TASISTAL ARROYO FAISAN

Part II:
Drone Photographs of this Tasistal and Tasistal-Tintal Transition Habitat

Nicholas Hellmuth

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Nicholas Hellmuth
FLAAR Mesoamerica
March, 2020

APPRECIATION

ASSISTANCE FOR LOCAL KNOWLEDGE OF PLANTS AND ANIMALS OF PETEXBATUN AREA
Julian Mariona, family owner of Hotel Ecologico Posada Caribe, Arroyo Petexbatun.
Kiki (Enrique Camorlinga) local guide who knows where the tasistal ecosystems can be found

Front cover photograph:
Tsistal Arroyo Faisan.
Photography by: Haniel López, FLAAR Mesoamerica.
Drone: Mavic Air Pro 2. January 30, 2020

Title page cover photograph:
Tasistal, Arroyo Faisan
Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

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Tasistal Arroyo Faisan. Photography by: Haniel López, FLAAR Mesoamerica
Drone:Mavic Air Pro 2. January 30, 2020

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WHAT IS A TASISTAL?

A tasiste is a palm, *Acoelorrhaphe wrightii.* A tasistal is an area where there are thousands of these palms tightly clumped together.

These palms prefer humid areas, at least seasonally humid. So all the seasonally inundated savannas documented by FLAAR Mesoamerica in Parque Nacional Yaxha Nakum Naranjo during 2019 had dispersed clumps of *Acoelorrhaphe wrightii* within these open grassland savannas.

Habitats that are humid all year long also have *Acoelorrhaphe wrightii:* along the river banks, lake shores, and in between mangrove swamps along the shores of El Golfete, Rio Dulce and all the inlets in this area of Izabal. We have documented these *Acoelorrhaphe wrightii* palms during field trips in February 2020 and mid-March 2020. But all the *Acoelorrhaphe wrightii* in PNYNN in Peten and all this palm in the Municipio of Livingston are in clusters, widely separated from each other. In a tasistal there can be a over a quarter of a million tasiste palms in a single area, literally. We estimate that if not burned each year a tasistal could have between half a million and a million individual palm trunks in a single tasistal area.

In Peten *Acoelorrhaphe wrightii* is called tasiste. In Izabal *Acoelorrhaphe wrightii* is called pimienta or pimientilla (or pimento or pimentillo, have to double check the correct spelling on our next field trip). The word tasiste is not used in Izabal and most local people have not heard that name.

There are no savannas that we have yet found in the Municipio de Livingston; and there are no areas even along the shores where continuous masses of *Acoelorrhaphe wrightii* palm exist. The largest mass we found was to the left of Hotel Tenemit Maya; this mass was about 10 or 15 meters wide. The Tasistal Arroyo Petexbatun is about 200 or 300 meters wide by about 3 or more kilometers long. The Tasistal Arroyo Faisan we only just learned about and have not yet been able to hike its entire length nor hike its entire width. I estimate it is not quite as large as the first tasistal we found (near Arroyo Petexbatun).

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

In Parque Nacional Yaxha Nakum Naranjo there are widely scattered clusters of *Acoelorrhaphe wrightii* palms in each of the three savannas that we have documented there in 2019. But there are no tasistals anywhere in this park nor in adjacent Parque Nacional Tikal. So the two tasistal areas of the Petexbatun wetlands upstream from Sayaxche are unique (so far, because we estimate there are other tasistals in several other areas of Peten and adjacent Alta Verapaz). There are unlikely any tasistal ecosystems in the Municipio of Livingston; the palms here are scattered, and along lake shores, riversides: where there is permanent water nearby.

Tasistal Arroyo Faisan. Drone View. Photography by: Haniel López, FLAAR Mesoamerica.
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WHY HAS NO PREVIOUS BOTANIST OR ECOLOGIST LISTED THIS TASISTAL BEFORE?

Botanist Cyrus Lundell cruised up and down the Arroyo Petexbatun over half a century ago. He was within less than 100 meters from Tasistal #1 (Tasistal Arroyo Petexbatun). I have cruised up and down Arroyo Petexbatun in the 1970's, 1980's, 1990's (with groups that appreciated access with local guides to visit Aguateca and experience the waterbirds of Lake Petexbatun). Among the individuals who came with us were Eldon Leiter and Jack Sulak and in another educational trip including Dr Michael Coe and Dr Mary Miller (Yale University), Dr Sophie Coe, Dr George Stuart (National Geographic), and epigrapher Dr David Stuart. Plus, still once every year in the recent decade I visited the Petexbatun area to study local flora and fauna (we know the local families at the hospitable Hotel Ecologoco Posada Caribe). So in this area we study medicinal plants, plants for dye colorants, pollinators, waterbirds and the Bufo marinus toads that local people use to clear their homes of insects.

But in all these decades, like botanist Cyrus Lundell, and the scores of archaeologists working in Aguateca, Dos Pilas, etc., none of us stopped to hike through the tintal along the shore to see, experience, and tell the world about the tasistal that was on the other side of the tintal.

The second tasistal, Tasistal Arroyo Faisan, is more understandable why no ecologist, geographer, or botanist has published this area: it is far away from any through route. Arroyo Faisan goes away from the main river: Arroyo Petexbatun. No one would have any reason whatsoever to explore Arroyo Faisan.

But we decided to venture here because our local plant scouts told us there was a second tasistal here. These individuals noticed how appreciative we were to have learned about Tasistal #1 (Tasistal Arroyo Petexbatun).

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

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AND WHY ARE THEY IMPORTANT TO LOCATE, TO STUDY, AND TO PROTECT?

My interest in visiting these two tasistal areas and photographing their physical extent is to encourage biologists and medical specialists to learn how the seeds of *Acoelorrhaphe wrightii* palms can be helpful as prostate food supplement. And potentially as other healthy edible alternatives. If the local people can earn money to support their families by having permission from the local land owners to harvest the seeds, then people will not randomly burn down these tasistal areas so that a few animals run out and thus can be turned into soup and steak. So our goals are to encourage the land owner not to chop these *Acoelorrhaphe wrightii* palms down to make pasture land for cattle ranches; and the encourage the land owner to coordinate with local people to harvest the seeds (with permission of the land owner); and encourage ecologists, geographers, and botanists to study these tasistals while they still exist in the wild. These tasistal areas also have nance fruit trees (most species of nance are edible). And there are jicara trees that can provide material for cups, bowls, and to make handicrafts for tourists from renewable resources.

Our first time visit to this Tasistal Arroyo Faisan is at the exploratory level. To map this area donations or grant funding would be needed. But at least we have made available an initial documentation of the potential for scholars to study this area in more detail. Would make a nice MS thesis or PhD dissertation for enthusiastic students at the capable universities in Guatemala which have experienced biologists on their faculty: USAC, UVG, Landivar and the ones I know the best since students from each of these universities assist us at FLAAR Mesoamerica office and on field trips.

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica.
Drone: Mavic Air Pro 2. January 30, 2020

INTRODUCTION TO OUR EXPERIENCE WITH DRONE PHOTOGRAPHY ON FIELD TRIPS

The first drone that we used was several years ago to record giant *Ceiba Pentandra* trees, especially in the Costa Sur of Guatemala. The drone pilot was pleasant and helpful but the camera was more like a GoPro camera, which I classify as "for hikers and bikers," in other words, for family vacations and weekend playing with drones. The camera was too wide angle and everything was distorted. Resolution was okay for showing to your family and friends, but resolution was not adequate for serious coverage. But images from the air were better than nothing and it was a good experience to learn what never to use in the future.

The second drone was to photograph roof architecture of Q'eqchi' area Mayan houses. Our goal was to find and document as many kinds of thatch: much more than just guano thatch and corozal thatch roofs. Plus our goal was to record this house architecture in detail not available from any of the excellent Carnegie Institution of Washington photographs used in Wauchope's helpful 1938 monograph on Modern Maya houses: a study of their archaeological significance. This drone camera was not as awful as the first one (the pilot intelligently got a better model after he noticed our reaction to the photos from the first drone).

For several years after that we did not use any more drones since it is expensive. But once we found the Tasistal Arroyo Petexbatun we realized that any study of this tasistal without aerial photos would be incomplete. You can't use LiDAR for two reasons: first, LidAR is for archaeologists who want to remove all vegetation and see what's on the surface of the ground. Second, there is no LiDAR of this part of Peten anyway (LiDAR is also totally lacking for Yaxha, Nakum, and Naranjo Maya ruins areas).

Arroyo Faisan, Haniel López whith Drone
Photography by: Juan Pablo Fumagalli, FLAAR Mesoamerica
Camera: Google Pixel. January 31, 2020

Once I realized that we needed a drone, Maria Alejandra Gutierrez found a capable drone pilot who was willing to come on field trips without charging a fee: we paid all travel expenses. He brought his own nice DJI Mavic Air. The photos he took were extremely helpful. But the 12 MP camera could not record enough detail to allow us to recognize and identify the species of each tree in the aerial photos. So we realized that we needed to buy a drone with a better camera. So I did research on-line and asked around. Eduardo Sacayon said the entity for which he was working, they had acquired a Mavic Pro 2. He said the government institute for which his brother worked had also selected a Mavic Pro 2. In my own research on-line, I also estimated this would be the best initial upgrade: so we obtained a Mavic Pro 2 from the local distributor in Guatemala, Canella.

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

There are several areas for botanists and ecologists to study: the tintal that starts at the river's edge. Then a transitional zone between tintal and tasistal (with many species of trees and bushes). Then the tasistal itself. Then the transition from tasistal to whatever type(s) of forests are on the other side (no time or funds available to hike to the outer edge).

We do not recommend trying to bring a drone to Guatemala in your suitcase. First, for a full day of flights on a field trip the three batteries that come with the drone are not enough. I bought three additional batteries.

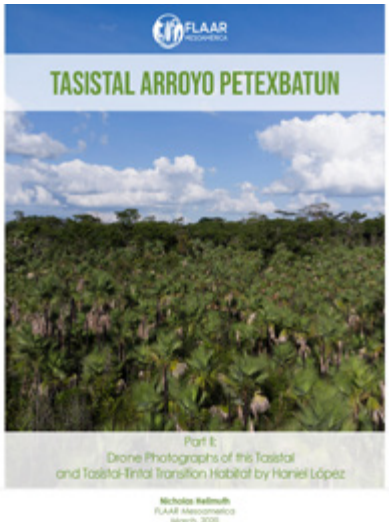
But these Lithium batteries are not allowed in luggage (and they cannot be shipped by air whatsoever). You are allowed to bring them in carry-on (as long as they don't touch each other, etc.). But it is best not to try to bring more than two at a time. So I flew down two in January and I will bring down the third in February.

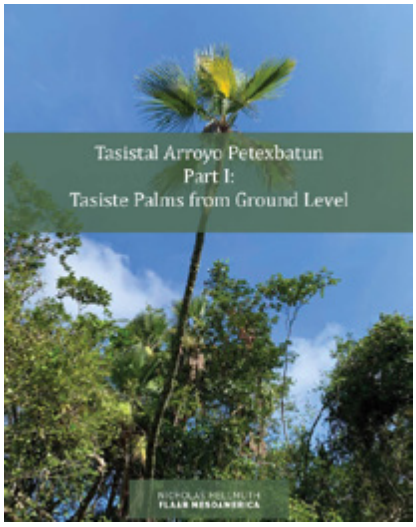
We bought the drone at Canella in Guatemala City for several reasons. First, this is a known and respected distributor (they also distribute Canon cameras and other international brands, such as Japanese brand vehicles, etc.). One of the owners went to the same high school in St Louis, Missouri, as my sister Mary Hellmuth. And in general Canella has a good reputation. Plus their building is easy to find and it's easy to park there.

Second, if you buy from a local distributor they provide training, certification, and backup. If you buy in USA and bring the drone down, you have no local source of support. The support team at Canella were great; we highly recommend Canella as a place to obtain a drone if you need one for your project.

Third, a drone has to be registered with the government agency in charge of this aspect. If you get your drone from the official DJI distributor, they register the drone in advance. If you fly it in from USA or EU, who knows how many weeks the registration might require?

Plus it is good to have a local pilot who knows the local regulations and is certified for the drone you are using.





TO LEARN MORE ABOUT THESE TASISTAL AREAS A FEW HOURS BOAT RIDE FROM SAYAXCHE, PETEN, WE HAVE THREE ADDITIONAL PUBLICATIONS.

DRONES AND BIRDS

The single most important aspect of using a drone is to avoid disturbing birds. Fortunately in the area of Tasistal #1 there were almost no birds in December. In January I saw birds once and the drone pilot landed the drone immediately, before the birds got close.

The tasistal habitats are incinerated each year by local people. Calculate how many bird nests are burned; how many birds die from just the smoke (not to mention heat of the fire). Plus how many food plants for the birds are destroyed, every year, by these fires. All the land turtles are baked. And deer, peccary, and lots of other animals lose their life because once the tasistal is burned, there are no plants to hide behind. Plus the fire drives all these animals out at once (so the hunters line up in advance). The turtles and snails can't move fast enough so they simply die in situ.

Thus it might be more realistic to carefully fly drones over these endangered areas in order to develop programs and projects to protect these habitats and protect the birds. No one is flying a drone every day. Drone recording is short and quick.

The other option is photography with a super-high resolution camera from a helicopter, but a drone is less cost.

More birds are killed and injured by kids using slingshots, with the birds as target practice.

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

THE OPTIMAL HIGH-RESOLUTION DRONE CAMERA IS PHASE ONE

Phase One is a company in Denmark that makes the most reliable and prestigious medium format cameras in the world. Their success caused the collapse of most other medium format camera manufacturers (since none of the others had crucial software like the Capture One of Phase One).

I have experience with medium format digital camera backs:

- Kodak
- Leaf
- Phase One

I have used these medium format digital backs on various cameras, but mostly on my 30-year old Hasselblad with original Zeiss lenses. For the last seven years, however, I use only Nikon D5, Canon EOS 1D X Mark II, and now Sony full-format DSLR digital cameras since they are more portable. Plus, to photograph birds in flight, or an orchid flower high in a tall tropical tree, you need the prime telephoto lenses of Nikon, Canon, or Sony. There are no such lenses on medium format: medium format is for macro, portrait, architecture, and landscape photography (so perfect for flowers, plants animals that are not far away, landscapes, and panoramas that you want to enlarge for a photo exhibit). So we would for sure wish to have a

- Phase One XT system to photograph trees and landscapes and panoramas.

Arroyo Faisan, Haniel López whith Drone
Photography by: Juan Pablo Fumagalli, FLAAR Mesoamerica
Camera: Google Pixel. January 30, 2020

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Nowadays Phase One camera digital backs are such high resolution that it is best to utilize lenses especially designed and engineered to work with hi-res digital backs. Rodenstock and Schneider make these special lenses.

Phase One Industrial (https://industrial.phaseone.com/Drone_Solution.aspx) has cooperated with DJI to create the M600 PRO drone solution. This uses a DJI M600 PRO drone with a Phase One iXM 100MP digital back.

There is nothing comparable (unless you have a military mapping airplane with million-dollar equipment).

- The DJI drone (to hold the weight of the medium format camera) costs $5,699.
- DJI Matrice 600 Intelligent Flight Battery TB47S (6 Pack) $1,150 (you need lots of extra batteries when you are in a remote area since often there is not enough electricity even in a hotel to charge everything).
- DJI Hex Charger (to charge all six batteries at once) $379
- Phase One camera kit – iXM 100MP, $40,000
- special lenses made just for this drone camera, $10,000
- Insurance is essential for the drone (in case of wind gusts, etc.)

It is very simple: are endangered biodiverse ecosystems worth saving?

Individuals and foundations and EU and USA government agencies are more likely to donate if they can see what it is they can save and preserve for future generations. So it makes a good impact at a meeting to walk in, and put on the table an enlarged inkjet print of several meters in size that shows the tasistal (or other ecosystem that also needs to be protected). The Mavic Pro 2 is better than the Mavic Air, but the DJI M600 PRO drone is sophisticated technology for serious aerial photography.

FLAAR-REPORTS has over 20 years of experience with wide-format inkjet printing technology, especially in grand format size (printers that print 3.2 meters in width by as many meters long as you wish; and 5m printers). We have over half a century of experience with photography (at age 19, working as a student intern for the Tikal Project in Peten, an entire 12 months in 1965).

I started photography at age 16, as a backpacker, photographing in Tabasco and Chiapas.

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

The resulting high school thesis with these photos of Tabasco rain forests and Palenque temples and palaces, won first prize and that got me into Harvard. My archaeological photography in Peru was one aspect of bring awarded a Post Graduate research fellowship at Yale University in the late 1960's. Was awarded several more different Post Graduate research fellowships at Yale in subsequent decades for Mesoamerican research where again, photography experience was an asset. Today, in 2020, photography is even more essential for botany, zoology, ecology, and every aspect of documenting the fragile ecosystems of Mesoamerica.

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

In this photograph most of the trees are not tasiste palms. So it would help to have a map of the entire tasistal and then number each drone photo, and then show where on the overall tasistal each drone photo is showing.

At the top middle you can see that the entrance trail is filled with water. We show us hiking through the deep water and deep mud of this brecha in Part I. But in the dry months of the year there would be no water on the surface of this area whatsoever.

In this photograph most of the trees are not tasiste palms because this is the transition between the tintal (to the top) and the tasistal (another 50 meters to the bottom). So it would help to have a map of the entire tasistal and then number each drone photo, and then show where on the overall tasistal each drone photo is showing.

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With a drone you can capture this view of the tree tops, but with no distortion (since the drone is physically parallel to the tree at this mid-point). So for our project-in-planning (to study treetop ecosystems and tree canopy ecosystems, a drone is essential). If you tried to take this photograph from the ground your image would be at a distorted angle.

For each of the two tasistals we have two separate PDFs. This is because each PDF has to be of a Megabyte size that can be sent as an attachment, etc. If everything were in one single PDF the MB file size would be too much.

Plus the two tasistal areas are slightly different: Tasistal Arroyo Petexbatun we visited twice. And we hiked the entire length and we walked cross-cross in each area. We have a better understanding of this tasistal since it is across the river from our base camp (the hotel). In distinction, Tasistal Arroyo Faisan is several hours to get there in the wet season. And since we have no outside funding we had time to visit Tasistal #2 only once and just for a few hours since getting back and forth took many hours.

DOCUMENTATION OF THE BURNT AREAS OF THIS TASISTAL ARROYO FAISAN

According to our local guides Tasistal Arroyo Faisan has been burned more often and more thoroughly than other tasistal areas. The local guide said that 20 years ago this area was “solid tasiste palms.” But now that the tasiste is burned down, other trees are able to sprout. In our Part I we have close-up photos of the burned trunks (the fire flashes through so fast that ironically the palm trunks often survive and the fronds resprout when the rains come). In the present Part II, we also try to show some of the burned areas, from above.

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Tasistal Arroyo Faisan. Drone view. Photography by: Haniel López, FLAAR Mesoamerica.
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Trunks are burned black, but due to rains the fronds have sprouted out again (but thousands of palms did not survive). In the far background to the left you see a higher forest (no longer tasiste palms). And to the right in the background there are areas with no forest.

Tasistal Arroyo Faisan, Drone View. Photography by: Haniel López, FLAAR Mesoamerica.
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In the far background you can see the forest does not continue. Again, it would sure help to return with enough time to map this Tasistal #2. For Tasistal #1 (Tasistal Arroyo Petexbatun) we visited that once in October 2019 (our discovery). Then walked though the entire width, length, etc. in December and again in 2020 with the higher quality drone..

CONCLUDING OBSERVATIONS ON THE UNFORTUNATE LACK OF DOCUMENTATION OF TASISTAL AREAS IN PETEN

So far we have not found one single botanical herbaria specimen that suggests anyone has recorded one single tasiste palm in the Petexbatun area. Standley and Steyermark, the best known botanists in the world for Flora of Guatemala in their epoch (1940's-1970's) did not know of one single tasiste from any herbaria. They clearly recognized that tasiste palm could be and should be found in Peten, but not one single tasiste palm was documented in their prestigious monograph on Flora of Guatemala.

Lundell had better documentation since Lundell had local Guatemalan plant scouts working throughout the La Libertad and other areas of Peten. Lundell himself was on a lancha up and down the Arroyo Petexbatun but never set foot in either tasistal: he only commented on trees on the shore (visible from his boat). This is the difference: we get out of the boat and wade knee deep in mud to reach what we wish to learn about.

Yet an estimated close to ONE MILLION tasiste palms were about 100 meters from the river that Lundell comfortably cruised up and down. And several kilometers away, tons more are in Petexbatun area Tasistal #2 (Tasistal Arroyo Faisan).

Plus the tasiste palm plants we found in three savannas in Parque Nacional Yaxha Nakum Naranjo last year.

It would help botanists, ecologists, and archaeologists if they could see these habitats on their computer monitors. How did the Classic Maya utilize these tasiste palm tasistal ecosystems? And were these flatland seasonally inundated two thousand years ago? And did tasiste palm grow in these areas two thousand years ago?

If there are even only just 500,000 tasiste palms in Tasistal #1, and only 300,000 tasiste palms in Tasistal #2 (not counting Tasistal #3 which we have not yet explored), that is a lot of potentially edible seeds to help feed the local Mayan people during the Preclassic, Classic, and Post Classic.

Tasistal Arroyo Faisan. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

PRESERVING TASISTAL PALM AREAS HAS A LOT OF POTENTIAL

Even more potential help is that seeds of saw palmetto are used to make a prostate food supplement (sold literally by the ton in grocery stores and pharmacies across the USA). Yet not one single seed from Guatemala is used: even the saw palmetto food supplement and medicinal products sold in Guatemala use seeds from Florida or elsewhere in the southeast USA. Instead of burning down all the tasistal areas every year to hunt the deer and other animals that occasionally visit these palm areas, it would seem to make more sense to preserve these tasistal areas and harvest a portion of the seeds to provide income in an ecofriendly manner (most of these palms grow from roots of their parents; not all grow from seeds).

If land owners realize they can earn money from tasiste palm, then they will protect these palms. Harvesting the seeds can provide income for local people (which again encourages them not to burn down these palms in the dry season). And tasiste palms are wild native pure Guatemalan species: these are not imported palm oil plantation trees whose processing uses more chemicals than you want to know about.

Plus there are tasistal habitats in other parts of Peten (Laguna Lachua area, that we have not yet explored). Sounds like tasiste palm is a potential underutilized plant that perhaps can be added to list of edible plants. Potentially to the list of medicinal plants. And the trunks can be poles to make walls for local Maya houses (instead of chopping down and sawing up trees that are over 100 years old to make house walls of planks (80% of the walls of houses in rural areas are nowadays made of planks from large trees). 100% of walls of homes in rural Mayan areas were originally made of bamboo-like grasses which are native to many rural areas. Other houses were made from split trunks of Cecropia (a very very fast growing tree). We have a list of every kind of tañil and poles used for house walls still today by Q'eqchi' Mayan people of Alta Verapaz and Peten. Mayan style houses are eco-friendly.

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An additional goal is to identify and list every tree that is present in addition to the hundreds of *Acoelorrhaphe wrightii*, tasiste palm. We have the personnel to initiate this, and we are open to cooperation with local university teams.

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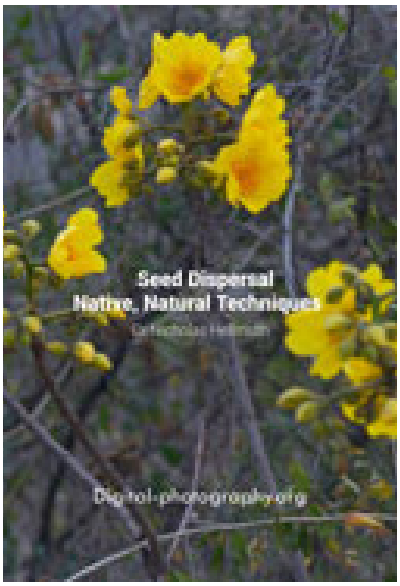
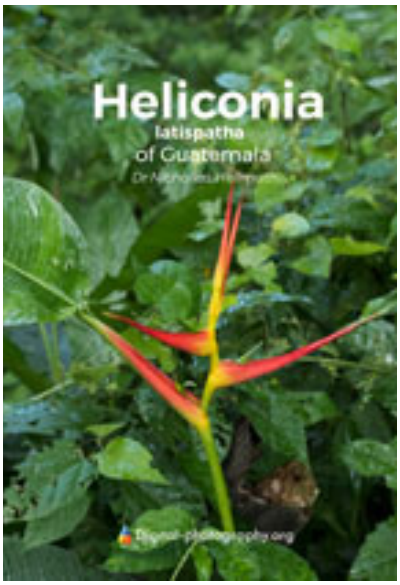
Drone: Mavic Air Pro 2. January 30, 2020

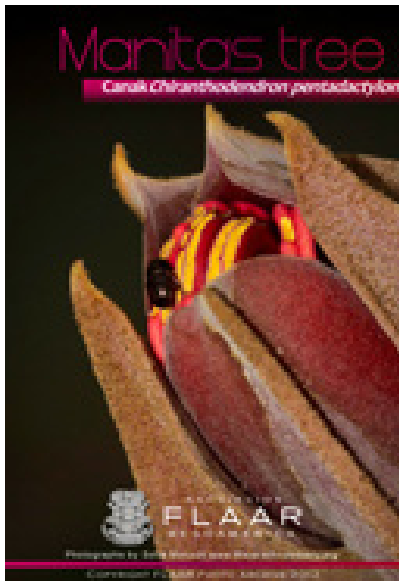
Tasistal Arroyo Faisan. Trees view. Photography by: Haniel López, FLAAR Mesoamerica. Drone: Mavic Air Pro 2. January 30, 2020

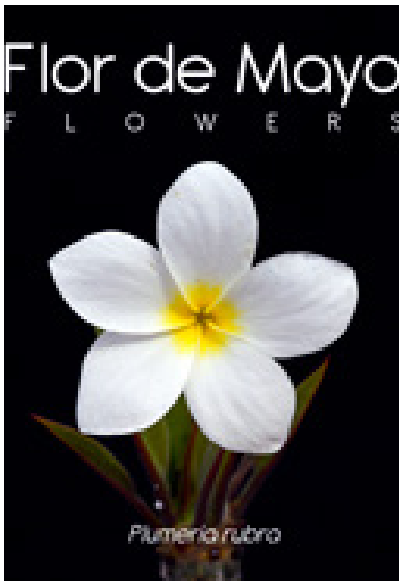
Imagine if we had a Phase One industrial camera on a drone. Then we could see the leaves on each individual tree, and identify each tree and place the genus species on a map. But now at least we have the Mavic Air Pro 2 (so one step at a time). It would also help to return over 2 months (minimally) in order to capture the trees when they are in full flower). It is easier to identify the genus and species when a tree is flowering.

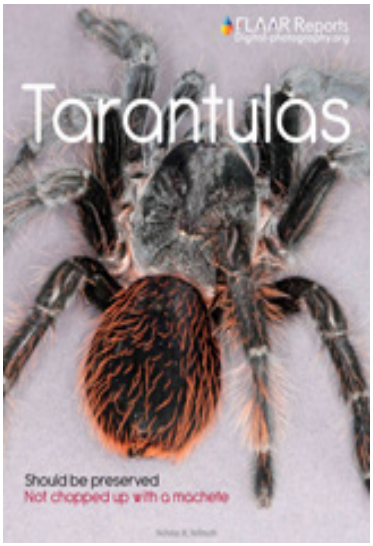
FRONT COVERS OF EARLIER PHOTO ESSAY STYLE REPORTS ON INSECTS, BIRDS, PENDANT NESTS AND OTHER ASPECTS OF THE FLORA AND FAUNA OF GUATEMALA



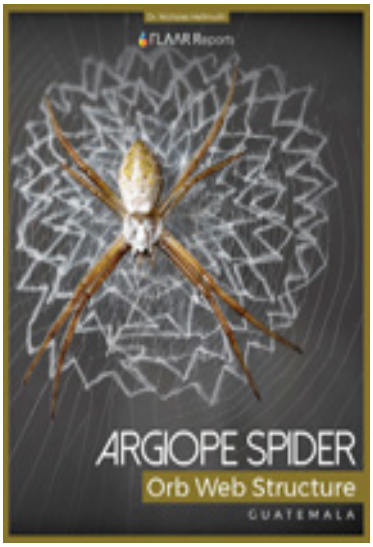






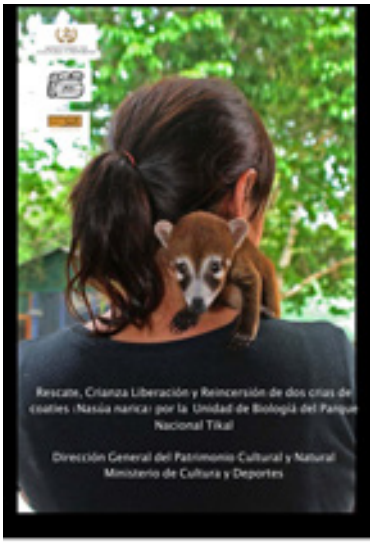

FLAAR Reports
Tarantulas
Should be preserved
Not chopped up with a machete


FLAAR Reports
GOLDEN SILK
Orb-Weaver Spiders
GUATEMALA

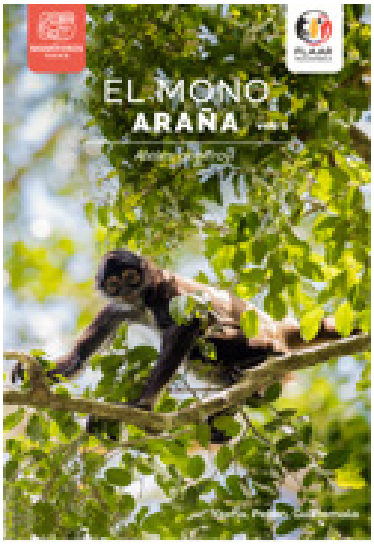

FLAAR Reports
ARGIOPE SPIDER
Orb Web Structure
GUATEMALA


Were
Domesticated INSECTS
part of Maya civilization ?
Niij
Dr Nicholas M Hellmuth
FLAAR Reports
Prepared for
IMS


Birds in the Mayan civilization:
The Owl
REVUE


Rescate, Crianza Liberación y Reincersión de dos crias de coatíes (Nasúa narica) por la Unidad de Biología del Parque Nacional Tikal
Dirección General del Patrimonio Cultural y Natural
Ministerio de Cultura y Deportes


Ants carrying
red flowers
at Copan Ruinas, Honduras
FLAAR
MESOAMERICA


EL MONO
ARAÑA


SPIDER WRAPPING PREY
GUATEMALA CITY
1500 meters elevation
FLAAR Reports
Dr Nicholas Hellmuth
August 2017


FLAAR
MESOAMÉRICA