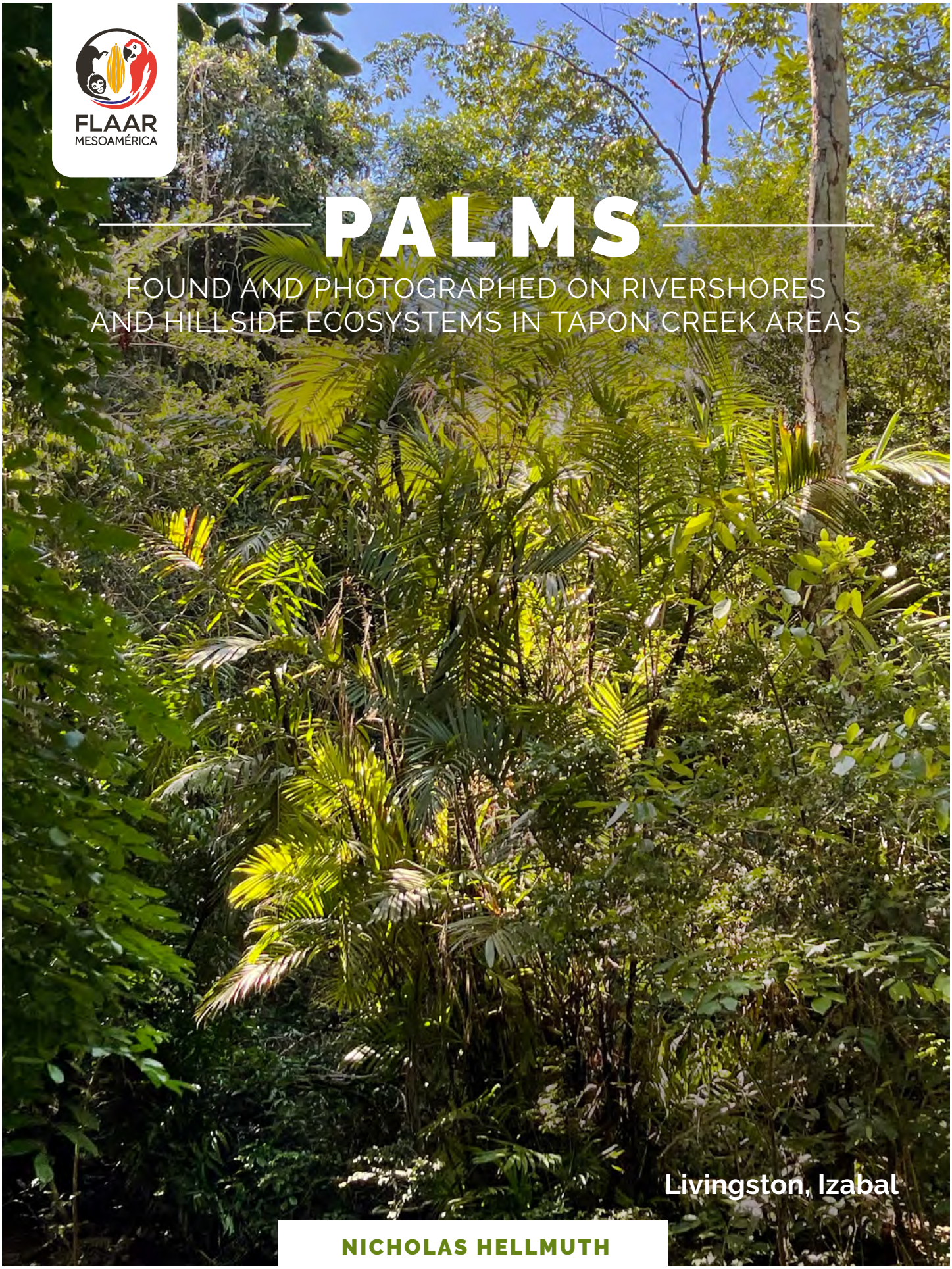


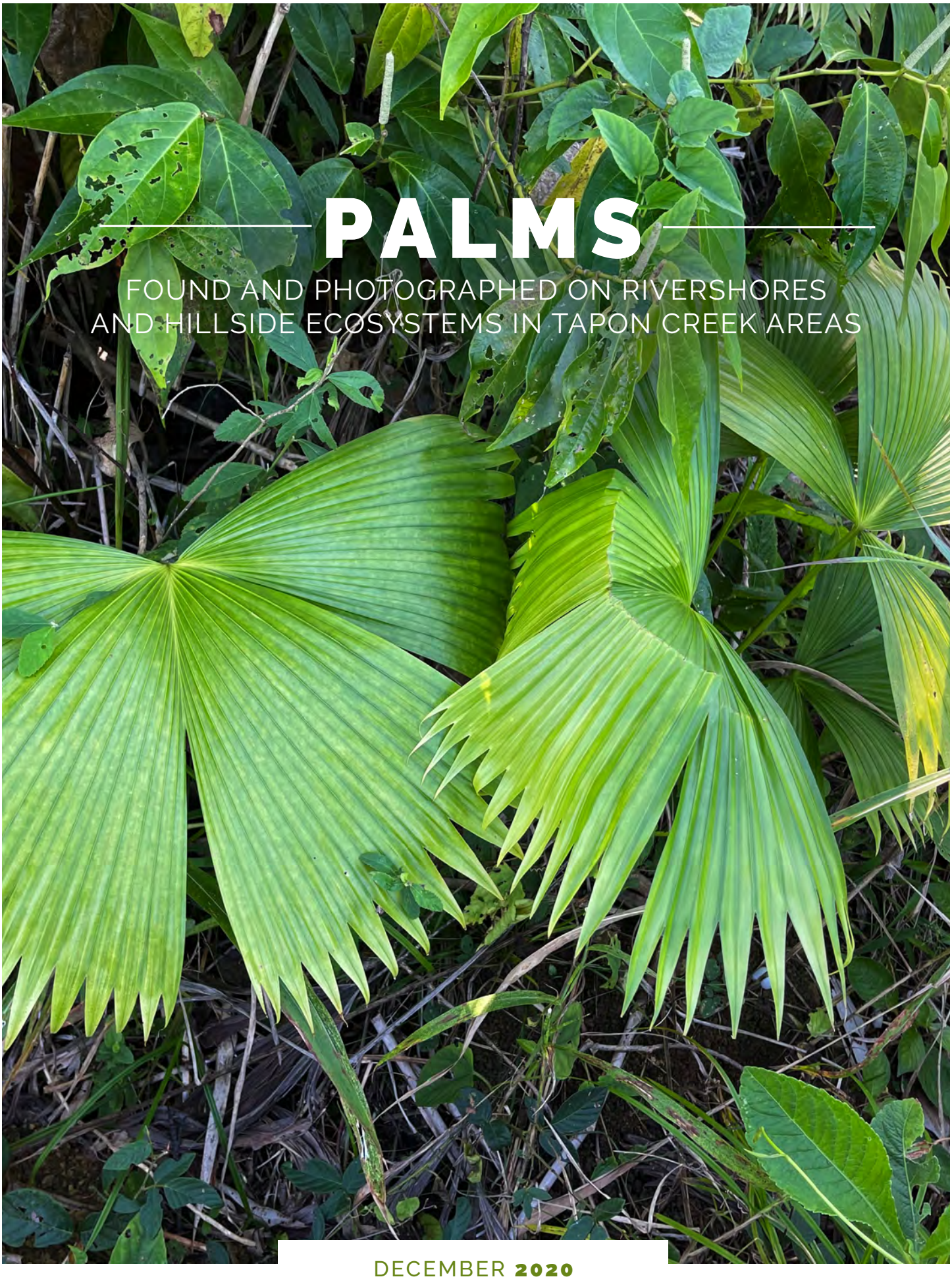
FLAAR
MESOAMÉRICA

PALMS

FOUND AND PHOTOGRAPHED ON RIVERSHORES AND HILLSIDE ECOSYSTEMS IN TAPON CREEK AREAS

Livingston, Izabal

NICHOLAS HELLMUTH
AND **VICTOR MENDOZA**



PALMS

FOUND AND PHOTOGRAPHED ON RIVERSHORES
AND HILLSIDE ECOSYSTEMS IN TAPON CREEK AREAS

DECEMBER **2020**

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Base camp custodian, Aldea Buena Vista Tapon Creek
Cristobal Iq

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Ramiro Garcia, Lilian Garcia, Ericka Garcia

PHOTO FROM FRONT COVER
***Bactris* sp.**
Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

PHOTO FROM TITLE PAGE
Cryosophila stauracantha.
Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

CONTENTS

FLAAR MESOAMÉRICA

December 3, 2020

TAPONCITO CREEK AND UPHILL

This day we stopped and photographed any palm that was not common elsewhere in our study areas (Municipio de Livingston). We did not stop for the many common palm species today since our goal was to reach the wild vanilla orchid vines that we hoped were still blooming deep into the fields and forests on high hills overlooking Amatique Bay, Municipio de Livingston, Izabal, Guatemala.

> Pamak is a generic Q'eqchi' word that covers several species of local palms. One linguist suggests it is *Geonoma interrupta* (Ruiz & Pav.) Mart. Var. interrupta (Zarger 2002: 206).

The leaves have no "windows" in the leaves close to the rachis. Nonetheless, I would not be surprised if this palm were a species of the genus *Reinhardtia.*

Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal, Guatemala. Camera: iPhone 12 Pro Max.

PALMS PHOTOGRAPHED DECEMBER 4, 2020 **PLUS A FEW FROM DEC. 3RD**

SCIENTIFIC NAME	FAMILY	COMMON NAME (SPANISH)	WHERE PHOTOGRAPHED (ENVIRONMENT)	PHOTOGRAPHER(S) OF THE FLAAR MESOAMERICA TEAM
Acoelorraphe wrightii	ARECACEAE	Tasiste o pimiento	Mostly noticed along riversides, usually several clusters together but never en-masse	Nicholas Hellmuth
Astrocaryum mexicanum	ARECACEAE	Lancetillo	Hillside, not in clumps, common but not like corozo	Nicholas Hellmuth
Attalea cohune	ARECACEAE	Corozo	Hillside, river, very common	Nicholas Hellmuth
***Bactris perhaps trichophylla.* two other different species for Belize (Balick et al. 2000)**	ARECACEAE	Huiscoyol	Hillside, river, in clumps/ clusters, common but not "everywhere"	Nicholas Hellmuth
Calyptrogyne ghiesbreghtiana	ARECACEAE	Japuque	River, Hillside	Nicholas Hellmuth
Cryosophila stauracantha	ARECACEAE	Escobo	Hillside and flat areas, not common in Tapon Creek areas	Nicholas Hellmuth
Desmoncus orthacanthos	ARECACEAE	Bayal	Riverside, including flooded swamp areas, Hillside	Nicholas Hellmuth
Geonoma seleri	ARECACEAE	capuque de montaña pamac' or pamak'	On karst hillside, rare	Nicholas Hellmuth
Sabal mauritiiformis	ARECACEAE	Guano, botán	Hillside and flat areas, not common along rivers going through swamps	Nicholas Hellmuth

DECEMBER 4, 2020

TAPON CREEK NATURE RESERVE **MANAGED BY FUNDAECO**

This day we had time to look for palm species that were not common. The common palms are easy to find because I can easly recognize their leaf size or shape; their stem size; at what angle their spines stick out (down, straight out); what shape the spines are: (thick, needle thin, flat and triangular like a small lance); and which stems have no spines. Here are the palms I can recognize without needing a check-list from over 50 years hiking through remote areas of Petén, Campeche, northern Alta Verapaz, and now many months in Izabal:

Acoelorraphe wrightii
Astrocaryum mexicanum
Attalea cohune
Bactris species
Cryosophila stauracantha
Desmoncus orthacanthos
Manicaria saccifera
Sabal mauritiiformis

Our interest is to find all the other palms that we know are in this area. *Manicaria saccifera,* palma de confra (also (mis)spelled comfra) was behind the base camp and visible by the thousands in the adjacent Buena Vista Nature Reserve area, but not as common inland around Taponcito Creek.

Our base camp was near Buena Vista Tapón Creek. The local Q'eqchi' Mayan people here assisted us when the stove ran out of propone gas. They also provided "lancha" (boat) service when we needed to reach the various areas we wished to explore. This is a hospitable place to have a base camp. We appreciate the Garcia family of Alta Verapaz for making their house available now for this second visit to Buena Vista, Amatique Bay area of Municipio de Livingston.

On page 46 of the present Photo Essay, you can find a map of Tapón Creek Natural reserve so that you can locate the places the FLAAR Mesoamerica team have been documenting.

We found lots of *Manicaria saccifera* palms on previous field trips, but none during the December trip (since we were in different habitats). So the tabulation on the next page lists just what we saw and photographed during morning and early afternoon. Late afternoon we went by lancha up Taponcito Creek to photograph the mangrove swamp ferns (that have leaves 2 meters high) and to photograph two species of terrestrial bromeliads that had their inflorescences sticking straight up (waiting for us to notice them).

Schippia concolor (silver palm) we have not yet found in Izabal, possibly because there are no open forests or savannas near the Caribbean coast (it's all thick forest on this part of the Guatemalan coast).

In January we are planning to explore Cerro San Gil (natural protected area also in Livingston), so we may find additional palm species there that are not on the coasts or river/lake shores that we have explored in earlier months.

In February 2021 I would like to explore all the land area of Municipio de Livingston that is reachable by 4WD (from dirt roads leading off Highway CA-13 from Rio Dulce bridge to Modesto Mendez). Again, these are areas away from the coast and with several ecosystems not present along El Golfete, Canyon Rio Dulce, or the coast of Amatique Bay. So month after month during 2021, we look forward to finding additional palm species that are predicted for Muni Livingston areas of Izabal ("Muni" is the diminutive for Municipalidad).

***Bactris* sp.** A palm species that has spines from 2 to 5 centimeters long.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Guatemala.
Camera: iPhone 12 Pro Max.

Manicaria saccifera.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 17, 2020. Tapón Creek, Livingston, Guatemala. Camera: Sony Alpha A7C. Lens: Sony FE 28-60mm. Settings: 1/200 sec; f/5.6; ISO 640.

DECEMBER 4, 2020

PALMS PHOTOGRAPHED

SCIENTIFIC NAME	FAMILY	COMMON NAME (SPANISH)	WHERE PHOTOGRAPHED (ENVIRONMENT)	PHOTOGRAPHER(S) OF THE FLAAR MESOAMERICA TEAM
Acoelorraphe wrightii	ARECACEAE	Tasiste o pimiento	Mostly noticed along riversides, usually several clusters together but never en-masse	Nicholas Hellmuth
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***Bactris perhaps trichophylla.* two other different species for Belize (Balick et al. 2000**	ARECACEAE	Huiscoyol	Hillside, river, in clumps/ clusters, common but not "everywhere"	Nicholas Hellmuth
Calyptrogyne ghiesbreghtiana	ARECACEAE	Capuque, tz'imin (need to check spelling of both)	River, Hillside	Nicholas Hellmuth
Cryosophila stauracantha	ARECACEAE	Escobo	Hillside and flat areas, not common in Tapon Creek areas	Nicholas Hellmuth
Desmoncus orthacanthos	ARECACEAE	Bayal	Riverside, including flooded swamp areas, Hillside	Nicholas Hellmuth
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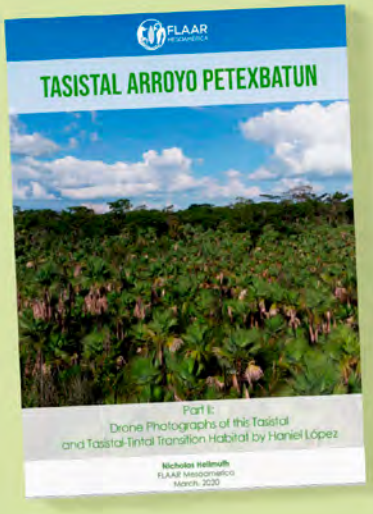
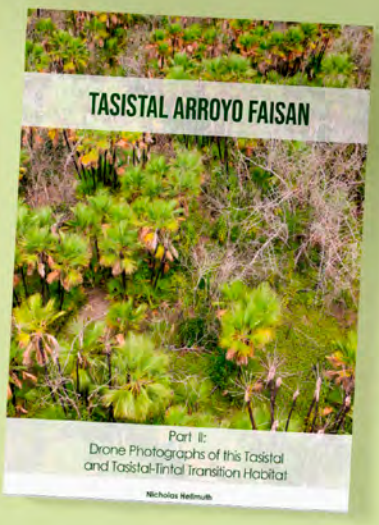
Sabal mauritiiformis	ARECACEAE	Guano, botán	Hillside and flat areas, not common along rivers going through swamps	Nicholas Hellmuth

"Tasiste" or ""pimentillo"Acoelorrhaphe wrightii palms are found in wet areas both in Peten, Izabal and elsewhere. We have four volumes of photographs of tasistal ecosystems from the Municipio de Sayaxche, Peten, along the Arroyo Petexbatun.

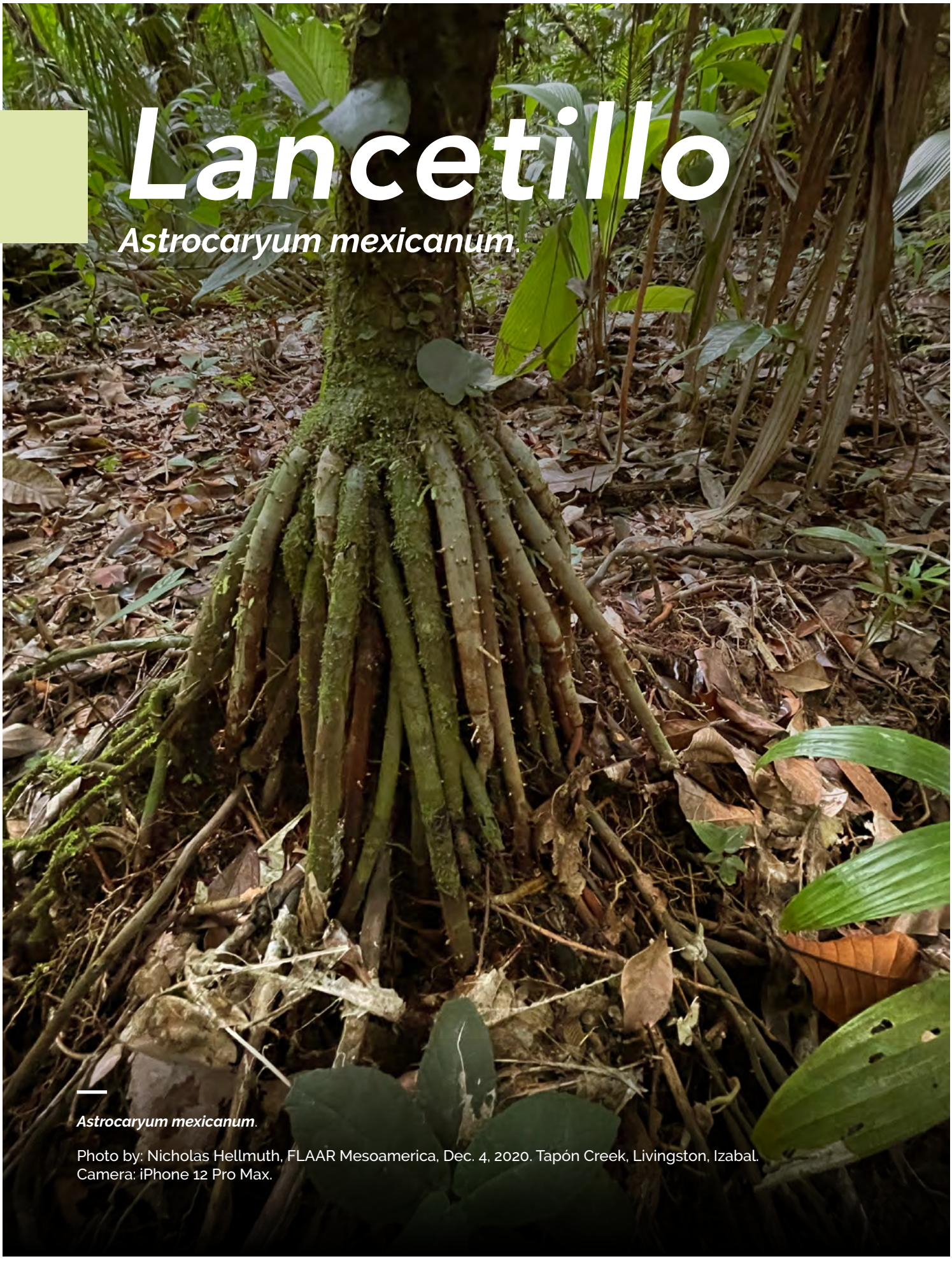




In Izabal these palms are never en masse by the thousands; they are in clusters of several at most. We see them mainly along the shores of rivers and lagoons. I estimate they like to be on the edge of water for two reasons: this is where they can get plenty of sun because there is no vegetation in front of them. And there is plenty of water for their roots to reach. This said, you can also find them inland (as long as it is seasonally inundated or at least gets lots of rain).

Lancetillo

Astrocaryum mexicanum.



Astrocaryum mexicanum.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

ASTROCARYUM MEXICANUM **LANCETILLO PALM**

These palms are notable for two reasons:

1. They are the only palm with flat, lance-shaped spines.

2. Their fruits are not only edible, they are popular and still eaten today by local Q'eqchi' Mayan people in the Municipio de Livingston areas.

Astrocaryum mexicanum. Flattened spines up to 10 centimeters long. The palm exposes it roots when soil losses from the ground or it is too rocky.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Izabal, Guatemala. Camera: iPhone 12 Pro Max.

Astrocaryum mexicanum.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Astrocaryum mexicanum.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Astrocaryum mexicanum.

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Astrocaryum mexicanum.

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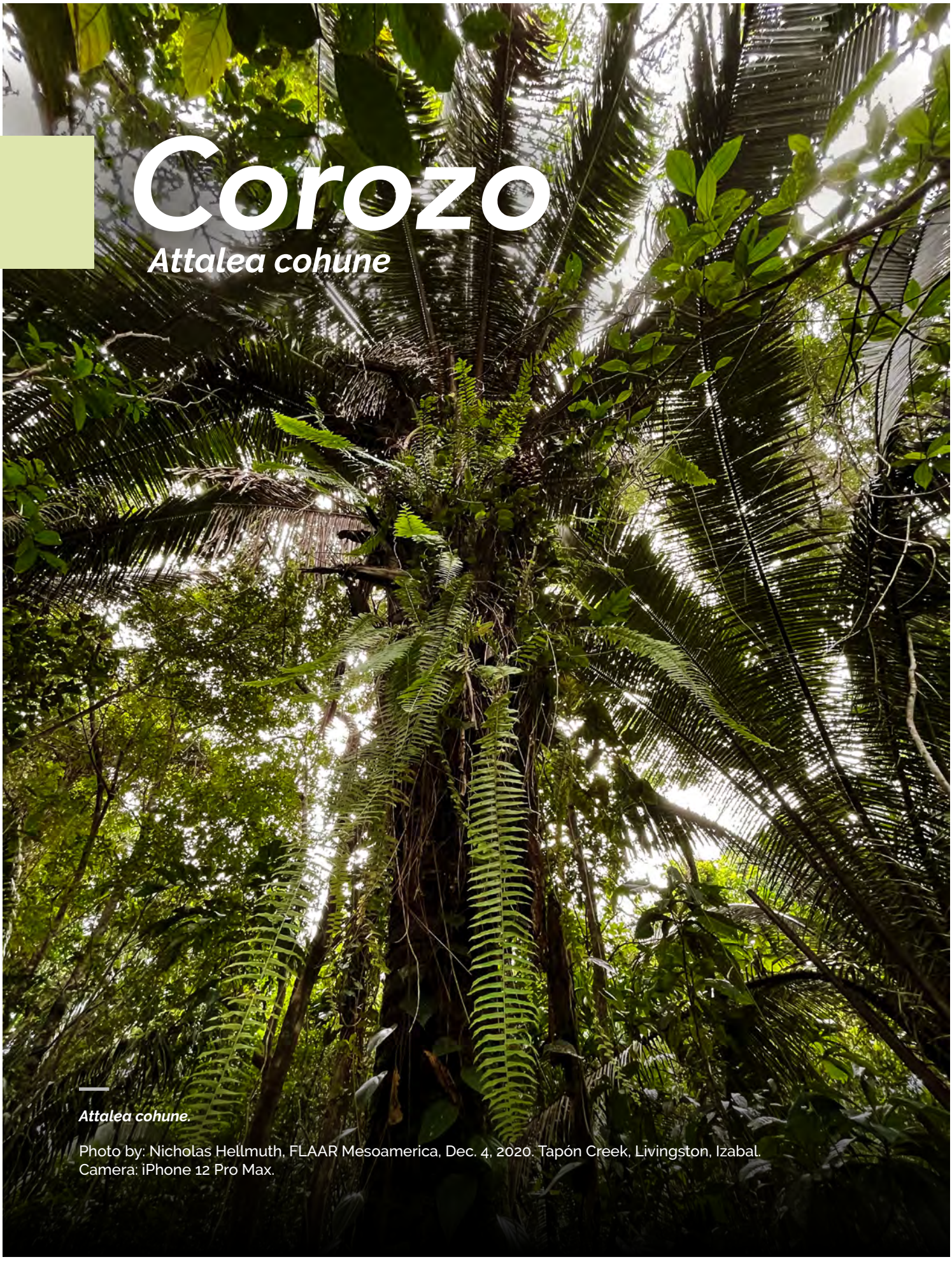
Camera: iPhone 12 Pro Max.

Astrocaryum mexicanum.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Izabal, Guatemala.
Camera: iPhone 12 Pro Max.

Corozo

Attalea cohune



Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

ATTALEA COHUNE, **COROZO PALM**

Cohune palms are called "corozo" in Guatemala. These are everywhere and come in size from the masses of leaves only growing up from ground level to the mature giants that tower so high up you can barely see the inflorescences when the tree is in flower. In theory, there are other Genus and species of other giant palms but, everyone names them *Attalea cohune* because you would have to set up an 800mm prime telephoto lens on a tripod to capture an image of the inflorescence to see whether it was a different species (and know all the other botanical differences).

Would be great to have a palm expert such as Dr Andrew Henderson to ascertain whether any of the other species of corozo are in Izabal or Petén. At Parque Nacional Yaxha, Nakum and Naranjo (PNYNN). There are several corozeras, areas with up to "many hundred palms of this one species in a single area."

Since these palms are so common and so easy to recognize, we rarely photograph them when we are looking for other plants. But, when I see one that is covered with ferns or aroids, then I tend to stop to photograph the "botanical garden" on one single palm trunk.

Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Aldea Plan Grande Tatín, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Attalea cohune A moss find its place on the trunk (almost 15 meters height) of a corozo palm.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, March. 9, 2020. Aldea Plan Grande Tatín, Livingstone, Izabal. Camera: iPhone Xs.

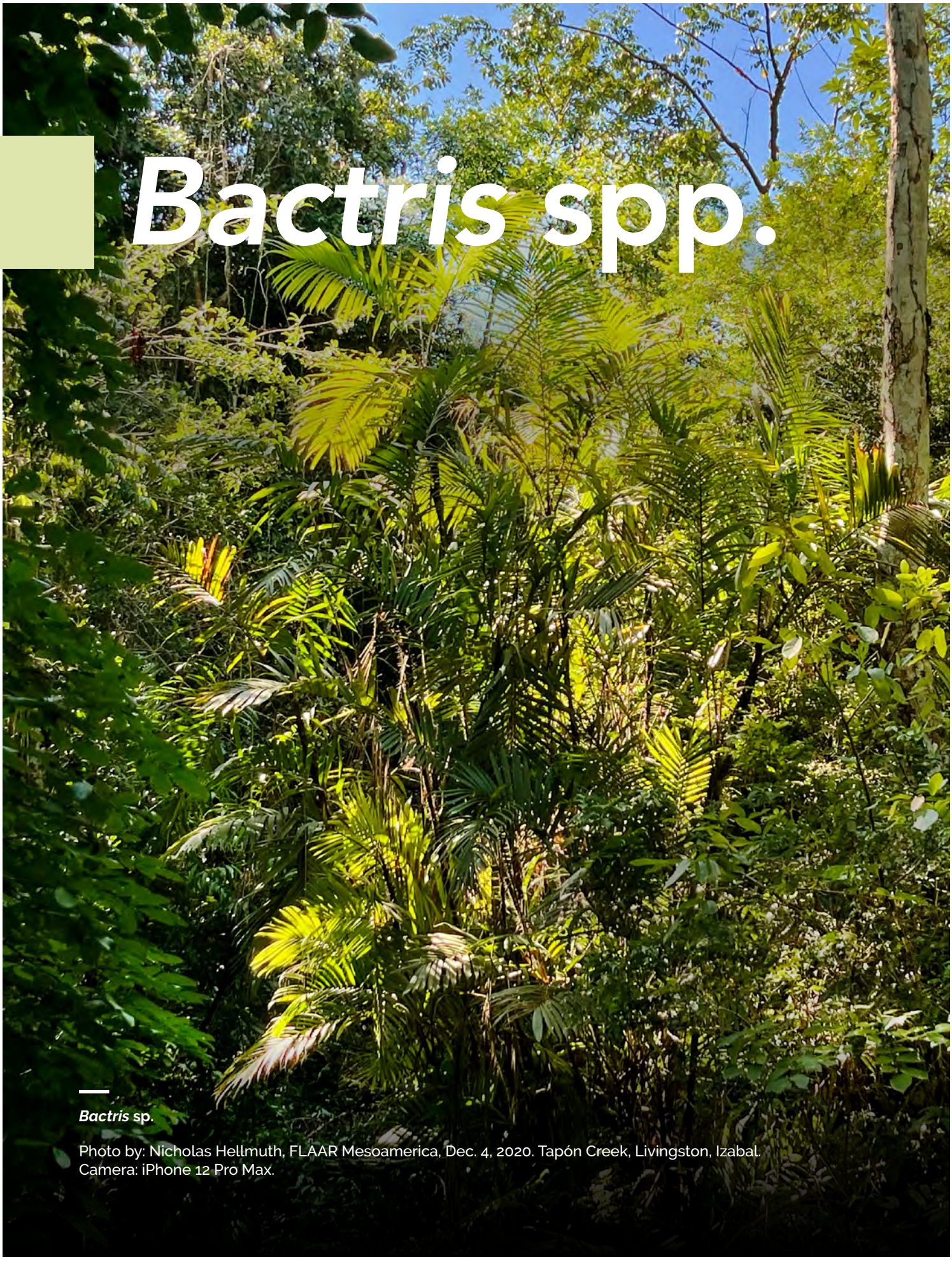
Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Attalea cohune.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Bactris spp.



***Bactris* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

BACTRIS **SPECIES**

Palms of the genus *Bactris* are easy to spot: they grow along river edges (Rio Icbolay, for example, in northern Alta Verapaz). If not on a river or lagoon side, they are in humid areas. They always grow in clumps (seven to a dozen or so in a surface area of 1x1 meter or 1x1.5 meters). And most notable, they have the sharpest thinnest spines; long, and often stick straight out (comparable to a tad shorter but nonetheless long needle-like spines on bayal palm vines).

At least several species of *Bactris* are potentially native to the Maya Lowlands. So I can only estimate what species these are. We need to be in front of them when the inflorescences are in flower, and also to photograph what color the berry-sized fruits are.

Bactris mexicana Mart. (with red fruits) and *Bactris major* Jacq. (or, *Bactris major* Jacq. var. major) are the two species most commonly noted for nearby areas. *Bactris trichophylla* Burret is a synonym of *Bactris mexicana* var. Trichophylla (Burret) A.J.Hend. So I prefer to use the name *Bactris mexicana*.

Only one of the *Bactris* palms had fruits in December, so we will need to keep checking in future months to learn whether my estimate of *Bactris mexicana* is correct.

***Bactris* sp.** The only palm with fruits we found on December 2020.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingstone, Izabal. Camera: iPhone 12 Pro Max.

***Bactris* sp.** on one of the shores of Río Tapón Creek.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Guatemala. Camera: iPhone 12 Pro Max.

***Bactris* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Bactris* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Bactris* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

***Bactris* sp.** Here the palm is happily growing far from the water. But the humidity on the atmosphere will provide the water it needs.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Bactris* sp.** Close-up of the spined palm-trunk. You can see the difference between A. mexicanum with spines wider than this one.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Bactris* sp.**

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Camera: iPhone 12 Pro Max.

***Bactris* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Capuque Tz´imin

Calyptogyne ghiesbreghtiana

Calyptogyne ghiesbreghtiana. A palm that will grow no taller than a shrub.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

CALYPTROGYNE GHIESBREGHTIANA, **CAPUQUE, TZ'IMIN**

This is a palm that I do not see often, but I will learn to recognize it:

- Inflorescence sticks straight up (not hanging or splitting)
- No visible stem (so no "trunk"); leaves sprout from near ground level.
- Likes moist areas

We need to learn why the local name capuque does not help show results on Google, such as searching for "palma, capuque". So, we need to ask additional local guides for other spellings? Japuque, hapuque??

Calyptogyne ghiesbreghtiana.

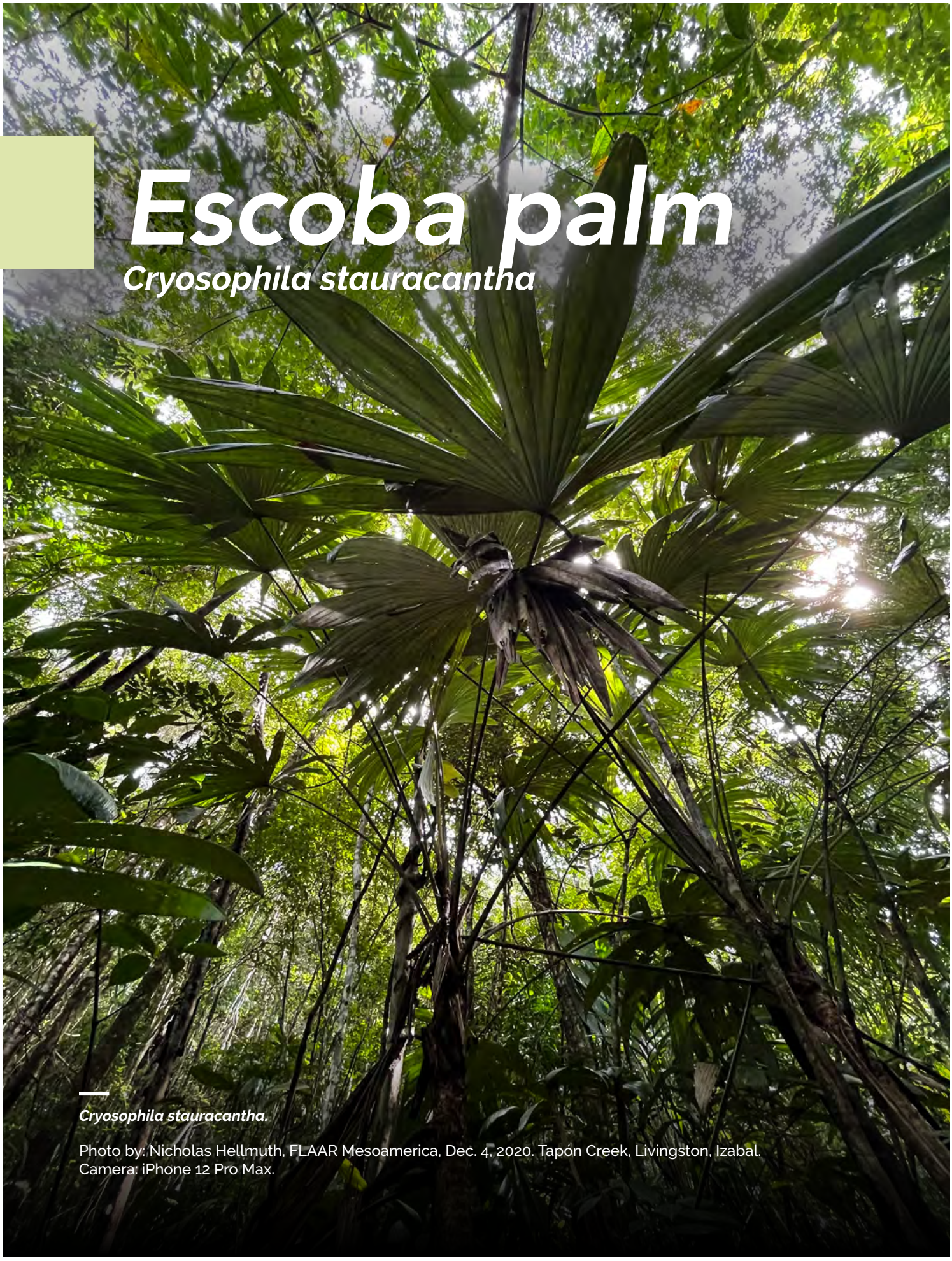
Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Calyptogyne ghiesbreghtiana.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Escoba palm

Cryosophila stauracantha



Cryosophila stauracantha.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

CRYOSOPHILA STAURACANTHA, **ESCOBA PALM**

Palma de escoba is very common in many lowland areas of Guatemala, including Tikal, PNYNN, and Municipio de Livingston. It is a solitary plant (so not in clusters) but there are areas where there are so many scattered around. These areas are called an "escobal"; just like "guanal" or "corozera" or "tasistal". Lots of palms form entire ecosystems. But so far in the Municipio de Livingston we have found only "confra" palms with "hundreds in one area."

Cryosophila stauracantha is easy to recognize because the spines usually point downwards; so not straight out. Plus the spines are roots near the base. Very interesting palm to study.

Cryosophila stauracantha.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Cryosophila stauracantha. Is not often that I see a *Cryosophila stauracantha* palm on the edge of a creek or lagoon. Of course the water level is not always this high, though a week earlier the base of this palm would have been under water. But in several months the water level will be at least 50 cm. lower.

We show only a few of these palms in the present report because in the future we will have an entire separate report on palma de escoba.

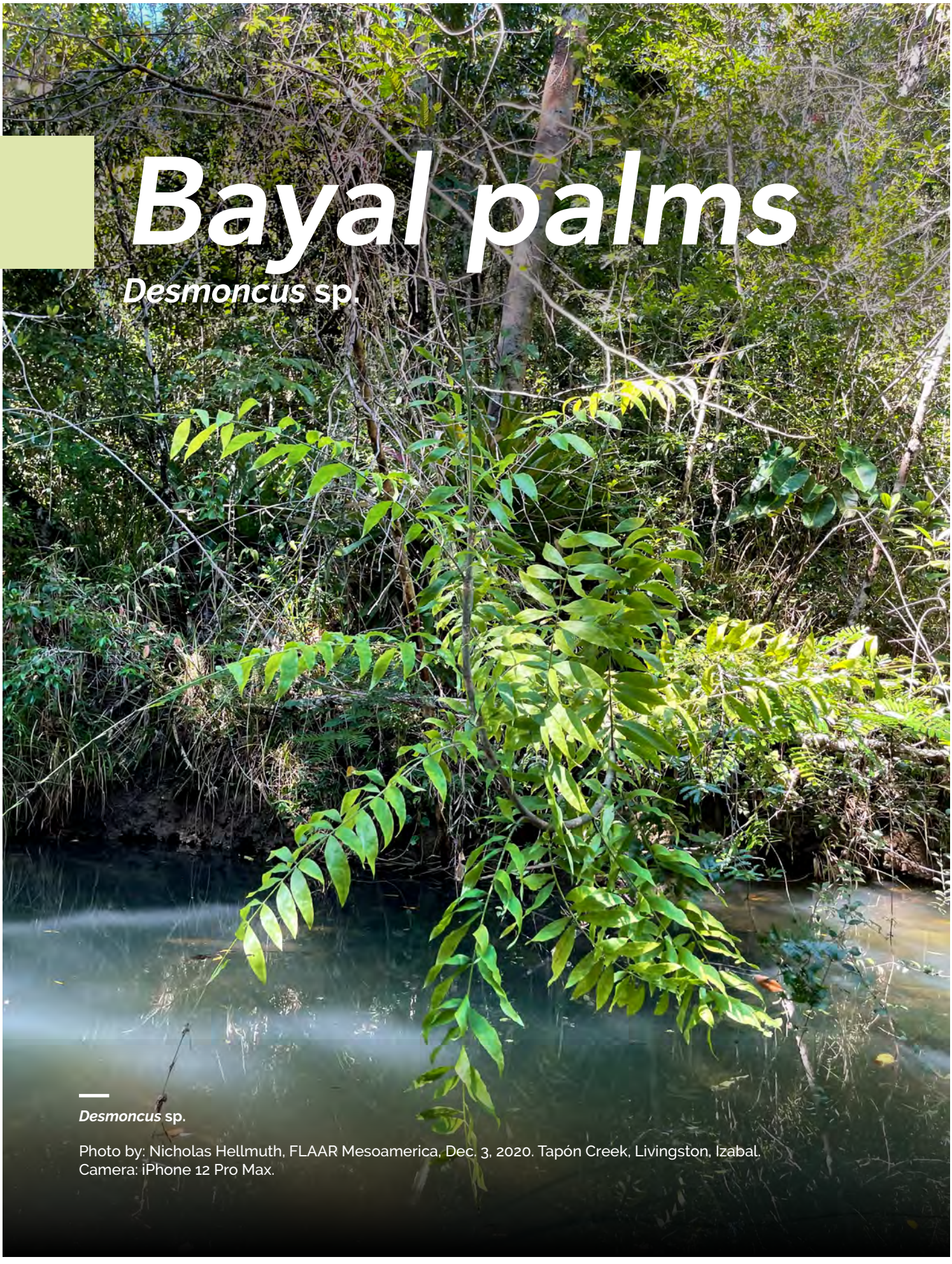
Tapon Creek, photographed by Nicholas Hellmuth with an Apple iPhone 12 Pro Max, December 4, 2020.

Cryosophila stauracantha.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Bayal palms

Desmoncus sp.



***Desmoncus* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

DESMONCUS SPECIES, **BAYAL PALM VINES**, PROBABLY *DESMONCUS ORTHACANTHOS* MART.

There are massive amounts of these palm vines when you drive to Ecolodge El Sombrero, to the left of the entrance to Parque Nacional Yaxha, Nakum and Naranjo (Petén). Elsewhere in this park you find lots more.

Once you are in Livingston, if you have access to a lancha to travel up and down all the creeks and rivers that enter the north side of El Golfte (area of Rio Dulce), you will see bayal palm vines along the shore, often in flooded swamps. Although this palm does like water, it does not require a swamp to grow in.

Fresh green shoots of bayal palm are edible (I have eaten them). After you strip off the needle-like spines, the hard inside is usable for basketry, making hats, and for making bajareque (wattle-and-daub) walls for houses. So, *Desmoncus orthacanthos* is a very useful plant.

Finding flowers (even finding inflorescences) is a challenge; the red mature berry-sized fruits, in a typical palm cluster, are easier to see.

***Desmoncus* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Desmoncus* sp.**
Most plants need sunlight and many plants "grow towards sun" when sun is scarce in other positions. Obviously a vine is more agile in where and how it can try to find sunlight.

Since *Desmoncus* palms are vines, they also need other plants to hang onto. This bayal is successful at finding sunlight but is not going to find anything to hang onto out over this creek.

Desmoncus palms like moist areas but do not require standing water to thrive. This bayal is growing from the shore; when the dry season comes the creek level will probably be 50 centimeters lower. On December 3rd the creek is still a bit high due to the two hurricanes (Eta and then Iota), but what you see in this photo is not the maximum height it would have reached at the height of either actual hurricane: water would have been 50cm or higher than what you see here.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Desmoncus* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Nov. 6, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Desmoncus* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Nov. 6, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Desmoncus* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dic. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Another Species of Arecaceae

Genoma seleri

Genoma seleri.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

POTENTIALLY ANOTHER **SPECIES OF ARECACEAE**

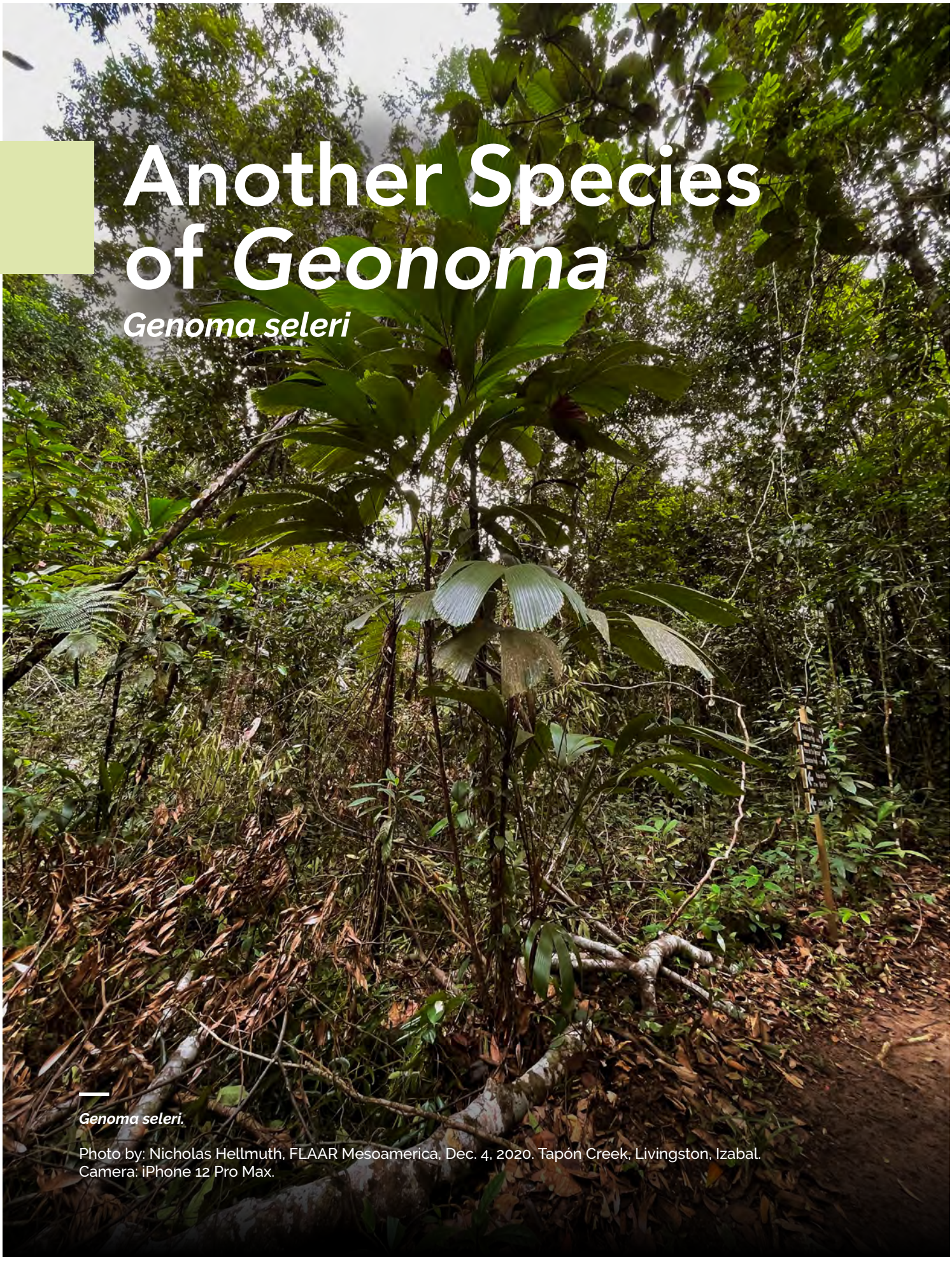
I have a hard time recognizing palms of the genus *Geonoma* and differentiating them from all the "xate" (*Chamaedorea* spp.) palms. I have a lot to learn. But, since the local name of this palm is "capuque de montaña", or "pamac'" (or pamak') in local Q'eqchi', it was possible to find the most alike species listed as *Geonoma seleri*.

Genoma seleri.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Another Species of *Geonoma*

Genoma seleri



Genoma seleri.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

POTENTIALLY ANOTHER **SPECIES OF *GEONOMA***

The local name for this palm is "capuque tzimin" or "palma de tzimin". Snag here is that "Tizimin" is the name of a town in Yucatan, so Google search gives you results mainly for Yucatan (even when you put a minus sign for Yucatan).

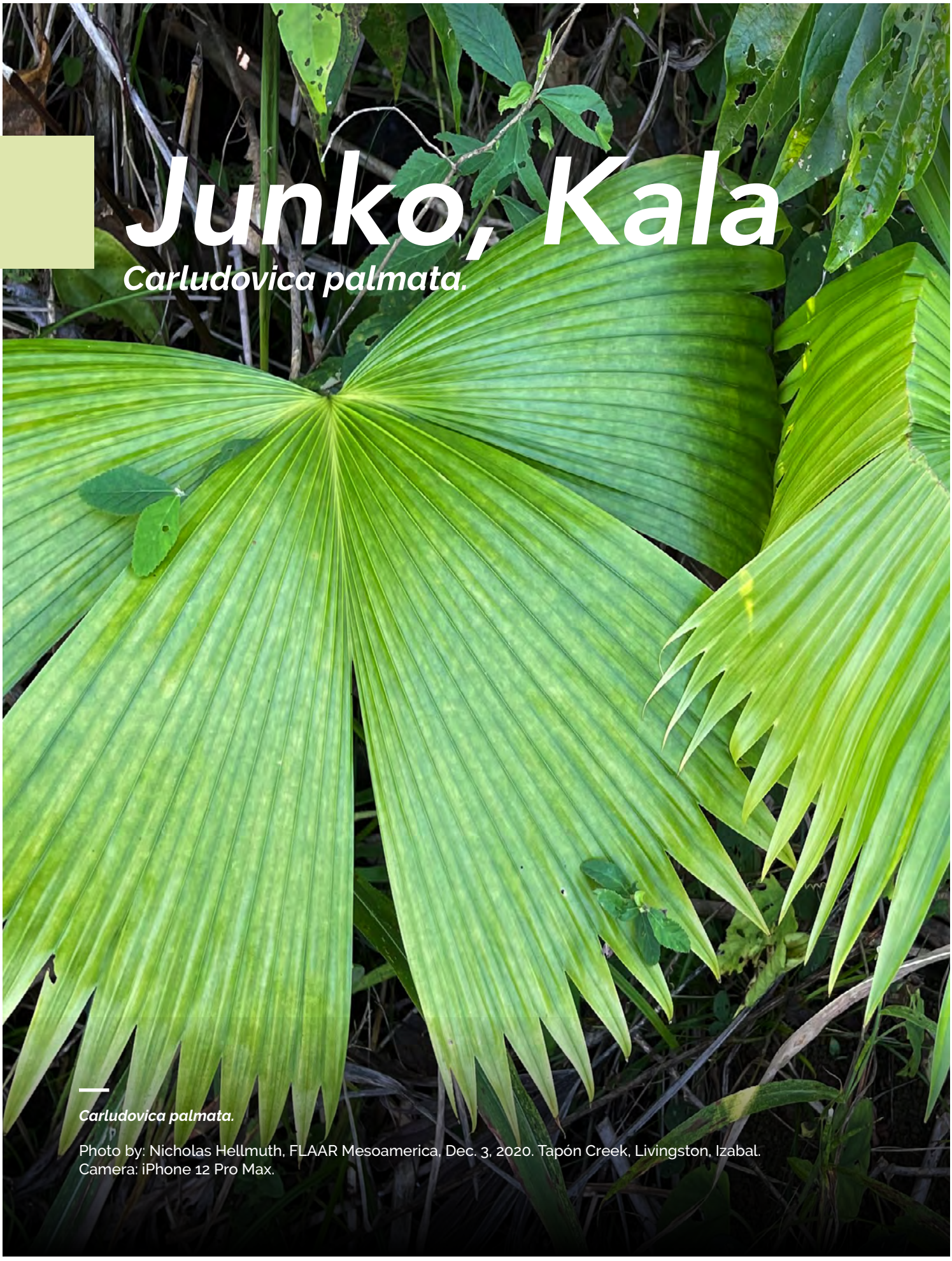
We will need to find more specimens, and with inflorescences. But, in the meantime, I estimate it may be *Geonoma interrupta*, or *Geonoma undata*, or a close relative. Hopefully a palm specialist can assist.

Geonoma interrupta probably. Even maybe *Geonoma undata.*

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Junko, Kala

Carludovica palmata.



Carludovica palmata.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

CARLUDOVICA PALMATA, **JUNCO, KALA**

These faux-palms were high up on the hilltop overlooking Taponcito-Creek, near vanilla vines. We are estimating these were the common *Carludovica palmata* though there are look-alikes with other names.

Carludovica palmata.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal. Camera: iPhone 12 Pro Max.

Carludovica palmata.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

Carludovica palmata.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 3, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

FINAL COMMENTS (AT THE MOMENT)

The two areas with the most diverse number of palms that we have found so far in the Municipio de Livingston are:

> Cascada La Lámpara (at end of the Río Lámpara)
> Lagunita Creek (south of Rio Sarstún).

We still have December field trip and then twelve months of 2021 to find additional species (and other areas that have lots of palms within one location). The water cascade at the end of Lampara River also has the most number of faux-palms (plants that look like palms but are totally unrelated plant family).

***Desmoncus* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Nov. 6, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

***Bactris* sp.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

SUGGESTED READING **ON PALMS**

The list of books below is not complete, but has basic resources on palms. We find that to learn about palms of Guatemala it also helps to make lists of palms surrounding us: Chiapas, Tabasco, Campeche, Quintana Roo, and Belize.

BALICK, M. J.
1988 The Palm-Tree of Life: Biology, Utilization and Conservation. Advanced in Economic Botany. New York Botanical Garden, New York. Vol. 6. 282 pages.

Sold online: https://www.amazon.com/Palm-Tree-Life-Utilization-Conservation-Advances/dp/0893273260

BALICK, M. J. and **H. S. BECK**
1990 Useful Palms of the World: A Synoptic Bibliography. Columbia University Press, New York, 724 pages.

BALICK, M. J., NEE, M. H. and **D. E. ATHA**
2000 Checklist of the vascular plants of Belize. Mem. New York Botanical Garden. Vol. 85. 246 pages.

Sold online: https://www.amazon.com/Checklist-Vascular-Plants-Belize-Botanical/dp/0893274402

BRIDGEWATER, Samuel, GARWOOD, Nancy C. and **Steven BREWER**
2007 Common Palms of Belize. Natural History Museum, London. 8 pages.

Very helpful field guide. Would be even more useful if each palm had an entire page of photographs after the checklist (the checklist format of just one row of photos helps you compare many different palms all on one page).

COOK, O. F.
1923 Opsiandra, a new genus of palms growing on Maya ruins in Petén, Guatemala, Journal of the Washington Academy of Sciences. Vol. 13, pp. 179-184.

www.biodiversitylibrary.org/part/147186#/summary

HENDERSON, Andrew, GALEANO, Gloria and **Rodrigo BERNAL**
1997 Field guide to the palms of the Americas. Princeton University Press. 363 pages.

Sold online: https://www.amazon.com/Field-Guide-Americas-Princeton-Paperbacks/dp/0691016003

Palms of the Americas is an essential book, but, as typical of books on Plant XYZ of the World, the authors are from USA and South America: so, plenty on South America and in general, but clearly Guatemala was neither their focus nor their area of expertise. But at least they do list all the palms (that they knew of in 1995) for each country: Belize has 38 (a lot for its size). Guatemala has 60 species since it's size is larger than Belize and Guatemala has more diversity of altitude and eco-systems. Mexico of course has more diversity of eco-systems than Guatemala, plus is significantly larger: so Mexico has lots more species. Yet Panama has more than Belize, Guatemala and Mexico put together. Peru has even more than Panama.

But this book is over three decades in the past. Fresh botanical field work on palms would be helpful. Plus, most discussions of palm trees need more information on local use.

HENDERSON, Andrew
2000 Bactris (Palmae). Flora Neotropica. Vol. 79. 181 pages.

Available online: www.jstor.org/stable/pdf/4393893.pdf?seq=1#page_scan_tab_contents

Quattrocchi, Umberto
2017 CRC World Dictionary of Palms: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. 2 volumes. CRC Press.

ZARGER, Rebecca Kristyn
2002 CHILDREN'S ETHNOECOLOGICAL KNOWLEDGE: SITUATED LEARNING AND THE CULTURAL TRANSMISSION OF SUBSISTENCE KNOWLEDGE AND SKILLS AMONG Q'EQCHI' MAYA. PhD dissertation, University of Georgia. 290 pages.

FLAAR MESOAMÉRICA

ACKNOWLEDGEMENTS TO FLAAR MESOAMÉRICA

The reports are a joint production between the field trip team and the in-house office team. So here we wish to cite the full team:

Flor de Maria Setina is the office manager, overseeing all the diverse projects around the world (including FLAAR-REPORTS research on advanced wide-format digital inkjet printers, a worldwide project for over 20 years). We also utilize the inkjet prints to produce educational banners to donate to schools.

Vivian Díaz environmental engineer, is project manager for flora, fauna projects (field work and resulting reports at a level helpful for botanists, zoologists and ecologists, and for university students). Also coordinates activities at MayanToons, division where educational material for kids is prepared.

Victor Mendoza identifies plants, mushrooms, lichen, insects, and arachnids. When his university schedule allows, he also likes to participate in field trips on flora and fauna research.

Vivian Hurtado prepares the bibliography for each subject and downloads pertinent research material for our e-library on flora and fauna. All of us use both these downloads plus our in-house library on flora and fauna of Mesoamerica (Mexico through Guatemala into Costa Rica).

Andrea de la Paz is a designer who helps prepare the master-plan for aspects of our publications. She is our editorial art director

Senaida Ba is photography assistant for many years. She knows the Canon, Nikon and is learning the two new Sony mirrorless cameras. She prepares, packs, sets-up, and helps the photographers before, during, and after each day's field trip.

Jaqueline Gonzalez is a designer who puts together the text and photographs to create the actual report (we have several designers at work since we have multiple reports to produce).

Roxana Leal is Social Media Manager for flora and fauna research and publications, and MayanToons educational book projects

Maria Alejandra Gutierrez is an experienced photographer, especially with the Canon EOS 1D X Mark II camera and 5x macro lens for photographing tiny insects, tiny flowers, and tiny mushrooms. Work during and after a field trip also includes sorting, naming, and processing. And then preparing reports in PDF format.

David Arrivillaga is an experienced photographer and is able to handle both Nikon and the newest Sony digital cameras. Work during and after a field trip also includes sorting, naming, and processing. And then preparing reports in PDF format.

Juan Carlos Hernandez takes the material that we write and places it into the pertinent modern Internet software to produce our web pages (total network is read by over half a million people around the world).

Paulo Nuñez is a webmaster, overlooking the multitude of web sites. Internet SEO changes every year, so we work together to evolve the format of our web sites.

Valeria Aviles is an illustrator for MayanToons, the division in charge of educational materials for schools, especially the Q'eqchi' Mayan schools in Alta Verapaz, Q'eqchi' and Petén Itzá Maya in Petén, and the Q'eqchi' Mayan and Garifuna schools in the municipality of Livingston, Izabal.

Josefina Sequen is illustrator for MayanToons and also helps prepare illustrations for Social Media posts and for animated videos.

Rosa Sequen is also an illustrator for MayanToons and also helps prepare illustrations for Social Media posts and for animated videos.

Laura Morales is preparing animated videos in MayanToons style since animated videos are the best way to help school children how to protect the fragile ecosystems and endangered species

Heidy Alejandra Galindo Setina joined our design team in August 2020. She likes photography, drawing, painting, and design.

Maria José Rabanales sheis part of the team for editing photographic reports and educational material of Flora and Fauna since September 2020. She works together with others of the team to prepare the finished pdf editions of the material of the Yaxha, Nakum and Naranjo Project.

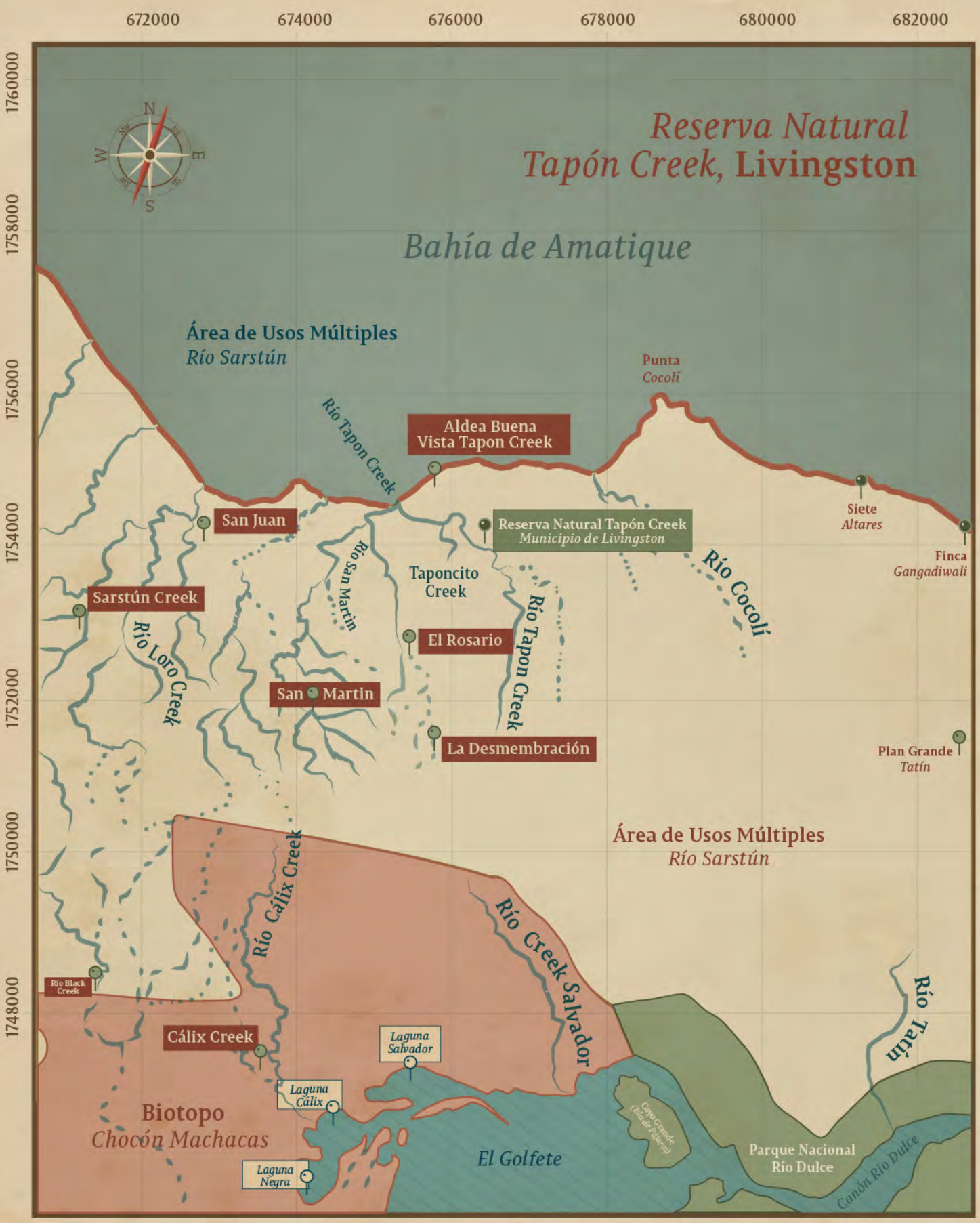
Alejandra Valenzuela, biology student is now part of Flora y Fauna's photographic report and educational material editing team since September 2020.

Alexander Gudiel: designer who join the editorial design team on December 2020. He will combine the text, pictures and maps into the FLAAR Mesoamerica editorial criteria.

Izabal

1. Área sin protección
2. Parque Nacional Río Dulce
3. El Higuerito
4. Área de Usos Múltiples Río Sarstún
5. Sierra de Santa Cruz
6. Biotopo Protegido Chocón Machacas
7. Reserva Protectora de Manantiales Cerro San Gil

Elaborado por: Andrea de la Paz; Amanda Estrada Rodas. FLAAR Mesoamerica 2020



Izabal

FLAAR MESOAMÉRICA

Información de referencia:

- Limites departamentales de Guatemala. (IGN)
- Instituto Geográfico Nacional (IGN) (Hojas 2463 IV y 2463 III)
- Google Map data 2020. Shapes: Sistema Guatemalteco de Áreas Protegidas 2017.
- Cuerpos de agua. Ministerio de Agricultura Ganadería y Alimentación (MAGA)
- Dirección de Análisis Geoespacial del (CONAP), Marzo/2017.

Elaborado por: Andrea de la Paz; Amanda Estrada Rodas. FLAAR Mesoamerica 2020

Izabal

1. Reserva Protectora de Manantiales Cerro San Gil
2. Biotopo Protegido Chocón Machacas
3. Área sin protección
4. Parque Nacional Río Dulce
5. Área de Usos Múltiples Río Sarstún
Acceso terrestre
Acceso de tierra

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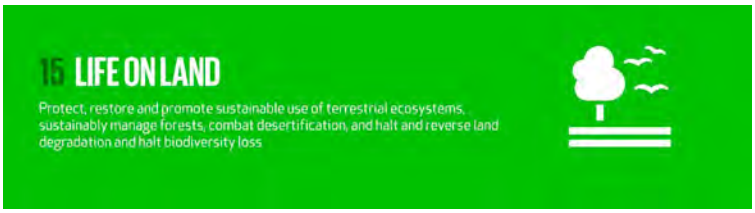
Elaborado por: Andrea de la Paz; Amanda Estrada Rodas. FLAAR Mesoamerica 2020



The current Alcalde of Livingston, Mr. Daniel Pinto, together with his team of International Cooperation division, Mr. Edwin Mármol, have set the goal of achieving the municipality development in the years 2020-2024 based on the goals and indicators proposed by the 2030 Agenda for Sustainable Development. From this agenda, FLAAR Mesoamerica will collaborate to achieve Sustainable Development Goal (SDG) number 15 "Life on Land".

Throughout this cooperation project, different materials have been prepared, like this Photo Essay, that helps to collect information on species, different ecosystems: terrestrial, wetlands and fresh water biodiversity. This information would also be useful as part of a strategy to protect threatened species and prevent their extinction. The municipality's goals include to promote the sustainable use, conservation and research of the species of flora and fauna of the terrestrial, wetlands and aquatic shore and coastal ecosystems of the Guatemalan Caribbean. Learn more about this project and the SDG indicators at: **https://flaar-mesoamerica.org/rain-forests-rivers-lakes-bays-ocean-caves-canyons-livingston-the-caribbean-biodiversity-wonderland-of-guatemala/**

SERIES OF MUNICIPIO OF LIVINGSTON

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www.maya-ethnobotany.org
www.maya-ethnozoology.org
www.maya-archaeology.org
www.digital-photography.org
www.FLAAR-Mesoamerica.org

This report may be cited with this information:

Hellmuth, N. (2020) Palms found and photographed on Rivershores and Hillside Ecosystemsin Tapon Creek areas, Municipio de Livingston,Izabal, Guatemala: FLAAR Mesoamerica.

BACK COVER PHOTO
Attalea cohune.
Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Dec. 4, 2020. Tapón Creek, Livingston, Izabal.
Camera: iPhone 12 Pro Max.

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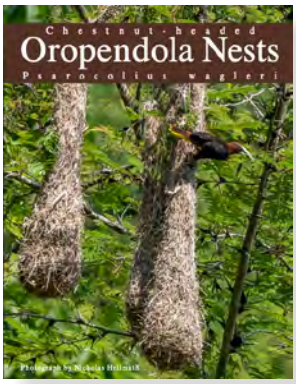

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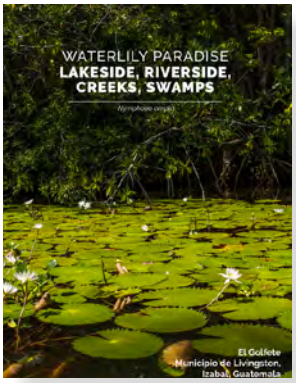

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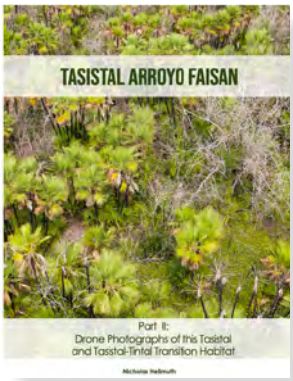

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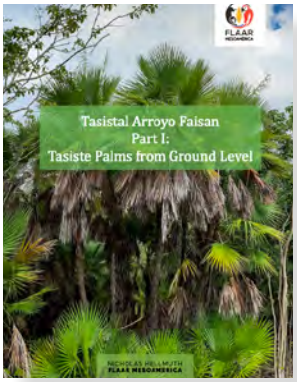

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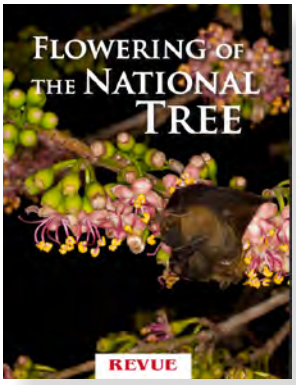

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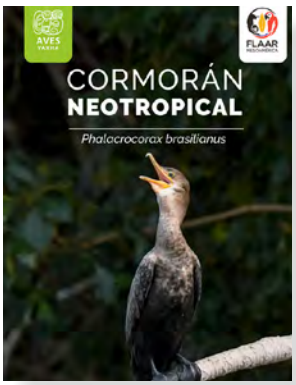

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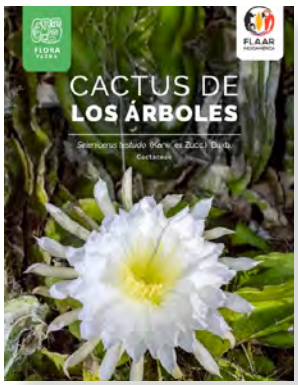

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