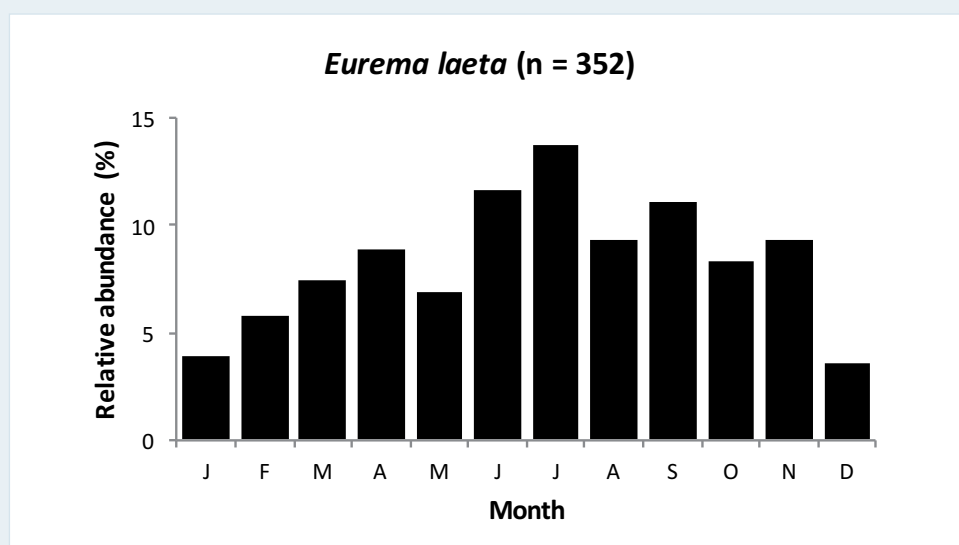
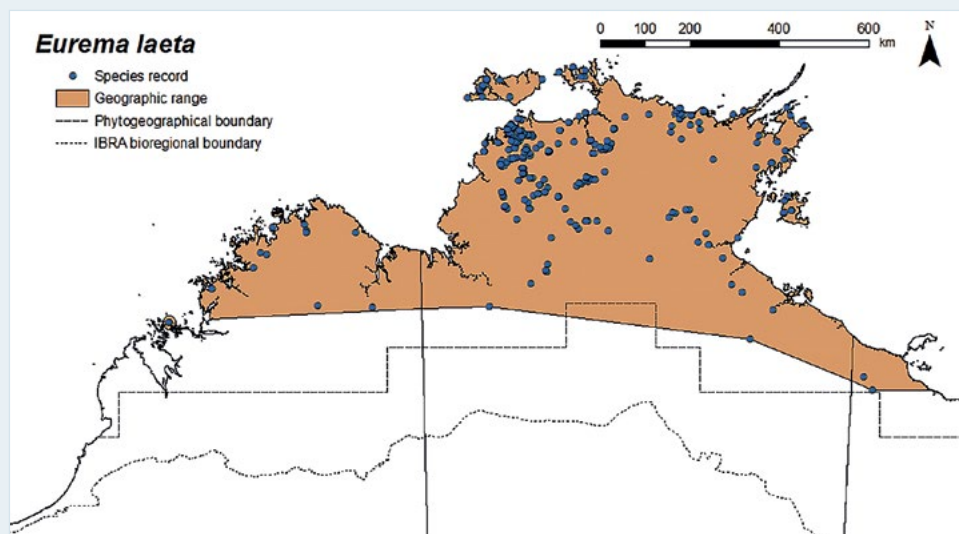
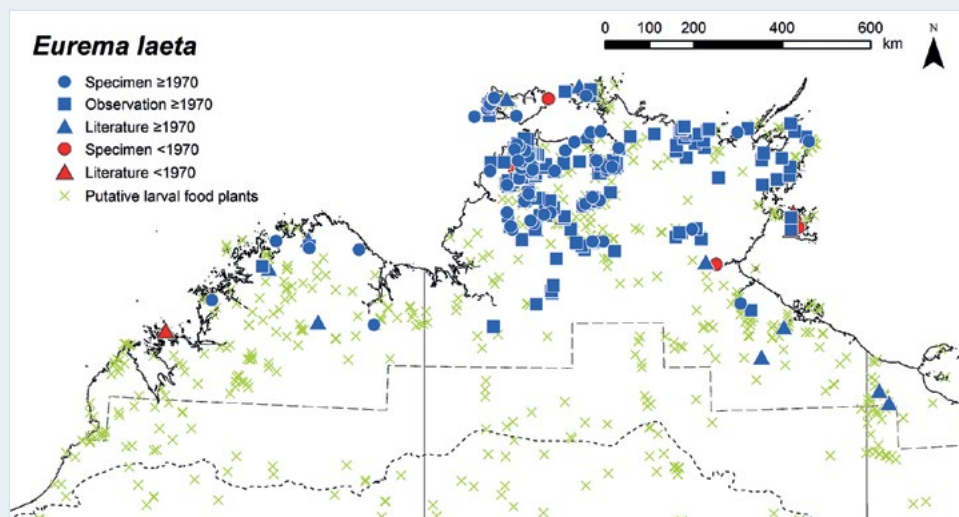
Adults occur throughout the year, but they are more numerous during the dry season (June–September) after the peak of *Eurema herla*. Presumably, adults stop breeding during the dry season, remain in reproductive diapause and contract to moist refuges where they may be observed in relatively large numbers, similar to populations in northern Queensland (Jones and Rienks 1987). The breeding phenology and seasonal history of the immature stages have not been recorded, but it is likely several generations are completed during the wet season.

Breeding status

This species is resident in the study region.

Conservation status

LC.



Month	J	F	M	A	M	J	J	A	S	O	N	D
Egg												
Larva												
Pupa												
Adult												

Macleay's Grass-yellow

Eurema herla (W. S. Macleay, 1826)



Plate 62 Wongalara Wildlife Sanctuary, NT
Photo: M. F. Braby

Distribution

This species has a very broad distribution, occurring throughout most of the study region. Its geographic range corresponds well with the spatial distribution of its larval food plants; however, *E. herla* extends further inland into semi-arid areas of lower rainfall (< 500 mm mean annual rainfall), including the Edgar Ranges, WA (Common 1981); 40 km south of Lajamanu, Rabbit Flat Roadhouse in the Tanami Desert (J. Archibald) and Tennant Creek, NT (Peters 1969); and Boodjamulla/Lawn Hill National Park, Qld (Daniels and Edwards 1998). It has also been recorded from Devils Marbles, NT (Dunn 1980), just outside the southern boundary of the study region. It is not known whether the species is permanently established in the semi-arid zone and breeds on alternative species of *Chamaecrista* or the populations are temporary. Most records from the southern edge of the range are in the dry season (April–August), which suggests *E. herla* makes temporary southern expansions after rainfall or with the onset of cooler, dry weather. However, a specimen has been collected at Tennant Creek (Mary Anne Dam) in February (J. Archibald). Outside the study region, *E. herla* occurs in north-eastern and eastern Australia.

Habitat

Eurema herla breeds in savannah woodland, favouring open grassy areas where the larval food plants grow in the ground layer as annual herbs (Braby 2011a, 2015e). In the drier inland areas, it is usually associated with woodland on rocky outcrops and breakaways or along rocky seasonal gullies and creeks.

Larval food plants

Chamaecrista mimosoides, *C. nigricans* (Fabaceae: Caesalpinioideae).

Seasonality

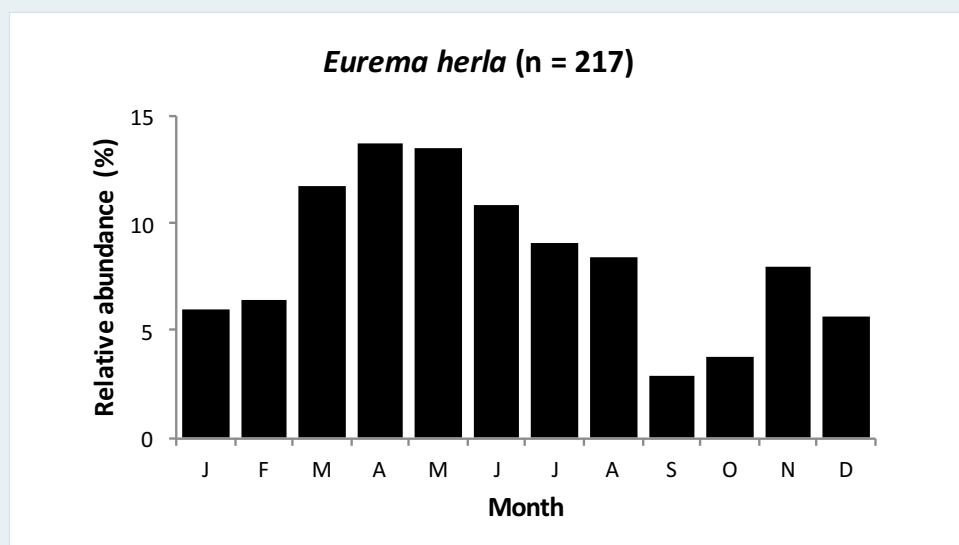
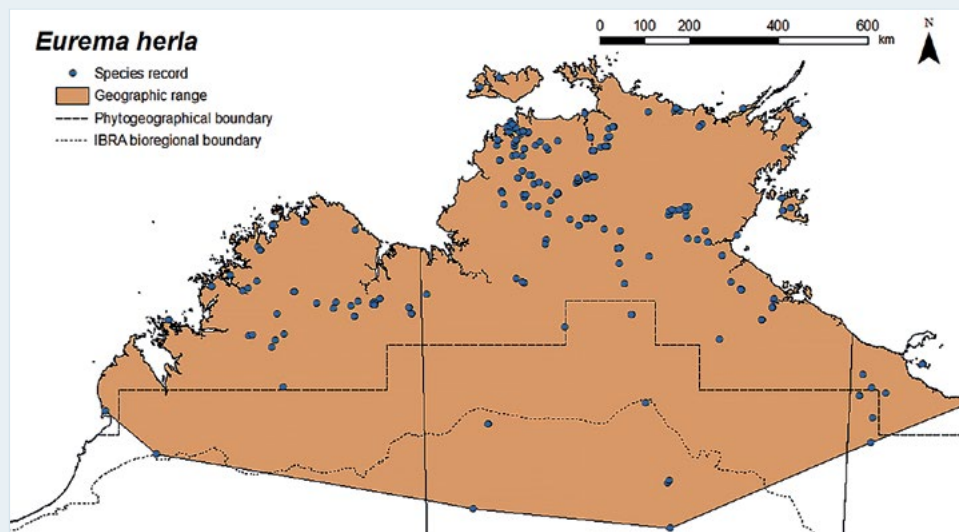
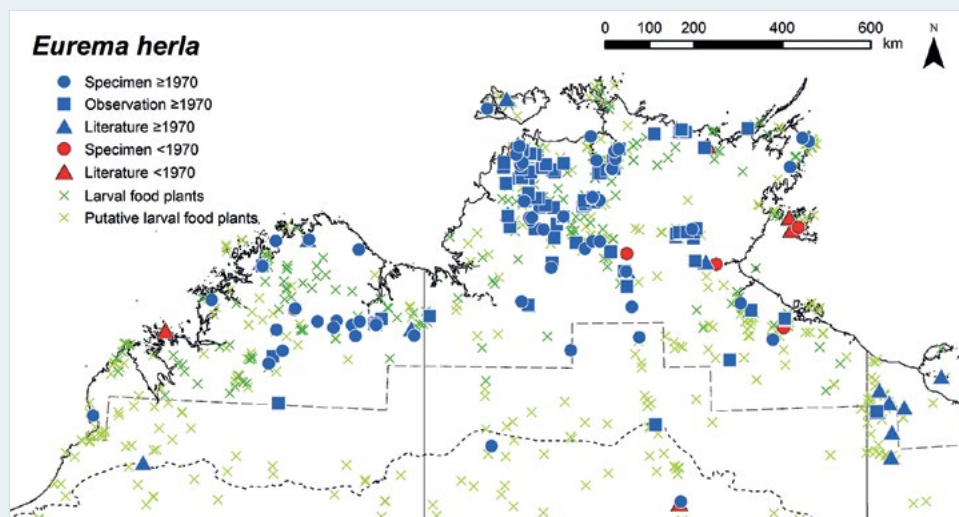
Adults occur throughout the year, but they are more abundant during the late wet season and early dry season (March–June), before the peak of *Eurema laeta*. The breeding phenology and seasonal history of the immature stages are poorly known, but females have been observed laying eggs in March and May. Presumably, the life cycle strategy is similar to populations in northern Queensland in which breeding is limited to the wet season and early dry season and females remain in reproductive diapause during the mid to late dry season (June–October), when the food plants are not available (Jones and Rienks 1987).

Breeding status

This species is resident in the study region.

Conservation status

LC.



Month	J	F	M	A	M	J	J	A	S	O	N	D
Egg												
Larva												
Pupa												
Adult												

Small Grass-yellow

Eurema smilax (Donovan, 1805)



Plate 63 Yenda, NSW
Photo: M. F. Braby

Distribution

This species occurs throughout much of the study region. It also extends into the arid zone of central Australia beyond the southern boundary of the study region. It is more common in the semi-arid areas and less frequently recorded in the higher rainfall areas, such as the north-western corner of the Top End, where it reaches its northernmost limit at Darwin, NT (Waterhouse and Lyell 1914; Campbell 1947; Angel 1951; Le Souëf 1971; Meyer et al. 2006). Surprisingly, there are no records of the species from the Tiwi Islands, Cobourg Peninsula or northern and eastern Arnhem Land despite the presence of the putative larval food plants, which occur widely in northern Australia; *Neptunia gracilis* occurs in monsoon and semi-arid areas, *N. monosperma* mainly in semi-arid areas and *Senna artemisioides* in semi-arid and arid areas. Outside the study region, *E. smilax* occurs widely throughout most of the Australian continent, particularly in semi-arid and arid areas.

Habitat

The breeding habitat of *E. smilax* has not been recorded in the study region. Adults occur in a wide variety of habitats, including savannah woodland, eucalypt low open woodland, grassland and *Acacia* shrubland, in which they no doubt breed.

Larval food plants

Not recorded in the study region; probably *Neptunia gracilis*, *N. monosperma*, *Senna artemisioides* (Fabaceae: Mimosoideae, Caesalpinoideae), which are three food plants in Queensland (Braby 2000).

Seasonality

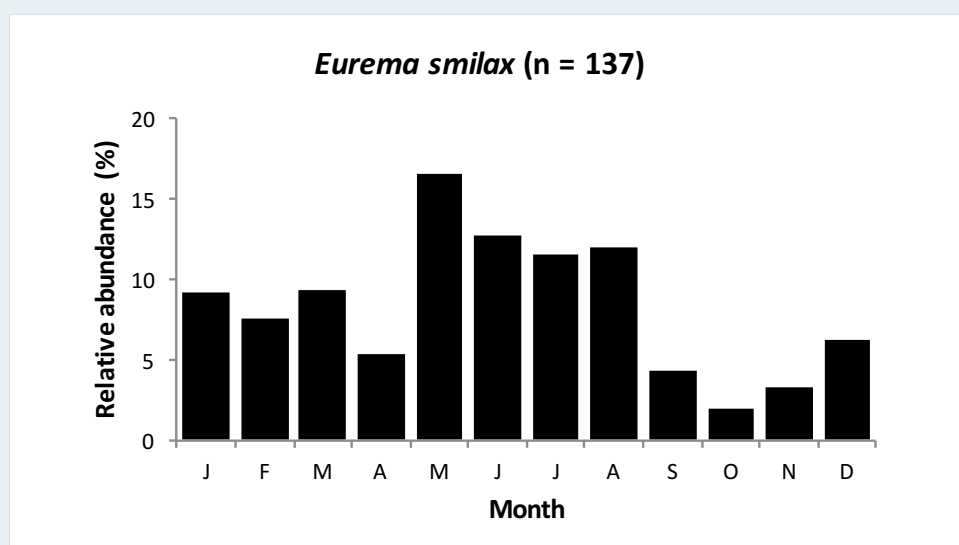
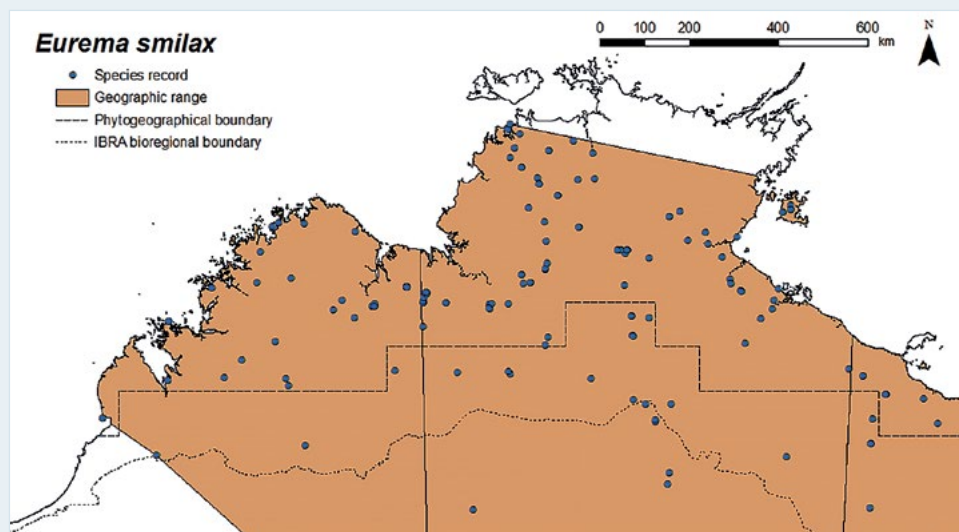
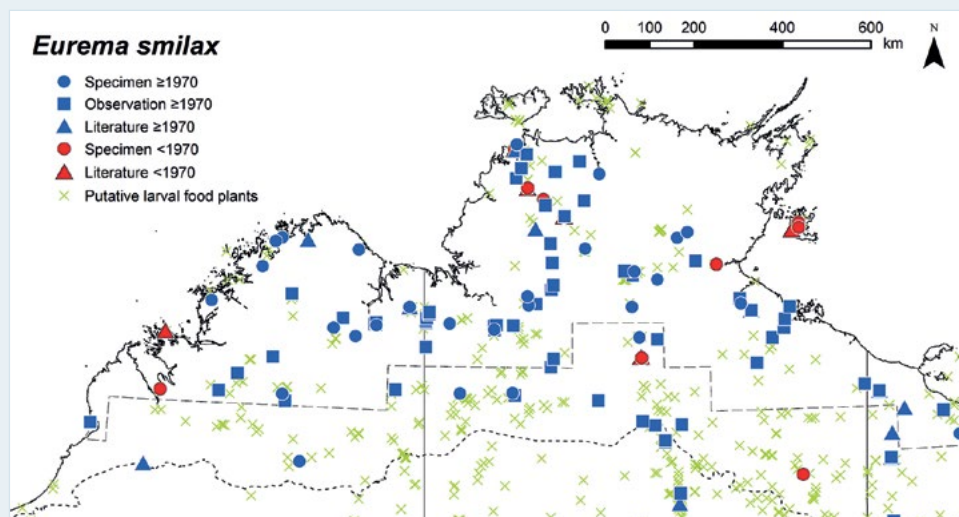
Adults occur throughout the year, but they are more numerous during the dry season (May–August), although they are rarely observed in large numbers compared with other species of *Eurema*. The breeding phenology and seasonal history of the immature stages have not been recorded. Presumably, the species breeds throughout the year but populations are opportunistic and highly mobile.

Breeding status

Eurema smilax is assumed to be resident in the study region, but populations appear to be nomadic and are possibly temporary in the northern areas of the range, particularly in the north of the Northern Territory.

Conservation status

LC.



Month	J	F	M	A	M	J	J	A	S	O	N	D
Egg												
Larva												
Pupa												
Adult												

Scalloped Grass-yellow

Eurema alitha (C. & R. Felder, 1862)



Plate 64 Fish River Station, NT
Photo: M. F. Braby

Distribution

This species is represented in the study region by the subspecies *E. alitha novaguineensis* Shriôzu & Yata, 1982. Although historical records go back as far as 1909, the species was previously confused with *Eurema hecabe*, such that *E. alitha* was not formally recognised in the fauna until quite recently (Braby 1997). It occurs in the western and northern Kimberley, where it extends from Augustus Water (J. E. and A. Koeysers) to Kalumburu (Grund and Hunt 2001), WA, and more widely in the Top End. It also extends into the Northern Deserts and western Gulf Country, where it occurs in the lower rainfall areas of the semi-arid zone (c. 700 mm mean annual rainfall). Its southernmost limits are Judbarra/Gregory National Park (Limestone Gorge) (Braby and Archibald 2016), Daly Waters (Braby 2000) and Cape Crawford (Braby 1997), NT. The larval food plant is considerably more widespread, occurring throughout much of the Kimberley, Northern Deserts and western Queensland in the Gulf Country. Further field surveys are therefore required to determine whether *E. alitha* is established in these areas. Outside the study region, *E. alitha* occurs from South-East Asia, through mainland New Guinea and adjacent islands to north-eastern and eastern Australia.

Habitat

Eurema alitha breeds in semi-deciduous monsoon vine thicket and savannah woodland with a sparse cover of grasses where the larval food plant grows as a spreading ground cover or climber, usually over rock scree or on rocky hill-slopes (Braby 2011a).

Larval food plants

Galactia tenuiflora (Fabaceae: Faboideae).

Seasonality

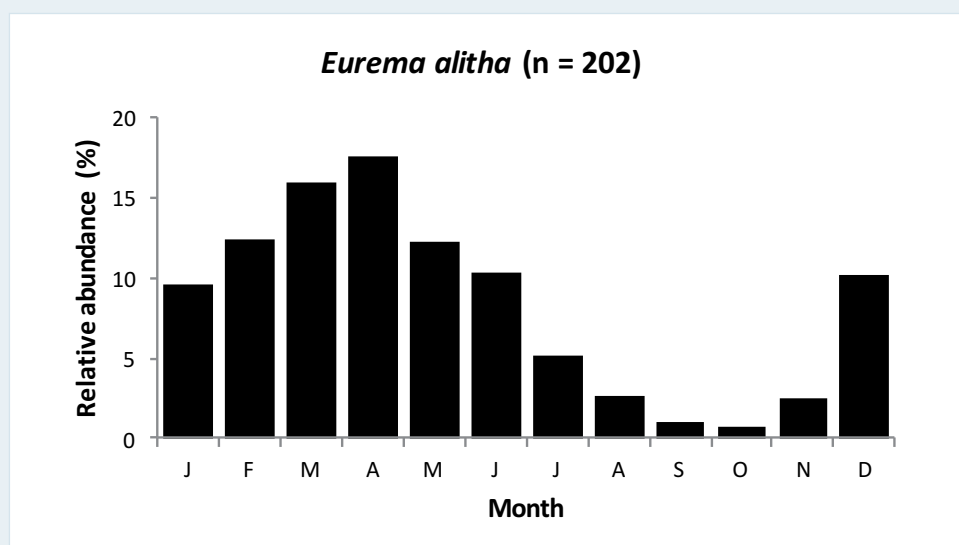
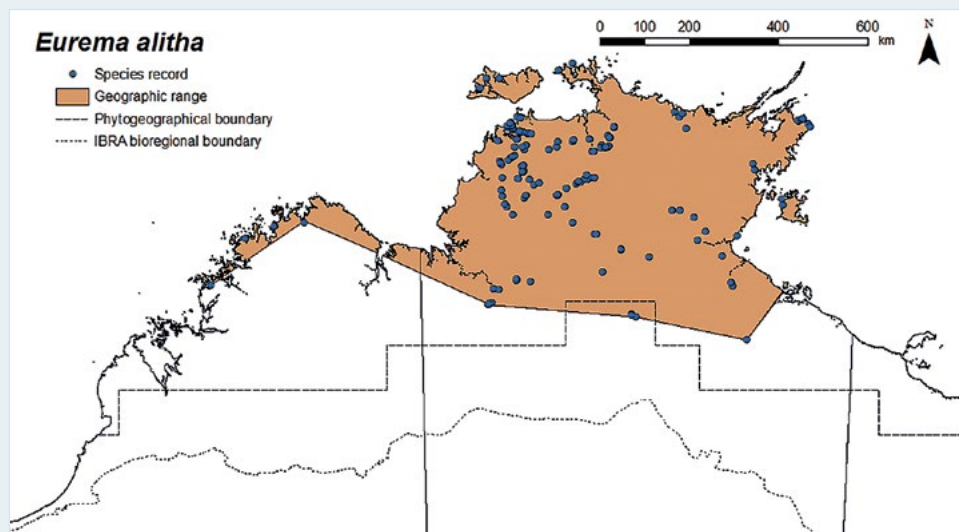
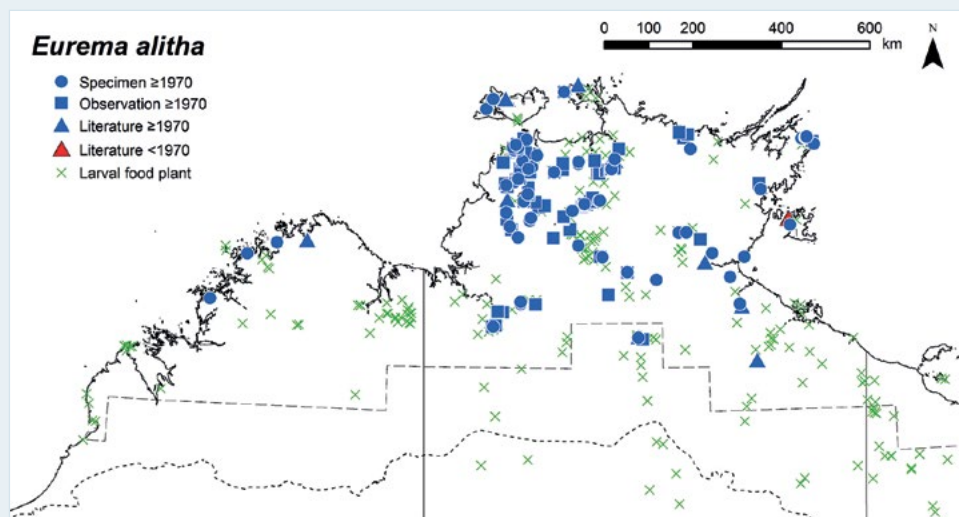
Adults occur throughout the year, but, like *Eurema hecabe*, they are most abundant during the wet season, with a peak in abundance in April. They become less numerous as the dry season progresses and are scarce towards the end of the dry (September and October). The immature stages have been recorded during the wet season (January–April), when adults are most abundant. It is not known whether females enter reproductive diapause during the dry season or breed continuously, but reproductive activity declines as the dry season progresses.

Breeding status

This species is resident in the study region.

Conservation status

LC.



Month	J	F	M	A	M	J	J	A	S	O	N	D
Egg												
Larva												
Pupa												
Adult												

Large Grass-yellow

Eurema hecabe (Linnaeus, 1758)



Plate 65 Wanguri, Darwin, NT
Photo: M. F. Braby

Distribution

This species occurs throughout much of the study region. It extends from moist coastal areas to drier inland areas of the semi-arid zone (< 400 mm mean annual rainfall), where it has been recorded as far south as Kelly Creek to the south of Tennant Creek, NT (M. Malipatil and J. Hawkins). Its geographic range corresponds with the broad spatial distribution of its native larval food plants, indicating that *E. hecabe* has been well sampled in the region. Outside the study region, *E. hecabe* occurs widely from Africa, India, southern China, Japan and South-East Asia, through mainland New Guinea and adjacent islands and north-eastern and eastern Australia to the islands of the South Pacific.

Habitat

Eurema hecabe occurs in a wide variety of habitats. It frequently breeds in both wet and dry monsoon forests, including evergreen monsoon vine forest associated with permanent freshwater springs or streams and semi-deciduous monsoon vine thicket associated with rock outcrops or coastal sand dunes and lateritic cliffs, where its native food plant (*Breynia cernua*) grows as a shrub. However, it also breeds in other habitats, including the edges of mangroves and savannah woodland where alternative food plants grow (particularly *Sesbania cannabina*).

Larval food plants

Senna surattensis, *Sesbania cannabina* (Fabaceae: Caesalpinioideae, Faboideae), *Breynia cernua*, *Phyllanthus* sp. (Phyllanthaceae); also **Senna alata*, **S. obtusifolia*, **Leucaena leucocephala* (Fabaceae: Caesalpinioideae, Mimosoideae).

Seasonality

Adults occur throughout the year, but, like *Eurema alitha*, they are most abundant during the wet season, with a peak in abundance in April. They may also be very abundant in May. They become less numerous as the dry season progresses and are scarce towards the end of the dry (August–October). The immature stages have been recorded during the wet season and early dry season (November–June). It is not known whether females enter reproductive diapause or breed continuously, but reproductive activity declines during the mid to late dry season (July–October). *Eurema hecabe* is a well-known migrant in eastern Australia (Smithers 1983b), but there few records of population movement in northern Australia. In April 2015, a large easterly flight was observed along the Stuart Highway between Noonamah and Adelaide River, NT (Braby 2016b).

Breeding status

This species is resident in the study region.

Conservation status

LC.

Black-spotted White

Leptosia nina (Fabricius, 1793)



Plate 66 South of Kalumburu, WA
Photo: M. F. Braby

Distribution

This species is restricted to the north-western Kimberley of the study region. *Leptosia nina* does not occur elsewhere in Australia and its presence in the region was detected only as recently as 1980 (Common and Waterhouse 1981; Naumann et al. 1991). It occurs only in the higher rainfall areas of the Kimberley (> 1,100 mm mean annual rainfall). Outside the study region, *L. nina* occurs throughout South-East Asia.

The subspecific status has not been determined, although Sands and New (2002) attributed the population to *L. nina comma* Fruhstorfer, 1902. However, Australian material appear to represent an undescribed subspecies because they differ from the two nearest subspecies in South-East Asia—*L. nina comma* from Timor to Tanimbar and *L. nina fumigata* Fruhstorfer, 1902 from Lombok to Flores—according to the diagnosis of Yata (1985).

Excluded data

Dunn and Dunn (1991) listed the species from Sandfire Flat, south of Broome, WA, based on a possible sighting made in 1979, but this record is considered erroneous because of its location, habitat and lack of voucher material (Braby 2000).

Habitat

Leptosia nina breeds in semi-deciduous monsoon vine thicket on steep basalt rock scree and breakaways, on bauxite with groundwater seepage and along seasonal rocky creeks where the larval food plant grows, preferring young vines growing very close to the ground. The dry monsoon forest in which it lives typically occurs in small patches protected from fire.

Larval food plant

Capparis sepiaria (Capparaceae).

Seasonality

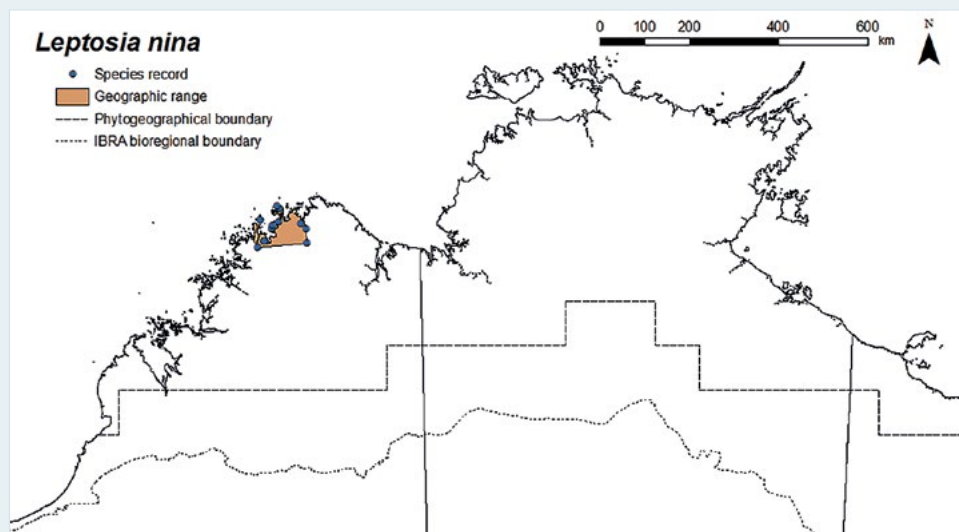
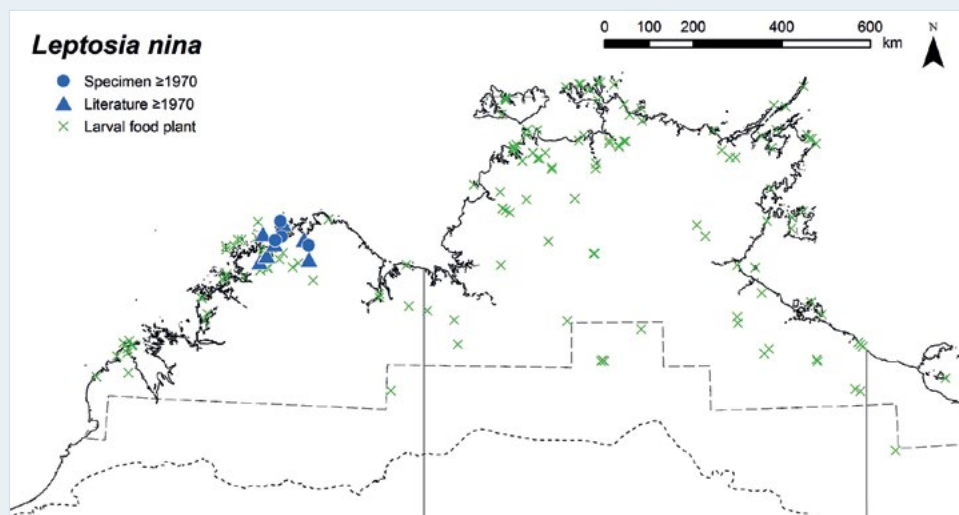
The seasonal abundance and breeding phenology of this species are not well understood. Adults have been recorded from February to July and in November, but there are too few records ($n = 14$) to assess any seasonal changes in abundance. Presumably, the species breeds continuously throughout the year.

Breeding status

This species is resident in the study region.

Conservation status

LC. The putative subspecies *L. nina* ssp. 'Kimberley' is a short-range endemic (EOO = 5,930 sq km), with part of the population occurring in two conservation reserves: Mitchell River National Park and Unguu IPA. Despite the restricted occurrence of the taxon, Sands and New (2002) considered it not to be threatened and therefore of no conservation significance.

[illegible]

	J	F	M	A	M	J	J	A	S	O	N	D
Egg												
Larva												
Pupa												
Adult												

Narrow-winged Pearl-white

Elodina padusa (Hewitson, 1853)



Plate 67 Boodjamulla (Lawn Hill) National Park, Qld
Photo: Don Franklin



Plate 68 Boodjamulla (Lawn Hill) National Park, Qld
Photo: Don Franklin

Distribution

This species occurs widely in the study region. It occurs mainly in semi-arid areas (south of latitude 13°S), reaching its northernmost limit at Kakadu National Park (Mary River Ranger Station), NT. In the semi-arid zone, it has been recorded as far south as Three Ways Roadhouse 25 km north of Tennant Creek, NT. It also extends into the arid zone of central Australia beyond the southern boundary of the study region. Its geographic range closely corresponds with the spatial distribution of its larval food plant, which is absent from the higher rainfall areas of the Top End (> 1,300 mm mean annual rainfall), where there are no records of *E. padusa*. Outside the study region, *E. padusa* occurs in the Pilbara of Western Australia and widely in central and eastern Australia.

Habitat

Elodina padusa breeds in mixed lancewood–vine thicket associations where the larval food plant grows as a large scrambling vine often reaching into the canopy (Braby 2011a). Adults have also been collected in mixed eucalypt woodland–monsoon vine thicket on rocky outcrops and riparian woodland with rainforest elements along rocky seasonal creeks and gullies, and they may well breed in these moister habitats, which are embedded within the savannah landscape.

Larval food plant

Capparis lasiantha (Capparaceae).

Seasonality

Adults have been recorded during most months of the year, but they are apparently more abundant during the mid dry season (May–July). The breeding phenology and seasonal history of the immature stages have not been recorded, but presumably the species breeds throughout the year. Smithers (1983b) did not list this species as a migrant, but Grund and Hunt (2001) noted adults on the Mitchell Plateau in the northern Kimberley, WA, migrating in large numbers in a southerly direction during June and July.

Breeding status

This species is resident in the study region.

Conservation status

LC.

Small Pearl-white

Elodina walkeri Butler, 1898



Plate 69 Buffalo Creek, Leanyer Swamp, NT
Photo: M. F. Braby

Distribution

This species occurs in the northern and eastern Kimberley, Top End and coastal areas of the western Gulf Country of the study region. It extends from moist coastal areas to drier inland areas of the semi-arid zone (c. 700 mm mean annual rainfall), reaching its southernmost limits at El Questro Wilderness Park (El Questro Gorge), WA; Pinkerton Range on the Victoria Highway, Judbarra/Gregory National Park (Limestone Gorge) and Killarney Station 60 km north of Top Springs, NT; and the Wellesley Islands (Bentinck Island), Qld (Fisher 1992). It also occurs in the Gulf of Carpentaria 5 km north of Karumba, Qld, just outside the boundary of the study region (Pierce 2017). The geographic range closely corresponds with the spatial distribution of its larval food plant. The food plant, however, extends slightly further south. Further field surveys are therefore required to determine whether *E. walkeri* is more widely distributed in semi-arid areas, particularly in coastal areas of the western Kimberley and near-coastal areas of the Gulf Country. Outside the study region, *E. walkeri* occurs in north-eastern Queensland.

We have provisionally included all records of *E. tongura* Tindale, 1923 with *E. walkeri* until the taxonomic status of *E. tongura* is clarified, primarily because the two species are indistinguishable on phenotypic characters.

Habitat

Elodina walkeri breeds in semi-deciduous monsoon vine thicket in both coastal and inland areas, particularly on rocky outcrops, where the larval food plant grows as a scrambling vine.

Larval food plant

Capparis sepiaria (Capparaceae).

Seasonality

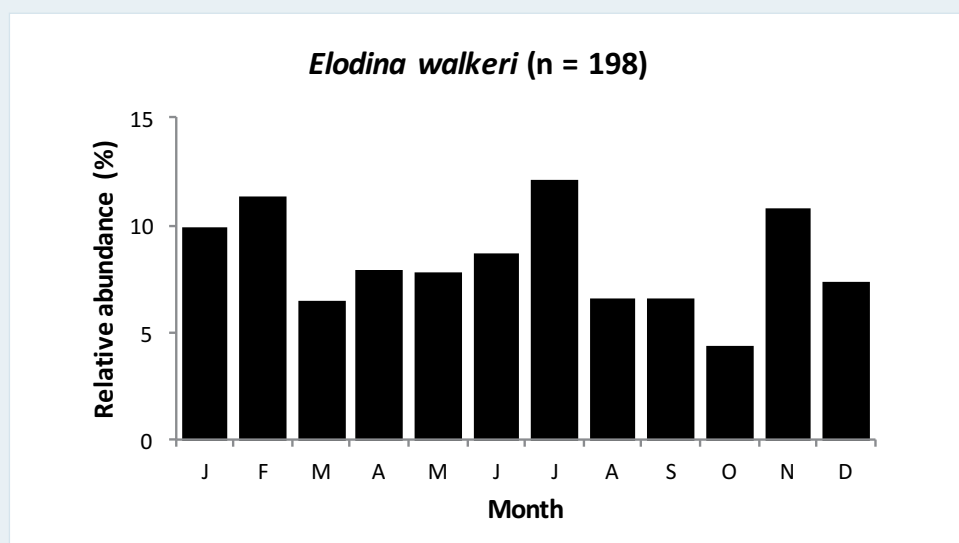
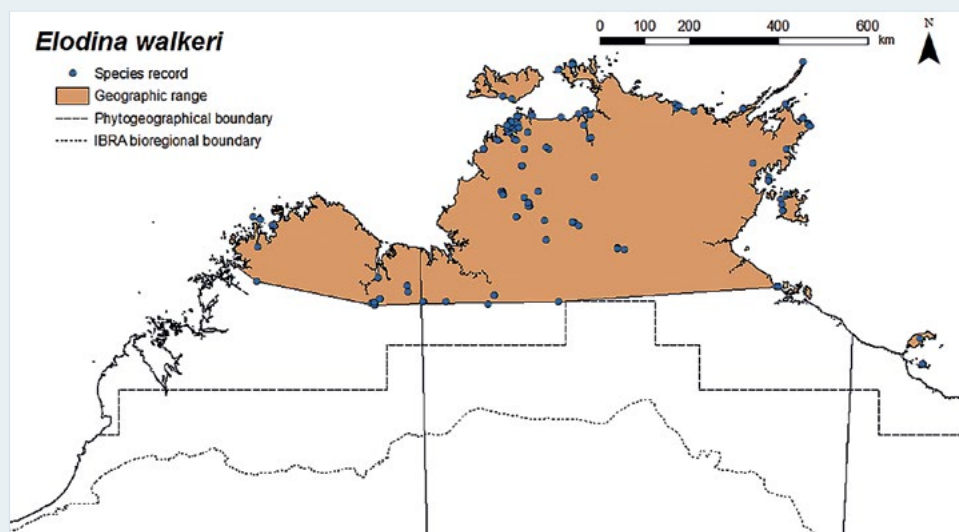
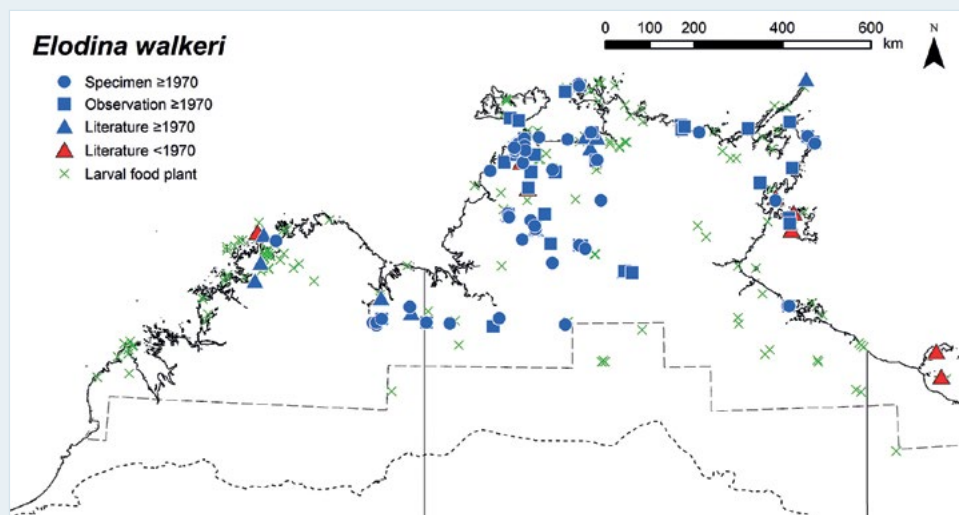
Adults occur throughout the year. They appear to show little seasonal variation in abundance, although they tend to be more numerous during the wet season (November–February)—possibly depending on the timing and amount of rainfall—and again in the mid dry season (July). Franklin (2011) found similar trends near Darwin, NT, based on quantitative studies conducted over 14 months during 2008–09. The immature stages have been recorded sporadically throughout the year, suggesting the species breeds continuously, with several generations completed annually.

Breeding status

This species is resident in the study region.

Conservation status

LC.



Month	J	F	M	A	M	J	J	A	S	O	N	D
Egg	Yellow						Yellow			Yellow		
Larva	Green			Green			Green			Green		
Pupa				Blue								
Adult	Orange											

White Albatross

Appias albina (Boisduval, 1836)



Plate 70 Black Point, Cobourgh Peninsula, NT
Photo: M. F. Braby

Distribution

This species is represented by two subspecies: *A. albina albina* (Boisduval, 1836) and *A. albina infuscata* Fruhstorfer, 1910. Both subspecies occur in the north of the Northern Territory of the study region. *Appias albina albina* occurs along the northern coast of the Top End (Braby et al. 2010a), whereas *A. albina infuscata* is known only from Humpty Doo 30 km east-south-east of Darwin, NT, where a female was observed on a rural property in January 2010 (Braby et al. 2010b). Although the larval food plant is substantially more widespread, *A. albina* is restricted to coastal locations in the higher rainfall areas (> 1,400 mm mean annual rainfall). Outside the study region, *A. albina* occurs widely from India and South-East Asia, through mainland New Guinea to the Torres Strait Islands, Qld.

Habitat

Appias albina breeds in coastal semi-deciduous monsoon vine thicket where the larval food plant grows as a tall shrub or small tree on laterite cliffs above the beach (Braby et al. 2010a).

Larval food plant

Drypetes deplanchei (Putranjivaceae).

Seasonality

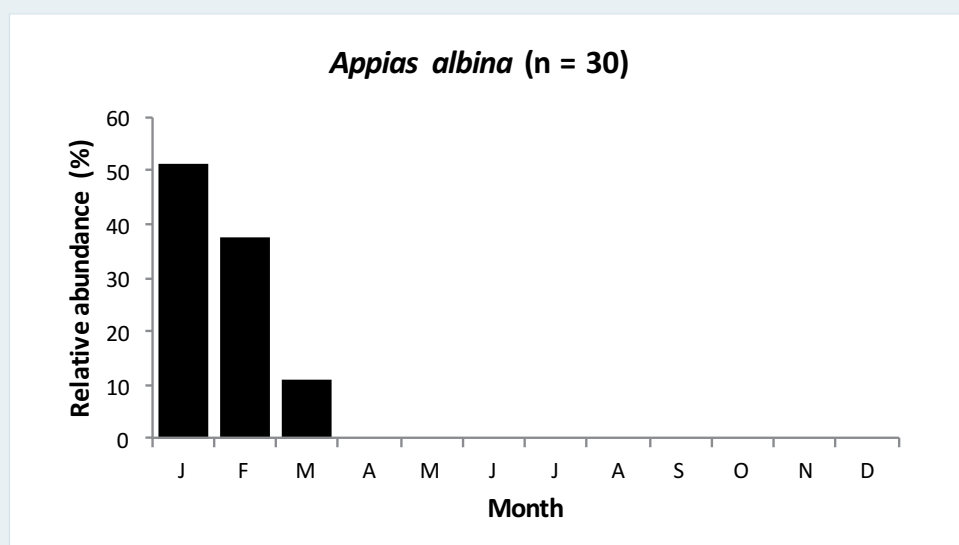
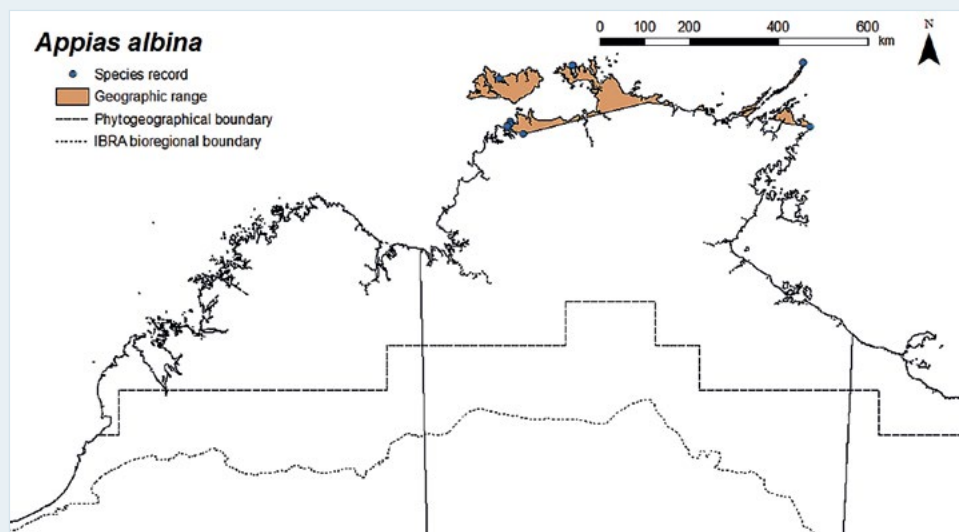
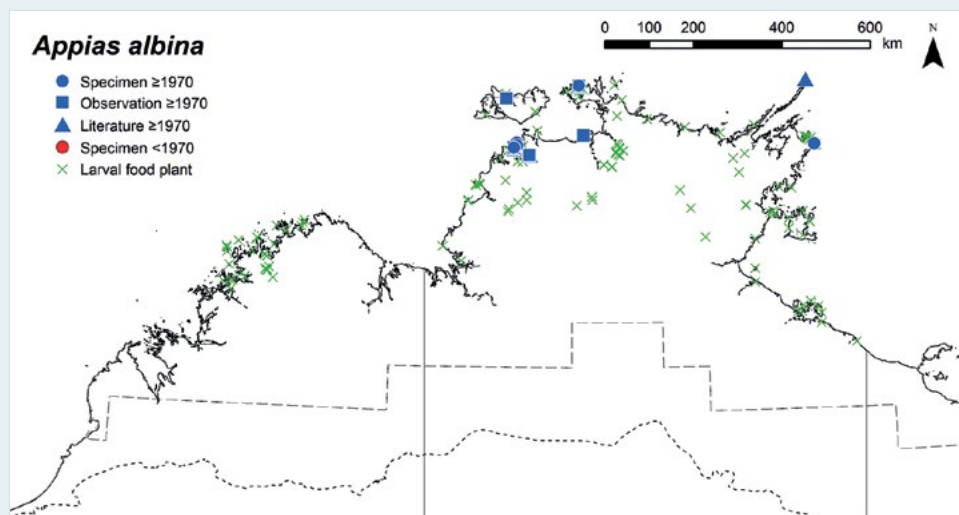
Adults are seasonal, occurring only during the wet season (January–March). They are most abundant in January and February during or just after the monsoon rains, and in good wet seasons of average or above average rainfall they may be particularly abundant for a few weeks. Breeding is strictly seasonal, with the immature stages recorded only during the wet season (January–April), when the larval food plant produces flushes of new soft leaf growth. It is not clear how the species survives the dry season; it is suspected the pupae remain in diapause for many months, but pupae reared from larvae in captivity at the end of the flight season developed directly and produced adults in March and April. Alternatively, it is possible that populations in the Northern Territory are temporary, with adults migrating from South-East Asia followed by a return flight of the next generation at the end of the wet season, but this has not been confirmed.

Breeding status

Appias albina albina is assumed to be resident in the study region, whereas *A. albina infuscata* is a rare vagrant from Indonesia and is non-resident.

Conservation status

Appias albina albina: LC. *Appias albina infuscata*: NA. The subspecies *A. albina albina* has a narrow range in the study region (geographic range = 22,370 sq km) within which it occurs in several conservation reserves, including East Point Reserve, Casuarina Coastal Reserve and Garig Gunak Barlu National Park on Cobourgh Peninsula, NT. Despite its restricted occurrence, there are no known threats facing the taxon.

[illegible][illegible]

Yellow Albatross

Appias paulina (Cramer, [1777])



Plate 71 East Point, Darwin, NT
Photo: M. F. Braby



Plate 72 Lakefield National Park, Cape York Peninsula, Qld
Photo: Don Franklin

Distribution

This species is represented in the study region by the subspecies *A. paulina ega* (Boisduval, 1836). It has a disjunct distribution, occurring mainly in the higher rainfall areas (> 1,100 mm mean annual rainfall) of the north-western Kimberley and in the Top End. The geographic range corresponds well with the spatial distribution of its larval food plant. However, *A. paulina* has been recorded substantially further south in the Kimberley, at Cockatoo Island and Derby, WA (Warham 1957), and in the western Gulf Country at Doomadgee, Qld (Puccetti 1991). Presumably, these records, if reliable, represent vagrant individuals that have dispersed beyond the normal breeding range. The larval food plant also occurs in the Tiwi Islands and Sir Edward Pellew Group, NT; thus, further field surveys are required to determine whether *A. paulina* occurs in these areas. Outside the study region, *A. paulina* occurs widely from India and South-East Asia, through mainland New Guinea and adjacent islands and eastern Australia to Samoa.

Excluded data

Bailey and Richards (1975) recorded this species from the Prince Regent Nature Reserve (Mt Trafalgar, Site W4), WA; however, examination of their material in the WADA indicated the specimen had been misidentified and was in fact a female *Cepora perimale*—a species they did not record.

Habitat

Appias paulina breeds in semi-deciduous monsoon vine thicket in both coastal and inland areas and evergreen monsoon vine forest associated with permanent freshwater streams where the larval food plant grows as a tall shrub or small tree.

Larval food plants

Drypetes deplanchei (Putranjivaceae). In addition, a female was observed laying several eggs on new leaf shoots of *Capparis sepiaria* (Capparaceae) at Black Point on Cobourg Peninsula, NT (Braby 2011a); however, the suitability of this vine as a food plant requires confirmation.

Seasonality

Adults occur throughout the year, but they are most abundant during the wet season (December–March), with a peak in abundance in February. The immature stages have also been recorded during the wet season (November–April) and, like *Appias albina*, the larvae feed only on the new soft leaves and shoots of the food plant. It is not known whether the species breeds continuously throughout the year (and uses alternative food plants during the dry season), reproductive activity declines or females stop breeding as the dry season progresses or breeding is strictly seasonal and the immature stages (e.g. pupa) remain in diapause, with adults emerging spasmodically during the dry season, similar to that seen in *Graphium eurypylus*. Although adults are known to be migratory (Smithers 1983b), we have no records of population movements.

Breeding status

This species is resident in the study region.

Conservation status

LC.

Caper White

Belenois java (Linnaeus, 1768)



Plate 73 Alice Springs, NT
Photo: M. F. Braby

Distribution

This species is represented in the study region by the subspecies *B. java teutonia* (Fabricius, 1775). It occurs throughout the region, as well as the arid zone of central Australia beyond the southern boundary of the study region—its broad geographic range closely matching the spatial distribution of its larval food plants. Surprisingly, there are no records of *B. java* from the Tiwi Islands, NT, despite the presence of the food plants in this area. Outside the study region, *B. java* occurs from the Lesser Sunda Islands, through mainland New Guinea and adjacent islands to the islands of the South Pacific. It also occurs throughout the Australian continent.

Habitat

Belenois java breeds in a variety of habitats, particularly savannah woodland and semi-deciduous monsoon vine thicket where the larval food plants grow as scrambling vines or small trees.

Larval food plants

Capparis jacobsonii, *C. lasiantha*, *C. sepiaria*, *C. umbonata* (Capparaceae).

Seasonality

Adults occur throughout the year, but they are most abundant from the late dry season to the mid wet season (September–January). In the Darwin area, they are seasonal in appearance: adults usually arrive during migration (with adults generally flying in a north–north–westerly or north–westerly direction) during the ‘build-up’ in September or October; they breed for a few months, during which several overlapping generations are completed and they may be extremely abundant; and then disappear by January (Braby 2016b). During the remainder of the year (February–August), adults and immatures are infrequent and usually absent in Darwin, although on one occasion the immature stages (eggs and larvae) were recorded in March during an influx of adults. Further work is needed to determine whether the patterns of seasonal migration and breeding in the Darwin area are replicated elsewhere in the northern coastal areas of the Kimberley and Top End.

Breeding status

This species is resident in the study region; however, in the northern parts of the range, the species is an immigrant and the populations are temporary.

Conservation status

LC.

Caper Gull

Cepora perimale (Donovan, 1805)



Plate 74 Shoal Bay, NT
Photo: M. F. Braby

Distribution

This species occurs widely in the study region. It occurs widely in the Kimberley, Top End and western Gulf Country, extending from moist coastal areas to drier inland areas of the semi-arid zone (c. 600 mm mean annual rainfall). It reaches its southernmost limits at Broome, WA (Williams et al. 2006); Montejini Station 43 km south-south-west of Top Springs, NT; and Boodjamulla/Lawn Hill National Park (Lawn Hill Gorge), Qld (Daniels and Edwards 1998; Franklin 2007). The geographic range closely corresponds with the spatial distribution of its larval food plants, except for one food plant (*Capparis umbonata*), which extends further inland into the arid zone of central Australia. Outside the study region, *C. perimale* occurs from Sulawesi and Lombok, through mainland New Guinea and adjacent islands and north-eastern and eastern Australia to Vanuatu, New Caledonia, Fiji and Norfolk Island.

The subspecific status has not been determined; it may be *C. perimale scyllara* (Macleay, 1826) from eastern Australia, but the adults are phenotypically distinct.

Habitat

Cepora perimale breeds in a variety of habitats, particularly semi-deciduous monsoon vine thicket and savannah woodland where the larval food plants grow as strangling vines, shrubs or small trees. It also breeds along the edges of evergreen monsoon vine forest and in mixed mangrove–monsoon forest associations along the banks of perennial streams and rivers.

Larval food plants

Capparis jacobsonii, *C. sepiaria*, *C. umbonata* (Capparaceae).

Seasonality

Adults occur throughout the year, but they are most abundant during the early dry season (April–June) and least abundant during the late dry season (August–October). The immature stages have been recorded during all months except August, indicating that it breeds continuously throughout the year, during which several generations are completed.

Breeding status

This species is resident in the study region.

Conservation status

LC.

Mangrove Jezebel

Delias aestiva Butler, 1897



Plate 75 Buffalo Creek, Leanyer Swamp, NT
Photo: M. F. Braby

Distribution

This species is represented by the subspecies *D. aestiva aestiva* Butler, 1897, which is endemic to the study region. It occurs in the Top End, where it is restricted to coastal areas north of latitude 15°S. The geographic range corresponds well with the spatial distribution of its known and putative larval food plants (*Excoecaria* spp.). The food plants, however, are far more extensive, occurring in coastal areas throughout the Kimberley and western Gulf Country. Further field surveys are therefore required to determine whether *D. aestiva* also occurs in these areas. Inland records from Adelaide River and Daly River (Ooloo crossing) (Hutchinson 1978), NT, probably represent vagrants that dispersed upstream along rivers. Outside the study region, *D. aestiva* occurs in the Gulf Country of western Cape York Peninsula, Qld.

The subspecies *D. aestiva smithersi* (Daniels 2012) occurs in the Gulf of Carpentaria at Karumba, Qld, just outside the boundary of the study region (Daniels 2012; Braby 2014b); thus, further field surveys are required to determine whether it extends further west into the Northern Territory.

Excluded data

Warham (1957) listed the species (under the name *D. mysis*) from Derby, Cockatoo Island and Wotjalum Mission (on the mainland to the south of the eastern end of Koolan Island) in Yampi Sound, WA. Braby (2012b), however, considered these records to be unreliable on the basis that no vouchered specimens were retained, the butterfly was likely to have been confused with *D. argenthona*—a common and

widespread species that occurs on Koolan Island (see McKenzie et al. 1995), but which was absent from Warham's list—and there have been no subsequent records from these areas for more than 50 years. More recently, Sands and New (2002) recorded the species in the Kimberley based on observations at Cape Leveque (in moist eucalypt woodland) and the Mitchell Plateau, WA; however, these locations/habitat do not accord with the biology of the species.

Habitat

Delias aestiva breeds in the landward edge of mangroves in coastal estuarine areas where the larval food plant grows as a deciduous tree (Braby 2012c). Adults frequently disperse into adjacent habitats such as paperbark woodland, monsoon vine thicket and even suburban parks and gardens, but they do not breed in these habitats.

Larval food plants

Excoecaria ovalis (Euphorbiaceae); probably *Excoecaria agallocha*.

Seasonality

Adults have been recorded during most months of the year, but they are most abundant during the dry season (particularly July–September). In some years, they may also be very abundant during the late wet season and early dry season (March–May), possibly depending on the timing of the last monsoon rains. They are generally scarce and often absent during the early wet season (November and December or January), when the larval food plant is seasonally deciduous. The immature stages (eggs or larvae) have been recorded mainly in the dry season (April–October), during which several generations are completed, with larvae feeding only on the mature foliage. It is not known how the species survives the period of food shortfall during the pre-monsoon 'build-up', but it is likely it remains in pupal diapause (Braby 2012c).

Breeding status

This species is resident in the study region.

Conservation status

LC. The subspecies *D. aestiva aestiva* has a restricted range within which it occurs in several conservation reserves, including Casuarina Coastal Reserve, Djukbinj National Park, Kakadu National Park and Djelk and Laynhapuy IPAs.

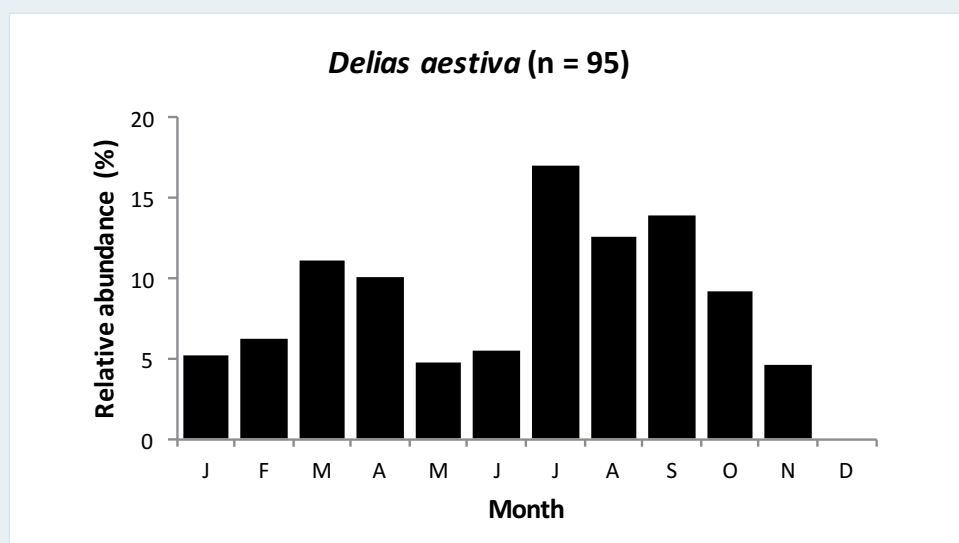
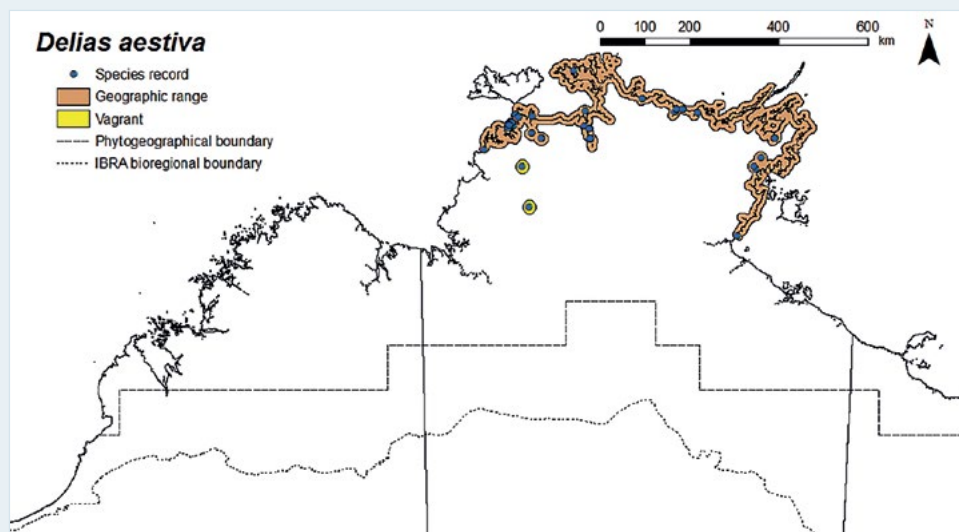
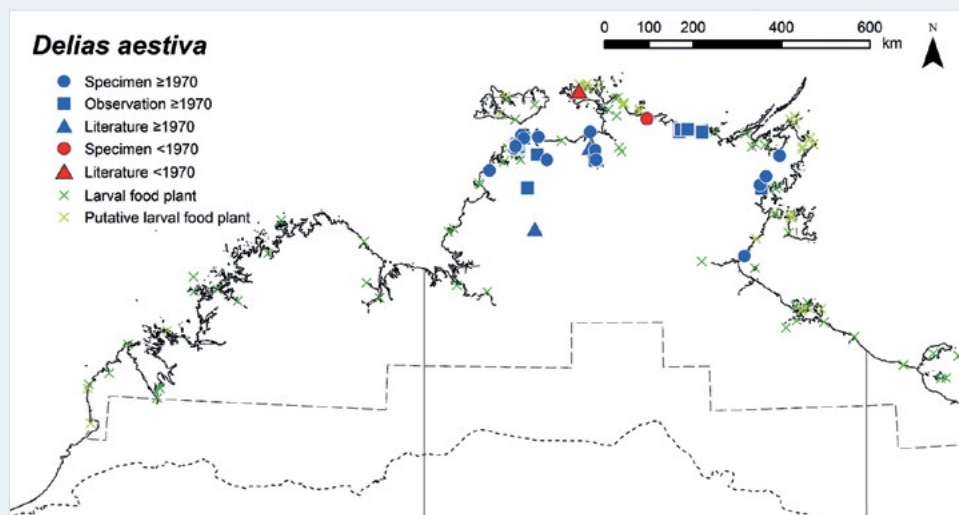
[illegible]



Photo: Robin Falls, NT, M.F. Braby

Scarlet Jezebel

Delias argenthona (Fabricius, 1793)



Plate 77 Mt Burrell, NT
Photo: M. F. Braby

Distribution

This species is represented by the subspecies *D. argenthona fragalactea* (Butler, 1869), which is endemic to the study region. It occurs throughout the Kimberley, Top End and western Gulf Country, extending from moist coastal areas to drier inland areas of the semi-arid zone (c. 700 mm mean annual rainfall). Its southernmost limits are Fitzroy Crossing, WA (Common and Waterhouse 1981), and Doomadgee, Qld (Puccetti 1991). Although the larval food plants are more widespread, particularly in the semi-arid areas, it is considered unlikely that *D. argenthona* is established in the hot, dry inland areas. Outside the study region, *D. argenthona* occurs in south-eastern New Guinea and eastern Australia.

The subspecies *D. argenthona argenthona* (Fabricius, 1793) occurs in the Gulf of Carpentaria at Walker Creek 36 km east of Karumba, Qld, just outside the eastern boundary of the study region (Braby 2015d). Further field surveys are therefore required to determine whether it extends further west or is continuous in extent with *D. argenthona fragalactea*.

Habitat

Delias argenthona typically breeds in a variety of woodland and open woodland habitats where the larval food plants grow as mistletoes (parasitic shrubs) on various trees, including *Eucalyptus*, *Alstonia*, *Erythrophleum* and *Grevillea* (Braby 2011a, 2015e). It also breeds in suburban parks and gardens.

Larval food plants

Amyema miquelii, *A. sanguinea*, *Decaisnina signata*, *Dendrophthoe glabrescens*, *Dendrophthoe odontocalyx* (Loranthaceae). *Decaisnina signata* is commonly used in suburban areas in Darwin, NT, where it frequently parasitises *Alstonia actinophylla* (Wade 1978; Anderson and Braby 2009).

Seasonality

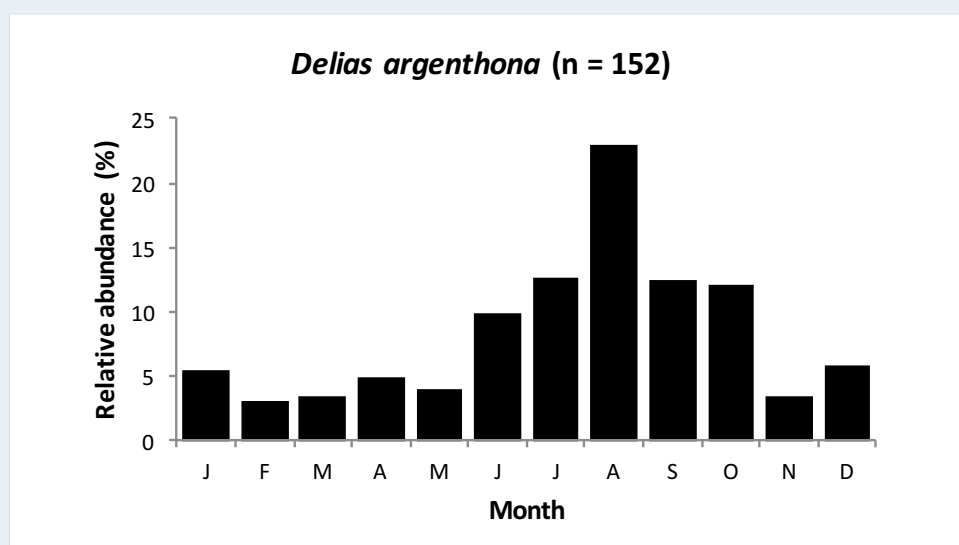
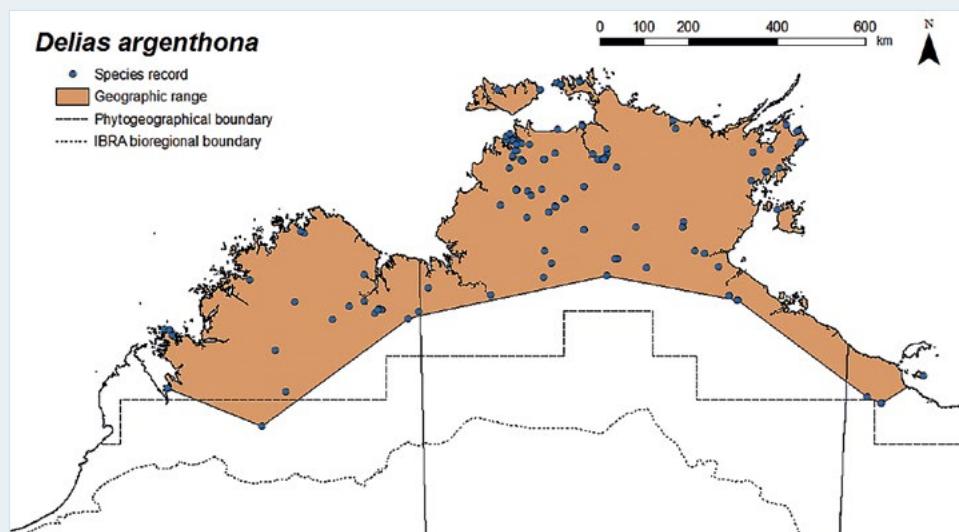
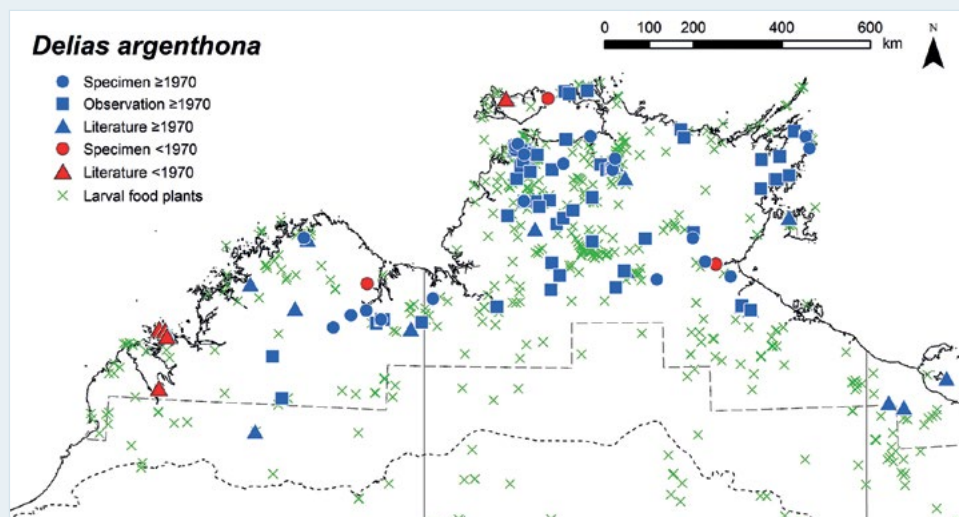
Adults occur throughout the year, but they are most abundant during the dry season (June–October), with a substantial peak in abundance in August. The immature stages have been recorded during most months, with larvae detected most frequently in August, indicating the species breeds throughout the year. Presumably, several overlapping generations are completed annually.

Breeding status

This species is resident in the study region.

Conservation status

LC.

[illegible]

This text is taken from *Atlas of Butterflies and Diurnal Moths in the Monsoon Tropics of Northern Australia*, by M.F. Braby, D.C. Franklin, D.E. Bisa, M.R. Williams, A.A.E. Williams, C.L. Bishop and R.A.M. Coppen, published 2018 by ANU Press, The Australian National University, Canberra, Australia.