An annotated list of Jamaican butterflies of potential conservation concern

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Abstract: Conservation measures needed to prevent extinction of Jamaica's National Butterfly, the Homerus Swallowtail (*Pterourus homerus*), and, to a lesser extent, measures needed to protect the endemic Blue Swallowtail (*Protographium marcellinus*), have been documented from time to time, but there has been no recent or overall assessment of the conservation status of all the island's butterflies. To correct this omission, we provide a brief summary of all the species of Jamaican butterflies in potential need of conservation measures, pending further studies.

Key Words: deforestation, endemic species, field surveys, forest fragmentation, subpopulations.

INTRODUCTION

There are 138 species of butterflies recorded from Jamaica. One butterfly, an unidentified species of *Caligo* Hübner, [1819] described but not illustrated by Sir Hans Sloane, who visited Jamaica between December 1687 and March 1689, is apparently extinct, with no known Jamaican specimens in collections. There are also no specimens yet collected of what appears to be a species resembling the Cuban *Anetia cubana* Salvin, 1869 that has been observed in the Blue Mountains of eastern Jamaica, and an *Archaeoprepona*-like insect, possibly a stray from Hispaniola, observed on the north coast of the island. *Heraclides cresphontes* (Cramer, 1777), whose larvae develop on citrus, was a probable introduction and is no longer present. As discussed in Discovering Jamaican Butterflies (Turner & Turland, 2017), of the remaining 134 species, five species are vagrants from Hispaniola, and five are known as repeat migrants or temporary visitors, sometimes also breeding but apparently not becoming permanent island residents. Seventy-two of the remaining species are found commonly across the island and a further thirty species are uncommon, largely because they are restricted to particular habitats and not encountered as often as other species. These do not require any special conservation measures at this time. An additional twenty-five species are categorized as rare, often found in restricted habitats that are frequently under severe threat from habitat destruction. Because some of these species are rarely seen, several have not been adequately studied. Their true status therefore is in need of further investigation (Turner & Turland, 2017).

Species such as *Cyanophrys hartii* Turner & Miller, 1992, are very uncommon and have not been seen in recent years. However, Jamaica is a mountainous country with numerous unexplored microhabitats where species can be suddenly found after long absences. This was the case for *Grais juncta* Evans, 1953 Jamaican Hermit Skipper, where a male was collected in the Cockpit Country in 2008 after an absence of 68 years. The female, which was unknown, was photographed for the first time in October 2014 (Turner & Turland, 2017). Also, because

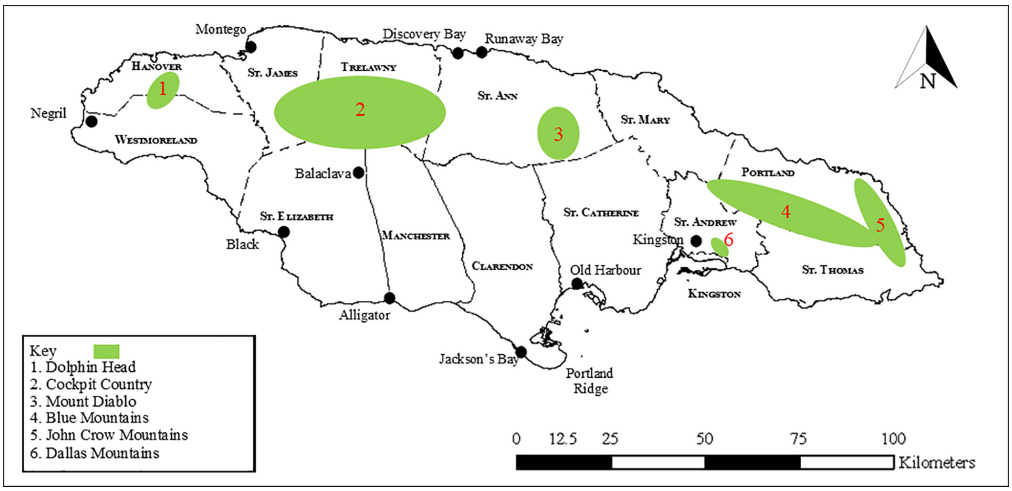


Figure 1. Map of Jamaica showing diagrammatic indication of key areas of conservation concern.

Jamaica, biologically speaking, is still not fully explored and because there are so few professional insect collectors in the island at any given time, much more systematic fieldwork needs to be done. There are still good reasons why, for example, *D. cleophile yameyensis* Turner & Turland, 2018, may yet be rediscovered in the central mountains of the island, even though this insect has not been reported since 1941.

Only *Pterourus homerus* (Fabricius, 1793), and *Protographium marcellinus* (Doubleday, 1845) are currently recognized by the International Union for Conservation of Nature and Natural Resources (IUCN) as being in need of conservation (Wells *et al*., 1983; Collins & Morris, 1985). However, a number of other Jamaican endemic species and subspecies are now confined to small habitats. These are often in isolated patches of primary forest subject to human incursions, which appear to be in need of conservation. They are listed here for the first time (Table 1).

Permit restrictions do not allow the publication of precise geographic coordinates of Jamaican butterflies in need of protection. Sites of occurrence between 1898 and 1972 are determined mostly from Brown & Heineman (1972). Sites of occurrence between 1973 and 2017 are determined from Turner & Turland (2017). The locations of species in need of protection between 2018 and the present time have been documented in continuing field surveys by Turner and Turland. Specimens have been photographed but not collected.

Table 1. List of Jamaican species of special conservation concern.

SPECIES	REASONS FOR CONCERN
Family **HESPERIIDAE**	
Subfamily Eudaminae	
Phocides perkinsi	Isolated population in the Cockpit Country.
Subfamily Pyrginae	
Grais juncta	Isolated population in the Cockpit Country.
Subfamily Hesperiinae	
Rinthon cubana	Insufficiently known.
Troyus turneri	Endemic genus and species. Insufficiently known.
Panoquina panoquinoides	Beach colonies. Threatened by development.
Panoquina ocola ocola	Rarely seen. Tiny, restricted habitats.
Lerodea eufala eufala	Rarely seen. Tiny, restricted habitats.
Family **PAPILIONIDAE**	
Subfamily Papilioninae	
Protographium marcellinus	Small, threatened, breeding sites. Currently IUCN Red List category **Vulnerable**.
Pterourus homerus	Two fragmented sub-populations. Currently IUCN Red List category **Endangered**.
Family **LYCAENIDAE**	
Subfamily Theclinae	
Cyanophrys hartii	Endemic. Known only from type.
Chlorostrymon orbis	Endemic. Known only from type.
Subfamily Polyommatinae	
Cyclargus shuturn	Endemic. Two small breeding sites.
Family **NYMPHALIDAE**	
Subfamily Danainae	
Greta diaphanus	Restricted forest habitats.
Danaus cleophile yameyensis	Endemic subspecies. Not reported since 1941.
Subfamily Nymphalinae	
Atlantea pantoni	Small fragmented sub-populations.
Antillea pelops pygmaea	Uncommon. Tiny shifting colonies.

Key to species distribution maps.

- Documented collection sites of specimens 1895-1995.
- Occasional sightings. Strays far from known breeding sites.
- Presence confirmed from surveys 1995-2020.
- Evidence of possible breeding sites, confirmation needed.

STATUS OF SPECIES IN TAXONOMIC ORDER

Phocides perkinsi (Kaye, 1931) (Hesperiidae: Eudaminae)

This endemic species is not commonly seen. It is a strong flying canopy dweller sometimes observed nectaring at *Gliricidia sepium* (Jacq.) Kunth ex Griseb or *Bauhinia divaricata* L. (both Fabaceae) flowers in and around the Cockpit Country. The larval foodplant is *Eugenia sachetae* Proctor (Myrtaceae), an endemic plant known only from southern Trelawny Parish in the Cockpit Country. Observations and collection records suggest this large powerfully flighted insect disperses from this small breeding area to both the north and south coasts, providing the false impression that the species permanently occupies a large territory and is a not uncommon species. The present breeding site is being subjected to gradual forest degradation.

Recommendations: Monitoring required. Both the butterfly and its known breeding area need to be periodically surveyed. Urgent surveys are required immediately followed by biannual surveys.

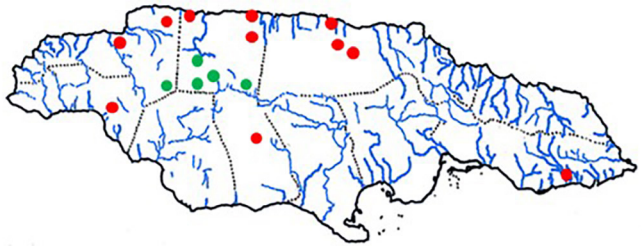


Figure 2. Distribution map, *Phocides perkinsi*.

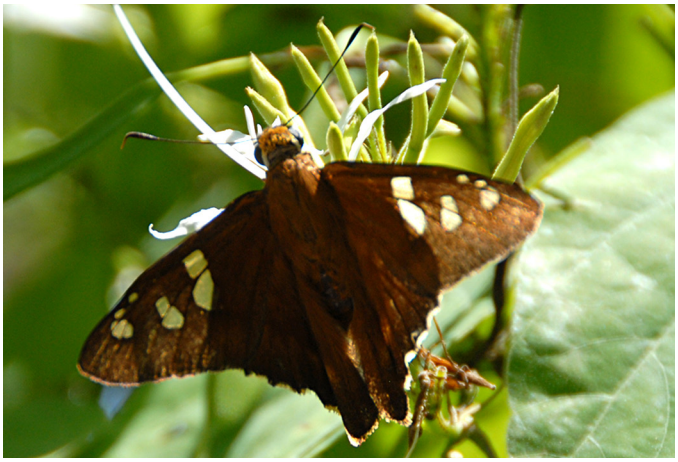


Figure 3. ♂ *Phocides perkinsi,* Cockpit Country, Apr., 2010.

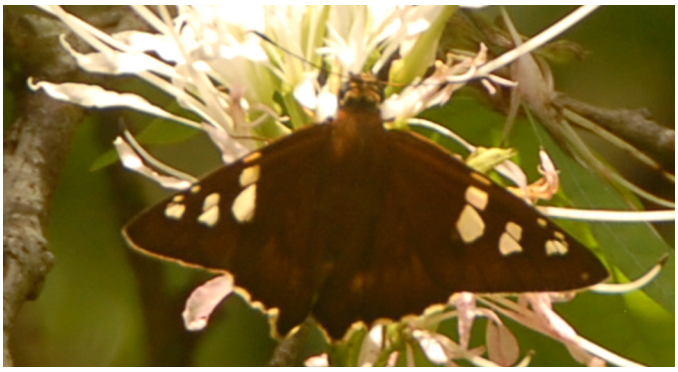


Figure 4. ♀ *Phocides perkinsi*, Cockpit Country, Apr., 2012

Grais juncta Evans, 1953 (Hesperiidae: Pyrginae)

This endemic species is rarely seen and the female has not yet been formally described. It is found only in the forests of the Cockpit Country. The larval foodplant has not yet been identified and the immature stages are undescribed.

Recommendations: Additional fieldwork is required to learn more about this insect's distribution, life history and behaviors. Relationships to mainland populations of *Grais* Godman & Salvin, [1894] are still unresolved.

Figure 5. Distribution map, *Grais juncta*.

Figure 6. ♂ *Grais juncta*, Cockpit Country, Nov., 2014.

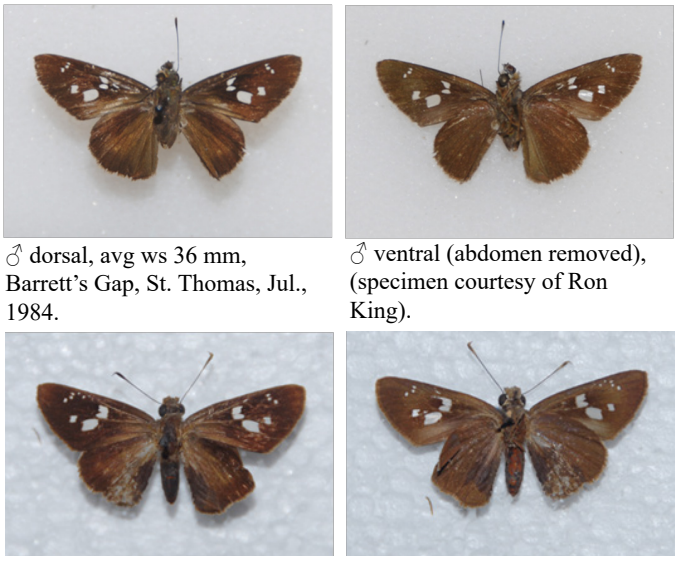
Figure 7. *Grais juncta*, ♀ Cockpit Country, Oct., 2014.

Rinthon cubana (Herrich-Schäffer, 1865) (Hesperiidae: Hesperiinae)

This skipper is very uncommon, found only on occasion in mesic habitats across the island. The taxonomic status of the Jamaican population needs to be resolved. The Jamaican insect is significantly smaller in size than those of populations from Cuba, Hispaniola and Puerto Rico, and also shows minor differences in the genitalia. In 1926, Kaye described this species as *Rinthon thermae*. Smith *et al.* (1994) and others regard all the Greater Antillean insects as *Rinthon cubana*. In Jamaica, the insect is recognized as subspecies *R. cubana thermae* (Turner & Turland, 2017).

Recommendations: This species is rarely collected. A series of specimens is required for examination and comparative studies to resolve differences of taxonomic opinions.

Figure 8. Distribution map, *Rinthon cubana*.



♂ dorsal, avg ws 36 mm, Barrett's Gap, St. Thomas, Jul., 1984.

♂ ventral (abdomen removed), (specimen courtesy of Ron King).

♀ dorsal, avg ws 36 mm, Carron Hall, St. Mary, Jul., 1952

♀ ventral.

Figure 9. *Rinthon cubana* (♀ photos courtesy of Museum of Natural History Jamaica, Institute of Jamaica [MNHJ, IJ]).

Troyus turneri Warren & Turland, 2012 (Hesperiidae: Hesperiinae)

This new genus and species was discovered in the Cockpit Country in 2011 (Turland *et al.*, 2012). The site where the immature stages were found faces imminent destruction from encroachment into the forest. Up until 2022, adults had been found at just two other nearby locations. In May 2022, Turland added another location, still in Cockpit Country, but further east on the Burnt Hill Road near Barbecue Bottom in the parish of Trelawny.

Recommendations: This very uncommon species has only been found by the authors deep in the forests of the Cockpit Country. Further study and surveys are required to determine the habitat needs of the species and the current extent of its apparently very restricted territory.

Figure 10. Distribution map, *Troyus turneri.*

♂ holotype, dorsal, ws 22 mm, Troy, Trelawny, Jul., 2012. ♂ ventral.

♀ paratype, dorsal, ws 26 mm, Troy, Trelawny, Jul., 2011. ♀ ventral.

Figure 11. *Troyus turneri* (photos courtesy of Natural History Museum Jamaica, Institute of Jamaica).

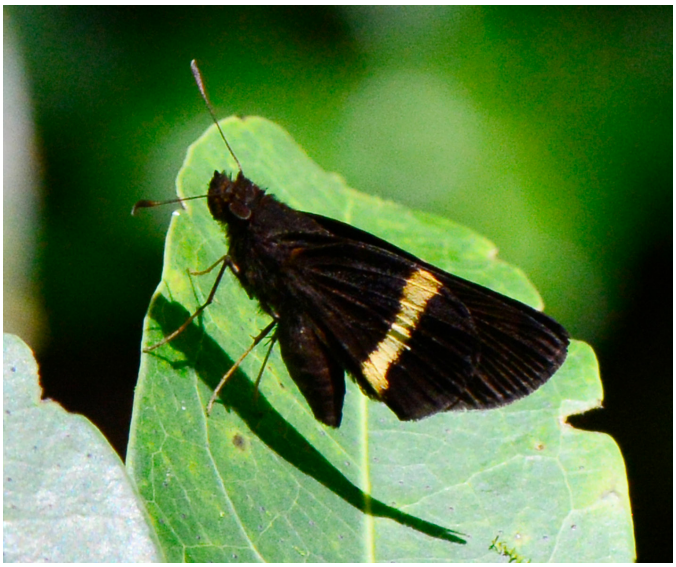


Figure 12. ♀ *Troyus turneri*, Cockpit Country, Trelawny, Sep. 2014.

Panoquina panoquinoides (Skinner, 1891) (Hesperiidae: Hesperiinae)

This coastal species is not uncommon throughout the Caribbean and the adjoining mainland, but in Jamaica this insect is represented by very small colonies found at the tops of sandy beaches near the confluence with permanent vegetation. Adults are usually found no further than 1.5 km from the sea. However, adults are not present at any one location throughout the year but appear briefly at a chosen location before disappearing again, presumably migrating to alternative sites along Jamaica's coastline. Full surveys are needed especially along southern and western beach heads. Because there are numerous hotels and privately owned villas along the Jamaican coast, beaches have been cleaned of native plants and are often landscaped, making those beaches unsuitable for even temporary occupation by this species.

Recommendations: Island-wide beach surveys are required, including those of the offshore keys. Several such surveys will need to be completed to locate isolated occupation sites which can be utilized at different times of the year.

Figure 13. Distribution map, *Panoquina panoquinoides.*

♂ dorsal, avg ws 23 mm, St. Thomas, May, 1972. ♂ ventral.

Figure 14. *Panoquina panoquinoides*.

Figure 15. ♀ *Panoquina panoquinoides*, Silver Sands, Trelawny, Nov., 2008.

Panoquina ocola ocola (Edwards, 1863) (Hesperiidae: Hesperiinae)

This skipper enjoys a wide circum-Caribbean distribution, but for reasons unknown in Jamaica it is found only in discrete locations from sea level up to 840 m in mesic locations, or in mesic habitats such as freshwater marshes within otherwise arid areas of the island. The reasons for such a random selection of occupation sites are unknown. The insect is generally uncommon and the immature stages in Jamaica have not been described.

Recommendations: Field surveys are required to locate occupation sites. The immature stages need to be discovered and described so comparisons can be made between these and other circum-Caribbean populations.

Figure 16. Distribution of *Panoquina ocola ocola.*

♂ dorsal, avg ws 31 mm, Fellowship, Portland, Sep., 1963.

♂ ventral.

Figure 17. *Panoquina ocola ocola*.

Figure 18. ♀ *Panoquina ocola ocola*, Black River Morass, St. Elizabeth, Aug., 2013.

Lerodea eufala eufala (Edwards, 1869) (Hesperiidae: Hesperiinae)

Although this insect occupies a wide geographic range from the southern United States, through the Caribbean and Central America to South America, for unknown reasons this insect is very uncommon in Jamaica. During the last 300 years it has been collected in very small numbers in isolated locations across the island from sea level to 1,500 m in the eastern Blue Mountain range, but it is rarely seen. Reasons for this rarity need to be determined.

Recommendations: Field surveys are required to determine reasons for the distribution patterns of this species and whether additional conservation measures are necessary.

Figure 19. Distribution map, *Lerodea eufala eufala*.

Figure 20. ♀ *Lerodea eufala eufala*, dorsal, avg ws 27 mm, Cinchona, St. Andrew, Apr., 1965, (photo courtesy of NHMJ, IJ).

Figure 21. ♀ *Lerodea eufala eufala*, Shooters Hill, Manchester, Sep., 2015.

Protographium marcellinus (Doubleday, 1845) (Papilionidae: Papilioninae) **VULNERABLE**

There are four very small confirmed breeding sites for this species, each approximately 1.5 km² in area. The habitat at two of these sites is heavily damaged and a third site is subject to disturbance. The fourth site in the Cockpit Country is currently undisturbed but is only 2.5 km from the forest edge, where destruction of the rainforest is nearly complete and is ongoing.
Recommendations: Additional surveys are urgently required during the short annual flight season to reassess the present state of each of the four subpopulations and to examine a possible fifth site. Recent assessments suggest the conservation status should be upgraded from Vulnerable to Endangered or Critically Endangered.

Figure 22. Distribution map: *Protographium marcellinus.*

Figure 23. ♂ *Protographium marcellinus*, Cockpit Country, Trelawny, Apr., 2015.

Figure 24. ♀ *Protographium marcellinus*, Cockpit Country, Trelawny, Apr., 2015.

Pterourus homerus (Fabricius, 1793) (Papilionidae: Papilioninae) **ENDANGERED**

The population is now reduced to five small separate subpopulations, each with even smaller overwintering ranges. Each subpopulation is in urgent need of protection against further forest destruction.
Recommendations: While the summer distribution of adults has been documented, the overwintering areas are in urgent need of definition as these are the localities occupied by this swallowtail when population numbers are at their lowest and most critical period. Fragmented subpopulations in and around the Cockpit Country, in particular, need urgent investigation.

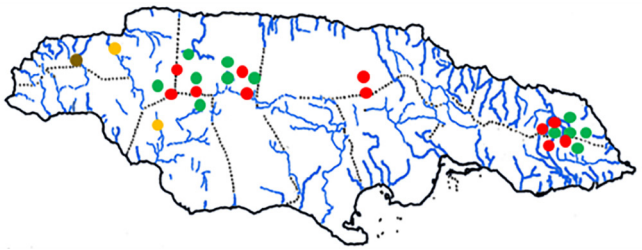


Figure 25. Distribution map, *Pterourus homerus*.

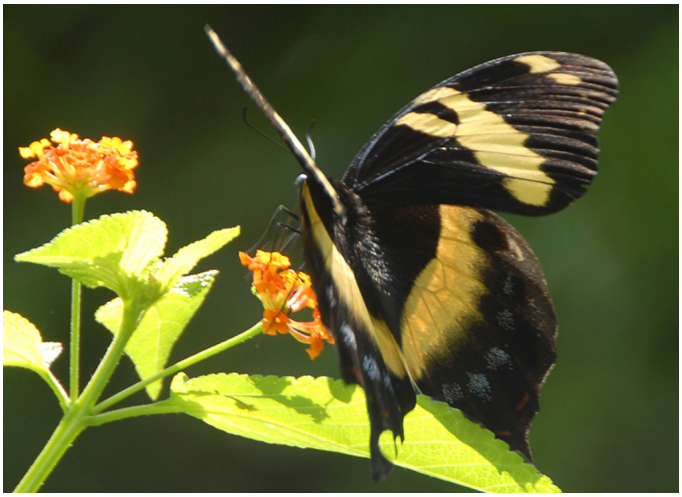


Figure 26. ♂ *Pterourus homerus*, Cockpit Country, Trelawny, Oct., 2011.

Figure 27. ♀ *Pterourus homerus*, Cockpit Country, Trelawny, Jul., 2012.

Cyanophrys hartii Turner & Miller, 1992 (Lycaenidae: Theclinae)

The male type was collected on the southern flanks of Dallas Mountain above the Hope River in July 1979 while feeding on *Cordia* flowers (Boraginaceae). The collection site has not since been thoroughly investigated. Additional information is discussed in Discovering Jamaican Butterflies (Turner & Turland, 2017).

Recommendations: Optimal times to find abundant nectar plants on which this species might be found are July-August and November-December. Fieldwork is urgently needed.

Figure 28. Distribution map, *Cyanophrys hartii*.

♂ holotype, dorsal, Dallas Mountain, St. Andrew, Jul., 1979. ♂ holotype, ventral (abdomen removed).

Figure 29. *Cyanophrys hartii* (Florida Museum of Natural History, McGuire Center for Lepidoptera and Biodiversity).

Chlorostrymon orbis K. Johnson & D. Smith, 1993 (Lycaenidae: Theclinae)

The female type of this distinctive species was collected in November 1919 by Frederick W. Jackson while this insect was visiting *Eupatorium villosum* Sw. (Asteraceae), on the southern flanks of Dallas Mountain. Details of the identification of this site are described in Discovering Jamaican Butterflies (Turner & Turland, 2017). The type locality has not been visited in recent years and the insect might still be found there even though it has been many years since this butterfly was collected.

Figure 30. Distribution map, *Chlorostrymon orbis*.

♀ holotype, dorsal, Dallas Mt., St. Andrew, Nov., 1919.

♀ holotype, ventral (head and abdomen missing).

Figure 31. *Chlorostrymon orbis* (photos © Trustees Natural History Museum, London).

Recommendations: The habitat needs to be visited in June-August and November-December to see if this insect might still be present. This is the same location where *C. hartii* and other hairstreaks have been collected.

Cyclargus shuturn K. Johnson & Balint, 1995 (Lycaenidae: Polyommatinae)

Although this species has been found at three locations along the north coast of Jamaica, only two breeding sites have been found. Both are in dry limestone habitat encroached upon by the clearing of forest for housing developments. The insect can be found in shrubbery at the margins of these developments

Figure 32. Distribution map, *Cyclargus shuturn*.

♂ Silver Sands, Trelawny, Dec., 2009.

♂ Silver Sands, Trelawny, Nov., 2008.

♀ Silver Sands, Trelawny, Dec., 2009.

♀ Silver Sands, Trelawny, Dec., 2009.

Figure 33. *Cyclargus shuturn*.

with some adults feeding on low-growing flowering plants in empty lots. As development proceeds and the surrounding vegetation, including the larval foodplant, are destroyed, the fate of this endemic species is uncertain. Fortunately, both housing developments are proceeding very slowly.

Recommendations: The extent of these coastal subpopulations needs to be determined along with land ownership and the boundaries of the present developments. It may be possible to find a landowner who could assist in protection of this species.

Greta diaphanus (Drury, 1773) (Nymphalidae: Danainae)

There are two isolated subpopulations of this endemic species in the Blue Mountains of eastern Jamaica. The first is centered around the confluence of the John Crow Mountains and the Blue Mountain range. Certain gaps between peaks of the Blue Mountains harbor additional clusters of the insect which may or may not be contiguous with the eastern center. There is a second subpopulation toward the western end of the Blue Mountain chain that is now separated from the first subpopulation by land cleared for coffee growing and settlements. This insect occurs in small, isolated groups.

Recommendations: Considerable fieldwork in difficult terrain is required to define the boundaries of present distribution of this insect and to more accurately determine its conservation status. Sites already identified have only small numbers of adults present.

Figure 34. Distribution map, *Greta diaphanus*.

Figure 35. ♂ *Greta diaphanus*, Hardwar Gap, St. Andrew, Aug., 2013.

Figure 36. ♀ *Greta diaphanus*, Hardwar Gap, St. Andrew, Aug., 2013.

Danaus cleophile yameyensis Turner & Turland, 2018 (Nymphalidae: Danainae)

Although this endemic subspecies was last collected in 1941, surveys in the central mountains of Jamaica have not been completed and, as discussed in the introduction, several species of Jamaican butterflies have been found after long absences.

Recommendations: Surveys need to be conducted in the central mountains, beginning with Mount Diablo and then expanding outwards into neighboring forested areas.

Figure 37. Distribution map, *Danaus cleophile yamayensis*.

♀ dorsal, holotype (purchased from P. H. Gosse).

♀ ventral, holotype (purchased from P. H. Gosse).

Figure 38. *Danaus cleophile yamayensis* (photos © Trustees Natural History Museum, London).

Atlantea pantoni (Kaye, 1906) (Nymphalidae: Nymphalinae)

Atlantea is a genus endemic to the Greater Antilles with a single endemic species present in each of the islands of Cuba, Jamaica, Hispaniola and Puerto Rico. The Jamaican species originally possessed a single population that extended from the western edge of the Cockpit Country east to the Town of Kellits in central Jamaica. However, since its discovery, much of the

land has been cleared for coffee-growing, forestry projects, and small-scale agriculture, and up until 2013 it was believed that only the population in the Cockpit Country remained. Then, in 2014, Turland found an isolated subpopulation in Peckham Woods in northern Manchester Parish and another segregate in 2015 in Matheson Forest in southern St. Ann Parish. The latter may or may not be contiguous with the Cockpit Country subpopulation. Another small site is located west of the main Cockpit Country between Elderslie and Niagara.

Recommendations: All four sites are located in very rugged, near impenetrable forested karst limestone terrain and require further investigation. The larval food plant and immature stages have not yet been described from Jamaica and finding these would assist in determining the best conservation measures. Both the significant loss of area occupied since 1940, and fragmentation of a once single population, suggest this species could be considered Endangered.

Figure 39. Distribution map, *Atlantea pantoni.*

Figure 40. ♂ *Atlantea pantoni*, Cockpit Country, Trelawny, Nov., 2014.

Figure 41. ♀ *Atlantea pantoni*, Cockpit Country, Trelawny, Nov., 2014.

Antillea pelops pygmaea (Godart, 1819) (Nymphalidae: Nymphalinae)

This endemic subspecies occurs in small shifting colonies and is nowhere common. Colonies exist for no more than two years before disappearing. New colonies are established some distance away but are difficult to locate. Over the last 200 years colonies have been found across the island, giving the impression that this species is not uncommon, but virtually all locations previously identified are now abandoned.

Recommendations: The reason for colonies dying out at a given location may be related to parasitic wasp attacks, but this hypothesis requires confirmation. While most adults remain at the emergence site after emerging from pupae, some disperse for considerable distances to form new colonies. Additional investigations are required.

Figure 42. Distribution map, *Antillea pelops pygmaea*.

Figure 43. ♂ *Antillea pelops pygmaea*, Santa Cruz, St. Elizabeth, Sep., 2013.

Figure 44. ♂ *Antillea pelops pygmaea*, YS, St. Elizabeth, Jun., 2009.

CONCLUSIONS

As stated earlier, a problem that has persisted in Jamaica in historic times is that there have rarely been more than three researchers of Lepidoptera in the island at any given time, and even fewer resident collectors. Overseas visitors to the island have collected specimens during the winter months, a few extensively, such as Bernard Heineman, but most only as occasional collectors. Brown & Heineman (1972), Riley (1975), and Smith *et al.* (1994) in particular have all have contributed to our knowledge of Jamaican butterflies, but a more expansive treatment, including much life history information, was provided by Turner & Turland (2017). This last publication also highlighted the need for conservation of several of Jamaica's butterflies.

Another fact that requires recognition, with particular regard to Jamaica, concerns type series. From a scientific viewpoint it is clearly preferable, whenever possible, for new species descriptions to be based on series of both male and female specimens. Specimens from the type series can then be deposited in more than one institution, for archival purposes as well as facilitating access to the material by other researchers. However, populations of some species of Jamaican butterflies appear to be very small and localized, and species descriptions have often been made from just a male or female holotype. It is obvious that not enough systematic collecting has been done on the island, with several new species being discovered in recent years. *Troyus turneri* Warren & Turland was discovered on a trail visited many times by scientists over the last seventy years, including by the present authors, yet it was only on 23 July 2011 that Turland discovered this species for the first time, and return visits to the site resulted in the discovery and description of the life history. In most instances, locations where new species have been collected have not been thoroughly reinvestigated.

This first list of Jamaican butterflies in need of conservation is just the beginning, and this list will change over time. Species not seen for years may be rediscovered; others might not be found and may be declared extinct. At the same time, continued habitat loss may result in additional species being added to the list of species in need of conservation.

One condition that has changed in recent years is that to collect and study any Jamaican Lepidoptera requires prior approval from the Jamaican National Environment and Planning Agency, NEPA, thus making the unpermitted collection of specimens by visiting scientists or casual collectors illegal. This does provide some additional protection for Jamaica's butterflies. A major conservation achievement has been the recent designation as a protected area of a part of the Cockpit Country, where there is high endemism in both flora and fauna. The boundary is marked on the ground and although mining will not be permitted, it remains to be seen if incursions into and destruction of the forest within this boundary will be allowed to continue.

Jamaica is incredibly fortunate in having the largest butterfly in the western hemisphere, the Homerus Swallowtail, which also happens to be the second largest butterfly in the world. It also has the second smallest butterfly in the world, *Brephidium exilis isophthalma* (Herrich-Schäffer, 1862), the Pygmy Blue. These are a part of Jamaica's natural heritage. Butterflies can be considered indicator species for habitat types, their presence or absence reflecting the state of the habitats they now occupy and which we also share. Their loss of habitat range or extinction also provides us with a warning that our shared surroundings are also changing. It is important for us to monitor their populations and ensure their well-being even as the adverse effects of climate change have begun to become more noticeable. Perhaps, more than at any other time, field surveys are urgently required to define more accurately the present state of populations of those butterflies listed here.

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