

# TASISTAL ARROYO PETEXBATUN



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



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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:**  
**Petexbatun, Tasistal. Diagonal view.**  
Photography by: Haniel Lopez,  
FLAAR Mesoamerica  
December, 2 2019

**Title page cover photograph:**  
**Petexbatun, Tasistal. Close up**  
Photography by: Haniel Lopez,  
FLAAR Mesoamerica  
December, 2 2019

## CREDITS

The helpful individuals listed below are part of the FLAAR Mesoamerica research and field work team. The office research team is additional individuals in the main office in Guatemala City.

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Abigail “Gaby” Cabnal  
Norma Estefany Cho Cu

### DRONE PILOT

Haniel López is an independent, certified, experienced drone pilot.

### LAYOUT OF THIS ENGLISH EDITION

Jaqueline Andrea González Gómez



**Tasistal, Drone view.** Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019

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**Tasistal, Arroyo Petexbatun** Photography by: Haniel Lopez, FLAAR Mesoamerica  
December 2, 2019. Camera: Mavic Air Drone



**Tasistal, Arroyo Petexbatun. 360 view.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019

The first drone that we used was several years ago was to record giant Ceiba pentandra trees, especially in the Costa Sur. 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. The images were helpful and it was a helpful experience to learn what never to use in the future.

The second drone was to photograph roof 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 we did not use any more drones since it is expensive. But once we found the tasistal 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 (LiDAR is also totally lacking for Yaxha, Nakum, and Naranjo Maya ruins areas).



**Tasistal, Arroyo Petexbatun. Drone view**  
Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019

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, Canella.



**Tasistal, Arroyo Petexbatun. Close up.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019.

We do not recommend trying to bring a drone in your suitcase. First, for a full day of flights 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 for several reasons. First, this is a known and respected distributor (they also distribute Canon cameras and other international brands, such as 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 easy to park.

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.

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.



## 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).



**Petexbatun, Tasistal, North to South strip map**  
Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019

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.



**Petexbatun, Tasistal, North to South strip map.**  
Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019

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.



**Petexbatun, Tasistal, drone view**  
Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019

## THE OPTIMAL HIGH-RESOLUTION DRONE COVERAGE

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

Using them 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, Canon, 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).



**Petexbatun, Tasital, East end from Middle**  
Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, Tasital, Transition trees begin**  
Photography by: Haniel Lopez, FLAAR Mesoamerica  
Camera: Mavic Air Drone. December 2, 2019

So we would for sure wish to have a

- Phase One XT system to photograph trees and landscapes and panoramas.
- Phase One to photograph flowers at 1:1 macro to be able to enlarge them to several meters by several meters to have the most spectacular photo exhibit on flora and fauna and habitats ever seen

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 ([industrial.phaseone.com/Drone\\_Solution.aspx](http://industrial.phaseone.com/Drone_Solution.aspx)) has the M600 PRO drone solution. This uses a DJI M600 PRO drone.

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

The DJI drone costs \$5,699.

DJI Matrice 600 Intelligent Flight Battery TB47S (6 Pack) \$1,150.

DJI Hex Charger (to charge all six batteries at once) \$379.

Phase One camera kit – iXM 100MP, \$40,000.

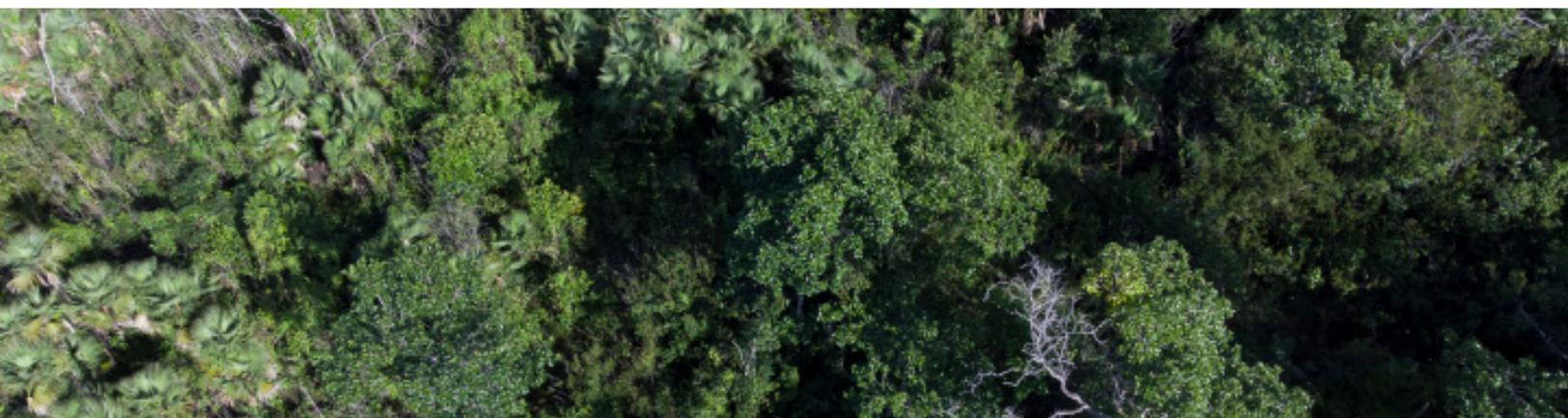
special lenses made just for this drone camera, \$10,000

Insurance

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.

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).





**Tasistal , Arroyo Petexbatun. drone view.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019.

## CONCLUDING OBSERVATIONS

Not one single botanist had 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 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).

Yet about ONE MILLION tasiste palms were about 100 meters from the river. 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 500,000 tasiste palms in Tasistal #1, and only 500,000 tasiste palms in Tasistal #2 (not counting Tasistal #3 which we have not yet explored), that is a lot of potentially edible nuts to help feed the local Mayan people during the Preclassic, Classic, and Post Classic.

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.



**Petexbatun, West end of Tasital.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, West end of Tasital.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, Drone view of Tasital.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, North to South strip map.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Tasistal, Arroyo Petexbatun.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Tasistal Arroyo, Petexbatun.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, West End of Tasistal.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, Drone view.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, East End of Tasistal.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019.



**Petexbatun, Transition Trees of Tasistal.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, Strip Map.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Drone. December 2, 2019



**Petexbatun, Drone View.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020.



**Petexbatun, Transition of Trees.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020.



**Petexbatun, Strip Map.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020.

This photograph shows the eastern half of the tasistal. You can see a forest on the entire left side; on the entire right side is the transition zone to the tinal a bit further towards the Arroyo Petexbatun (which is about 100 to 150 meters away).

If funding becomes available we would like to prepare a complete "map" of the entire tasistal (so, show the western half and this eastern half together).

It is also crucial to photograph this tasistal at the height of the dry season to show the differences in vegetation. The photographs in December and in January were in months with rain.



**Petexbatun, River View.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020.



**Tasistal, Arroyo Petexbatun** Photography by: Haniel Lopez, FLAAR  
Mesoamerica. Camera: Mavic Air Pro 2 Drone. January 28, 2020



**Tasistal, Arroyo Petexbatun** Photography by: Haniel Lopez, FLAAR  
Mesoamerica. Camera: Mavic Air Pro 2 Drone. January 28, 2020

This shows you the Arroyo Petexbatun at the far east end of the Tasistal. The pond we named Lagunita San Nicolas (since our first visit was near Christmas time; I was born on January 3rd, and my parents told me that "you were a gift from Santa Claus that year.")

Not many tasiste palms visible in this scene because it's the end of the tasiste area.

The other side of Arroyo Petexbatun is cattle ranches.



**Petexbatun, River View.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020.



**Petexbatun, Tasistal**, Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020



**Petexbatun, Tasistal**, Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020

Here you notice that all the trunks are black color. This is because almost every year local invaders torch the entire tasistal (so they can drive out the wild animals to catch them to eat).

We show the burned trunks in our Part I (Part I are the photos taken from the ground; you are now looking at Part II, the photos taken with a drone).



**Petexbatun, Tasistal**, Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020

In the future we would like to publish all our photos at full page size so that you can see more detail. Would also help to have a "map" of the tasistal and then indicate which part is in each photo. But the discovery of this tasistal was a total surprise. We visited our friend Julian in October and since he knows we like to see different ecosystems he shows us the tasistal that month. We then returned in December, and again in January. But since we had no budget we were able just to get the snapshots you see here.

But at least now all ecologists, biologists, botanists, and zoologists know where to find this tasistal (it's about 5 minutes boat ride from Hotel Ecologico Posada Caribe (of Julian Mariona and his family) and then less than 10 minutes hike from the shore).

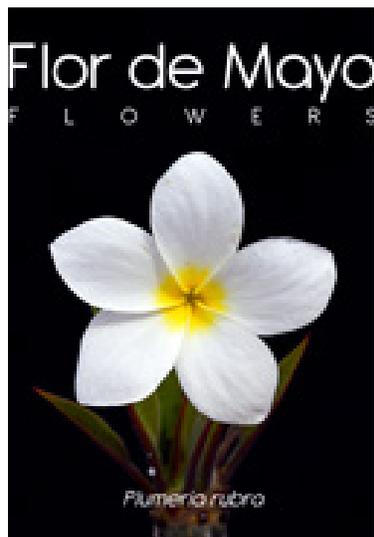
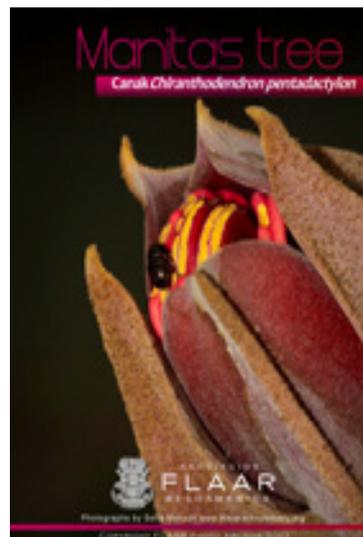
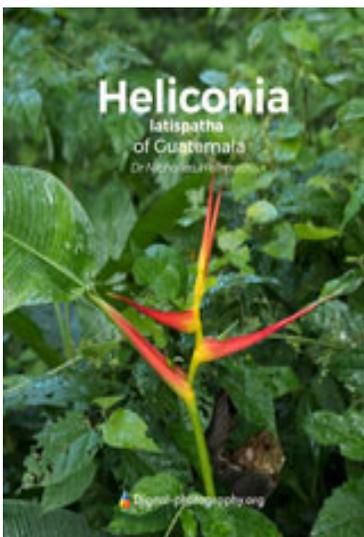
In February Julian Mariona and his local friends took our team to a second tasistal, Tasistal Arroyo Faisan. We have two separate FLAAR reports on this: one volume of photos from the ground; a second volume of drone photos from the air.

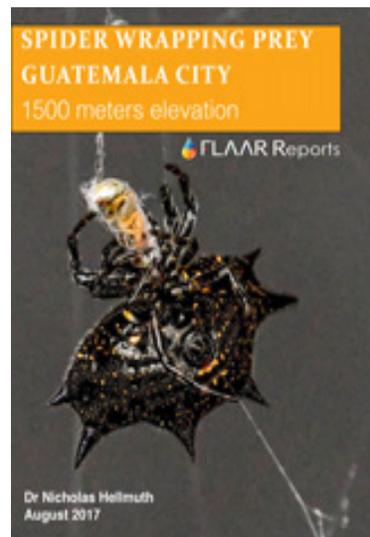
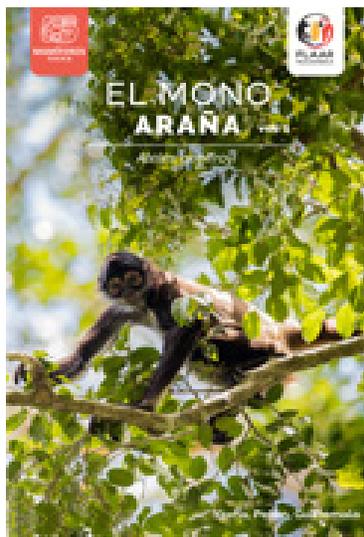
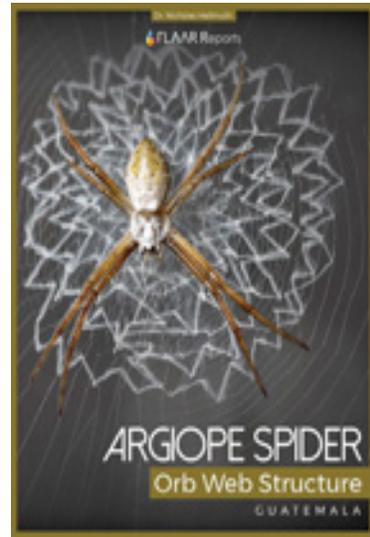
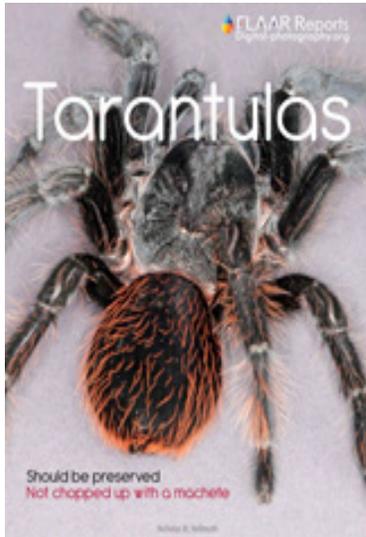
There is a slim chance of being one more tasistal nearby; but we do not yet know whether it is all chopped down and turned into a cattle pasture. We need to initiate another field trip once travel is open again. so far we have found no tasistal or other kinds of savannas in our two field trips to Municipio de Livingston (one trip in February, then a trip in mid-March, 2020).



**Tasistal, Arroyo Petexbatun, Drone view.** Photography by: Haniel Lopez, FLAAR Mesoamerica.  
Camera: Mavic Air Pro 2 Drone. January 28, 2020.

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





**Back cover photograph:**

**Tasistal, Arroyo Petexbatun. River View**

Photography by: Haniel Lopez,  
FLAAR Mesoamerica  
December, 2 2019

This is a drone photograph showing the Arroyo Petexbatun as it winds through the area. The tasistal out of view to the left (and a bit below). The hotel of Julian, our base camp (Hotel Ecologico Posada Caribe), is a few minutes away by boat. This is where we have stayed during trips to the Lake Petexbatun area, for birdwatching, to take tour groups to Aguateca or Dos Pilas, or for a peaceful place to spend Christmas week.

