Corozera at South Entrance to Naranjo-Sa'al Area of PNYNN

Corozo (Cohune), Guano, Botan, Escobo and Bayal Palms

Ground Photos and Text: Nicholas Hellmuth
Drone Pilot and Aerial Photos: Carlos Elgueta

FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), May 2025

When you finally find your way out of the streets of Melchor de Mencos you pass through cattle ranches, milpas and other farming areas for a dozen kilometers. You can see lots of corozo palms remaining in the fields—even on hilly areas. Some are remains of former corozeras.

But when you arrive at the end of the cattle ranches at the entrance to the Naranjo area of PNYNN you enter into a frankly incredible Palm Paradise Peten of about 2 kilometers of thousands of corozo palms forming what local Peteneros call a corozera. The present FLAAR Reports shows you the beauty of this remarkable bio-diverse eco-system of lots of *Sabal mauritiiformis* palms massed together with other trees.

Fig. 1.

For Nakum there are trekking trails for people that want to experience hiking from Yaxha to Nakum (where you pass through two incredible palm corozeras). Then if you have the services of camping entity (Teco, Moises Daniel Perez Diaz) or glamping services of Sebastian de la Hoz (of El Sombrero Ecolodge of Yaxha) you can hike from Nakum to Naranjo (or you can start with Naranjo and hike from there to Nakum and then to Yaxha).

But do not attempt to hike from Melchor to Naranjo-Sa'al (and don't confuse the Maya ruins of Naranjo with the town of El Naranjo on the Rio San Pedro northwest of Flores, Peten).

But once you reach the southwest border of PNYNN you have hiking trails (as you see in this photo). Or you can hike along the road from the entrance to the base camp (over a kilometer but an enjoyable palm experience) then from the base camp to the ruins (less than one kilometer). Obviously only hike if you have a local guide—it's easy to get lost in the rain forests.

All photos and panoramas from the ground are by Nicholas Hellmuth with an iPhone 15 Pro Max. All the aerial photos are by Carlos Elgueta with FLAAR drone, Mavic 3. FLAAR Digital Photo Archive of Flora, Fauna and Ecosystems of Guatemala.

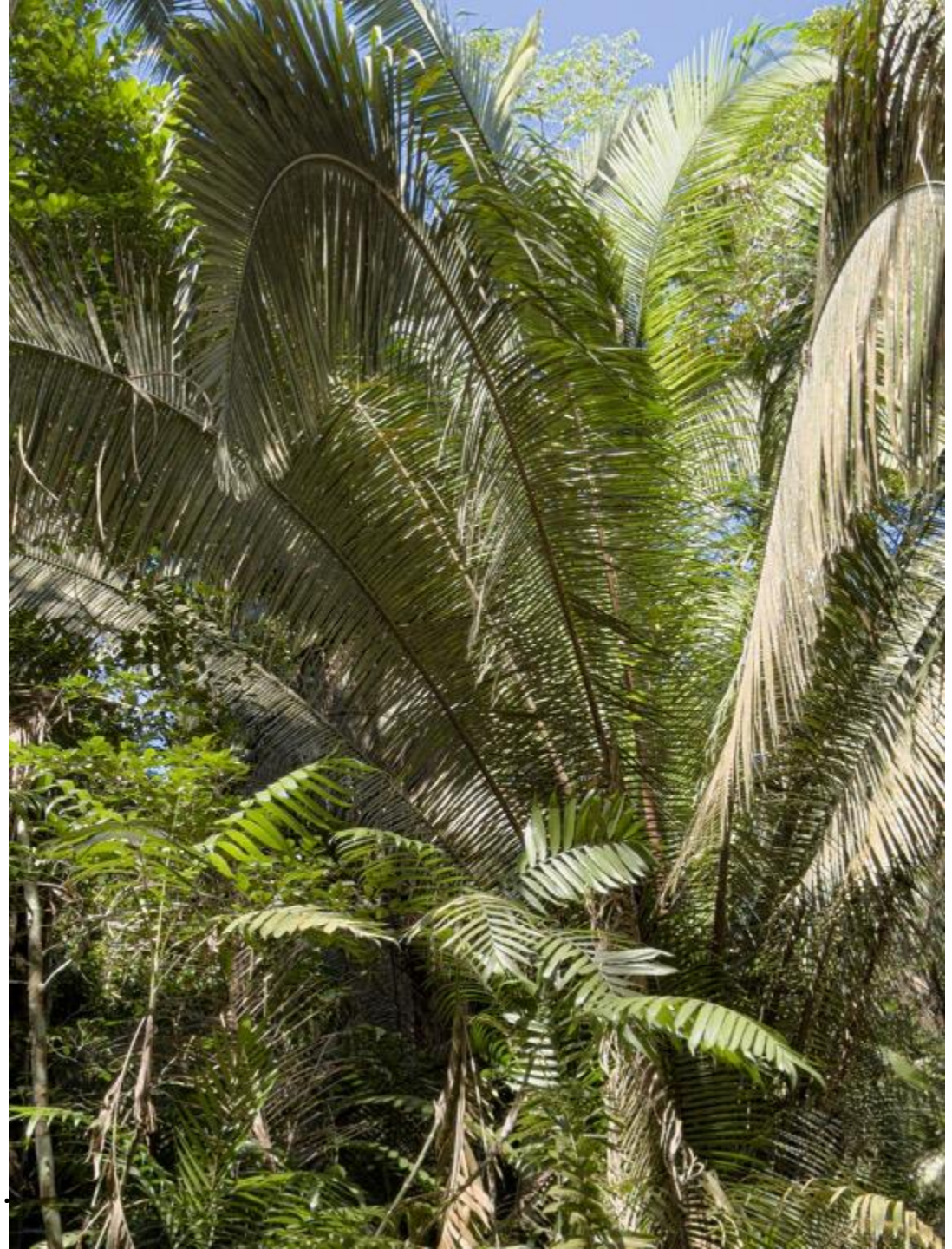
Fig. 2

Fig. 3. Thousands of corozo palms, many other species of palms, and dozens of other plants, vines and trees await you.

To hike into a palm jungle is a memorable experience as you will see from the 71 pages of full color photos of Neotropical vegetation of the Reserva de la Biosfera Maya, RBM, administrated by CONAP and park authorities of IDAEH.

The most abundant palm is named corozo in Peten and cohune in adjacent Belize.

Attalea cohune Mart. is the botanical name.



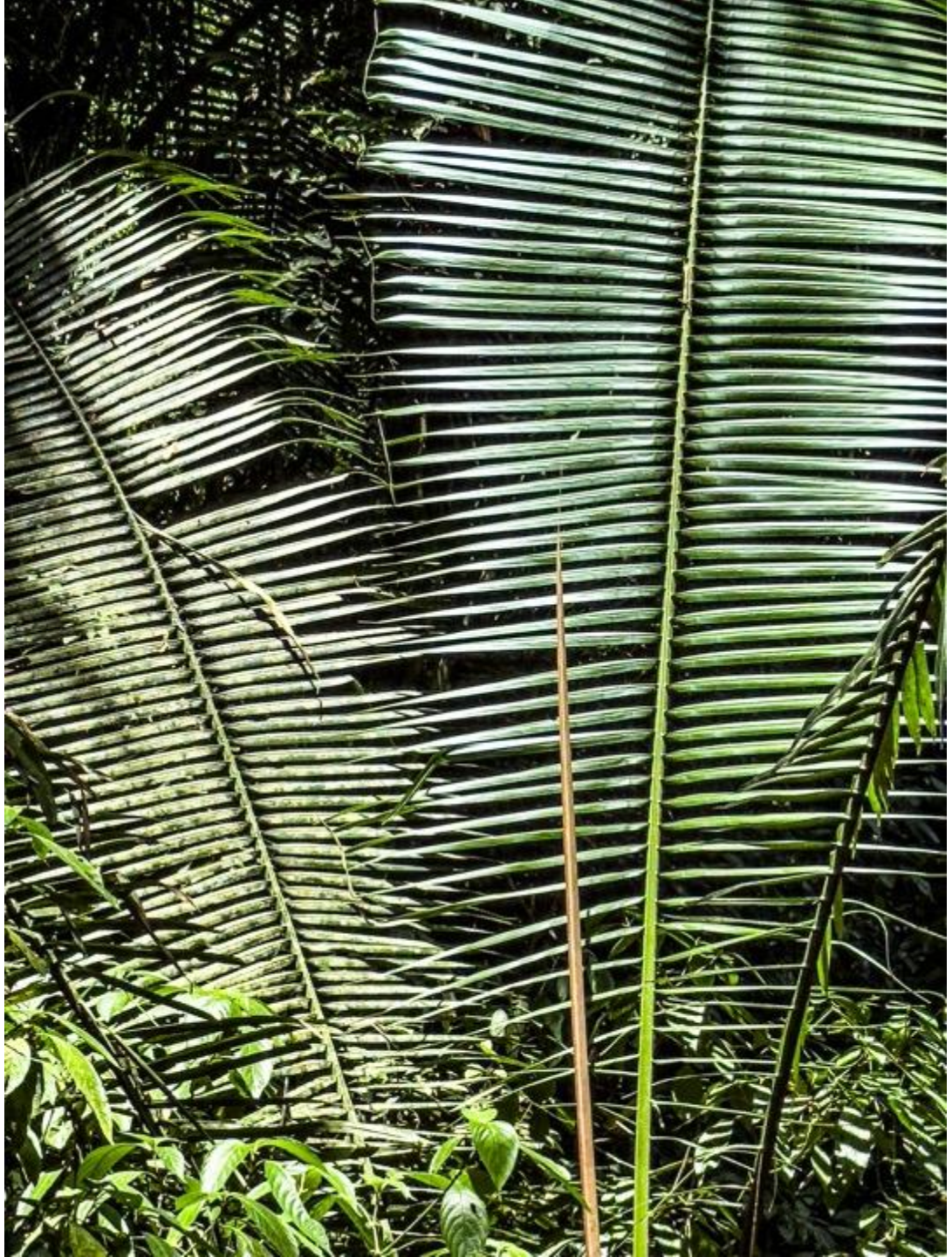


Fig. 4 a and b.

Fig. 5, a and b. During the 1980's-1990's Hellmuth specialized in fine art giclee style photography. FLAAR had a popular website www.fine-art-giclee-printers.org that helped artists and photographers around the world learn how best to print giclee images. Now we do botanical and ecology photography but when I see the natural beauty of palm fronts I like to return to fine art style photography.

That website is only in WayBack or comparable.

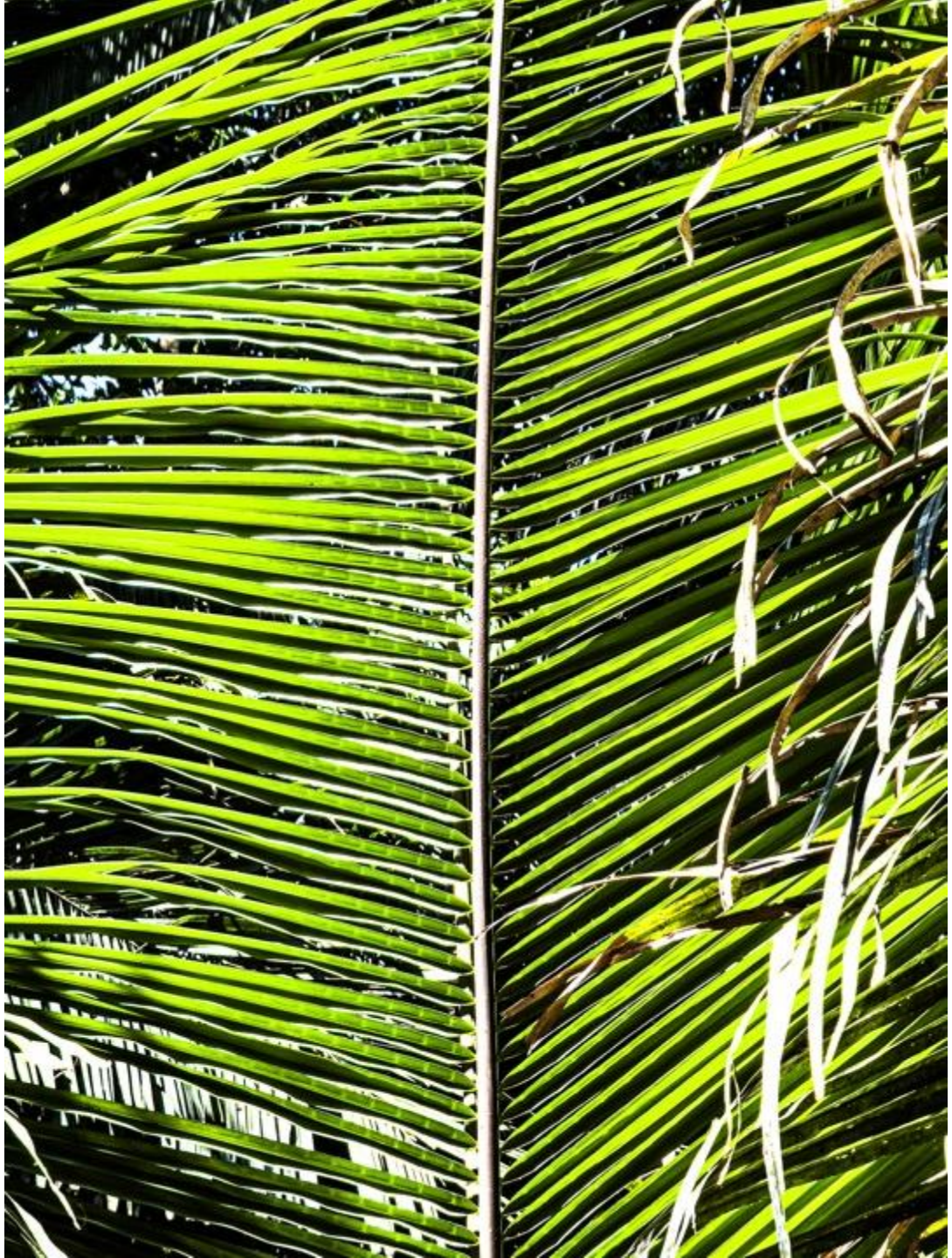
The wilting fronds of corozo palms to me are beautiful works of art by Mother Nature that they deserve to be shown.

Fig. 6, a and b.

Obviously the fresh young leaves of corozo palms are even more photogenic.

Fig. 7, a and b.

Fig. 8, a.



b

Fig. 9, a and b. If you are driven from the site entrance to the base camp you will not experience the natural beauty of a pristine, wild, palm rain forest.

So we had the 4x4 drive us to the entrance to the park and then we hiked the one or two kilometers back to the base camp to see, in-person and up-close, the photogenic palm fronds.

Although most corozeras of PNYNN are on flat areas, the corozeras at south and west sides of the Maya ruins of Naranjo-Sa'al are also on the lower parts of hill slopes.

Fig. 10, a and b.

As the fronds mature and wilt they stay on the stem (trunk) of the palm for a year or so.

Fig. 11, a and b.

Fig. 12, a and b.

Fig. 13. Good example of a fine art photograph that would make a notable fine art giclee print.

In the 1990's onward we evaluated digital cameras and Hellmuth taught courses in digital photography at Universidad Francisco Marroquin (Guatemala) and at universities in USA (BGSU is one). But in recent years we are so busy with field trips to find and document flora and fauna in remote bio-diverse ecosystems that we don't have time to review and evaluate cameras any more. But we do still take fine art photos and our www.digital-photography.org web site is still on line with LOTS of examples of Hellmuth style photography.

Fig. 14, a and b.

I like photographing rust and old decaying plants. I would go to abandoned and decayed factories in East St Louis (on the Illinois side of the river) and photograph inside incredible factories where all the manufacturing machines were still in place as the buildings and everything was rotting, rusting and falling apart.

So I really enjoy walking through kilometers of corozo palm areas to see the aging, rotting fronds.

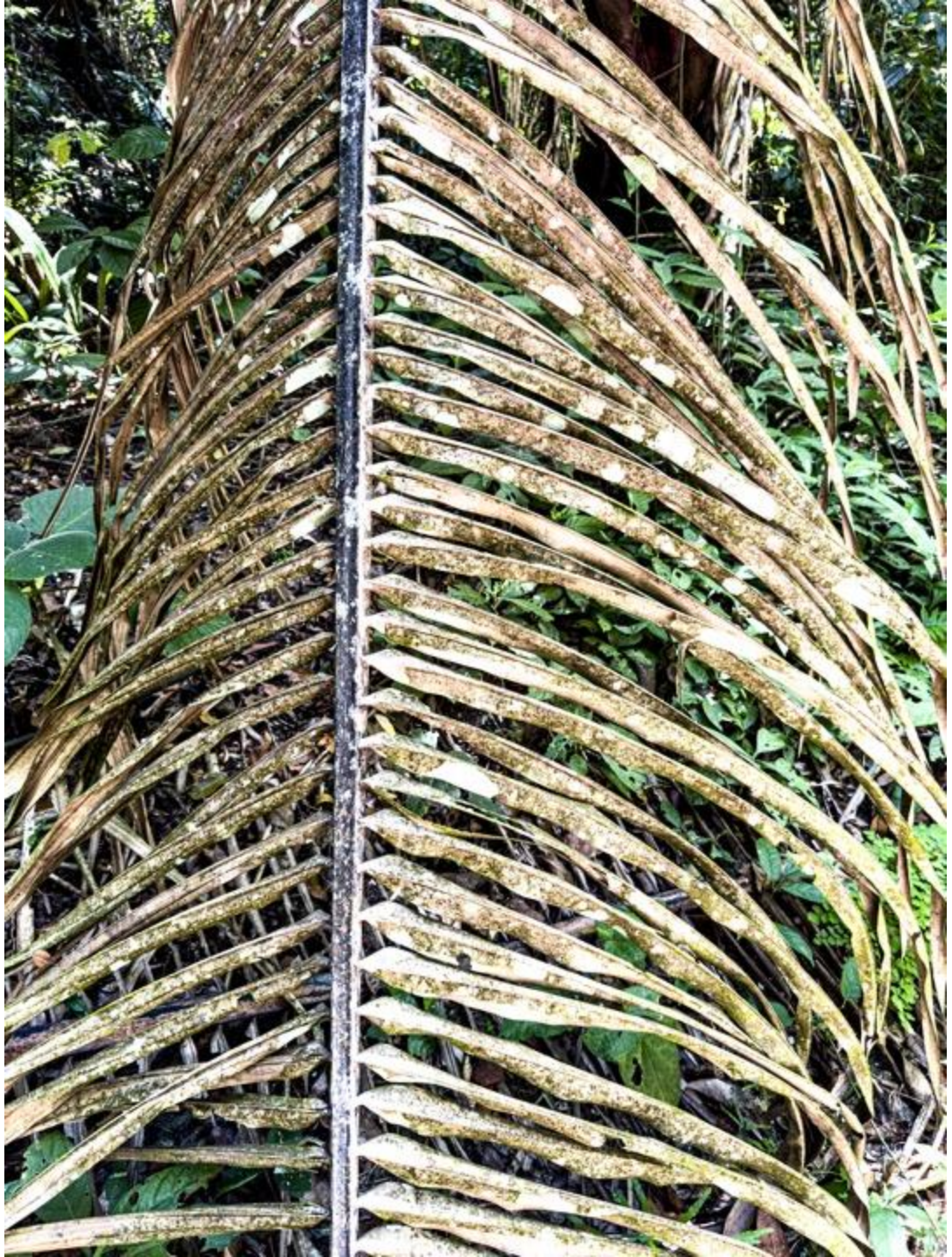


Fig. 15.

When the fronds fall off many species of palm tree the stubs of the fronds capture fallen leaves that over the years rot and form a kind of “soil” for other plants to grow up and down the trunks.

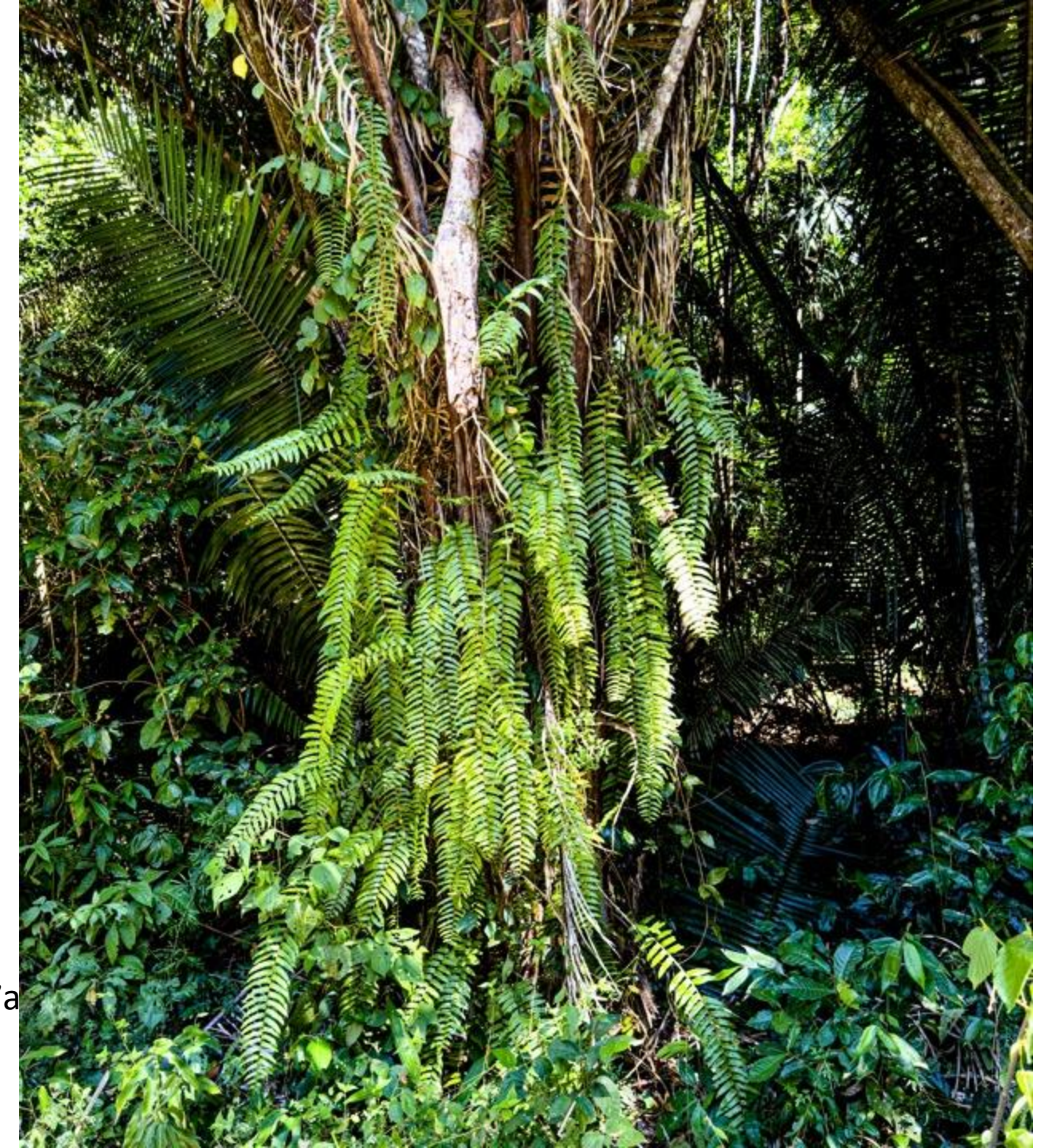
Here and on the following pages you can see ferns and other fines flourishing on the “leaf litter” areas of this corozo stem.

If you Google Leaf-Litter Trap Palma de Corozo you can download an entire photo album of all the different plants that grow up and down the trunk (stem) of corozo palms in the Izabal area of Guatemala (where FLAAR had an 18 month project of flora, fauna and ecosystems during the COVID years).

Guana palms also collect leaf litter.

Fig. 16.

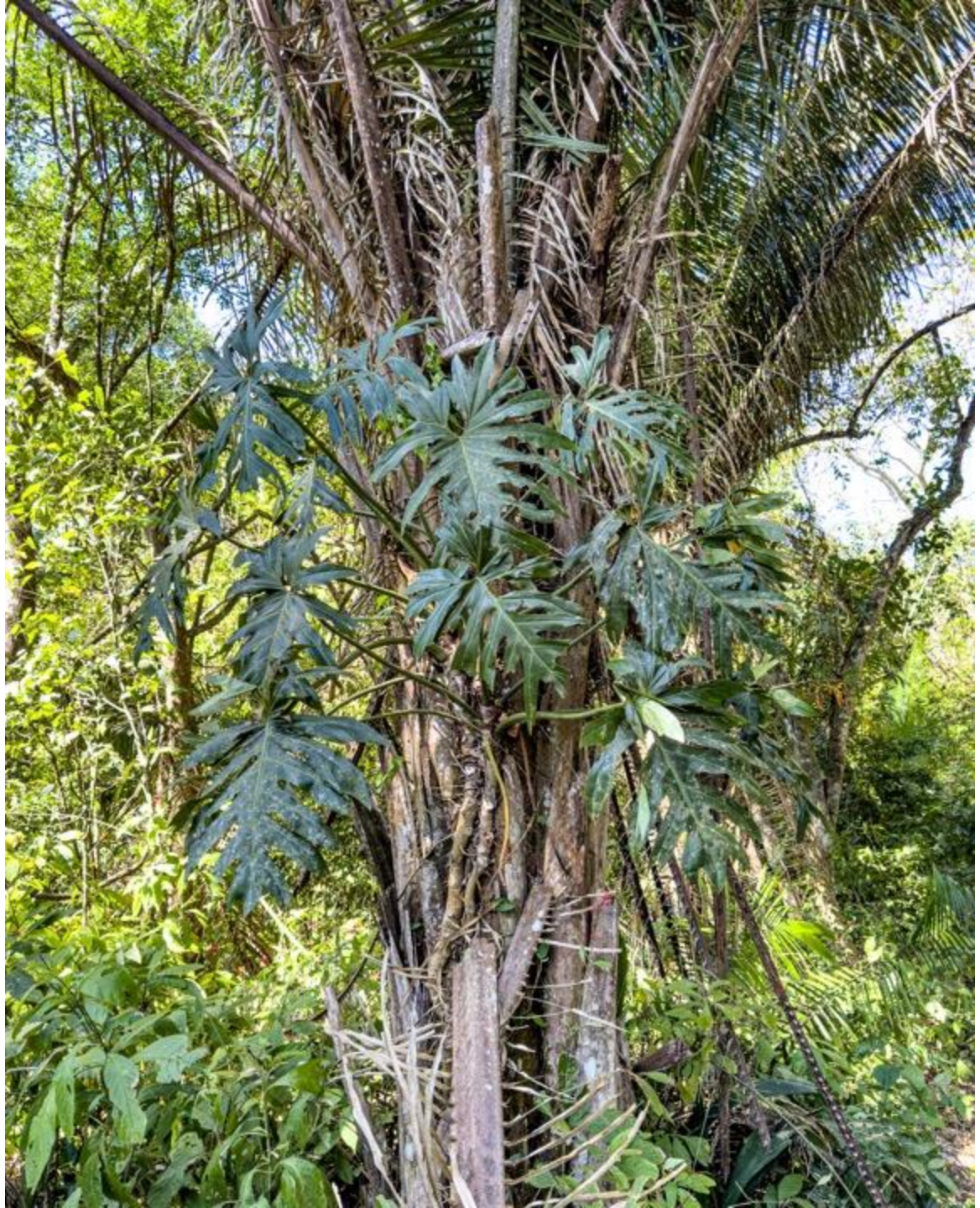
Fig. 17a



b

Here it is a *Philoden-dron* vine enjoying the leaf litter to grow and prosper.

Fig. 18, a and b.



As mentioned previously, the FLAAR publication, Nicholas Hellmuth, 2022, LEAF-LITTER TRAP PALMA DE COROZO, has even more photos, in large format, that shows gorgeous photos of wild plants that grow up and down the palm stems. Definitely worth downloading on the internet.

There is one page where we list almost all the FLAAR Reports on palms from the recent years of field trips.

All the photos in the present report are from hiking from the entrance of Naranjo-Sa'al to reach the base camp in late April 2025.

Fig. 19.

Corozo palms can grow quite tall though botan palms grow even higher. You can see botan palms in the aerial photos in the final pages of this report.

Fig. 20.

Vines, often thick woody vines, are very common, but these hang from trees and not often from palms.

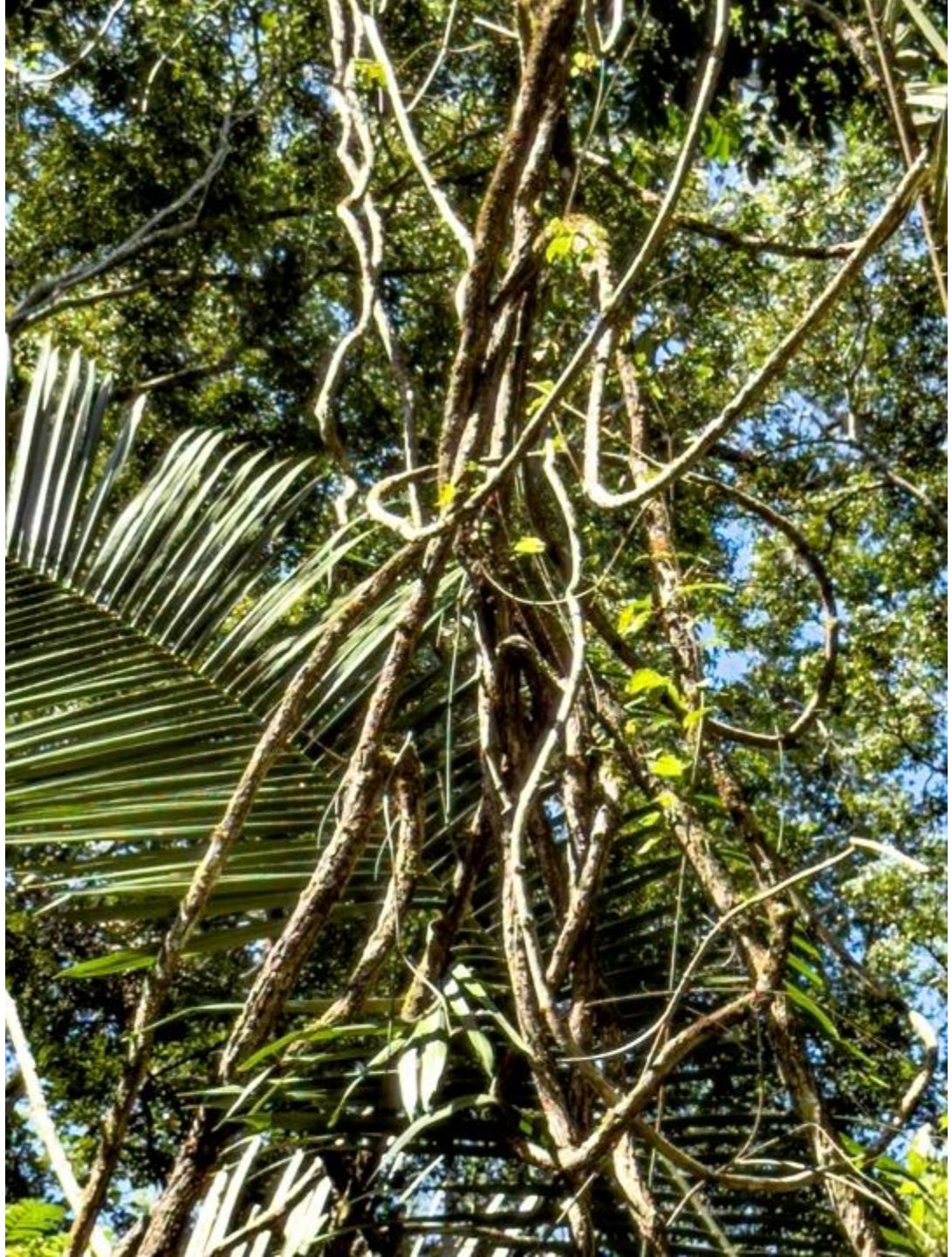


Fig. 21.

This experience is awaiting you if you adventure to reach Naranjo-Sa’al portion of PNYNN (Parque Nacional Yaxha, Nakum and Naranjo) of the RBM (Reserva de la Biosfera Maya) of Peten, Guatemala.

Fig. 22.

The fronds of corozo palms arch out in many directions—sideways, upside down and diagonally upwards.

Here is a palm frond growing sideways. Wind and rain storms often cause the fronds to change position.

Fig. 23.

April and May are a good time to visit PNYNN because not much rain (though obviously with climate change each year is a bit different). So here on April 28, 2025 the sky was blue all week with occasional beautiful white clouds floating overhead.

We have accomplished field trips in June, July, and August but the heat is often roasting out in a savanna (but acceptable if shaded by palm trees). And when it rains the mud roads are often not transportable by even 4x4 pickup trucks (unless they have been lifted up).

Fig. 24.

Palms other than Corozo that are in the Corozera at South Entrance to Naranjo-Sa'al

In PNYNN and rest of RBM there are guanal areas of "solid guano palms". There are also escobal areas (usually mixed with lots of guano). These you can find on both sides of the dirt/mud road from Nakum to El Tigre.

In a corozera obviously corozo palms are the most common, but in the Naranjo-Sa'al corozera you also get lots of *Gaussia maya* palms. We show aerial views in the following section of this report.

There are also lots of escobo palms, *Cryosophila stauracantha*; lots of bayal palm vines, *Desmoncus orthacanthos* and a mish-mash of synonyms; and several species of xate and other palms. Our goal during 2026 field work will be to dedicate more time to hiking throughout each corozera to list and photograph each species of palm besides the obvious common ones.

Fig. 25.

I estimate this is a young escobo palm, *Cryosophila stauracantha*. When taller you can see the hundreds of needle spines up and down the stem, but on a young short palm you would have to go very close to inspect the start of the stem.

Fig. 26.

Desmoncus orthacanthos, very common vine palm in PNYNN, PANAT and surrounding RBM. Many different species names and synonyms—total confusion.

In the coming year we will be preparing FLAAR Reports on this amazing spiny vine—one of my favorite palms of Peten. But in the meantime, if you Google How to Photograph Tiny tropical plants, Nicholas Hellmuth, then you will see the gorgeous red fruits-berries of this vine palm.

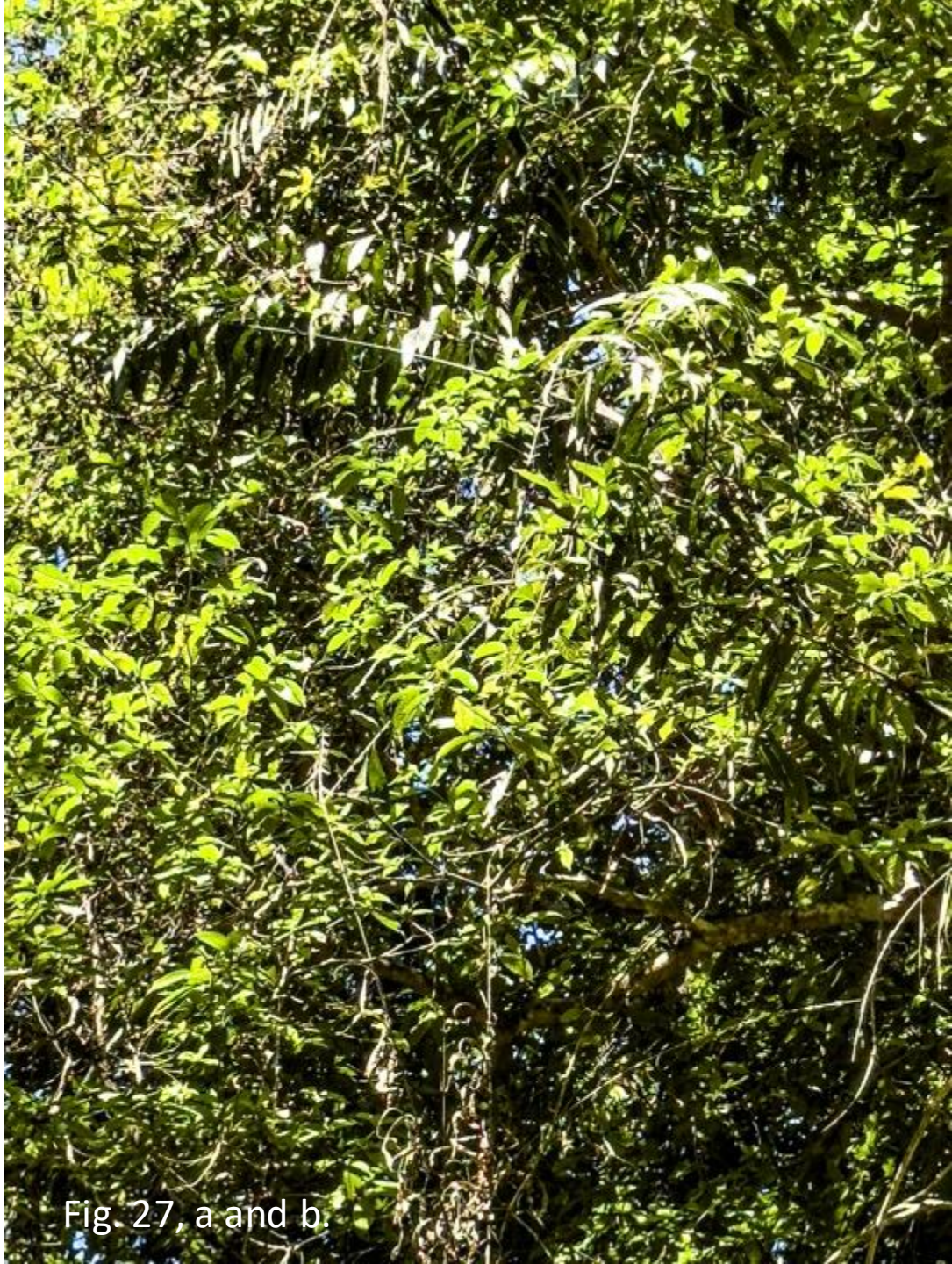


Fig. 27, a and b.

Pacaya palm, *Chamaedorea tepejilote* has delicious edible flowers. Hellmuth and the FLAAR team were featured in a Guatemalan TV documentary, *Sabor de Mi Tierra*, on edible flowers of Guatemala, but the link to this episode is no longer on the Internet.

Fig. 28, a and b.

Each different palm species has leaf patterns on the fronds that are very photogenic.

Chamaedorea tepejilote, pacaya palm, is most common in Alta Verapaz but we found lots in the Naranjo-Sa'al area of PNYNN.

Fig. 29 a and b

Probably *Chamaedorea ernesti-augustii*, fishtail palm, xate cola de pescado.

There are lots of more species of palm genus *Chamaedorea* to find in the understory of a corozera, though many *Chamaedorea* species may grow in other ecosystems.

Fig. 30.

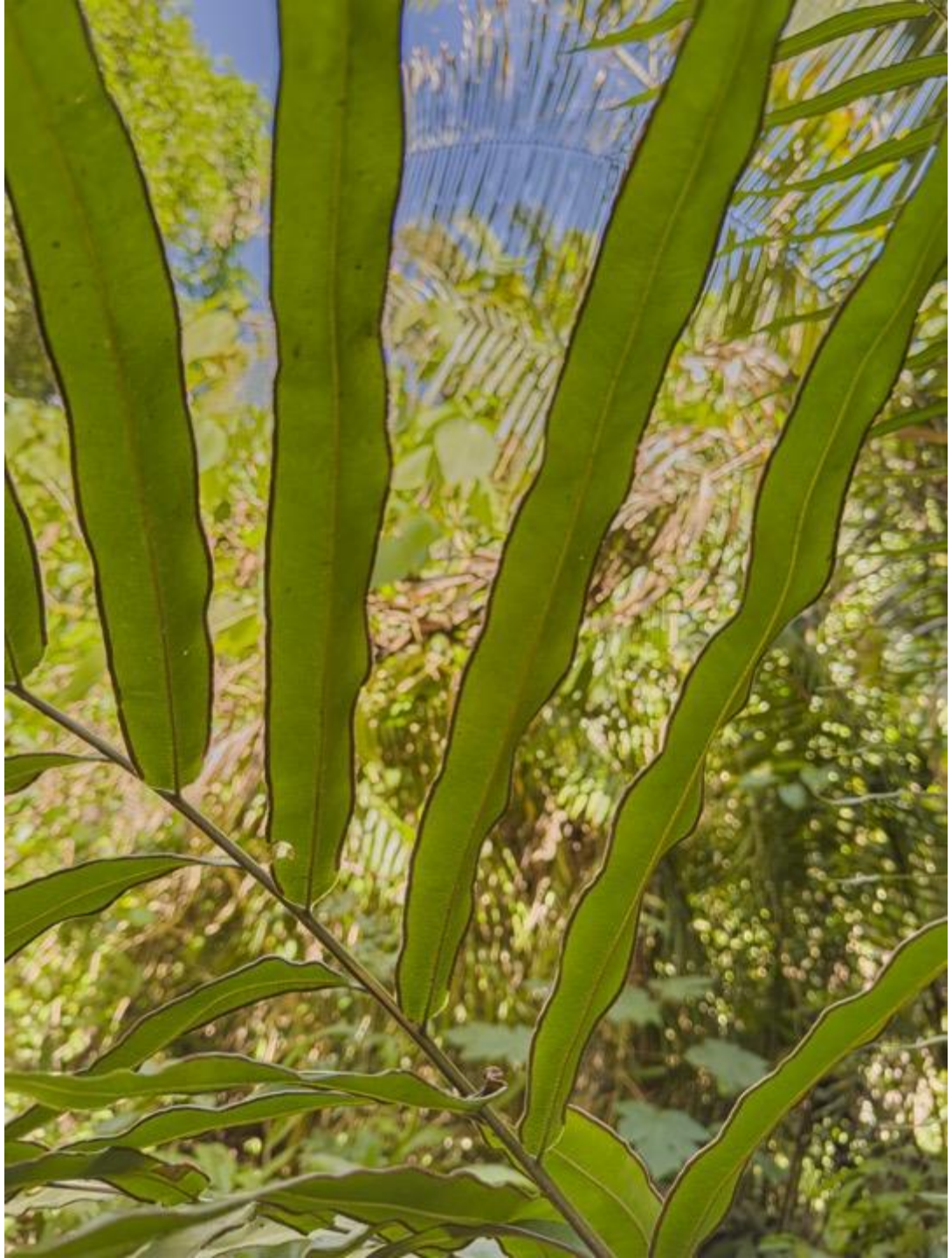
Fig. 31. There are two species of GIANT mangrove ferns in the wetlands of Izabal. Google Edible Mangrove Fern, Livingston, Izabal, Hellmuth and you can download 40 pages of photos and documentation of *Acrostichum aureum*.

There is also a mass of giant ferns along the highway near Biotopo Cerro Cahui but they need to be identified.

Surrounding several sides of the Maya-made Poza Maya (to the east side of the road from Yaxha to Nakum) there are hundreds of GIANT ferns. I estimate these are *Acrostichum danaeifolium* Langsd. & Fisch., giant leather fern, mangrove fern. You can see the large format photos in the FLAAR Reports, 2025, Hellmuth, *Foods for the Classic Maya of Petén: from Wild (uncultivated) Plants of Rain Forests, Savannas and Wetlands*, that is available on-line as a quick and easy download.

But no mangrove anywhere in PNYNN (but there is a remnant mangrove swamp along the shores of Rio San Pedro, at the Peten-Tabasco border, documented by FLAAR team as part of our RBM research for CONAP).

So a botanist who is interested in ferns definitely should come to PNYNN and be sure to hire Teco as your guide since he has learned about the flora, fauna, and ecosystems during his continuing 23 years as park ranger.



The local name given to me by Teco is Juluve. Google image search identifies the photo as *Odontonema tubaeforme*, firespike. But best for a botanist to document the Genus species.

This plant is very common in PNYNN including in corozeras.

Fig. 32.

Fig. 33.

Fig. 34. Its dark deep in a corozo palm area. Here is Nicholas photographing along the road into Naranjo-Sa’al. Photo by Carlos Elgueta.

All the previous and all the following aerial photos are by Carlos Elgueta with FLAAR drone, Mavic 3.

Fig. 35. The original pristine forest protected by PNYNN and CONAP at the left ends in cattle ranches and agricultural fields.

Fig. 36. Protected forest on hillside going into PNYNN. Cattle ranch at the left.

Fig. 37. Some islands of forest are visible before you enter PNYNN. Sebastian de la Hoz has a reforestation project, Green Balam Forests, especially elsewhere in Peten, but their office is in Melchor de Mencos, Peten: www.GreenBalamForests.org

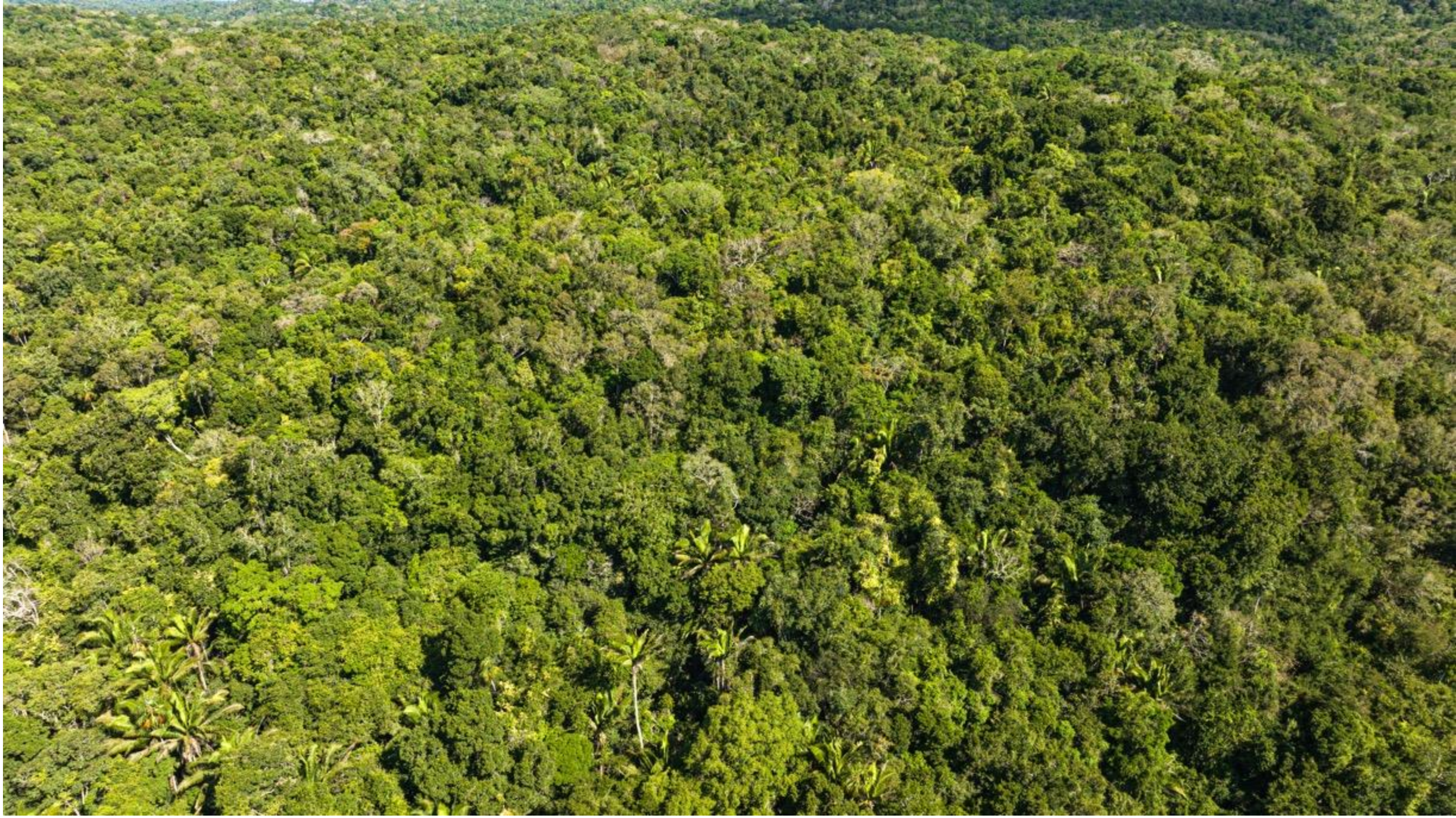


Fig. 38.

Once you enter the national park, the forests here are protected by CONAP, IDAEH, and the military. Lots of palms across bottom.

Fig. 39. This corozera at south entrance to Naranjo-Sa’al is definitely worth visiting and absolutely worth documenting.

Fig. 41.

I prefer to hike through a corozera rather than seeing it from the window of a 4x4 pickup truck. The Mavic 3 can be flown at eye level. No drone pilot would risk flying a Mavic 2 Pro through the forest. The Mavic 4 Pro is what we need for year 2026 onwards.

Fig. 43. Lots of corozo palm but also many other trees are in this corozera at south entrance to Naranjo-Sa’al area of PNYNN.

Fig. 46. Although wonderful to see from the ground, these aerial photos really share with you the natural beauty of PNYNN.

Fig. 47. The previous photo was a diagonal view—now we show you a view directly from above this corozo palm with giant fronds.

Fig. 48. View from the top is not yet available in most botanical reports. The dirt/mud road goes diagonally across this area.

Fig. 51. Here lots of corozo palms but no visible botan palms (but those are elsewhere). Pacaya palms don’t rise up this high.

Fig. 52. Here you can see that this corozera is filled with dozens of species of trees.

Fig. 53. This is an enlargement cropped from the previous photo. The open areas are probably cattle ranches outside the entrance to PNYNN.

Fig. 55. Lots of tall corozo palm but only a few tall thin botan palms. And this corozera has dozens of different tree species—so more than just palms.

I estimate this is the southwest part of the Maya ruins (the open flat area under the trees).

What is needed is a high-res satellite view to show the south and west areas all in the same aerial photo to show the full extent of the two corozeras (South and West) to see whether they join together.

Fig. 56. So the Corozera palms come all the way to the start of the elevated area where the site begins.

Ruins of Naranjo peeking through the vegetation

So this corozera is on the slightly lower elevation around the south and west of the site.

I estimate that the South Corozera and the West Corozera are potentially one long continuous angled ecosystem.

Fig. 57, Would help greatly if a colleague could send a high-res satellite or aerial view of Naranjo and its south and west sides

Fig. 58. Solid corozo palms in one area but solid trees elsewhere (but under these are corozo palms that have not yet reached max height.

Fig. 59. Although most corozeras are on areas that are flat they can also be found on the base of hills, as here.

Fig. 60. In some areas there are literally solid corozo palms. In other areas there are palms but also dozens of tree species.

The corozo palms literally come up to the edge of the ruins of Naranjo Sa’al

Fig. 61, I estimate the probable thatch roof is of the visitor’s center structure at the entrance to the area of mounds and pyramids.

Fig. 62.

I estimate the present FLAAR Reports on corozeras is one of the first botanical and ecological reports to use drone photography.

Most drones can’t fly anywhere near a tree. This is why we upgraded from our Mavic 2 Pro to a Mavic 3. The Mavic 3 can be flown at eye level through the forest (if you have an open path and if you have a drone pilot with patience and experience).

Here drone pilot Carlos Elgueta has captured a view of the inflorescences with berry-shaped fruits. These fruits are young so are green. As they mature they turn more orange in color.

Fig. 65.

I estimate this is *Gaussia maya*, one of the many palm species in the Corozera at South Entrance to Naranjo-Sa'al.

You can see the mass of inflorescences with large "seeds" towards the bottom of the trunk.

It really helps to have a drone that can fly near trees to do photography like this—a method of documentation not available to botanists of previous decades.

You can see the gorgeous colors of the more mature berry-sized fruits in Hellmuth's 2022 FLAAR Reports on "Multi-Colored Masses of large berry-sized Fruits of *Gaussia maya* Palms, Parque Nacional Tikal (PANAT), Reserva de la Biosfera Maya (RBM), Petén, Guatemala. Aug. 2022"

Fig. 66.

Gaussia maya with its inflorescences about a meter below the lower fronds.

Fig. 67.

I estimate this is *Gaussia maya*, one of the many palm species in the Corozera at the South Entrance to Naranjo-Sa'al.

Fig. 68.

Fig. 69. The heavy rains of 2024 have completely washed out the sides of the road (as you can see at the top left).

In other areas the ruts are so deep your vehicle will sink into the ruts and the raised middle of the road will scrape off the underside of your motor. One of our 4x4 pickup trucks had to be towed to rescue it (it was abandoned all night until towed out the next day). And there is not much WiFi or telephone access so you can't telephone anyone for help--for this reason we always have two vehicles for our field trip, so we can pull our vehicle out of a gully or tow it if the underside gets torn off. But the incredible Neotropical vegetation of Naranjo-Sa'al is worth studying.

At the left the road has been washed out during the heavy rains of year 2024.

Fig. 70.

Fig. 71. While Vilma Fialko and Raul Noriega were working at Naranjo-Sa'al they helped access to the site by putting stones in the deep ruts through the wettest areas of the mud road. But the heavy rains of 2024 have washed out many of the sides of the road and the rushing water has cut gullies across the road. So today no normal vehicle can reach the site without having its underside shredded. So even a 4x4 SUV would have its underside scraped off. Indeed one of our 4x4 pickup trucks had to be abandoned on the road since it was not a "lifted" pickup--but even with 4x4 it did not survive the deep ruts and the washed out gullies criss- crossing the dirt road.

Would be helpful to provide income for local Peteneros if more vehicles could arrive for eco-tourism since Naranjo has remarkable bio-diverse ecosystems in addition to impressive monumental

The military camp at Naranjo-Sa'al was initiated recently. There is also a military camp at the entrance to Yaxha. The officers and soldiers have always been hospitable and helpful.

The park rangers of IDAEH and CONAP have assisted our flora, fauna, and ecosystem research during the now over six years that we have focused on the PNYNN area.

Fig. 72.

Dedication for FLAAR Reports on Naranjo-Sa'al

Archaeologist Vilma Fialko and her team and architect Raul Noriega have transformed the Classic Maya ruins of Naranjo-Sa'al into a beautiful place to visit and to experience. We highly recommend visiting Naranjo-Sa'al obviously for the gorgeous palm areas around the south and west of the site, but also for the impressive palaces with endless "throne rooms". Archaeologist Oscar Quintana and many others have also accomplished helpful field work and publications on Naranjo-Sa'al and in many other areas of PNYNN.

The Savanna West of Naranjo Sa'al at North End of Bajo La Pita is visible from the top of one of the pyramids—but unless you are a botanist or ecologist, the hike to reach there is challenging and you need a local guide. I must admit that I am enamored by grassland savannas (PNYNN) and tasiste savannas (Arroyo Petexbatun area) but the palm areas are easier to access and experience.

I also wish to dedicate this report on Naranjo-Sa'al palm paradise Peten to the individuals and NGO's that added the Naranjo area to the Yaxha-Sacnab-Nakum park. Hellmuth was asked by the president of Guatemala circa 1973 to be his guide for Yaxha and several months later the president asked Hellmuth to be his guide at Tikal. So it was possible to speak with him to encourage him to create a national park to protect Lake Yaxha and Laguna Sacnab from destruction of the pristine forest by cattle ranches and slash-and-burn milpa agriculture. And was essential to protect Yaxha, Topoxte and Nakum from looters. We also had meetings with the director of FYDEP, Coronel Casasola, to encourage him to have the area declared a parque nacional. Hellmuth also spoke with a team of the parks department of the USA (who were in Peten in the early 1970's) to include Yaxha and Sacnab in their reports for areas that should be made a park in Guatemala. The day we finished the Yaxha mapping project circa 1974 we found a government sign saying Parque Nacional Laguna Yaxha, Laguna Sacnab. In subsequent years additional individuals and NGO's focused on conservation added the ruins of Naranjo-Sa'al to the park. It took literally decades for the final paperwork to be signed but the PNYNN is one of the great forest and wildlife conservation areas of all Mesoamerica and part of the Reserva de la Biosfera Maya (RBM) that is one of the largest areas of conservation under the leadership of CONAP.

I would like to add the names of the individuals and NGO's that added Naranjo (because in the 1970's there was no easy road to enter Naranjo). I have heard that Federico Fahsen was one of the individuals who helped nudge the government paperwork to finish the complete park. If people know other individuals and NGO's that added the Naranjo area, I will add their names in future editions. Gabriela Moretii has mentioned SIGAP and also Hilda Rivera and Oscar Quintana.

Bibliography on Naranjo-Sa'al

Since the Maya city of Naranjo-Sa'al was the "capital" of military and political alliances from the Snake Kingdom of Calakmul and then switching of alliances and winning battles and then losing battles there are dozens of reports on Naranjo by epigraphers and iconographers and archaeologists. For the architecture at Naranjo Sa'al there are reports by Vilma Fialko and by Raul Noriega and their colleagues. If you Google Naranjo Sa'al you will find videos, articles, and helpful reports. Fialko and her team also produced the impressive year 2009 *Guía Florística del Sitio Arqueológico Naranjo-Saal, Petén, Guatemala* that features orchids, bromeliads, cacti and medicinal plants.

For palms of the RBM and Izabal areas of Guatemala we already have almost a dozen FLAAR Reports on-line as easy downloads (at no cost). During late May we will be posting our new reports on corozeras of PNYNN and north of Uaxactun. But in the meantime, below is the link to LOTS of photo albums on palms of Izabal and Peten:

https://www.maya-ethnobotany.org/reserva-de-la-biosfera-maya-rbm-peten-guatemala/flaar-reports-publications-on-palms-of-guatemala-rbm-peten-izabal-guatemala.php

A bibliography on cohune palm (called corozo in Guatemala) would fill endless pages, but I want to show one web page that has photos of *Attalea cohune* palm that are taller than 90% of the ones I have seen in the Reserva de la Biosfera Maya (RBM), Peten.

https://palmpedia.net/wiki/Attalea_cohune

Credits and Acknowledgements

We visited with Mario Vásquez (CONAP for PNYNN area) while passing through San Benito/Santa Elena en route to the corozera areas.

The field trip concept and itinerary was initiated by Nicholas Hellmuth. He also does pano photography and other photography from the ground with an iPhone 15 Pro Max.

Norma Estefany Cho and Byron Pacay, FLAAR Mesoamerica, prepare all the photography, drone, and camping equipment, plus assist every day the entire week of the field trip. Byron also drives the VW Amarok—he knows all the roads from years of experience.

Edwin Solares did video and ground photography. He is also very experienced in video editing.

Carlos Elgueta is a professional drone pilot, aerial photographer, and photographer with his Sony camera. He was recommended by drone pilot Haniel Lopez when Haniel himself had other projects so was not available the first week of May.

Vivian Hurtado prepares the daily menu and oversees the organization of all field work and research projects. Since there is not space in the pickup trucks she works from her home office.

Teco, the nickname for Moises Daniel Perez Diaz, park ranger at PNYNN for 23 years, so has impressive experience on flora, fauna and ecosystems of this part and also of surrounding areas.

Franklin Baudilio Perez Mendez helped as general assistant setting up camp at each base camp and helped as porter carrying needed things during each day's hike. He is the son of Teco.

Rubelsin Ariel Recinos Orellan, driver of the decades old Toyota 22r that survived all the ruts and gullies washed out across the roads because this Toyota was "raised" so the underside of the motor did not get scraped.

Perfecto Matus is a driver who transported our equipment to the camp of Naranjo Sa´al, in his Toyota 22r.

Daniel Ramirez Mendez, driver of the Ford Ranger.

Daniel Alexander Recinos Corrales, driver of the Izusu DMA.

Maria Isabel Jacome Franco has assisted as a cook on several FLAAR field trips. There are obviously no hotels or restaurants at Nakum or Naranjo, but there are cooking areas that the local park personnel make available to research teams who have permission from the park administrators to camp in those areas.

Ruben Edmundo Carreto Almaraz, park ranger in Naranjo-Sa'al provided helpful assistance in our camping at that site.

In past visits Horacio Palacios guided us to the savanna and the corozera. We also thank Arqueologa Vilma Fialko and Architecto Raul Noriega for hospitality at Naranjo-Sa'al in the recent years when they were there.