Botanal, Botan Palm Ecosystem
Corozera, Corozo Palm Ecosystem
adjacent to the Maya Ruins of Pochetoca,
PNYNN (Parque Nacional Yaxha, Nakum and Naranjo)
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Aerial Photos, May 1, 2025, drone pilot Carlos Elgueta
Text and Photos, Nicholas Hellmuth,

FLAAR Reports

FLAAR (USA) and FLAAR Mesoamerica (Guatemala)

June 2025

Introduction

Many years ago we drove 4x4 pickup truck to the Maya ruins of Pochetoca to see what plants were notable there. This was probably during our 1-year project with the IDAEH administrators of PNYNN, for us to document flora, fauna and previously unstudied biodiverse ecosystems (so a year before our current project in the entire RBM with CONAP). Now, since 2023, we (FLAAR research teams) have been interested in palm ecosystems, locally named corozera, guanal, or escobal (place of thousands of corozo palm, place of thousands of guano palm and place of thousands of escoba palm). Usually a corozera has guano, botan and escoba palm (and other species such as pacaya palm, guano, xate and more), but a corozera is "solid corozo palms" as far as the eye can see. I use the word corozera because that's what Teco, park ranger for PNYNN, uses. Most botanical reports in Spanish use the word corozal (since it is same as guanal for guano palm, botanal for botan palm, escobal for escoba palm, pital for pita, *Aechmea magdalenae*, etc. But the term corozera makes the ones in PNYNN stand out.

When you drive from Nakum base camp to Pochetoca you pass through the Corozera South of Nakum (Corozera surrounding Ceiba Tree) and after passing through bajo areas you reach the Corozera North of Yaxha (which is about 4 km south). The turnoff to Pochetoca no longer had any sign remaining so you need a guide with experience in ecosystems within PNYNN. Teco (Moises Daniel Perez Diaz) knew of this corozera and how to get there.

We were told it was "about a 3 kilometer hike from the main road" (from Yaxha to Nakum). No surprise, it turned out to be 4 and a half kilometers (so a total of 9 kilometers back-and-forth). Not bad for an 80-year old researcher. With the assistance of a professional physical therapist for the recent 6 months, the therapist takes me hiking 3 kilometers every Monday, Wednesday, and Friday, every month. Often with a 5-pound weight strapped around each ankle. Of course 9 kilometers is 200% more than 3km, so everyone on the team was surprised that I was able to hike 9 kilometers. Then in the afternoon we hiked another 1 kilometer to visit and photograph the Corozera West of Nakum—so a total of 10km today. We have a separate FLAAR Reports on that corozera west of the Maya ruins of Nakum.

Fig. 1. The corozera adjacent to Pochetoca is not reachable by any road and no trail existed from the road to the areas of lots of palms around Pochetoca, so the only available photos are from the Mavic 3 drone camera.

The turnoff to Pochetoca has fallen trees across the road every kilometer so you can't drive here without having a chainsaw. But hiking is good exercise. What would help greatly would be satellite photos that can show you where the Pochetoca ruins are and where the hundreds of corozo palms are, and whether there is just one continuous corozera or two slightly separate corozeras.

Fig. 2. A chain of rolling hilltops across the horizon. And the area in front is definitely not bajo vegetation. The forest seems to be higher towards the middle right area. Lots of tall botan palms are visible but not many corozo—so this is not yet a corozera. That said, there are lots of palms in this area near the Classic Maya ruins of Pochetoca.

Fig. 4. Botan are one of the tallest species of palms native to Peten. This area has so many botan palms that it’s a botanal.

It helps to have the aerial photos looking down diagon-ally.

Fig. 5.

Fig. 6. Hundreds of botan palms results in me naming this a botanal. No corozo palms visible here, why? Different soil?.

Fig. 7. Wider aerial view of this extensive botanal. I doubt that botanal areas have been studied as often as corozeras.

Other areas are mostly corozo palm, but there is usually botan palm mixed in (upper left, middle right). So these can be named a corozera botanal.

The next page shows a botan palm surrounded by corozo.

Fig. 8.

Fig. 15. Corozera with lots of tall corozo palms. Many botan palms in lower middle and lower right. Plus LOTS of other tree species.

Fig. 17. Four and a half kilometers hike in, and same distance back to the main road (between Nakum heading down to Yaxha).

A few corozo palms, but not very many, but lots of fan palms.

Fig. 21.

Fig. 22.

Now a few more corozo palms, but not very tall.

Fig. 25.

Fig. 27. Rather than walking along the Rue de Seine in Paris, or through impressive Roman and Greek ruins, I prefer to hike through the biodiverse ecosystems of the PNYNN, Reserva de la Biosfera Maya (RBM) of the Peten area of Guatemala.

Guanal—area with LOTS of guano palm.

The “road” has been overgrown from both sides, and down the middle, because no archaeologists have been working at Pochetoca for many years.

No longer realistic to drive your vehicle here—the branches will scrape off much of your vehicle’s paint on both sides.

Fig. 29.

Fig. 30, a and b.

Guano palm at the left.

Young corozo palm at the right.

Most areas that are filled with palms have several different species. The exception are tasistal savannas upstream from Sayaxche—there the tasiste palm is the absolute dominant species.

Fig. 31, a and b.

Lots of escoba palms, with long spines up and down their thin stem (trunk).

This is an escobal—area with LOTS of escoba palms.

Fig. 32.

Bayal palm vine at the front, very tall botan palm at the back.

Google A1 Overview is totally wrong when you ask about botan palm.

Botan is not guano, botan is *Sabal mauritiiformis*.

Fig. 34, a and b.

You can see the hundreds of short but sharp piercing spines on all sides of this palm. Lots of different palms of Mesoamerica have spines.

The mass of seeds are ripening.

Fig. 35.

Fig. 36. Lots of tall botan palms and several very tall corozo palms at the left.

Fig. 38. Now we are looking at a corozera-botanal. These corozo are very very tall and are quite thick. Lots of tall botan palms. All the other species of palms don’t grow above the canopy so you can’t see them in an aerial photo.

Fig. 39. Chain of tall hills across the entire horizon. Masses of tall corozo palms form a corozera. Tangled vines in middle and both sides.

Fig.40. Now much more botan and not many corozo. Always with lots of different tree species everywhere.

Fig. 41. Now more giant corozo but also lots of botan palms. Guano palms look very similar but don’t grow this tall.

Fig. 42. Palms everywhere and other tree species also. Very helpful to have IDAEH and CONAP protecting this national park, PNYNN.

Lots of tall botan palms across the front half.

Fig. 44.

Fig. 50. Very tall corozo palms and really tall botan palms—this is a corozera-botanal area.

Fig. 51. Amazing how thin the botan palms are yet they survive growing to great heights.

Now we enter an area with lots of vines and shrubs. Two tall corozo palms.

Fig. 52.

Fig. 53. Beginning to see what look like lots of vines growing all over everything.

Vines and shrubs every-where.

I have never noticed any eco-system like this in PNYNN before. But you would only notice it from the air.

Fig. 55.

Botan palm and corozo palm, but lots of trees filled with tiny leaves.

The following photo on the next page is the identical area but a wider view.

Fig. 56.

Fig. 58. Now Carlos is flying the drone at eye level through the lower story of the corozo botan palm area.

Fig. 62. Now the drone is back up in the sky, looking down at corozera-botanal palms. Why are most of the trees shorter than the corozo palms?

Fig. 63. Curious that the corozo palms are higher than all the surrounding trees. Lots of fan palms near the corozo (but these fan palms are not (or not yet) tall botan palms. Fewer palms up on the slope of the hills.

Very tall botan palm and unusually tall corozo palm at the left.

Fig. 64.

Fig. 65. The corozera-botanal continues. PNYNN is a great place to undertake botanical and ecological field work. There is a camp area at Nakum with a kitchen area, toilets, showers. At the entrance to Yaxha there is the hotel El Sombrero Ecolodge—comfortable and has excellent food, including Italian style meals.

Fig. 66. Lots of tall botan palms and lots more very tall corozo palms—the botanal-corozera continues. The range of hills is on the right horizon.

Lots of young guano palms and lots of young corozo palms (the stem is so low that it’s not yet visible).

A potential guanal-corozera area.

May 1, 2025, photo by Nicholas Hellmuth, iPhone 15 Pro Max.

Fig. 70, a and b.

More young guano palms and lots of young corozo palms (the stem (trunk) is so low that it’s not yet visible).

A potential guanal-corozera area.

Fig. 71.

Fig. 72. What would help would be if botanists and ecologists had the type of drone that can map an area, and with multi-spectral soft- ware can show how many of each species of trees are here. Plus a drone with mapping capability can show where all this is in relation to the Maya ruins of Pochetoca.

In this area there are lots of corozo and also lots of botan palms—plus of course dozens of other tree species. In the next two photos we show a botanal—lots more botan palms but not many corozo palms. Would help if a soil scientist could document whether different kinds of soil favor one species of palm over the other.

Fig. 73. Our initial focus was corozeras—but we found a BOTANal, with no visible corozo palms. These botan palms also document the concept of PALM Paradise Peten.

Fig. 74. Very impressive view with the FLAAR Mavic 3 drone (flown by Carlos Elgueta) showing a remarkably biodiverse ecosystem that has to my knowledge never been documented with this quality of diagonal aerial photographs. By publishing all our FLAAR Reports our goal is to assist IDAEH and CONAP to prepare their next Plan Maestro with additional information on the importance of preserving the rain forest here—and to not allow slash-and-burn milpa agriculture nor cattle ranches to encroach into PNYNN. This seasonal rain forest deserves to be preserved, and studied by botanists, ecologists, soil scientists, geologists, and archaeologists.

Map by Byron Pacay to show the route of the morning of May 1, 2025, written over Google Earth.

Would greatly help to have satellite images of significantly better resolution.

We left Nakum in the morning in a 4x4 vehicle that was “lifted” so it can handle the deep ruts. Lifted means the center of the vehicle is higher—so the bottom of the motor does not get scraped off.

The vehicle dropped us off at the crossroads (where we hiked for many hours). Then we got back to the vehicle in the afternoon and were driven back to the base came at Nakum. The next day we drove to El Tigre, El Caoba, Tikal to spend the night at Uaxactun.

Fig. 75.

Map by Byron Pacay to show the route of the morning of May 1, 2025, and where we were south of Nakum and north of Laguna Sacnab.

Written over Google Earth.

On the next page, left to right: Teco, Byron, Franklin, Norma, Nicholas, Edwin, and Carlos.

A research field trip takes more than just one or two people.

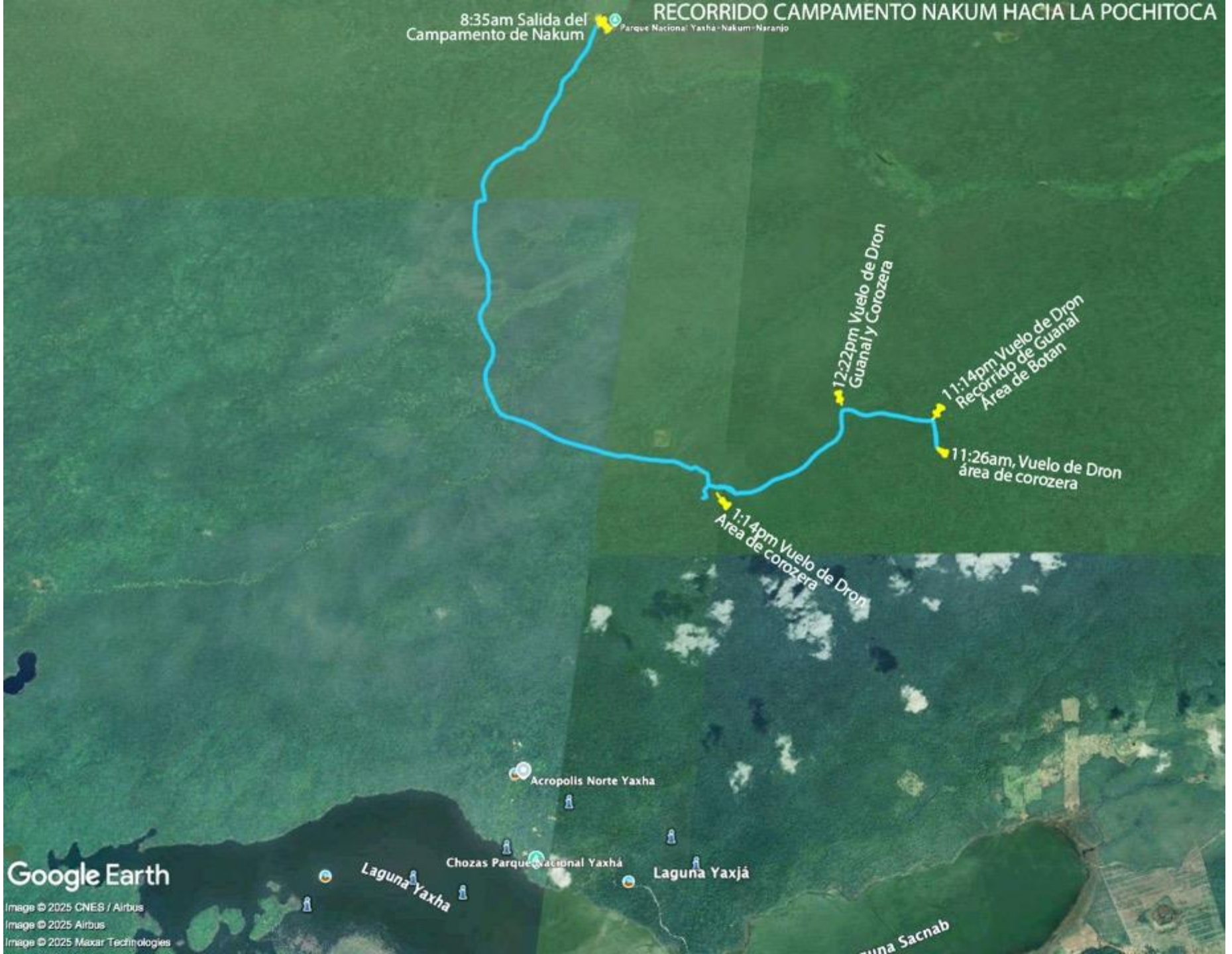

Fig. 76.