

Proceedings of the
2nd SYMPOSIUM
on the
CONSERVATION OF JAMAICA'S
GIANT (HOMERUS) SWALLOWTAIL
(*Pterourus homerus*)

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3. OPENING ADDRESS (Summarized)

On behalf of Mr. Peter Knight, CEO of the National Environment and Planning Agency (NEPA), Mr. Ricardo Miller welcomed participants and thanked everyone for their dedication to the Homerus Swallowtail – an icon of Jamaica’s unique natural heritage. The protection of this butterfly and its habitats rests not only with the persons present at the symposium but with all Jamaicans. Since the 2010 Symposium, considerable progress has been achieved in improving the protection status of the swallowtail’s habitat strongholds but gaps remain, including:

- Although a substantial portion of Cockpit Country will be protected from bauxite mining, important regions, including areas known to be occupied by the Homerus Swallowtail, remain outside of the designated protected area boundary;
- On-going research remains vital for science-based planning and conservation;
- Ecotourism and its potential for sustainable development remains underexploited on Jamaica;
- Recent poaching incidents have shown once again how difficult law enforcement and how a specialist national and international, multi-agency group will always be needed for tackling international trade in endangered fauna and flora species. Jamaican authorities remain committed to addressing this problem, with the support of stakeholders such as those gathered for this 2019 Symposium.

Thank you all for your continued dedication to protecting our Giant Swallowtail.

4. SYMPOSIUM OBJECTIVES

In the nearly 10 years since a 1st Symposium was convened to support conservation efforts for the Jamaican Giant (Homerus) Swallowtail (*Pterourus homerus*), milestones have been achieved in enhancing the protection of the species’ critical habitats. In 2015 the Blue and John Crow Mountains National Park (BJCMNP), home to the eastern population of the swallowtail, was inscribed as a World Heritage Site by UNESCO, and in 2017 Jamaica’s Prime Minister, The Most Honourable Andrew Holness, ON MP, presented a boundary for a designated Cockpit Country Protected Area (CCPA), with the assurance that once gazetted, this area would be closed to bauxite mining. Together, these measures underscored Government of Jamaica’s awareness for the nation’s globally-unique heritage and of the importance in protecting the “Land of Wood and Water” for future generations.

In light of the improving conservation status of the Jamaican Giant Swallowtail’s habitat strongholds, but with the recognition that some critical areas of the species’ known range in Cockpit Country were excluded from the 2017 designated CCPA boundary, a new symposium was convened in 2019, to bring together key stakeholders in order to:

- Review outputs and recommendations from the 2010 1st Symposium;
- Update stakeholders on CCPA boundary ground-truthing efforts;
- Ensure that the known distribution of *P. homerus* and its larval food plant are integrated

into landscape-level conservation of Cockpit Country;

- Review the species' biotic and abiotic requirements in the context of landscape-level planning to prevent deforestation and habitat fragmentation and to mitigate for predicted scenarios under climate-change;
- Update stakeholders on conservation actions in the BJCMNP, including community-based efforts;
- Within the context of national and international laws, review reports of poaching and other relevant illegal activities since 2010;
- Identify knowledge gaps and research needs;
- Support NEPA with updating the Jamaican Swallowtail Recovery Plan, which integrates research, habitat protection, legislation, and public education into an action plan for the conservation of the Jamaican Giant (*Homerus*) Swallowtail.

5. PRESENTATION SYNOPSES

5.1. 2010 Symposium on the Conservation of the *Homerus* Swallowtail and Cockpit Country, Jamaica: A brief overview of its conclusions and recommendations (Caspar Bijleveld)

In September 2010, with the support of Dutch Zoo Conservation Fund (DZCF), the International Association of Butterfly Exhibitors and Suppliers (IABES) and the International Tropical Conservation Foundation (ITCF), Jamaican and international partners came together with a shared goal for the protection and conservation of Jamaica's iconic and nationally-loved Giant (*Homerus*) Swallowtail. The objectives of the 2010 symposium¹ were to:

- Reconcile all scientific facts, including the distribution of the Jamaican Giant Swallowtail butterfly (*Pterourus (Papilio) homerus*), to guide the development of a conservation plan for the Jamaican Giant Swallowtail butterfly;
- Identify gaps in knowledge, particularly in relation to genetic diversity, factors that potentially limit dispersal, demography, and the viability of Western populations;
- Facilitate the acquaintance of persons active in the research, monitoring, and conservation of the Jamaican Giant Swallowtail.

Following presentations on the history of *P. homerus* research, the species' biology, ecology, and demography, and the status of its western habitat stronghold of Cockpit Country, a round-

¹ Proceedings of the 2010 Symposium are available on IABES' website: <https://iabes.org/conservation/save-homerus>

table discussion generated 10 recommendations (for 2019 status updates and new recommendations from this 2nd symposium, see Sections 6 and 7):

2010 Recommendations	
1.	Conduct DNA sampling (molecular genetics) to determine the current level of diversity within and between the two extant populations – the eastern Blue and John Crow Mountains population and the west-central Cockpit Country population – to determine whether they should be managed as a single species, two distinct subspecies, or two distinct species.
2.	Establish a scientifically led “Captive Life-Cycle Research Project” to fill knowledge gaps in ecology and demography, including ovipositing rates, duration of egg-laying cycles, total egg production, and patterns (if any) of diapause.
3.	In relation to Recommendation 2 and if releasing captive-reared animals is determined to be safe for wild populations, controlled releases under variable conditions should be conducted to identify the factors that limit dispersal, with a goal of understanding corridor requirements in order to maintain gene flow among subpopulations.
4.	Continue field surveys to improve distribution maps, particularly to document seasonal and annual variation, which may be correlated to rainfall patterns. Survey results, including climate parameters, should be integrated into a model to predict potential effects of climate change on <i>P. homerus</i> populations.
5.	Protocols should be developed to enable standardized surveying of all <i>P. homerus</i> life-history stages within permanent monitoring plots already established by Forestry Department’s BioPhysical Inventory Programme. Results of new <i>P. homerus</i> field surveys may help guide the placement of additional permanent monitoring plots.
6.	To confirm <i>P. homerus</i> ’ unique and beloved status in Jamaica, workshop participants endorse its formal nomination as the “National Butterfly”. Education and outreach would accompany official recognition. Mechanisms for dissemination include NEPA’s Education Branch, the CC-LFMCs, and “SmartPhone” technology offered by mobile telephone service providers. Dr. Garraway’s 1984 video of <i>P. homerus</i> life history and more-recent video by Court Whelan could offer glimpses of this unique butterfly to the majority of Jamaicans who have never seen this species. All materials used should be endorsed by NEPA to make sure no sensitive materials potentially endangering <i>P. homerus</i> enters the public domain.

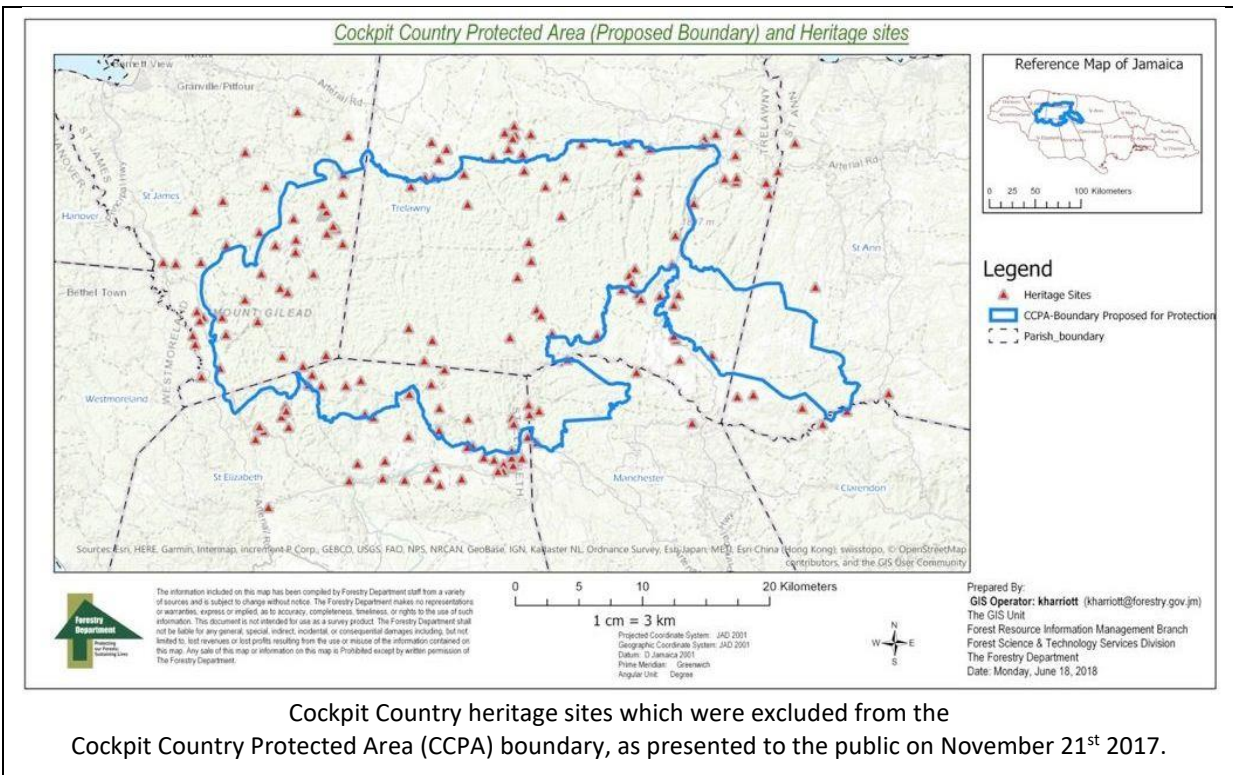
<p>7. To facilitate development of educational materials, along with pursuing conservation recommendations, a “Homerus Working Group” was established during the workshop and a ListServe will be created for maintaining communication.</p>
<p>8. With any increased attention given to <i>P. homerus</i>, either locally or nationally, there will be an increased risk of poaching and smuggling to supply an illicit international market. National enforcement agencies, including NEPA and the Island Special Constabulary Force must be networked effectively with CITES, to ensure adequate vigilance to increased smuggling, particularly of pupae.</p> <p>Although “flooding the market” with legal animals, licensed out of Jamaica, may be one option to defeat demand, the “joy of circumventing government control” by some members of the Jamaican public will make legal control of a market extremely difficult. Until adequate safeguards are in place, the CITES ban on trade must be enforced.</p>
<p>9. The feasibility of eco-tourism must be assessed for the “High Priority” western region of Cockpit Country, which is a recognized hotspot for <i>P. homerus</i> and is under major threat from bauxite mining as some agencies do not acknowledge that the area is part of “Cockpit Country.”</p> <p>The natural and cultural assets need to be identified and mapped, to enable proper spatial planning. From this, a proposal can be developed to support alternative income strategies, such as a “Cockpit Country Heritage Centre,” which should not have an exclusive focus on <i>P. homerus</i> but, rather, should focus visitor attention to a healthy, integrated ecosystem.</p>
<p>10. With the recognition that the western region of Cockpit Country is a “hotspot” for <i>P. homerus</i> and that the region remains vulnerable to bauxite mining, continuing efforts should be directed towards expanding community support for maintaining buffer zones around existing Forest Reserves.</p> <p>As scientific research improves our understanding of the factors that limit <i>P. homerus</i> populations in Cockpit Country, it will be possible to spatially identify and prioritize conservation corridors in western Cockpit Country.</p>

5.2. Cockpit Country Protected Area: Is Homerus Secure? (Susan Koenig)

For more than 20 years, site-based NGOs such as Windsor Research Centre (WRC) and other community-based and national stakeholders have focused their efforts on protecting Cockpit Country – the stronghold of the western population of the Jamaican Giant Swallowtail – from open-pit mining of bauxite, the raw material for aluminum. Efforts were galvanized in 2007, when the then-Prime Minister, The Most Honourable Bruce Golding, assured stakeholders that the Government was committed to establishing a boundary for Cockpit Country so that mining could be prohibited. At that time there were at least 8 delineations associated with this unique

karst landscape, each of which represented different features-of-interest (e.g. the history of Maroons retaining their freedom from slavery by defeating British soldiers; geomorphology; hydrology, plant and animal distributions, Forest Reserve, etc.). Spear-headed by WRC, the Cockpit Country Stakeholders Group (CCSG) brought all of these layers of the karstscape together, thus enabling Cockpit Country to define itself via its ecological features and cultural heritage.

Following more than 10 years of community advocacy for the CCSG Cockpit Country boundary, on November 21st 2017, Jamaica’s current Prime Minister, The Most Honourable Andrew Holness, ON MP, presented to Parliament a boundary for a Cockpit Country Protected Area². In determining the boundary, the Prime Minister noted that the Cabinet took into account the features of geomorphology, the closed broadleaf forest, the rich biodiversity (including, notably, the Giant Swallowtail butterfly), the hydrology, and important historical & cultural sites. That is, the Cabinet identified the same features which the CCSG used to enable Cockpit Country to define itself. However, while the CCSG embraced all data, the Cabinet visibly excluded easily-identifiable and recognized features of Cockpit Country from its designated Cockpit Country Protected Area (CCPA) boundary.

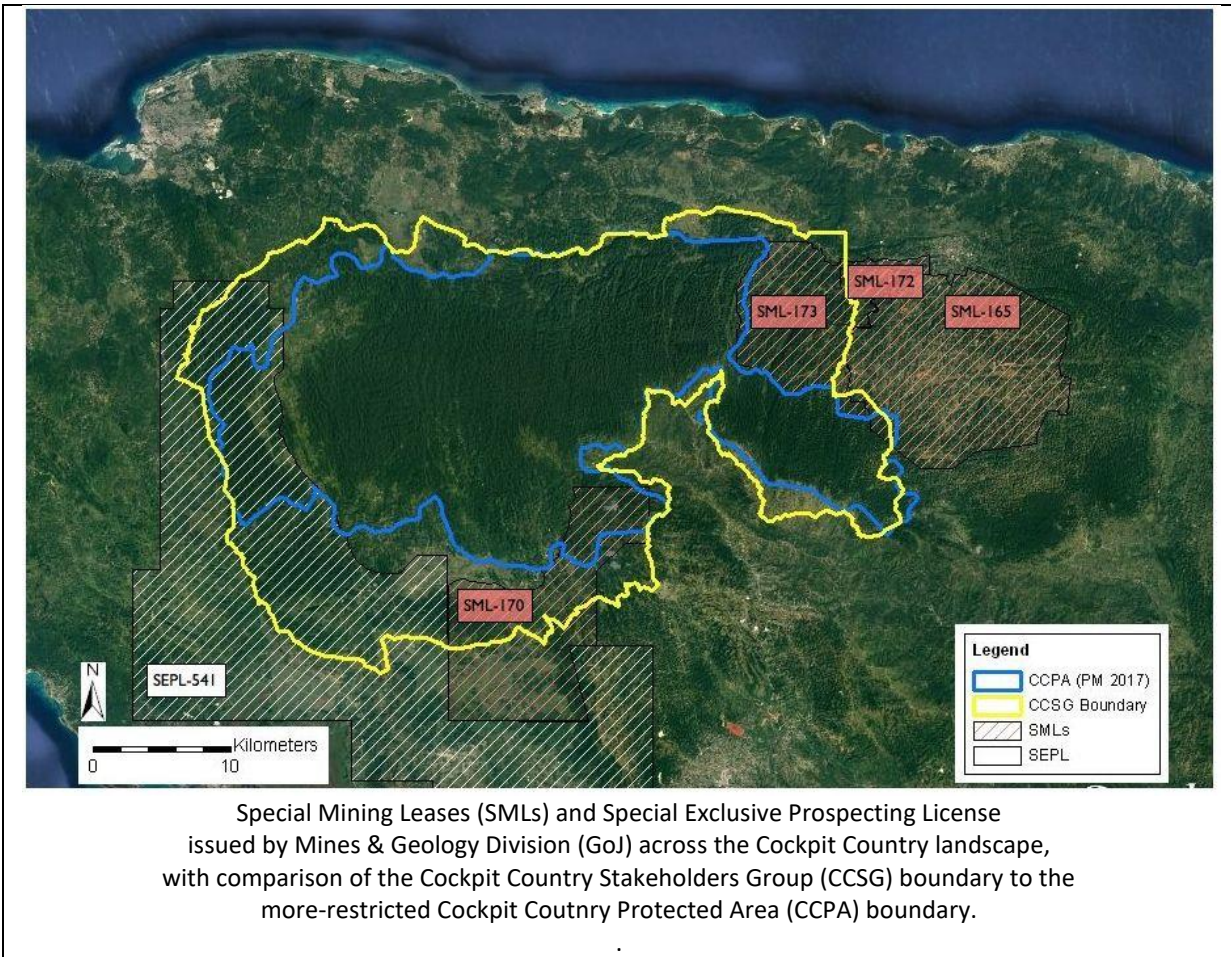


Further, the designated CCPA boundary failed to take into consideration the proven underground water flows of the cockpit karst aquifer, the source of 40% of Jamaica’s

²The full speech is available at: <http://go-jamaica.com/pages/cockpit/#>

freshwater supplies. It also noticeably excluded known areas occupied by the Jamaican Giant Swallowtail and other species which are described by experts as “endemic to Cockpit Country.”

What the Prime Minister did reveal, however, was that the CCPA boundary was designed to ensure that mining interests (incl. Government of Jamaica via partnership arrangements) retained access to desired bauxite deposits.



All stakeholders must also be aware that, until the CCPA is ground-truthed³ and gazetted, no part of Cockpit Country is “Closed to Mining.” Additionally, Special Mining Leases (SMLs) and Special Exclusive Prospecting Licenses (SEPLs) continue to be in-force not only up-to the designated CCPA boundary but also some portions still fall within the designated CCPA. To-date, the Prime Minister has never presented discussions for buffer zones to protect the integrity of the Protected Area.

During the question-and-answer period following the presentation, symposium participants reinforced the observations known to the many communities who will be impacted should any

³ As of the end of September 2019, 119 km of the estimated 246 km length of the CCPA has been ground-truthed by Jamaica’s Forestry Department.

mining be allowed in Cockpit Country: regardless of whether one invokes the name of the CCPA Boundary, the CCSG Boundary or any other human-defined boundary, community livelihoods (notably those which depend on the soils for agricultural productivity), the forest and its myriad ecosystem services, the clean water supplies, and public health (especially dust-associated respiratory illnesses and exposure to air-borne heavy metals) will all be irreversibly damaged by bauxite mining in the Cockpit Country karstscape.

Thus, Cockpit Country Communities for Conservation were correct when they adopted the Jamaican Giant Swallowtail for their logo: a healthy environment which protects this iconic butterfly will protect current and future generations of Jamaicans.

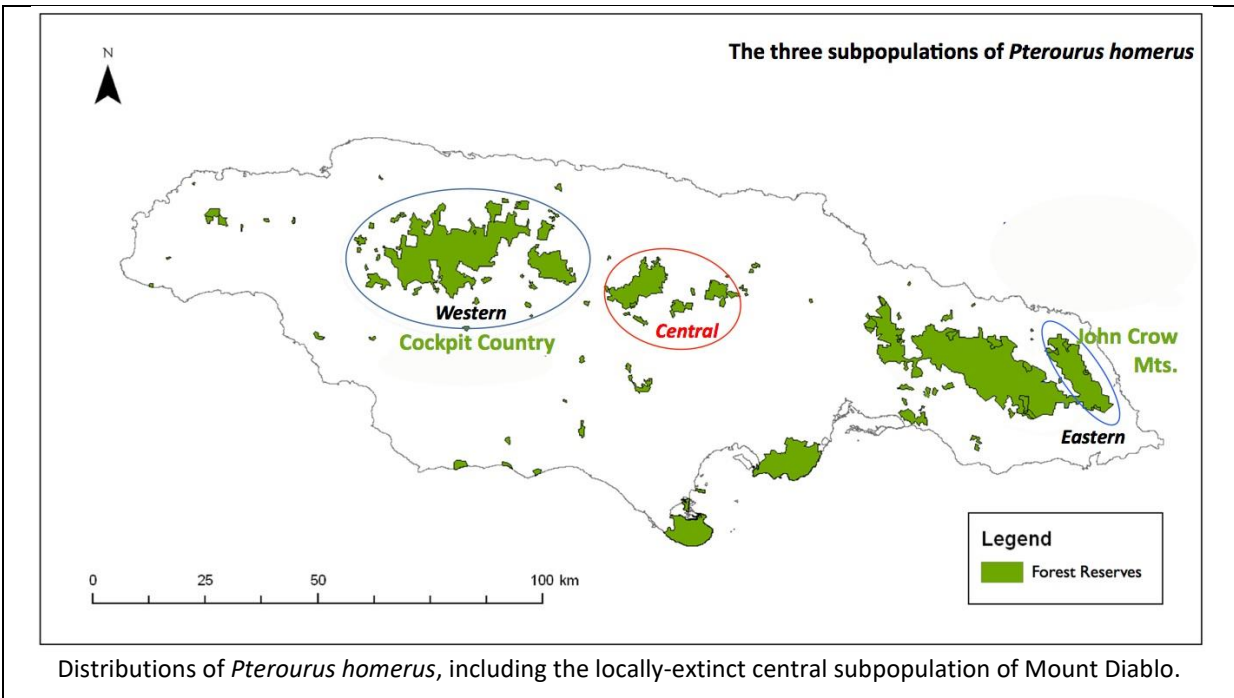


5.3. Steps Required to Prevent the Extinction of Jamaica’s National Butterfly, the Homerus Swallowtail, *Pterourus homerus* (Fabricius, 1793) (Lepidoptera: Papilionidae) (Thomas Turner and Vaughan Turland)

The survival of a species of butterfly or moth is dependent on the availability of suitable habitat with adequate food resources for both larva and adult with a population of a suitable size to be genetically viable. In addition, the species must be adapted to counter the adverse effects of predation, parasitism and disease, and must be able to withstand the effects of extreme weather such as periods of drought, violent storms, or extreme temperatures. A balanced interrelationship between insect and habitat with its many occupants, including predators, evolves over many thousands of years.

The demise and extinction in the late 19th century of a large, spectacular species of Jamaican Lepidopteran moth, *Urania sloanus* (colloquially called “The Christmas Fly” for the timing of adult emergence), serves as a warning for how precarious survival is for even a widespread species when forest habitat is converted, remnant patches are rendered isolated, and / or food plants become too patchily distributed. The question now is whether a second large, spectacular Jamaican Lepidopteran, *Pterourus homerus*, is on the same catastrophic trajectory.

Historically, there were three subpopulations of *P. homerus*. The last record for the central population dates back to 1925 and, like *U. sloanus*, we can but speculate on its localized extirpation. Forest conversion and habitat fragmentation were likely major contributors to its demise.



Eastern subpopulation

In the east, the swallowtail and its larval host plant, *Hernandia catalpifolia* occur in a very special climate, where eastern tradewinds bring moisture from the sea which then precipitates as mist and rain via an orographic effect rising to a peak of 1143 meters. The host plant grows between a limited elevational range of ~ 400 - 840 m, in non-calcerous clay soils, and in close association with streams. While up-through the 1940s the eastern subpopulation flew over a forested range > 200 km², at present the flight range is estimated to be only 116 km², a reduction of nearly 50% in the last 80 years. The current range encapsulates a worryingly-small known breeding area of only 22 km² as well as meeting the requirements for adults to migrate to lower elevations between October and March, when heavy mists significantly limit warming sunlight at elevations about 600 m.

Because of the special climatic requirements of both the host plant and *P. homerus* (e.g pupae desiccate if not kept in humid conditions), predictions of climate change models, especially prolonged drought cycles in the Caribbean, must now be addressed for Jamaican Giant Swallowtail conservation planning. Indeed, the effects of climate change have already become noticeable: whereas the area of Millbank, historically one of the four wettest locations on Earth, used to receive 10,000 mm of rainfall per annum, this has declined over the last 450 years to the present rainfall of 6,350 mm per annum. While this overall appears adequate to meet the ecological requirements of *P. homerus*, numbers of adults observed are markedly reduced during noticeably hotter and drier years, such as 2019 witnessed.

Other human-related threats to the eastern subpopulation include long-term effects of historic conversion of native broadleaf forest to commercial plantings of Caribbean pine (*Pinus caribbeae*) which may hinder *P. homerus*' horizontal movement from one stream to another

stream (vs. flight up-and-down a single stream drainage), continued deforestation at lower elevations, and poaching for the illegal trade of this CITES Appendix 1 species.

Western subpopulation

For the western subpopulation, while the geography differs significantly from the eastern subpopulation, moisture gradients similarly dictate the distribution of the swallowtail and its host plant, *Hernandia jamaicensis*. A foundation of karst limestone means that rain percolates almost immediately and vertically below ground so that there are very few surface streams, except where they emerge around the periphery of Cockpit Country. A topography of cockpit karst – conical hills joining to form enclosed depressions – results in a forest structure whereby hilltops and hillsides, exposed to dessicating winds and with little accumulated soils support stunted, drought-adapted vegetation while the cockpit bottomlands, with deep soils and protection from both wind and full direct sunlight, support large trees and maintain a very moist sub-canopy microclimate. It is in these cockpit bottomlands, with their deep pockets of soil and damp, shaded conditions, that the host plant grows to be an emergent canopy tree.

The cockpit microclimate not only is a requisite for the survival of the western subpopulation of the Jamaican Giant Swallowtail but the area also serves as a moisture refugium for other species of butterflies which will shift their patterns of habitat usage during periods of severe drought.

While the 2017 designated Cockpit Country Protected Area (CCPA) includes a majority of the currently-known range of occupancy of the western subpopulation, it did exclude forested areas where both the larval food plant and adult butterfly have been seen. This gap needs to be addressed. Additionally, the southwestern region of the CCPA which receives the highest rainfall – the climatic stronghold for the swallowtail – requires attention to address issues of historic selective logging, forest conversion, forest fragmentation and dessication of smaller forest patches, and on-going loss of the larval host plant along the margins and outside of the Protected Area.

On-going threats to the survival of the western subpopulation include:

- Open pit bauxite mining and its associated loss of forested habitat, dessication along forest edges, and poor post-mining rehabilitation practices which preclude reforestation success;
- Limestone quarrying which, along with bauxite mining not only results in habitat loss but generates large quantities of dust which coats leaves of remaining forest trees, rendering them unsuitable for oviposition;
- Cutting of saplings for yam-sticks and fish-pots (selective harvesting affects tree species diversity and forest regeneration dynamics);
- Forest conversion for agriculture and livestock production;
- Selective logging (legal and illegal);
- Charcoal burning;

- Potential for inappropriate use of pesticides
- Poaching



Within the context of the Cockpit Country Protected Area, a management plan is needed for the Cockpit Country landscape so as to ensure that not only is no further *P. homerus*-occupied habitat lost but that connectivity and historic range are restored with food plants and for the maintenance of the required subcanopy microclimate. Topics for management should include:

- Scientific research needs, including identifying areas where the western populations overwinters;
- Focus on food plant distributions and identifying where replanting would be beneficial;

- Delineating zones for the types of prohibited or permissible activities, such as a core with no mining or conversion to farming; a transition zone which focuses on restoring forest connectivity with fast-growing native tree species and which interfaces outwards to a buffer zone with agriculture and mining that integrates tree planting.

5.4. *Homerus*: Flagship of the Blue and John Crow Mountains National Park & World Heritage Site (Susan Otoukon)

History

In 1993 the Blue and John Crow Mountains National Park (BJCMNP) – Jamaica’s 1st national park – was legally gazetted, affording a new level of protection to 41,198 hectares (approximately 4% of Jamaica) of tropical montane cloud forest and river systems. From its inception, the national park strongly identified with the Jamaican Giant (Homerus) Swallowtail as a source of pride: not only does the Giant Swallowtail feature prominently in the park’s logo but the design, itself, was the result of a competition during a two-year mobilization period which preceded the park’s creation.



Pride in the Giant Swallowtail directly linked to a greater awareness and appreciation for the BJCMNP and its conservation value. In 1993, a Giant Swallowtail Butterfly Project was implemented by the park’s management, the Jamaica Conservation and Development Trust (JCDT⁴) with funding from the Rare Center for Tropical Conservation (RARE). In reaching out to 29,000 students, from 101 schools, JCDT not only saw a 54% increase in the number of people who knew the name of Jamaica’s largest butterfly, but there was a 14% increase in the number of people who viewed the BJCMNP as “Very Important” and felt that government should invest time and funding into its management.



Ambasabeth Cabins

Other early community-based support was organized through a local committee called the Millbank Progressive League, which subsequently fused with the Bowden Pen Farmers Association (BPFA) in 2004. With a long history of working in close collaboration with Giant Swallowtail researchers e.g as research field assistants and guides, BPFA members continue to assist with monitoring and caretaking of the swallowtail through ecotourism opportunities associated with their Ambasabeth Cabins.

⁴ <https://www.jcdt.org.jm/>

Current management

The years 2002 – 2013 saw increasing involvement of Maroon communities and in 2015, the Blue and John Crow Mountains were inscribed as a World Heritage Site under the UNESCO World Heritage Convention for their outstanding universal values of cultural heritage, living traditions, and unique biological diversity. Indeed, even this mix of universal values is unique: the Blue and John Crow Mountains are one of only 39 “Mixed” World Heritage Sites of 1,121 World Heritage Sites.

Under the current 10-year management plan, attention is focused on reducing and eliminating major threats. These include:

Stress / Threat	Source
1. Deforestation / Habitat Destruction	1.1. Conversion to agriculture 1.2. Logging 1.3. Fire
2. Forest Degradation	2.1. Invasive species
3. Wildlife Destruction and / or Disturbance	3.1. Hunting 3.2. River poisoning 3.3. Habitat loss
4. Loss of Cultural Heritage	4.1. Reducing interest, especially amongst youth

Some of the root causes of these threats are:

- Insufficient environmental education
- Limited environmentally sustainable income-generating activities
- Inadequate enforcement
- Insufficient conservation activities
- Conflicting policies
- Inadequately demarcated boundaries
- Inadequate resources and management
- Climate change

To address these threats, the management plan has adopted strategic programmes:

- Conservation of Natural Heritage
- Preservation of Cultural Heritage
- Enforcement & Compliance
- Public Education & Outreach
- Recreation & Tourism
- Monitoring & Evaluation
- Governance & Administration

While core funding from Government of Jamaica⁵ supports park management and the Ranger Corps, the Management Programmes are supported by externally-sourced funds. As an example, from 2017 – 2019, JCDT secured a grant from the Global Environment Facility Small Grants Programme (GEF-SGP). The project -- a Natural & Conservation Heritage Conservation Project -- enabled forest assessments in key community locations, conservation planning for reforestation (particularly climate-friendly agro-forestry) activities, enhanced enforcement, and assessments for enhancing existing ecotourism sites and tours. Together, these activities aim to improve the habitat of the Jamaican Giant Swallowtail and ensure that visitors will continue to have positive experiences in the wild Blue and John Crow Mountains.



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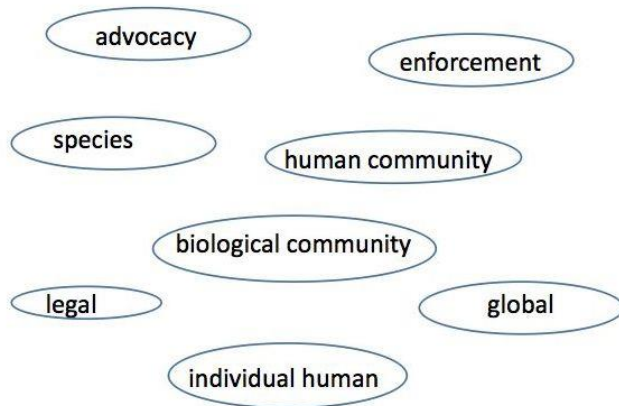
5.5. The Role of Communities in Conservation (Eric Garraway⁶)

Conservation requires forging positive links between often-conflicting desires and aspirations. While the literature repeatedly presents the premise that to achieve conservation success local communities must be engaged and be shown how they can benefit from conservation effort, the reality is that finding a good success story is often difficult. And even when we think conservation has been achieved in the short-term, we must always ask whether the effort can be sustained, particularly with ever-changing external factors. A case study of *Pterourus (Papilio) homerus* allows us to understand the strengths and weaknesses and ask: has a local community benefitted from its contributions to protecting an endangered species and have benefits transferred to the conservation of the species and its habitat?

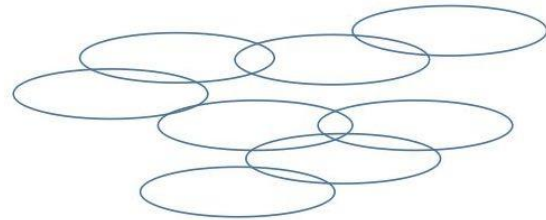
⁵ GoJ funding is provided by the Natural Resources Conservation Authority (NRCA) via the National Environment and Planning Agency (NEPA)

⁶ This presentation was adapted from a detailed Case Report prepared by Dr. Garraway and his colleagues Drs. John Parnell and Delano Lewis. We encourage everyone to read their full study: Garraway, E., J. Parnell, and D.S. Lewis (2017). Successful community-based conservation: the study of Millbank and *Pterourus (Papilio) homerus*. *Insects* 8, 69, doi:10.3390/insects8030069

Some areas of conservation activity ...



... how do communities aid the linkages?



In July 2010, the presenter was preparing to hike into the John Crow Mountains when he was approached by two young girls from the Millbank community after they noticed the insect net he carried. The girls blocked the path and threatened to call the police because “this stranger was going to catch the butterfly”. A conservation concept of “communities-as-frontline-conservators,” which had been introduced and nurtured regularly throughout the mid-1980s and 1990s and intermittently thereafter by this very same researcher, appeared to have transcended the generations and empowered these young conservation custodians to protect “their” Giant Swallowtail. How had these young girls become empowered in their knowledge, particularly when so many aspects of conservation efforts are finite and frequently transient (e.g. the presence of researchers who come and go and who may be perceived as coming in and “taking away” information, funding agencies / duration of grants, law enforcers, etc.)?

A key aspect of the Giant Swallowtail field research project which Dr. Garraway and his associates established in the mid-1980s didn’t actually involve direct activities with the swallowtail. Instead, they found themselves slowly integrating into the daily lives and concerns of the community – chatting at a local bar, eating at the local shops, supporting church activities, creating school assignments for community children, attending town-hall meetings to hear about issues affecting farmers, seeing how community members resolved disputes.

While such total immersion takes a considerable amount of time (and associated long-term commitments from funding agencies) and can often be very difficult, it is absolutely necessary for establishing trust with the community. For it is from mutual trust that indigenous community knowledge can add to the research process and ideas of research-conservationists can become part of the culture of the community. Every researcher needs to hear the community members when they say, “what you tell us about this animal is very interesting, but at the end of the day, you are going to go away while we have to stay here and get on with our

lives.” Without the mutual trust which develops through long-term immersion and involvement with community-building activities, researchers should never expect their conservation message to be received without question. But with long-term mutual trust, cultural change can, indeed, occur, as evidenced when Dr. Garraway was stopped and questioned by two young girls.

But in putting such onus of conservation onto the shoulders of the communities, are we being fair? What must communities do when the legislative framework doesn't prevent large agencies, including the state, from implementing wide-scale projects that undermine conservation efforts? What happens when urban planners decide they know what is best for rural communities? What happens when nostalgia for the “simple life of one's childhood” fails to recognize that rural communities are part of the “forgotten people” who often lack basic housing amenities, have poor access to quality medical care, may have poor diets, and have limited educational opportunities? What happens when over-simplified promises of conservation benefits creates unrealistic expectations (e.g., as all-too-often happens with touting ecotourism, which can be argued has generally failed in Jamaica) and the community becomes disengaged from the process? What happens when an initial, small success is taken-over by a complex, externally-designed and externally-driven project which exceeds the skill-sets, capacity or aspirations of the community? What do the communities think about their opportunities? Has National Park and World Heritage status served well the communities of the Giant Swallowtail's Blue and John Crow Mountains such that other areas in Jamaica should try to copy this model? All of these questions must be explored to answer how well we are progressing to community-based, sustainable conservation.

5.6. Cockpit Country: What do poachers know? (Susan Koenig)

In 2015, an international “tourist” damaged the front axle on his rental car, rendering himself immobile on a back-a-bush country road in Cockpit Country. Fortuitously, this occurred on a road in Windsor, where Windsor Research Centre is located, so a local farmer directed the “tourist” -- who was dressed in normal-for-Windsor-visitor-clothing of hiking boots, long green trousers, floppy field hat – to us. We immediately recognized something else: just as the two young school girls in Millbank recognized Dr. Garraway's insect net and immediately questioned his motives, we recognized the insect net and glass killing jar which the “tourist” was carrying. As Game

Wardens for NEPA, we asked to inspect his equipment, noted glassine envelopes with recent dates and names of butterfly species but found no actual specimens within the envelopes, and asked to see his research permit. When he said he didn't have a permit – he said he was merely catching butterflies to photograph and then release them -- we offered assistance in his contacting NEPA and managed to get him to write his name on a research application form. In



Day & month in timestamp intentionally deleted

the absence of finding either *Pterourus (Papilio) homerus* or *Protographium marcellinus*, the two butterfly species protected by Jamaica's Wild Life Protection Act, we couldn't detain this individual. We did, however, make an immediate report to NEPA, which launched subsequent coordination with immigration and customs officers on the "tourist's" scheduled day of departure from Jamaica. He never bothered to report his immobile, undriveable rental car to the company (we did!!) but, instead, rented a second car from another company so he could return to Windsor 3 days later, only this time not coming as far as Windsor so as to avoid our detection. Unfortunately for the "tourist", one of our day-workers saw him walking along the roadside, dressed in his full "field entomologist" kit so our worker assumed he was one of our guests and mentioned him to us.

Why was our radar twitching so much with this "tourist"? Not merely because he'd flown half-way around the globe to have an experience with wild Jamaican butterflies, but because his trip was timed precisely to the emergence of one of Jamaica's two protected species. How did he know the timing of their emergence? Because we'd posted commentary on our website! In an attempt to share information with the public, to inspire Jamaicans to appreciate their unique, endemic natural heritage, we inadvertently tipped-off a potential poacher to the "time and place" for the best chances to collect specimens.

After scrubbing our webpages, we found ourselves in the dilemma faced by so many conservationists: How much information should be shared publicly without further endangering an already-endangered species? Can / should we ever show techniques on capture and handling for educational purposes which may, instead, be co-opted as training demonstrations for community poachers? Our ability to assess the risk depends in-part on our community-policing efforts, abilities to detect smuggled wildlife specimens, and law enforcement capabilities. Our experience with wild parrots in Windsor tells us we should never underestimate the cleverness of poachers.

5.7. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Jamaica (Karl Aiken)

The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) is a multilateral treaty which aims to ensure that international trade does not threaten the survival of plants and animals in the wild. The convention was opened for signature by members of the United Nations in 1973 and entered into force on 1 July 1975. Participation is voluntary, and countries that have agreed to be bound by the convention are known as Parties. There are currently 183 Parties which have signed the convention (though not all have ratified it domestically). While CITES is legally binding, it does not take the place of national laws. Instead, it provides a framework for each Party to strengthen domestic legislation to implement CITES at the national level. CITES has four major requirements for a Party: (1) designation of Management and Scientific Authorities; (2) domestic legislation prohibiting the trade in violation of CITES; (3) penalties for such trade; and (4) laws providing for the confiscation of specimens.

To protect species against over-exploitation through international trade, CITES assigns species into one of three Appendices:

- Appendix I: includes species threatened with extinction; international commercial trade of wild-caught specimens is prohibited. Jamaica's Giant Swallowtail Butterfly (*Pterourus (Papilio) homerus*) is an Appendix I species.
- Appendix II: includes species not necessarily threatened with extinction but may become so unless trade is regulated; international commercial trade is allowed, but controlled. Examples of this in Jamaica are the monitored harvesting of Queen Conch (*Lobatus (Strombus) gigas*) and trade in endemic orchids.
- Appendix III: includes species subject to regulation within the jurisdiction of a Party and for which cooperation of other Parties is needed to control international trade (e.g., Brush-footed butterflies (family Nymphalidae) in Bolivia)



Lepanthes pulchella

Jamaica ratified CITES on 22 July 1997 and established the two requisite Authorities: (1) the Scientific Authority, which reviews trade and status issues; and (2) the Management Authority (overseen by the Natural Resources Conservation Authority [NRCA]), which accepts or rejects recommendations from the Scientific Authority for trade matters affecting listed species. For the Management Authority to issue export permits for CITES species, three conditions must be fulfilled: legality, traceability, and sustainability. All trade decisions must be “Non-Detrimental” to the future survival of the focal species.

In support of CITES' requirements for laws prohibiting trade, penalties for such trade, and forfeiture of specimens seized, Jamaica implemented the Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000. This Act has four schedules, the first three of which are equivalent to CITES Appendices. The fourth schedule includes species in Jamaica, the trade of which is controlled to prevent or restrict exploitation and which would require the cooperation of other Parties. This fourth schedule essentially provides protection for species not protected explicitly on Jamaica's Wild Life Protection Act, 1945.

Jamaica's Scientific Authority also reviews scientific research applications and introduction-of-species (or parts thereof) applications, to make recommendations to the NRCA with regards to issuing of permits. And further, the Scientific Authority assists in the development of species Management Plans and the preparation of annual trade and special reports to CITES.

An example of the valuable partnership between CITES and Jamaica was witnessed in 1993. At that time, a local company failed to obtain a CITES permit for a shipping container filled with Queen Conch meat. They appeared to have presumed that, if caught-out at the receiving side of the line, a permit could be issued retroactively. Instead, they suffered a loss of > USD 1

million – the contents of the container, US dock storage fees, and penalties. Since 1993, every conch exporter from Jamaica has shipped containers with proper CITES documentation which, consequently, also enables Jamaica to properly monitor the trade and close the harvesting season when over-exploitation is being detected.



Lobatus gigas

Jamaica's current Scientific Authority has 10 members, representing GoJ, university, and non-governmental stakeholders. Members are appointed for 3-year periods by the minister with responsibility for the environment and meet every 6 weeks. Under this format, the Scientific Authority has been able to address a broad range of issues and topics, such as orchid exports, queen conch spawning research and export quotas, shark conservation, dolphin policy, smuggling of parrots, sea cucumber conservation, DNA profiles of protected animals, export of river eels and a national wildlife trade policy inclusive with bio-security. On paper, Jamaica is legally well-positioned to protect CITES species, including its Appendix I Jamaican Giant Swallowtail.

5.8. Jamaica's Wild Life Protection Act and Enforcement for Homerus Swallowtail Conservation (Ricardo Miller)

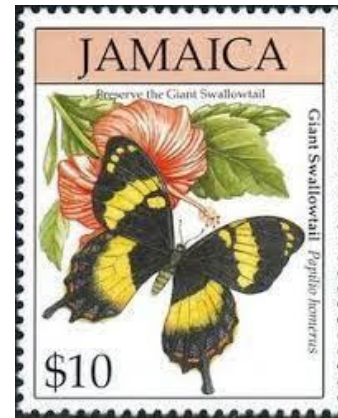
Jamaica's endemic Homerus (Giant) Swallowtail is protected by both national legislation and international conventions. During the 1987 6th CITES Conference of Parties (CoP6), the species was proposed and subsequently added to Appendix I of the Convention owing to its IUCN Red List status of Endangered (at risk of becoming extinct within the near future) and because of the known history of trade in specimens⁷.

Nationally, the swallowtail is protected by its current inclusion on the Third Schedule of the Wild Life Protection Act (1945). Under this Act, it is an offense to have in one's possession the whole specimen, alive or dead, or any parts thereof. At present, breaches of the Act can result in fines up-to JMD 100,000 (approx. USD 850) and / or up-to 12 months imprisonment. Additionally, Jamaica's Endangered Species (Protection, Conservation and Regulation of Trade) Act (2000), allows Resident Magistrates to enact fines of up-to JMD 2,000,000 (approx. USD

⁷ In 1987, when Great Britain and North Ireland proposed adding *Pterourus (Papilio) homerus* to CITES Appendix 1, there were no specific Jamaican laws against collecting it. Jamaican ratified CITES in 1997 and closed this gap.

16,000) and / or up-to 2 years imprisonment while cases brought to the Circuit Court have unlimited, open fines and / or up-to 10 years imprisonment. Thus, on paper, Jamaica is well-positioned to protect this species.

In practice, and with reported black-market prices of USD 8,000 – 10,000, illegal collecting persists and enforcement of protective laws remains a challenge. In part this is potentially due to the ease with which specimens can be posted through mail services, as was suspected during a May 2015 incident where Windsor Research Centre reported a suspected poacher in Cockpit Country to NEPA. Although the suspect was intercepted by NEPA and Jamaica Customs at the international airport, no specimens were found amongst his insect collecting and killing equipment. Similarly, ongoing reports of poaching of adult butterflies and larvae in Millbank have proven difficult to investigate for various reasons.



Instead of smuggling dead animals through the mail, wouldn't a stamp of a magnificent live animal be better and more ethical?

On the other hand, as demonstrated when Hisayoshi Kojima, the self-proclaimed “world’s most-wanted butterfly smuggler,” was successfully prosecuted by the US Fish and Wildlife Service in 2007 -- amongst his collection was the Jamaican Giant Swallowtail – enforcement is possible with a collaborative network and good communication exchanges. More recently, Jamaica’s Local Environmental Enforcement Task Force (LEETF) has joined “Operation Thunderball”, a global enforcement operation coordinated by INTERPOL and World Customs Organization to halt wildlife trafficking and timber crimes. Current members in the LEETF include:

- INTERPOL
- Jamaica Customs Agency
- National Environment and Planning Agency (NEPA)
- Jamaica Constabulary Force
- Major Organized Crime and Anti-corruption (MOCA) Agency

This group recognizes the importance of tackling illegal wildlife trade and not solely because it is so-often linked to drug trafficking and organized crime but because the wildlife trade, itself, is a major threat to Jamaican biodiversity.

5.9. Corozal Sustainable Future Initiative: 30 years of conservation in northern Belize (Caspar Bijleveld)

In 1989, two zoological institutions in Europe, the Royal Burger’s Zoo in the Netherlands and the Papiliorama Foundation in Switzerland decided to unite their efforts and contribute to the

conservation of tropical forests. To this end, they created a charity, the *International Tropical Conservation Foundation* (ITCF), based both in Holland and Switzerland.

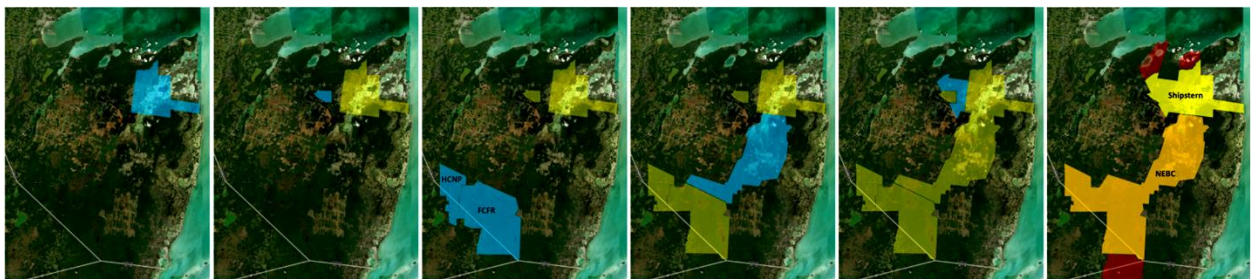
That same year, by a series of coincidences, the ITCF found itself in a position to buy a privately and foreign-owned property in northern Belize, on the Yucatan Peninsula. The property, covering approximately 8,000 hectares, was still in pristine condition, due to its isolation and the only recent connection to road network of Belize. After acquisition, the property was renamed Shipstern Nature Reserve.

The Shipstern Peninsula owns its name to the large inland and eponymous lagoon system. Its shallow waters make it barely navigable, but harbour vast low mangrove forests. The Shipstern Lagoon is surrounded by forests of various types, from marsh to dry deciduous forests. Among these, the *Pseudophoenix sargentii* coastal dry forest is one of the rarest and fastest disappearing habitats on the Yucatan Peninsula.



Corozal Sustainable Future Initiative 1990 - 2020 :

Connecting and preserving critical heritage landscapes in North-eastern Belize



For about 18 years, Shipstern Reserve was managed on a rather modest level, remaining relatively unknown to the rest of the country. It was nevertheless extended in 1994 by approximately 1,800 acres, through the purchase of another privately US-owned parcel of land.

As of 2008, management was upscaled and the protection to the area was much enhanced, with regular patrols. In 2012, after many months of negotiations, Shipstern Nature Reserve became a Trust in Perpetuity. This legal instrument under Common Law allows for a private property to be held in trust in perpetuity for the benefit of the People and the Government of Belize (perpetuity being here defined as 120 years). When it became a trust, the reserve was renamed the Shipstern Conservation and Management Area, to align with existing denominations for other reserves under trust.

The inception of the trust effectively marked a turning point in the history of Shipstern. The small not-for-profit Belizean company owning Shipstern became the «*Corozal Sustainable Future Initiative* (CSFI) ». Recognizing that financing conservation is not an easy task for governments that have many other priorities to cover, CSFI from then on defined itself as non-political support system for the Government of Belize, taking over the task of protecting reserves recognized within the National Protected Area System. In this task, it is often supported by the Forest Department and the Police, and when needed, even the Belize Defence Force.

In 2013, and within the scope of this new partnership, CSFI proposed to the Government a co-management of the Freshwater Creek Forest Reserve and the Honey Camp Lagoon National Park, both to the South of Shipstern. These protected areas were both in the process of being invaded by illegal agriculture. Through careful negotiations and by allowing squatters to finish the cycles of their crops, the situation was stabilized, and eventually, all illegal agricultural plots were vacated. Over the next six years, CSFI set up a *Mahogany enhancement programme*, as both protected areas had been much depleted of their Mahogany trees. As such, several thousand trees were planted in various open areas, mostly former illegal fields. This was carried out to ensure that mother trees would be present in the future in order to naturally replenish stocks.

In 2015, together with another NGO and private landowners, CSFI revived a 1997 World Bank project to create biological corridors, which at the time unfortunately never saw any corridor implemented in the field. This new coalition of partners wrote a letter of intent to the Government of Belize, and after four years of hard work, involving negotiations, legal work, and land acquisitions (both from private owners and government), the *North-Eastern Biological Corridor* (NBC) was finally declared through an Act passed by the Cabinet of Belize. The new corridor is now also co-managed by CSFI.

In 2020, the ITCF and its international partners managed to fund the acquisition of a further 2,750 hectares of forest, bringing the total area under CSFI's management to 400 km², or approximately 100,000 acres.

CSFI's goals in the near future is to continue expanding the biological corridor towards the south-east, in order to link the system with the *Crooked Tree Wildlife Sanctuary*. It will continue to do so in partnership with the Government of Belize, as a support system towards achieving tangible conservation goals for the country.

6. ROUND-TABLE DISCUSSION & RECOMMENDATIONS

With full support that the on-going DNA sampling (molecular genetics) project continues to be critical for determining whether the eastern and western populations of *Pterourus homerus* should be managed as a single species, two distinct subspecies, or two distinct species, the round-table discussion focused on issues of:

- Landscape-level actions for habitat protection
- Policy & legislation which could support both species and habitat protection
- The continuing role of public education and engagement, particularly to assist efforts to stop illegal collection
- Supporting an update of the Jamaican Giant Swallowtail Recovery Plan prepared by the Natural Resources Conservation Authority (NRCA) in 2001

6.1. Landscape-level Research & Conservation

Identifying P. homerus' potential range of occupancy: status and distribution of the larval host plants

Recommendation:

Design and implement a field programme to map the distributions of *Hernandia catalpifolia* and *H. jamaicensis*, with a support training component to mentor field personnel in identifying signs of *P. homerus* activity on the plants. Funding is needed to put boots-on-the-ground: quite literally, any budget needs to include footwear, which we know gets shredded mercilessly on karst limestone.

The “Signs-of-Activity” training should be integrated into Forestry Department’s BioPhysical Inventory methodology for surveying as well as monitoring of permanent sample plots within Forest Reserves. This activity supports Forestry Department’s *National Forest Management and Conservation Plan 2016-2026*⁸, which includes the Giant Swallowtail as a conservation target. It also should be promoted as “high priority” for all Forest Reserves which are located within Special Mining Leases (SMLs) and Special Exclusive Prospecting Licenses (SEPLs) as well

⁸ Available at: https://megjc.gov.jm/docs/policies/nfmcp_draft_jan_2017.pdf . In approving the NFMCP in 2018, the Cabinet and the Prime Minister, the Most Honourable Andrew Holness, ON, MP, communicated commitment to reversing forest degradation, deforestation and the loss of forest biodiversity as well as the plan’s support for international obligations, including the United Nations Forum on Forests (UNFF), Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC) and its REDD+ (Reducing Emissions from Deforestation and Forest Degradation) mechanism, and Sustainable Development Goals (SDGs): <https://japarliament.gov.jm/attachments/article/1866/2018%20Ministry%20Paper%2017.pdf>

as being conducted on private lands within the appropriate climatic life-zone of the tree species. Attention will need to be given to ensure that this activity doesn't inadvertently train a local "tree spotter" to become an illegal collector of larvae.

Cockpit Country landscape

While declaring the designated Cockpit Country Protected Area (CCPA) "Closed to Mining," (as was promised by Jamaica's Prime Minister in November 2017) represents a considerable achievement for environmental conservation, two major issues of relevance to the Jamaican Giant Swallowtail remain:

- The CCPA boundary fails to protect the currently-known distribution of the western population of *Pterourus homerus*
- To-date there has never been any discussion or presentation by the Government for a Buffer Zone to protect the functional integrity of the CCPA, particularly from bauxite mining which currently is proposed up-to the border of the designated CCPA

Recommendation:

With the assumption that the CCPA boundary will be legally gazetted, advocacy for the CCSG boundary to serve as Buffer Zone must continue. This aligns with the recommendations made by Professor Dale Webber and Dr. Claudel Noel, of the Centre for Environmental Management, UWI-Mona, following a series of public consultations on defining the boundaries of the Cockpit Country in 2013, namely that the CCSG boundary should serve as an outer buffer zone to a core and transition zones, all of which should be protected from bauxite mining⁹.

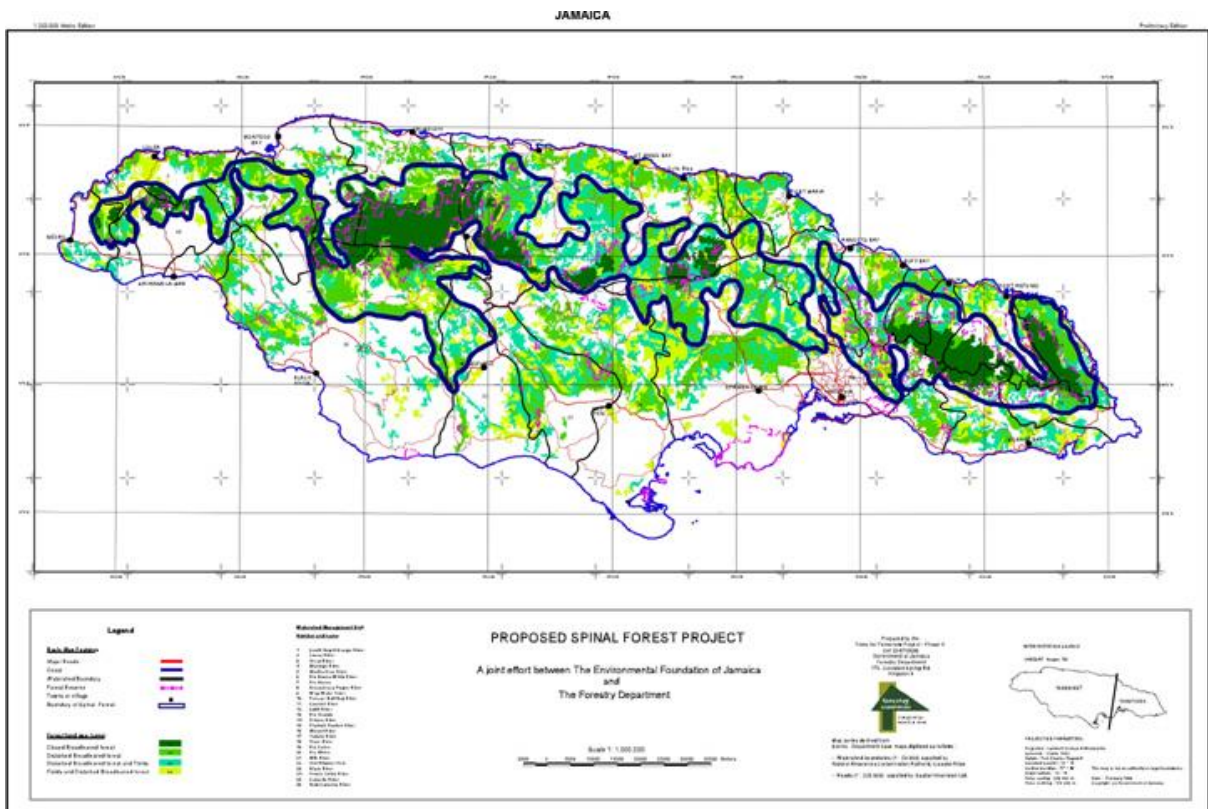
Recommendation:

Because communities occur within the CCPA boundary as well as in what may be considered the CCSG Buffer Zone, communities must be supported in taking a pro-active role in guiding what non-mining activities will be allowed within the Protected Area and Buffer Zone. That is, the communities must be supported (e.g., such as through existing Local Forest Management Committees) to enable their desired participation in land use planning and zoning of a Protected Area and Buffer Zone.

Jamaica's Spinal Forest: Protecting & Re-Connecting a Landscape

⁹ The full report is available at: <http://cockpitcountry.com/pdfs/2013-UWI-CC-Boudary-Report.pdf> It should be noted that communities throughout Cockpit Country recognize the CCSG Boundary and are adamant that they do not want mining destroying their communities, their livelihoods, their Cockpit Country heritage, and the myriad other ecosystem services it provides.

In the early 2000s, Jamaica’s Forestry Department, NEPA, and the Environmental Foundation of Jamaica (EFJ), developed a framework plan for the upper elevation mountainous ridges that extend along the center spine of the island. Prior to the arrival of European colonizers, these areas were a contiguous blanket of moist- and wet evergreen forests, supporting extraordinarily high levels of endemic flora and fauna, including *P. homerus*. Forest conversion not only has caused a quantitative loss of forest but also created a patchwork of variably-sized remnant forest blocks, degraded in quality. The goal of the Spinal Forest Project, which involved a complex matrix of public and private lands, was not only to protect the remaining forest but also to implement restoration planting activities to rehabilitate connectivity and improve the viability of smaller, isolated forest patches. One of the flagship faunal species for this project was the Jamaican Giant Swallowtail¹⁰



PROPOSED SPINAL FOREST PROJECT

Re-establishing connectivity of the closed broadleaf forest (dark green) across the central spine of Jamaica could enable the return of the Jamaican Giant Swallowtail to its historic range from Cockpit Country in the west to Mount Diablo in the center of the island.

Recommendation:

¹⁰ For an overview of the Spinal Forest Project, see: <http://www.fao.org/3/XII/0530-C3.htm>

The concept of the Spinal Forest not only should be revived but it also must be brought up-to-date to align with the Jamaican public's awareness of the consequences of climate change and the role of forests in mitigating impacts. To achieve this, priority must be placed first-and-foremost that all remaining native forest needs to be protected: accepting promises of reforestation is no longer good enough, particularly given symposium participants' first-hand experiences with reforestation attempts where eradication of invasive alien plant species have been required and in light of the fact that efforts to rehabilitate native forest after bauxite mining and limestone quarrying have been unmitigated failures on Jamaica.¹¹

Until it is recognized that silviculture is a discipline which integrates biotic and abiotic factors (e.g., soils with their associated microbial communities) -- it is not merely a list of tree species - reforestation efforts will continue to fail; hence, the requirement to protect what forest currently remains standing.

6.2. Policy and legislation

Culture & heritage

In 2014, the Blue and John Crow Mountains National Park (BJCMNP) and the community buffer zone of the Rio Grande Valley were designated Protected National Heritage under section 13 of The Jamaica National Heritage Trust Act (JNHTA) to help preserve the tangible and intangible heritage, particularly of the Windward Maroon community. Under this same Act, any species of animal or plant also may be designated Protected National Heritage. Currently Jamaica has a National flower (Lignum vitae *Guaiacum officinale*), tree (Blue Mahoe *Hibiscus elatus*), fruit (ackee *Blighia sapida*) and bird (Red-billed Streamertail hummingbird *Trochilus polytmus*), but it has yet to designate a national butterfly.

Recommendation:

Following the example of the BJCMNP, stakeholders of Cockpit Country should look to the JNHTA to support conservation and heritage advocacy efforts as well as assisting in sustainable zoning for the landscape of the western population of *P. homerus*.

Recommendation:

Support the designation of the Jamaican Giant (Homerus) Swallowtail (*Pterourus (Papilio) homerus*) as Protected National Heritage. With this designation, habitat preservation efforts such as the Spinal Forest Project can be strengthened to address the requirements of the larval host plants across the swallowtail's full historic range.

¹¹ During the symposium, reference was made to a presentation just a week prior, given by Mr. Lawrence Nelson of the Forestry Department in which he described the failures of reforesting mined-out lands; Mr. Nelson also communicated this information during meetings of the National Restoration Committee, as noted by meeting minutes from late 2009 to mid-2016.

Bauxite mining & limestone quarrying

With the recognition that Jamaica's Mining Act (1945¹²) has enabled almost unhindered irreversible damage to the Giant Swallowtail's historic central range (as well as to other areas beyond this species' range) and it will continue to do so under the current structure of mining leases and prospecting licenses, attention must focus on the current standards for mining, reclamation, and land cover rehabilitation. As one symposium participant outlined of his 1st-hand experience of mining in his childhood, "mining completely changed the structure of the soils and now all that can barely grow on the land is grass."

The Mining Act and its associated Regulations are explicit in the *minimum* requirements for the Commissioner of Mines to certify that "every hectare of land disturbed for mining in such area, as nearly as may be practicable" is restored (sic¹³), to "the level of agricultural or pastoral productivity or of utilization for afforestation purposes or such other uses as may be approved by the Commissioner or the Town and Country Planning Authority . . ." Thus, within the Act there is scope to demand higher quality for the conditions of the land after mining.

Recommendation:

With the recognition that the NRCA delegated environmental monitoring to the Jamaica Bauxite Institute (JBI) in 1994, identify whether GoJ agencies other than Mines and Geology Division are involved in setting the terms for what constitutes acceptable post-mining rehabilitation and advocate for a long-term, holistic, ecological, systems approach to rehabilitation requirements.

Recommendation:

Assess whether there is scope for applying the environmental protection principals found within The Quarries Control Act (1984¹⁴) to the situation of bauxite mining (which falls under The Mining Act). Under Section 9 of The Quarries Control Act, the Minister shall refuse to issue a license if the operation of the quarry would be against the interest of the public, taking into account: "(a) the preservation of the character of the environment including the fauna and flora; (b) the availability of natural environment for the enjoyment of the public; . . . (j) any other factors which in the opinion of the Minister will be against the public interest."

Recommendation:

¹² <https://moj.gov.jm/laws/mining-act-0>

¹³ The Mining Act's usage of the word "restore" is incorrect in that once an area's geology (incl. soils) has been irreversibly removed / altered, it can never be returned to its original condition; the correct terms for what happens post-mining are reclamation and rehabilitation.

¹⁴ <https://moj.gov.jm/laws/quarries-control-act>

Assess whether there is scope to require an environmental bond or cess above-and-beyond the existing bauxite levy, which would enable (require) the involvement of outside experts (i.e., persons not directly employed by the mining companies) to guide and undertake rehabilitation efforts. Of great importance is that the mining industry, not the general public, must bear the full costs of all stages of mining.

6.3. Public engagement: the frontline for conservation and stopping illegal collecting

Despite all efforts to reduce the abilities of unauthorized persons to locate *P. homerus* in the wild (e.g., NEPA permits requiring that precise locations of endemic species can't be published; "scrubbing" of websites to delete information about timing of emergencies), the reality is that there is already published information and other materials available on the internet that can be used by poachers to achieve their desired goals.

The experiences of Dr. Garraway and Dr. Koenig are clear: without community members, on the ground 365 days a year, keeping their eyes and ears open, having the knowledge and courage to stop strangers, and being able to report quickly to NEPA (as Dr. Koenig and partner Mike Schwartz did in their capacity as NEPA Game Wardens), poaching of *P. homerus* will continue.

Recommendation:

Continue to recognize the value and irreplaceable roles of site- and community-based groups in their abilities to detect and report immediate illegal activities or breaches of permits through an effective enforcement network.

Focus on developing projects or opportunities that allow for communities to see that "nature" is worth more to them alive in the wild than extracted or dead.

6.4. The 2001 Jamaican Giant Swallowtail Recovery Plan

Recommendation:

All stakeholders to support NEPA in updating the 2001 plan so activities can be launched for the agency's next 5-Year Operational Plan.

7. Summary Tables

7.1 2010 1st Symposium – Current Activity Status

2010 Recommendations	2019 Status	Recommended Expansion
<p>1. Conduct DNA sampling (molecular genetics) to determine the current level of diversity within and between the two extant populations – the eastern Blue and John Crow Mountains population and the west-central Cockpit Country population – to determine whether they should be managed as a single species, two distinct subspecies, or two distinct species.</p>	<p>1. On-going research by Dr. Eric Garraway</p>	
<p>2. Establish a scientifically led “Captive Life-Cycle Research Project” to fill knowledge gaps in ecology and demography, including ovipositing rates, duration of egg-laying cycles, total egg production, and patterns (if any) of diapause.</p>	<p>2. Not yet undertaken</p>	
<p>3. In relation to Recommendation 2 and if releasing captive-reared animals is determined to be safe for wild populations, controlled releases under variable conditions should be conducted to identify the factors that limit dispersal, with a goal of understanding corridor requirements in order to maintain gene flow among subpopulations.</p>	<p>3. Dependent upon results from #1 and #2</p>	
<p>4. Continue field surveys to improve distribution maps, particularly to document seasonal and annual variation, which may be correlated to rainfall patterns.</p> <p>Survey results, including climate parameters, should be integrated into a model to predict potential effects of climate change on <i>P. homerus</i> populations.</p>	<p>4. Surveys of adults established in Cockpit Country by WRC; continued knowledge gap in host plant distributions</p> <p>Presentation by T. Turner during symposium, incl. climatic information.</p>	<p>4. Expand surveys to include assessments of host tree, <i>Hernandia jamaicensis</i>; WRC field assistants need “Signs of Larval Activity” training.</p>

<p>5. Protocols should be developed to enable standardized surveying of all <i>P. homerus</i> life-history stages within permanent monitoring plots already established by Forestry Department’s BioPhysical Inventory Programme.</p> <p>Results of new <i>P. homerus</i> field surveys may help guide the placement of additional permanent monitoring plots.</p>	<p>5. Not yet undertaken.</p>	<p>5. Review by Forestry Department of the BioPhysical Inventory database for distribution records of both <i>Hernandia</i> species; identify gaps (e.g., Reserves still in need of field surveys); officers participate in “Signs of Larval Activity” training</p>
<p>6. To confirm <i>P. homerus</i>’ unique and beloved status in Jamaica, workshop participants endorse its formal nomination as the “National Butterfly”. Education and outreach would accompany official recognition.</p> <p>Mechanisms for dissemination include NEPA’s Education Branch, the CC-LFMCs, and “SmartPhone” technology offered by mobile telephone service providers. Dr. Garraway’s 1984 video of <i>P. homerus</i> life history and more-recent video by Court Whelan could offer glimpses of this unique butterfly to the majority of Jamaicans who have never seen this species.</p> <p>All materials used should be endorsed by NEPA to make sure no sensitive materials potentially endangering <i>P. homerus</i> enters the public domain.</p>	<p>6. Presentation by JCDT during symposium; <i>P. homerus</i> adopted by Cockpit Country communities for its “No Mining” logo.</p>	<p>6. Determine requirements and advocate to have <i>P. homerus</i> designated Protected National Heritage under the JNHT Act.</p> <p>Communications strategy to be addressed within the updated Jamaican Giant Swallowtail Recovery Plan by NEPA</p>
<p>7. To facilitate development of educational materials, along with pursuing conservation recommendations, a “Homerus Working Group” was established during the workshop and a ListServe will be created for maintaining communication.</p>	<p>7. The Endangered Species Working Group, coordinated by NEPA, serves as focal point; meets bi-monthly.</p>	

<p>8. With any increased attention given to <i>P. homerus</i>, either locally or nationally, there will be an increased risk of poaching and smuggling to supply an illicit international market. National enforcement agencies, including NEPA and the Island Special Constabulary Force must be networked effectively with CITES, to ensure adequate vigilance to increased smuggling, particularly of pupae.</p> <p>Although “flooding the market” with legal animals, licensed out of Jamaica, may be one option to defeat demand, the “joy of circumventing government control” by some members of the Jamaican public will make legal control of a market extremely difficult. Until adequate safeguards are in place, the CITES ban on trade must be enforced.</p>	<p>8. Presentation by NEPA outlined Jamaica’s Local Environmental Enforcement Task Force, which also has joined the global enforcement effort “ Operation Thunderball” ; presentation by the chair of Jamaica’s CITES Scientific Authority outlined the nation’s obligations and commitment to halting illegal trade.</p>	
<p>9. The feasibility of eco-tourism must be assessed for the “High Priority” western region of Cockpit Country, which is a recognized hotspot for <i>P. homerus</i> and is under major threat from bauxite mining as some agencies do not acknowledge that the area is part of “Cockpit Country.”</p> <p>The natural and cultural assets need to be identified and mapped, to enable proper spatial planning. From this, a proposal can be developed to support alternative income strategies, such as a “Cockpit Country Heritage Centre,” which should not have an exclusive focus on <i>P. homerus</i> but, rather, should focus visitor attention to a healthy, integrated ecosystem.</p>	<p>9. Extensive work by WRC’s Mike Schwartz¹⁵ and the Jamaica National Heritage Trust¹⁶; not formally presented during symposium</p>	<p>9. Following example of BJMNP, explore opportunities for designating Cockpit Country as Protected National Heritage under the JNHT Act</p>

¹⁵ Examples of opportunities outlined for communities can be seen on WRC’s website: (eg. www.cockpitcountry.com/LFMCNews1.html ; www.cockpitcountry.com/forestproducts.html ; www.cockpitcountry.com/builtheritage.html)

¹⁶ JNHT’s 2009 Cockpit Country Heritage Survey Report is available at: <http://www.cockpitcountry.com/JNHTCOCKPIT%20COUNTRY%20FINAL%20REPORT%202009.pdf>

<p>10. With the recognition that the western region of Cockpit Country is a “hotspot” for <i>P. homerus</i> and that the region remains vulnerable to bauxite mining, continuing efforts should be directed towards expanding community support for maintaining buffer zones around existing Forest Reserves.</p> <p>As scientific research improves our understanding of the factors that limit <i>P. homerus</i> populations in Cockpit Country, it will be possible to spatially identify and prioritize conservation corridors in western Cockpit Country.</p>	<p>10. Cockpit Country defined by the Cockpit Country Stakeholders Group (CCSG) and by a boundary for a Cockpit Country Protected Area (CCPA); presentation by WRC during symposium.</p>	<p>10. In partnership with local communities, expand advocacy for a CCPA Buffer Zone, which should also be closed to mining in accordance with community desires and recommendations from other stakeholders.</p> <p>Ensure the currently-known range of the western population of <i>P. homerus</i> is protected from mining and quarrying.</p>
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7.2 2019 2nd Symposium - New Recommendations

2019 Recommendations
(A) Design and implement a field project in order to map the distributions of the host plants <i>Hernandia catalpifolia</i> and <i>H. jamaicensis</i> , with a support training component to mentor field personnel in identifying signs of <i>P. homerus</i> activity on the plants; ensure this project is integrated into Forestry Department's BioPhysical Inventory.
(B) Revive the Spinal Forest Project, bringing it up-to-date to align with the Jamaican public's awareness of the consequences of climate change, the role of forests in mitigating climate impacts, and increasing calls for intergenerational justice with regards to the climate crisis and the continued unsustainable extraction of natural resources; the overarching objective is to protect all existing natural forest owing to the repeated failures of reforestation / tree planting efforts on Jamaica.
(C) Advocate for the environmental protection principals of The Quarries Control Act to be applied to the bauxite mining industry.
(D) Improve the requirements for the rehabilitation of mined-out bauxite ore bodies and limestone quarries so that native forest land cover can mature over time.
(E) Support NEPA in updating of the <i>Jamaican Giant Swallowtail Recovery Plan</i> prepared by the NRCA in 2001; ensure linkage to the Forestry Department's <i>National Forest Management and Conservation Plan 2016-2026</i>