FLAAR ANNUAL REPORT 2024

Field work, Library research
Neotropical Flora and Fauna
Biodiverse Ecosystems of Guatemala
In coordination with FLAAR Mesoamerica
Iconography and Epigraphy
Of Classic Maya art

Prepared by Vivian Hurtado and Nicholas Hellmuth

Content

Introduction 1

FLAAR Mesoamerica manages all FLAAR projects

- Research Field Trips, Expeditions during 2024 3
  - Documentation at Lake Atitlán 10
- Photo Essays to document Flora, Fauna, Ecosystems and Mayan Culture 23
- Audiovisual production by the video editing team of FLAAR Mesoamérica 32
- Events and activities 35
  - Results of the Second Edition 43
- Expanding Our Reach: Web & Social Media Impact 48
  - Social Media 49

MayanToons

- Educational material 53
  - Fanzines and specialized materials 54
  - Workshops 55

Objectives and Work Plan for 2025 61

Introducción

This report compiles the work carried out during the twelve months 2024 by the multidisciplinary team of FLAAR Mesoamérica, as an extension of FLAAR U.S.A. This year was marked by significant achievements that reinforce our commitment to research, dissemination, and the conservation of biodiversity and cultural heritage.

As part of the **Biodiversity Documentation Project in the Maya Biosphere Reserve (RBM)**, we conducted a field trip to Uaxactún to document bats, animals that have been well represented in Maya art and worldview. This bat research field trip was coordinated with the experienced biologist Jose Octavio Cajas. The rest of our efforts relative to the RBM focused on processing the data collected throughout the project to create **two comprehensive catalogs of flora and fauna species in the RBM.** These catalogs are expected to be highly useful for park rangers and protected area administrators, CONAP personnel, tour guides, students, researchers, and anyone interested in learning more about the incredible biodiversity found in Guatemala's largest natural reserve, covering over 21,000 km². These catalogs, which integrate detailed and visual information, will be officially presented in 2025 as the global result of the project. Additionally, we published five independent photo essays highlighting key aspects of our documentation, including:

- The ecosystem of the Biotope Laguna del Tigre-Río Escondido.
- Stingless bees (available in both Spanish and English).
- The inland mangroves of the San Pedro River (also in Spanish and English).

At the beginning of 2025, a report on the pine ecosystem that inhabits the borders between Uaxactún and Tikal will be published, contributing more knowledge about the diversity of habitats within the RBM.

Expanding our reach, we conducted two trips to Copán, Honduras, to document emblematic archaeological pieces from the Copán Archaeological Site and enrich the knowledge about them. Several reports were published on our website, and in 2025 we plan to publish more, along with other archaeological reports focusing on different sites.

Additionally, we carried out a trip to Atitlán, Guatemala, focusing on documenting aquatic birds to generate educational materials in 2025. We also visited the municipality of Senahú in Alta Verapaz, Guatemala, to document the use of sapote mamey (*Pouteria sapota*) seeds as a substitute for cacao. Another expedition was conducted in the mangrove ecosystems of Guatemala's southern coast to record footage that will be included in our upcoming documentary video: *Pleistocene Mangroves*.

Regarding audiovisual production, this year we reached significant milestones. We published nine short videos on our YouTube channel and developed two high-quality documentaries:

- Ibagari in the Guatemalan Caribbean, which highlights the connection between biodiversity and culture documented during our Livingston project between 2020 and 2021.

- Guacamayas, an outstanding work that not only received an award for FLAAR videographer Edwin Solares at the Wildlife Conservation Film Festival in New York but also set a precedent as the first Guatemalan documentary selected for this prestigious festival. This documentary was screened at Elite Cinemas, Monterrey, Mexico, during the festival's premiere, expanding its international reach. Additionally, the documentary is available in Spanish and Kaqchikel, with an English version coming soon.

Furthermore, we successfully organized the second edition of FLAAR Fest "Discover Mesoamerica", an event dedicated to spreading knowledge about the biodiversity of Guatemala and the Mesoamerican region. This festival not only gathered 91 participants but also achieved its goal of raising funds to print educational materials. Thanks to the funds from the first festival, this year we printed 2,350 MayanToons books, of which 659 were donated to schools in Petén and Izabal, directly benefiting local communities with educational resources that promote environmental care and cultural identity. The remaining copies will be used to sustain the project and distribute them to other rural schools. The donated copies included:

- *Coloreando el Abecedario Trilingüe en español, inglés y q'eqchi'*
- *Coloreando el Servicio de Limpieza de Plagas.*
- *Buscando Plantas Medicinales para la Abuela.*

We deeply appreciate the effort and dedication of every member of the FLAAR team, whose commitment made each of these achievements possible. We remain steadfast in our mission to strengthen and expand our impact in 2025, continuing with documentation and environmental education as fundamental pillars of our work and essential tools for the conservation of Guatemala's biodiversity.

FLAAR Mesoamerica team at the annual Christmas gathering a tradition where colleagues come together for a festive meal to celebrate the holiday season. This gathering is also an opportunity to share updates and insights about ongoing and future projects with the team.

As part of our family-friendly approach, employees with children are welcome to bring them to the office for the event.

FLAAR Mesoamerica manages all FLAAR projects

Research Field Trips, Expeditions during 2024

Bird Documentation on the Southern Coast

Waterbirds are the most common birds in paintings on Maya vases, bowls and plates and also in stone sculptures. But iconographers and epigraphers who do not travel in-person to see the many different species have a hard time correctly identifying the long-beaked waterbirds in Classic Maya art.

The FLAAR Mesoamérica team began the 2024 expeditions in late January on the Southern Coast, focusing on documenting birds frequently represented in Maya art, primarily aquatic species such as ducks, herons, storks, and ibises. Additionally, falcons and vultures were recorded.

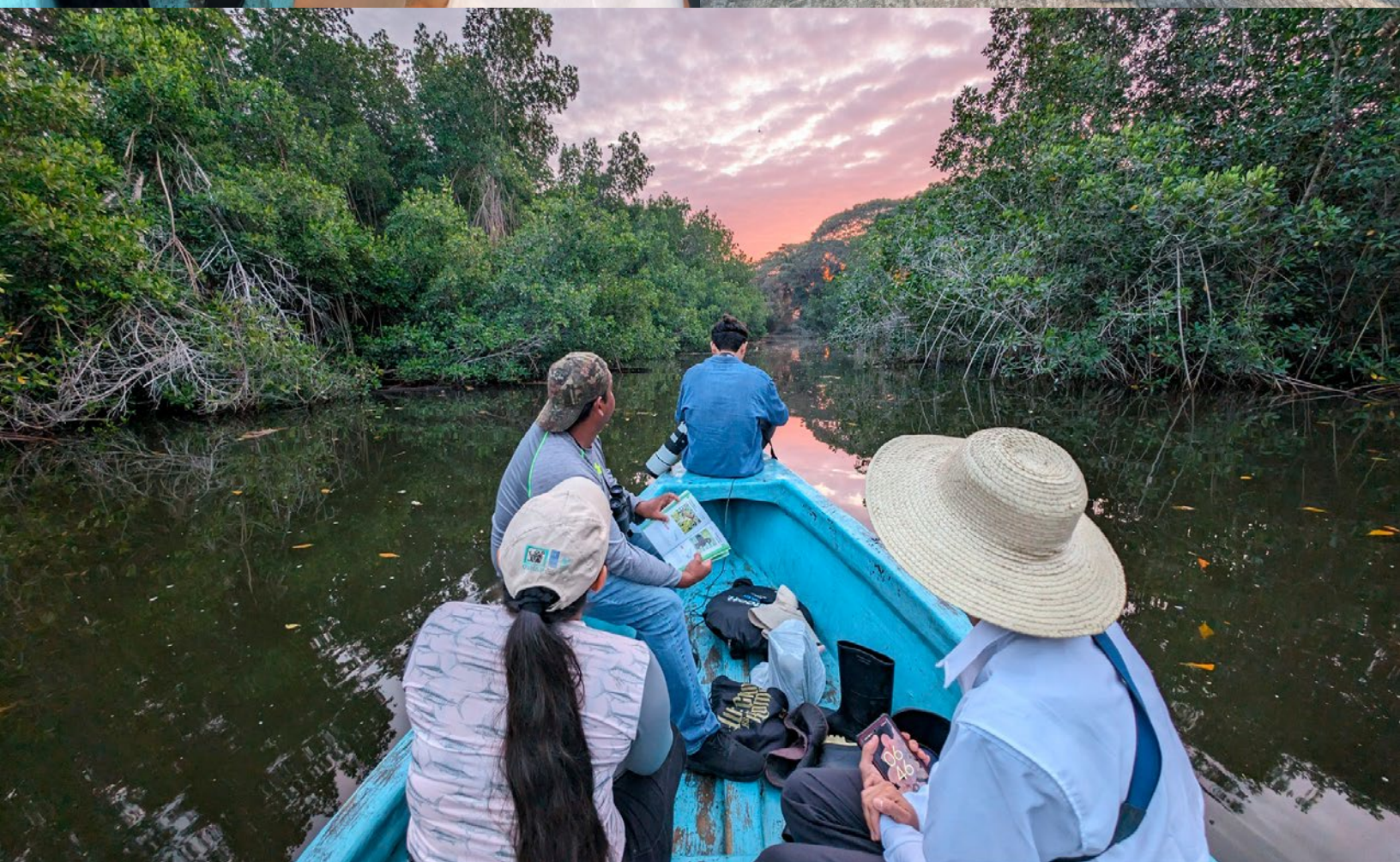
The activities started in Sipacate Naranjo National Park, thanks to the support of CONAP. We extend our special gratitude to Lady Sulena Blanco for arranging boat transportation. We also thank FUNDAECO for providing accommodation for the expedition team on this occasion.

After completing the recordings in Sipacate, the team headed to Laguna Grande, located in Monterrico. In this area, Alex Cuellar supported FLAAR as a guide, with whom we have collaborated for several years

Espátula rosada (*Platalea ajaja*) en Laguna Grande, Monterrico.
Photography by Edwin Solares, January 2024.

Cigüeña americana (*Mycteria americana*).
Parque Nacional Sipacate Naranjo. Photography by Edwin Solares, January 2024.

White Ibis (*Eudocimus albus*) and Tricolored Heron (*Egretta tricolor*).
Parque Nacional Sipacate Naranjo. Photography by Edwin Solares, January 2024.



The FLAAR Mesoamérica team documenting aquatic birds in Sipacate Naranjo National Park with the support of the National Council of Protected Areas (CONAP). January 2024.

The FLAAR Mesoamérica team documenting aquatic birds in Laguna Grande, Monterrico with the support of Alex Cuellar. January, 2024.

Visits to Copán, Honduras

Copán is home to some of the best-preserved classic Maya stone sculptures, including stelae, altars, and the intricately carved front panels of throne benches. The portraits of Copán's rulers and the hieroglyphs on these sculptures depict many mythical creatures and special royal attire, conveying messages that the kings of Copán intended to leave for posterity.

FLAAR has conducted several field trips to Copán from the 1970s to the present. However, as FLAAR's iconographic research has advanced significantly, we decided to carry out two additional field trips in 2024.
The first expedition, in early February, focused specifically on capturing detailed macro photography of individual Maya glyphs on Copán's stelae, particularly those designed in a fully personified figure style. These images were prepared for Dr. Hellmuth's presentation at the epigraphy conference at the Popol Vuh Museum in July 2024, held at MUNAE.

The second expedition, in May, aimed to photograph some remaining sculptures and document Maya ceramics housed at the Regional Center for Archaeological Research (CRIA), managed by the Honduran Institute of Anthropology and History (IHAH). The IHAH kindly granted us the necessary permits, and each time we work in Copán, they provide invaluable assistance and hospitality, for which we are deeply grateful.

Hijole Sculpture in the Archaeological Site Museum of Copán, Honduras.

On the left, David Arrivillaga (FLAAR Mesoamérica) photographing a stela at the Copán Archaeological Site, Honduras. On the right, the FLAAR Mesoamérica team with the team from the Honduran Institute of Anthropology and History after FLAAR provided a photography training session, February 2024.

Hellmuth has been a Guest Visiting Professor in digital imaging, scanning, and photography for six months in Japan in the 1990's, for the island of Malta cultural research group, at Brevard Community College, Rollins College, Bowling Green State University, and Universidad Francisco Marroquin (in Guatemala).

FLAAR is dedicated to studying and documenting with high-quality digital cameras the flora, fauna and ecosystems of Mesoamerica. We focus especially on the plants and animals which were important to the Classic Maya people for thousands of years. This photo of two happy macaws--obviously not in a cage--is by Edwin Solares, FLAAR Mesoamerica, at the Copan Archaeological Park, Honduras.

Documentation at Lake Atitlán

In February 2024, the FLAAR Mesoamérica team, in collaboration with Asociación Vivamos Mejor, conducted an expedition to Lake Atitlán to document the migratory species of this lacustrine ecosystem. Vivamos Mejor, which works on environmental awareness in the department of Sololá, organized a two-day expedition that included a census of aquatic birds.

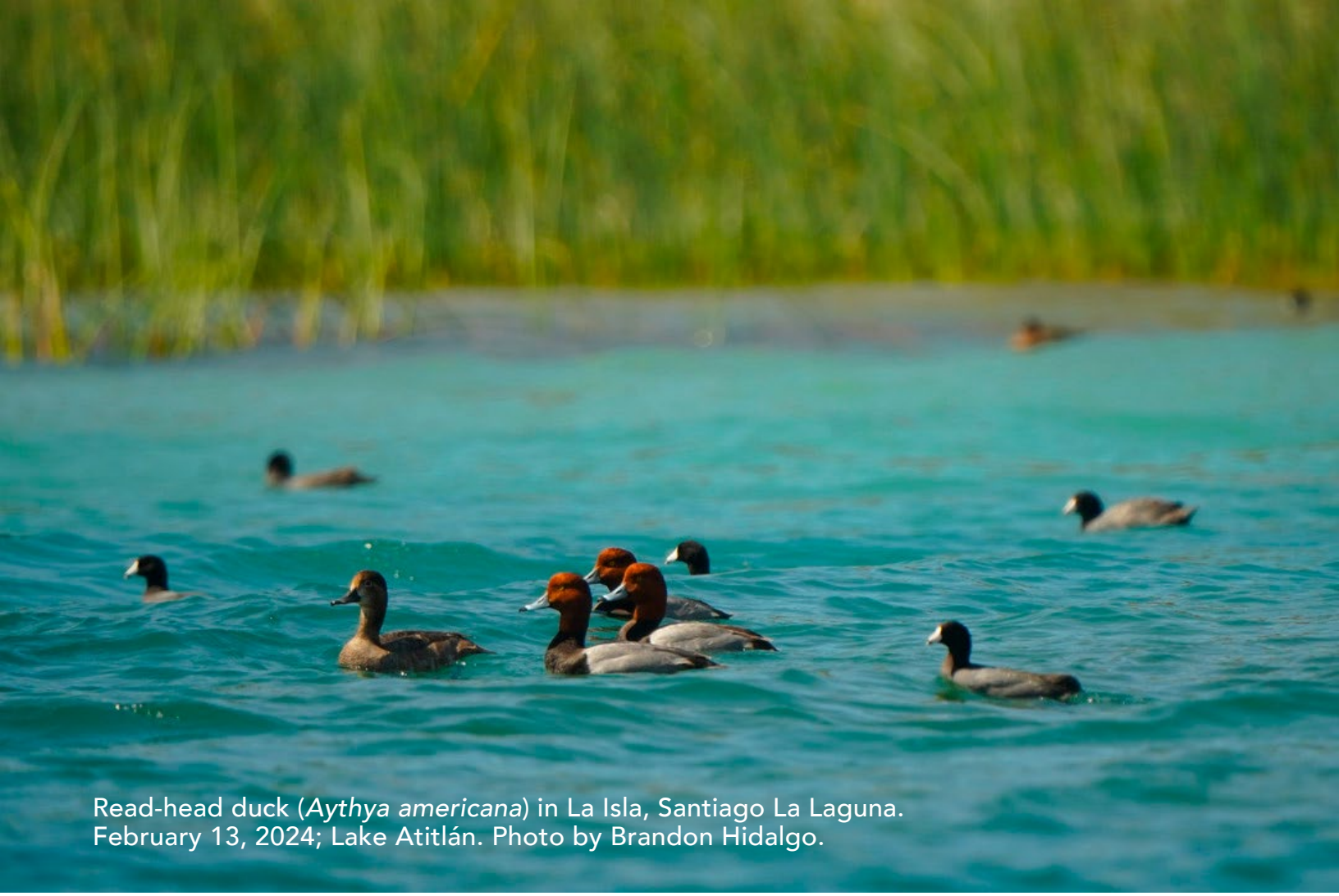
On February 12th, both teams set sail at 6:00 a.m. from Panajachel, traveling along the northern and eastern shores of the lake, visiting the Quiscab River mouth, Santa Cruz La Laguna, San Marcos La Laguna, San Pablo La Laguna, Playa Las Cristalinas, San Juan La Laguna, and San Pedro La Laguna.

The following day, February 13th, the team departed again at 5:00 a.m., this time to navigate the southern and western shores of the lake, visiting locations such as Santiago La Laguna, La Isla, Cerro de Oro, and San Lucas Tolimán, before returning to Panajachel via San Andrés Palopó and Santa Catarina Palopó.

The results of the aquatic bird census, processed by Asociación Vivamos Mejor, recorded a total of 6,884 individual birds from 25 species across 7 families. The most abundant species was Fulica americana, with 5,799 individuals recorded over both days. The least abundant species was Pelecanus occidentalis, with only one individual documented. Other abundant species included *Aythya affinis, Aythya collaris*, and *Spatula discors,* along with various heron and gull species.

Meanwhile, the FLAAR Mesoamérica team compiled an extensive photographic archive, capturing images of the observed species as well as aerial shots of the lake's various ecosystems, including beaches, shorelines, swamps, and shallow waters with submerged macrophytes.

FLAAR Mesoamérica's expedition team and members of the Vivamos Mejor Association. February 13, 2024; Lake Atitlán. Photo by Marlón Calderon.



Read-head duck (*Aythya americana*) in La Isla, Santiago La Laguna. February 13, 2024; Lake Atitlán. Photo by Brandon Hidalgo.

Shallow waters with dense aquatic vegetation at Santiago La Laguna. February 13, 2024; Lake Atitlán. Drone photo by Brandon Hidalgo.

Osprey (*Pandion haliaetus*) in La Isla. February 13, 2024; Lake Atitlán.
Photo by Brandon Hidalgo.

Expedition to Northeastern Guatemala

On April 5, 2024, our team traveled to northeastern Guatemala in search of four native plants traditionally used as flavorings for cacao. These species are:

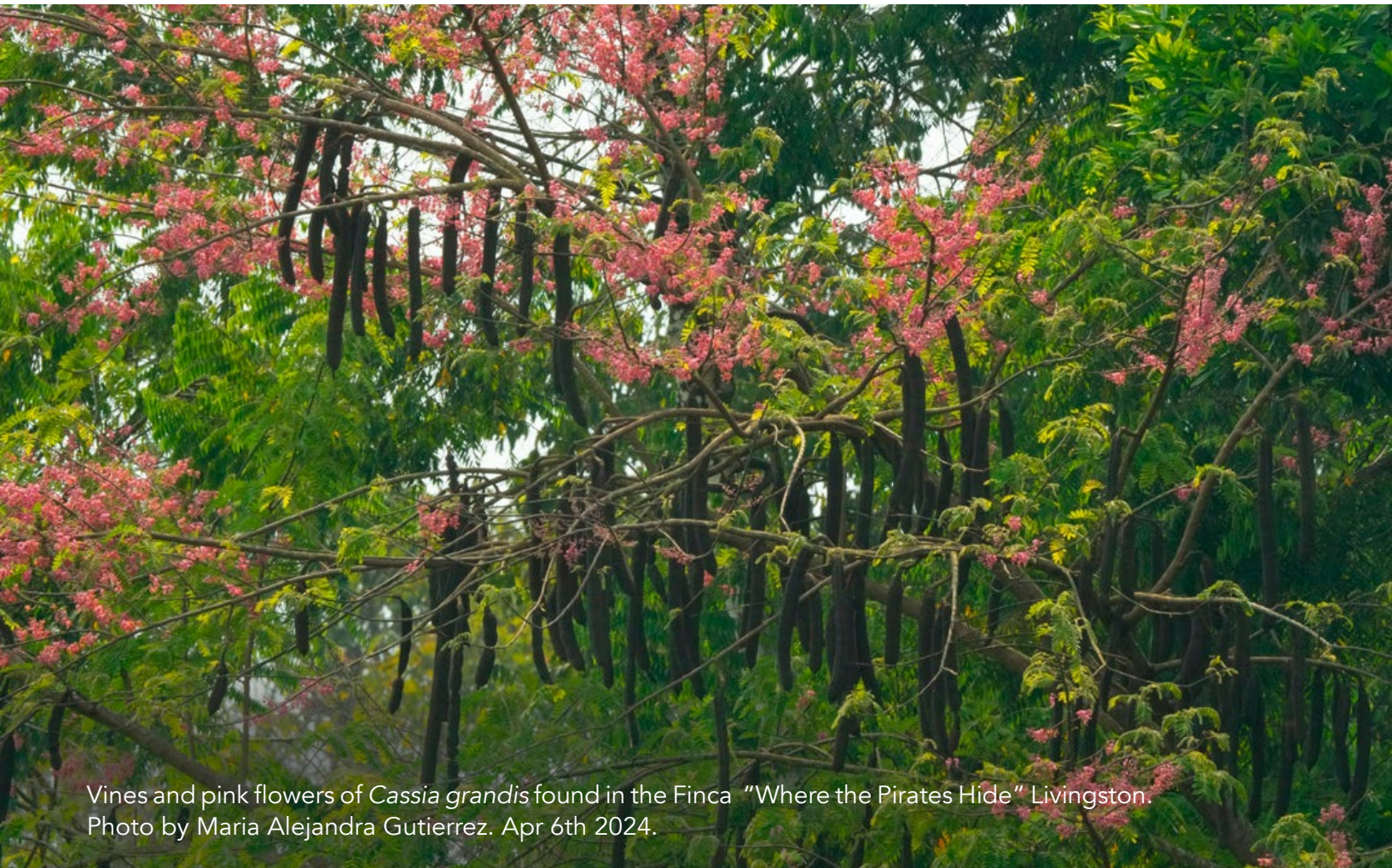
- *Cassia grandis*
- *Ceiba pentandra*
- *Ceiba aesculifolia*
- *Pachira aquatica*

The expedition began with the search for *Ceiba pentandra* and *Ceiba aesculifolia* in the department of Zacapa. Large Ceiba pentandra trees were found, with their pods, locally known as pochas, already open, releasing the characteristic fiber surrounding the seeds. The collection of 100 pochas for seed documentation was successful. Additionally, we visited the Natural Reserve for the Conservation of Heloderma and the Dry Forest, where, with the support of park ranger Gilberto Salazar, we were able to collect pochas from *Ceiba aesculifolia*. According to Dr. Nicholas Hellmuth, the seeds (named pochote) of these species have traditionally been used as flavorings for cacao in Maya culture.

Since *Cassia grandis* was not found in the same area, the expedition extended to the Guatemalan Caribbean. Upon arriving in Livingston, we consulted with local residents and visited several private nature reserves, where we found over five *Cassia grandis* trees in full bloom, which were captured in aerial photographs. With the help of Pedro Chub, an assistant at FLAAR Mesoamérica, we successfully collected the necessary pods to document the seeds, which, according to Dr. Hellmuth, are also used as cacao flavorings. Interestingly, this tree is known by different names: in Petén, it is called Bucutz, while in Livingston, it is commonly known as "Carajo" or "Carao." Local residents also reported that its seeds are used as a remedy for blood-related illnesses due to their high iron content.

Finally, in Livingston, we also searched for *Pachira aquatica*, locally known as Zapotón. Numerous trees were found at Quehueche Beach, where, with the necessary permits, five fruits were collected for documentation. According to Dr. Hellmuth, this plant has historically been used as a food source, and its immature seeds have been employed as cacao flavorings.

Fruits and cotton of *Ceiba pentandra* –
Photo by Maria Alejandra Gutierrez. Zacapa. Apr 5th 2024



Vines and pink flowers of *Cassia grandis* found in the Finca "Where the Pirates Hide" Livingston.
Photo by Maria Alejandra Gutierrez. Apr 6th 2024.

Tree top, pink flowers of *Cassia grandis* in "Barrio Paris" at Livingston.
Photo by Pilot Drone Brandon Hidalgo. Apr. 6th 2024.

Other FLAAR photos from previous years

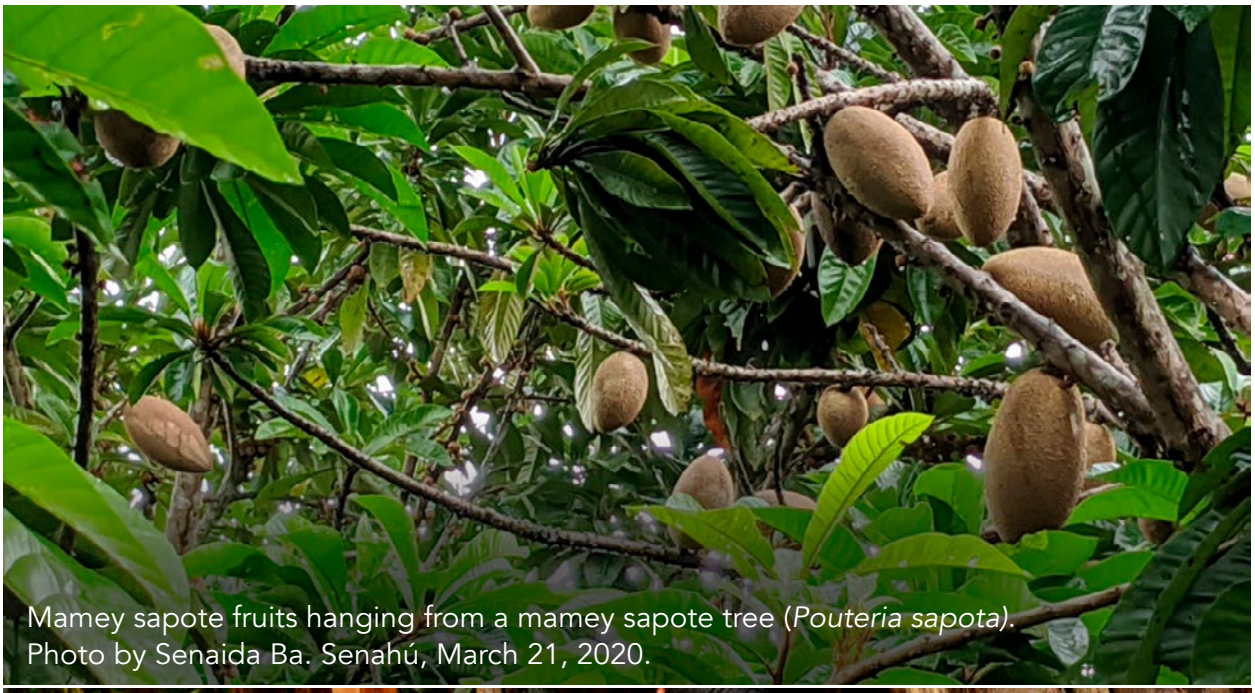
Open fruit of *Pachira aquatica*.
Photography by Sofía Monzón.

Flowers of *Cassia grandis* in Finca La Esperanza.
Photography by Sofía Monzón. Jun 16 de 2015.

Visit to the Community of Chipemech, Senahú

In April 2024, an expedition was carried out to the mountains of Senahú to visit the community of Chipemech, located 20 km from the center of Senahú. On this occasion, we had the opportunity to meet some relatives of our photography assistant and local ethnobotany expert, Senaida Ba.

The purpose of the visit was to document the traditional preparation of beverages using sapote mamey (*Pouteria sapota*) seeds as a substitute for cacao.



Mamey sapote fruits hanging from a mamey sapote tree (*Pouteria sapota*).
Photo by Senaida Ba. Senahú, March 21, 2020.

Isabella Caal removing the hard peel of Sapote Mamey seeds.
Photo by Brandon Hidalgo. Senahú, Chipemech community; April 17, 2024.

Roasting the Sapote Mamey seeds. Photo by Victor Mendoza.
Senahú, Chipemech community April 19, 2024.

The mamey sapote seeds are turned into a dough.
Photo by Maria Alejandra Gutierrez. Senahú, Chipemech community; April 19, 2024.

Activities in Uaxactún, Petén

At the end of July 2024, we visited the village of Uaxactún, located in the Maya Biosphere Reserve in Petén. The purpose of this visit was to carry out two activities related to the conservation of bats in the country's rainforests with the biologist Jose Octavio Cajas.

The first activity consisted of educational talks and the distribution of educational materials to the students of Uaxactún's school. The second activity involved conducting a rapid assessment of bat species present in the area during the rainy season, using two complementary methodologies: mist net captures and high-frequency recording analysis.

A total of 20 species were recorded, 11 captured using mist nets and 9 identified through recordings. These species represented 6 of the 7 bat families found in Guatemala. Most of the recorded species are widely distributed, and 10 of them are protected under Guatemalan law. Among the captured species, *Mimon cozumelae* stood out, as it is considered an indicator of well-preserved forests. The results suggest that this area of the Maya Biosphere Reserve has a high diversity of bat species, highlighting the importance of continuing research to complete the species inventory.

This effort was made possible thanks to the collaboration and support of the Association of Forest Communities of Petén (ACOFOP), BQB Biósfera, the Guatemalan Association of Mammalogy (ASOGUAMA), and the Guatemala Bat Conservation Program (PCMG). Additionally, several schools were visited to donate books, an activity that will be mentioned later in this report in the MayanToons section.

Biologist José Cajas analyzing the characteristics of an unidentified bat. *Artibeus lituratus* on the right side.

FLAAR Mesoamérica team with biologist José Cajas and ACOFOP members.

Research on indigenous Cacao Beverages of Oaxaca, Mexico

Since FLAAR Mesoamerica photographer Edwin Solares was invited to Oaxaca, Mexico, for a separate project, he took the opportunity to dedicate several days to furthering FLAAR's research on cacao and the other plant seeds that were traditionally mixed with cacao by indigenous peoples across Mesoamerica. Several plant seeds, entirely unrelated to *Theobroma cacao,* have been used to create cacao-like beverages or blended with cacao to produce unique, multi-flavored drinks. One notable example is *tejate*, a traditional beverage well known in the Oaxaca region of Mexico, yet rarely documented in Maya research projects.

Cacahuaxóchitl, flor de cacao, flor de tejate, árbol del funeral, tejate, flor de cacao, or rosita de cacao (*Quararibea funebris*), the flavoring used for the elaboration of Tejate.
Photography by Edwin Solares, September 17th, Oaxaca, Mexico.

Ingredients used for the preparation of Tejate: Cacao (*Theobroma cacao*), Cacahuaxóchitl (*Quararibea funebris*), Maize (*Zea mays*). Photography by Edwin Solares, September 17th, Oaxaca, Mexico.

A woman showing the process to elaborate *Tejate*.
Photography by Edwin Solares, September 17th, Oaxaca, Mexico.

The FLAAR team had the opportunity to travel to Monterrico from November 19 to 21 to document various aspects of the mangrove ecosystem, which will be included in our upcoming documentary "Manglares del Pleistoceno." This trip was carried out in collaboration with the project "Alas y Raíces Resilientes," which aims to create resilient ecosystems that promote sustainable development in harmony with shorebirds. The project's objective is to reduce climate vulnerability and protect coastal wetlands through strategies such as mangrove restoration, reestablishing hydrological connectivity, and implementing nature-based solutions. Additionally, it focuses on governance processes, including community self-management mechanisms incorporated into the master plan for protected areas, the promotion of forest incentives, and community-based birdwatching tourism in synergy with existing projects.

To date, significant progress has been made, including the restoration of 90 hectares of mangroves, the organization of two summer courses for children in Monterrico-Hawaii, and the development of a Migratory Bird Festival. At the end of January 2024, we expect to continue collaborating with this project by participating in a mangrove reforestation initiative. The objective is to document the activity to increase its visibility through the documentary currently in production. Additionally, interviews with local stakeholders and project managers will be included.

The FLAAR Mesoamérica team and the team of Alas y Raíces Resilientes working together in Monterrico. November, 20th of 2024.

No.	Places visited	Execution Dates	Participants	Documentation Objectives
1	**Costa Sur**	26-29 de enero	Vivian Hurtado Edwin Solares Ale Gutiérrez Brandon Hidalgo Sergio Jérez	Birds represented in Maya art: • Boat-billed heron, *Cochlearius cochlearius* • Yellow-headed vulture, *Cathartes burrovianus* • Turkey vulture, *Cathartes aura* • Snail kite, *Herpetotheres cachinnans* • Wood stork, *Mycteria americana* • Roseate spoonbill, *Platalea ajaja* • White ibis, *Eudocimus albus* • Black-bellied whistling duck, *Dendrocygna autumnalis* • Fulvous whistling duck, *Dendrocygna bicolor* • Northern pintail, *Anas acuta* • Lesser scaup, *Aythya affinis* • Least grebe, *Tachybaptus dominicus* • Thick-billed grebe, *Podilymbus podiceps* • Northern shoveler, Spatula clypeata
2	**Copán**	1-10 de febrero	Nicholas Hellmuth Vivian Hurtado Edwin Solares David Arrivillaga Karla Cho Norma Cho Luis Molina	Glyphs on various stelae, various archaeological pieces

No.	Places visited	Execution Dates	Participants	Documentation Objectives
3	**Atitlán**	11 al 14 de febrero	María Alejandra Gutiérrez Victor Mendoza Brandon Hidalgo Sergio Jerez	Migratory bird species in the Atitlán Basin
4	**Zacapa y Livingston**	5 al 8 de abril	María Alejandra Gutiérrez Victor Mendoza Brandon Hidalgo	• *Cassia grandis* • *Ceiba pentandra* • *Ceiba aesculifolia* • *Pachira acuática*
5	**Senahú**	16 al 20 de abril	María Alejandra Gutiérrez Victor Mendoza Brandon Hidalgo	Use of sapote seeds as a substitute for cacao
6	**Copán**	5 al 12 de mayo	Nicholas Hellmuth Vivian Hurtado Edwin Solares Karla Cho Norma Cho Jim Estrada	Sculptures in the Copán Archaeological Site Museum. Ceramics in the Regional Archaeological Research Center (CRIA)
7	**Uaxactún**	17 al 21 de julio	Vivian Hurtado Edwin Solares José Cajas (BQ Biosfera)	Bat species related to Camazotz in Maya culture: *Artibeus lituratus* and the false vampire bat *Vampyrum spectrum*. Donation of MayanToons books to schools.
8		15 al 18 de septiembre		
9	**Monterrico**	19 al 21 de noviembre	Edwin Solares Sergio Jerez David Arrivillaga	Shots of the mangrove ecosystem to integrate into our upcoming documentary.

Photo Essays to document Flora, Fauna, Ecosystems and Mayan Culture

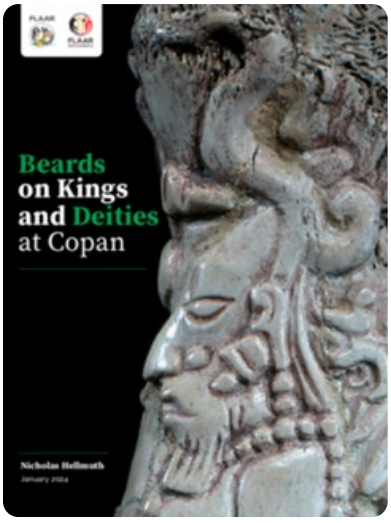
Biotope "Laguna del Tigre-Río Escondido": Plants, Birds & Unexpected Ecosystems

In the ecosystems of Laguna del Tigre-Río Escondido in the Petén region of Guatemala, various research and documentation efforts have been carried out. These efforts have successfully revealed the high diversity of plants (flora) and animals (fauna) in the area, each with notable characteristics, roles within the ecosystem, and anthropological connections. Notable flora in these ecosystems includes 'coastal plants' like *Acoelorrhaphe wrightii* and *Crescentia cujete*, among others. On the other hand, the predominant fauna consists of birds, with species such as *Tigrisoma mexicanum* and Jacana spinosa standing out. The document emphasizes the importance of studying, researching, and documenting the area, with a focus on how these efforts directly impact the conservation of the Laguna del Tigre-Río Escondido region in Petén.

English Spanish

Beards on Kings and Deities at Copan

This photo-essay presents individuals with beards, including kings and deities, from the ancient Maya city of Copán. Although not all king portraits feature beards, those that do, depicted on carved stone stelae, represent Copán monarchs during the Late Classic period. Additionally, supernatural figures that were likely associated with the region's ruling class are shown.



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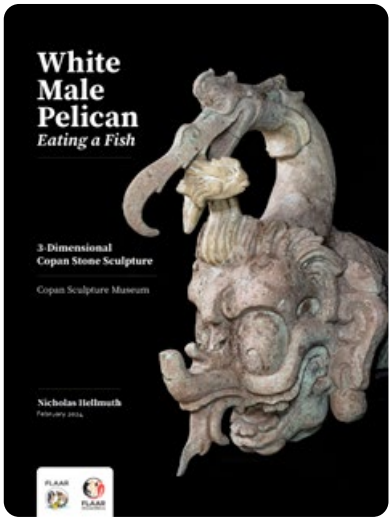
White Male Pelican Eating a Fish

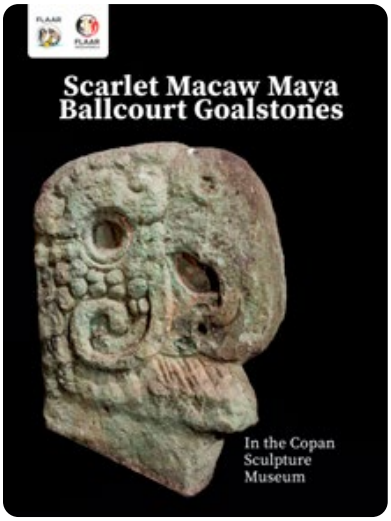
This report includes detailed images of the sculpture of the "Pelícano Hijole" located at the Copán Museum and explores how aquatic birds, especially pelicans, inspired Maya sculptures. The photographic series documents the three-dimensional stone sculptures found in the collapsed "Estructura Hijole" of Copán, offering a unique view of the relationship between birds and Maya art.



Read here

Scarlet Macaw Maya Ballcourt Goalstones

This report, created for the Copán Sculpture Museum, provides a detailed view of the goalstones in the Maya ballcourt featuring scarlet macaws. Two series of macaws are presented: one naturalistic and the other stylized, likely representing different stages of the game. The photo session, conducted in February 2024, used advanced lighting techniques and specialized equipment to capture high-quality images.



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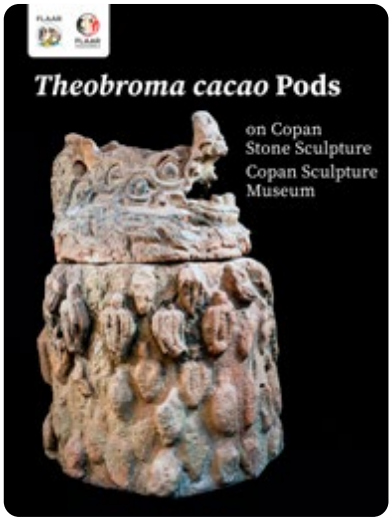
Theobroma cacao Pods

During a field tour in February 2024, FLAAR Mesoamérica documented the remarkable pods of *Theobroma cacao* represented in Maya sculptures. This report offers an in-depth look at the world of Mesoamerican civilizations, highlighting the importance of cacao in Maya culture.



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Yellow Flor de Mayo across Guatemala

This photo-essay showcases the yellow variety of Flor de Mayo documented in various locations throughout Guatemala. Through detailed images and descriptions, the characteristics of this lesser-known variety are explored, offering readers a new perspective on the plant.

Read here

Plumeria rubra:
Wild White Flor de Mayo Frangipani Flowers up close

The wild Flor de Mayo, an emblematic species of Guatemala, particularly from the El Progreso region, is the focus of this photo-essay. Through a collection of images, the beauty and unique features of this plant are documented, allowing the reader to appreciate both its morphology and natural habitat.

Read here

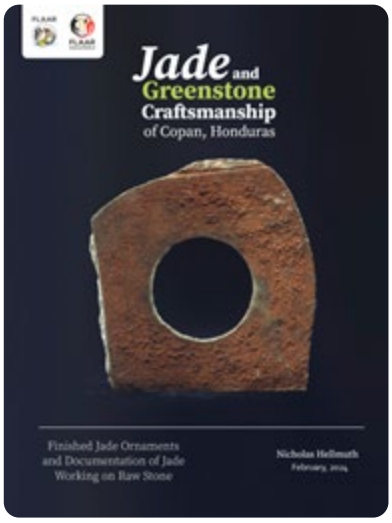
Plumeria rubra, Wild, White Flowering Flor de Mayo

The Flor de Mayo, with its distinctive white flowers, is widely known in Guatemala. This article documents its presence in various environments, from dry forests to the humid areas of Alta Verapaz, showing its distribution and beauty through images that capture its essence in the landscapes of Panzos and Cahabón.

Read here

Jade and Greenstone Craftsmanship of Copan, Honduras

This report explores jade, a key precious stone in Maya culture, and the impressive craftsmanship of the Maya in Copán. Through visual details and geological explanations, the distinction between jadeite and nephrite is clarified, providing a deeper understanding of the significance of this stone in the Maya context.



Read here

Stingless bees: Tetragonisca angustula, Trigona nigerrima, Scaptotrigona mexicana, Melipona beechi, Lestrimelitta sp., Trigona fulviventris & Nannotrigona perilampoides

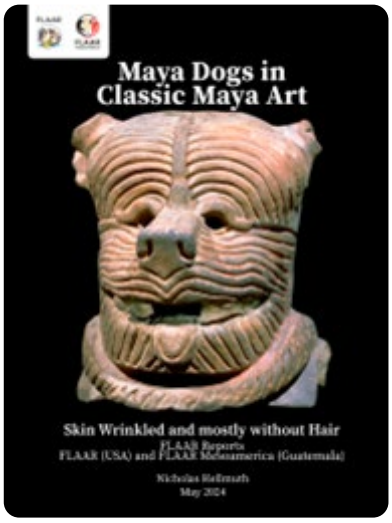
Guatemala and the Mesoamerican region host several native insects, with stingless bees being some of the most well-known. Several species of these bees, including *Tetragonisca angustula*, *Trigona nigerrima*, and *Scaptotrigona mexicana*, among others, have been reported in Guatemala. These insects possess fascinating biology, from their morphology to the important ecological roles they play in native ecosystems. The FLAAR Mesoamérica team has prepared detailed documentation on these species of stingless bees, including *Tetragonisca angustula*, *Trigona nigerrima*, *Scaptotrigona mexicana*, *Melipona beechi*, *Lestrimelitta sp.*, *Trigona fulviventris*, and *Nannotrigona perilampoides*. This document includes photographs and concise information to help readers understand their importance and promote the conservation of these insects.

English Spanish

A special thanks to Quebin Bosbely Casiá Ajché from the Research Unit for the Knowledge, Use, and Appreciation of Biodiversity (UBIO) and the Center for Conservation Studies (CECON), USAC, for his support in the identification of bee species in this report.

Maya Dogs in Classic Maya Art

This report explores the representation of dogs in Classic Maya art. It focuses on hairless and barkless species still found in Mesoamerica and describes how these dogs appear on Codex-style vessels and three-dimensional figures. The dogs were used for hunting and were believed to guide individuals to the Maya underworld, Xibalba. Additionally, the document mentions the presence of these figures in museums such as the National Museum of Archaeology and Ethnology (MUNAE) in Guatemala, highlighting specific anatomical details depicted in the three-dimensional sculptures.



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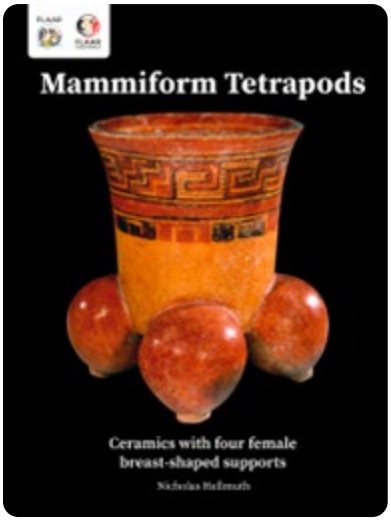
Mammiform Tetrapods

This report presents ceramics of mammiform tetrapods, with globular supports mimicking the shape of a female breast. The variations in the forms of ceramics, including bowls and vases, and how the support details evolved, changing from a chest shape to peccary head shapes, are explored.



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Mangle Rojo (Rhizophora mangle) en las Riberas del Río San Pedro

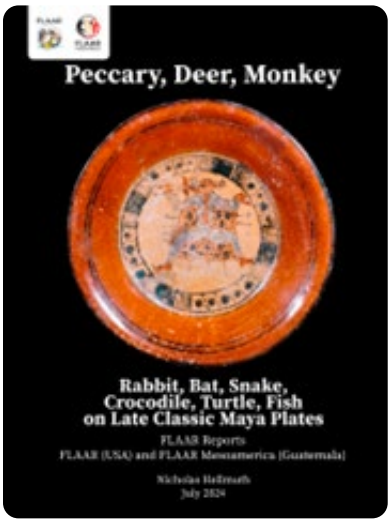
The interior mangroves along the San Pedro River, from Petén, Guatemala to the rest of Tabasco, Mexico, are among the few ecosystems that break the typical characteristics of a mangrove ecosystem. They were only studied for the first time a few years ago. However, the red mangroves (*Rhizophora mangle*) located in the Guatemalan section of this river have been studied very little and likely have never been photographed with high-quality images. For this reason, the FLAAR Mesoamérica team carried out a documentation trip aimed at finding and photographing these trees. The photographs taken are included in this report, along with existing information about their ecology, natural history, and the particular relationship they have with some epiphytic species. These trees have a millennia-long history and constitute natural remnants from the past.

English Spanish

Additionally, for the creation of this report, we collaborated with Mexican biologists Neil Morales and Eva Dobrusin, graduates of the Juárez Autonomous University of Tabasco, as well as Professor PhD Carlos Manuel Burelo Ramos, who have studied the interior mangroves in the Tabasco area.

Peccary, Deer, Monkey, Rabbit, Bat, Snake, Crocodile, Turtle, Fish on Late Classic Maya Plates

Through Maya art, numerous characteristics reflect their history and cultural impact over time. Among the most common artistic expressions are the representations of local animals from those Maya communities, often considered sacred or mystically attributed qualities. This report presents a complete collection of high-quality photographs documenting ceramic plates adorned with images of various animals from that region during that era. The painted species include a monkey, a snake, a rabbit, and a peccary, among others.



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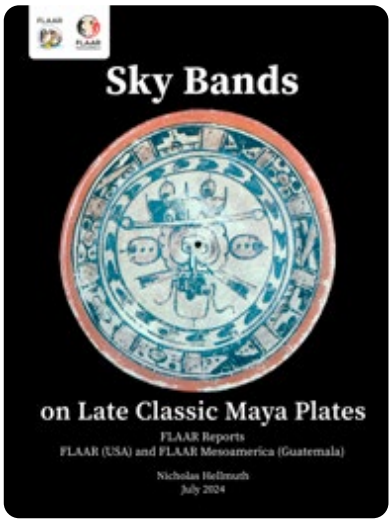
Sky Bands on Late Classic Maya Plates

Sky Bands are a type of iconography found mainly on Late Classic Maya plates, jars, stelae, and codices. These illustrations are a series of celestial motifs enclosed in rectangular frames, arranged adjacently and separated. This report is a first edition and documents these motifs in illustrations and photographs of Maya plates, along with the history behind the naming of several of them. Twenty of these motifs were studied and named by Carlson and Landis (1985), and in 2018, Chris Layser named another eleven motifs in his master's thesis. However, many motifs remain unstudied or unnamed, representing a gap in information that could be an interesting research topic. Some of the sky motifs found in this report include the Kan Cross band and Codex Style celestial motifs.



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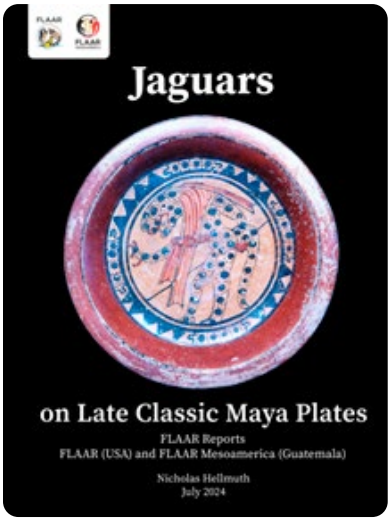
Jaguars on Late Classic Maya Plates

The jaguar is a commonly represented feline in Classic Maya art and culture. This FLAAR report is a compilation of photographs and illustrations of jaguars on Late Classic Maya plates, depicted in different settings and styles. In some cases, jaguars are anthropomorphized, sitting, standing, or holding decapitated heads, while in others, they are shown in their natural state. Another common variation is how the spots on the jaguar are placed, sometimes in geometric patterns or only on the head. Additional elements are also present, such as other animals like bats, deer, and other felines, as well as headdresses decorated with flowers or tail feathers adorning the jaguar's head.



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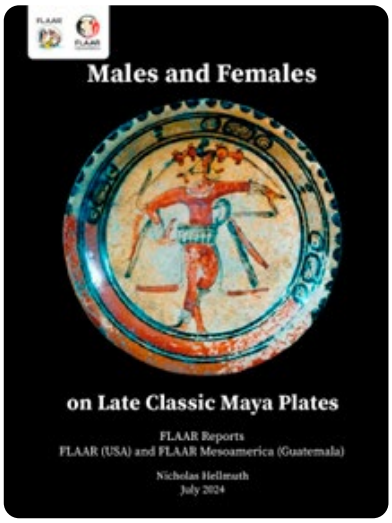
Males and Females on Late Classic Maya Plates

This photographic report presents over 120 images and drawings from the FLAAR archive, focusing on Late Classic Maya plates. The collection highlights representations of human bodies, anthropomorphic creatures, and Maya deities, with figures such as dancers, hunters, warriors, lords, and a skeleton, created in various styles.

The images are organized into categories such as dancers in frontal or profile positions, profile scenes, seated groups, deities, and faces on Maya plates. This report is a valuable contribution, showcasing the frequency of these representations in Maya art.



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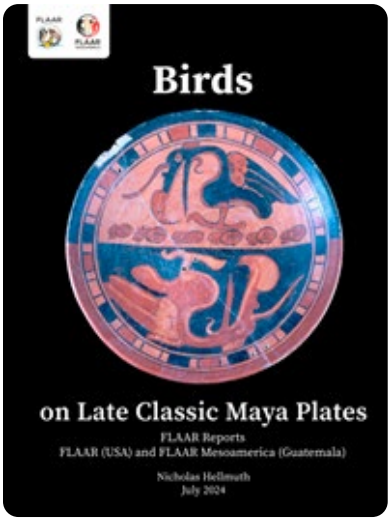
Birds on Late Classic Maya Plates

This report analyzes the representations of birds in Maya ceramics from this period, highlighting the symbolism and mythological elements associated with them. It mainly focuses on waterfowl and figures like the Principal Bird Deity and the Muan bird. The latter, with its characteristic black plumage, is associated with death and the underworld in the Maya worldview. The plates exhibit various artistic styles, including Codex style, and feature unique elements like the Sky Band and faces of deities. The birds are depicted in dynamic scenes, interacting with other beings or capturing fish, combining natural behaviors with mythological narratives, such as their connection with the Hero Twins. The careful crafting and repair of the plates further emphasize their cultural value and prolonged use.



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Audiovisual production by the video editing team of FLAAR Mesoamérica

Humedales en la Eterna Primavera

This video explores the rich biodiversity of Guatemala's wetlands, highlighting their crucial role in conserving local ecosystems and their importance for environmental balance preservation.

Halcón de Pecho Naranja en el Corazón del Mundo Maya

During one of FLAAR's expeditions, the Orange-breasted Falcon, a species that inhabits the Maya World region, was documented. This video immerses us in another FLAAR adventure, showcasing the falcon's behavior, habitat, and the importance of protecting this endangered species.

La Dieta del Mono Araña

This video showcases the dietary habits of the fascinating spider monkey, from its fruit-based diet to its ability to hunt small animals, highlighting the complexity of its feeding behavior in the tropical jungle.

Conoce la fauna de Tikal

Through this video, the wildlife diversity inhabiting the archaeological site of Tikal is presented, including species such as the Potoo bird, toucans, and spider monkeys, highlighting the site's rich biodiversity.

Agua: Fuente de Vida

This video celebrates World Water Day, highlighting the importance of water resources in Guatemala for agriculture, public health, and energy, while addressing the challenges of climate change and water pollution.

Explorando el Río San Pedro

One of the goals of this expedition was to visit the protected area Laguna del Tigre-Río Escondido, as there were no photographs or aerial videos of this territory before our visit. To reach the site, the San Pedro River must be traveled, and this video highlights the rich fauna and flora inhabiting its surroundings, as well as the river's importance in the region's ecological balance. It also showcases the incredible interior mangroves found along the river, and we've prepared a specific report on this topic.

¿Un bosque de pino en Petén?

The Maya Biosphere Reserve contains a pine forest area located on the boundary between Uaxactún and Tikal, in the Santa Fe lowlands. It is believed that this area was occupied by the Maya during the Preclassic and Early Classic periods. Additionally, the formation of this forest occurred naturally.

Descubre miles de Murciélagos en Izabal

This video captures the cave system located in Izabal, the Cuevas del Silvino, home to various bat species. It highlights the importance of these mammals for the local ecosystem and their role in biodiversity conservation.

Lo que no sabías de la Flor de Mayo

This video delves into the wild variety of the Flor de Mayo, showcasing its distinctive characteristics and distribution across Guatemala's various biomes, emphasizing its ecological importance.

Events and activities

Environmental Education Day

A conference was held by the FLAAR Mesoamérica research tema for The Environmental Education Day at Rafael Landívar University, aimed at students from the Environmental Engineering and Agricultural Engineering careers. The session focused on the importance of environmental education in fostering sustainable practices and raising awareness about biodiversity conservation.
During the presentation, we highlighted the work of FLAAR Mesoamérica in promoting environmental knowledge through research, outreach, and educational initiatives. We shared insights into our projects related to native ecosystems, flora, and fauna of Guatemala.

Approximately 40 students attended, showing great interest and participation.

Seminar: Introduction to the Marine-Coastal Life of Guatemala

The FLAAR Mesoamérica team had a prominent role in the seminar "Introduction to the Marine-Coastal Life of Guatemala," delivering two specialized lectures on marine and coastal fauna. This event brought together 15 environmental organizations committed to the conservation and study of the country's coastal ecosystems.

The seminar took place over four Saturdays, from February 3 to 24, providing a space for learning and knowledge exchange between experts and environmental enthusiasts.

Representing FLAAR Mesoamérica, biologists Mariana Rivas and Flor Morales gave a talk on February 10th, sharing their expertise on the diversity, ecology, and importance of Guatemala's marine-coastal fauna. Their presentation allowed attendees to deepen their understanding of the crucial role these species play in the ecosystem and the conservation challenges they face.

This participation reaffirms FLAAR Mesoamérica's commitment to scientific outreach and the protection of the country's natural heritage, promoting environmental education and collaboration among various institutions dedicated to the study and conservation of marine and coastal resources.

Workshop for Vivamos Mejor Association in Atitlán

In February 2024, FLAAR Mesoamérica conducted a specialized workshop for the Vivamos Mejor Association in Atitlán, focusing on photographic documentation techniques.

During this training, participants gained knowledge on using photography as a tool for recording, analyzing, and disseminating environmental and cultural information. FLAAR Mesoamérica also presented examples of products generated using these tools.

This initiative reaffirms our commitment to strengthening local capacities by providing practical tools to enhance visual documentation in conservation and sustainable development projects in Atitlán.

Workshop in Copán Archaeological Site, Honduras on topics of archaeology and photography

On February 8, 2024, Dr. Nicholas Hellmuth, Director of FLAAR Mesoamérica, delivered a presentation at the Honduran Institute of Anthropology and History in Copán, Honduras, focusing on the study of Paddler gods represented in the archaeological sites of Tikal, Ixlú, Jimbal, and Copán. During his presentation, he shared his extensive knowledge of Maya iconography and symbolism, offering a detailed perspective on the presence and significance of these deities in various ancient cities.

In addition to the lecture, Dr. Hellmuth and his expedition team conducted a photography training session, focusing on the use of mobile phones as practical tools for archaeological documentation. The session covered techniques for capturing images to improve the quality of visual records, emphasizing the importance of photography in preserving and studying cultural heritage.

These activities were part of FLAAR Mesoamérica's documentation trip to Copán in February 2024, where they worked in the Archaeological Park capturing images of glyphs and architectural details in Maya structures. This effort reinforces the organization's commitment to research, conservation, and dissemination of the cultural legacy of the Maya civilization.

International Bee Day

As part of the activities organized for the International Bee Day, the Natural History Museum and the Conservation Studies Center of the University of San Carlos of Guatemala managed an educational workshop on bees, exploring their characteristics, ecological importance, and differences from other insects.

During the event, the fundamental role of bees in pollination and ecosystem balance was highlighted, as well as the challenges they face due to habitat loss, pesticide use, and climate change.

The infographics used in the workshop were the result of a collaborative effort with The Biodiversity Outreach Network (BON), developed as part of our Smart Bee project. This visual material helped attendees better understand bee diversity and function, raising awareness about their conservation and the need to protect them for the sustainability of biodiversity.

Participation in the Inter-Institutional Coordination Board on Environmental Education for Sustainable Development

In 2024, FLAAR Mesoamérica joined the Inter-institutional Coordination Table for Environmental Education for Sustainable Development, an initiative managed by the Ministry of Environment and Natural Resources (MARN) and the Ministry of Education (MINEDUC).

This working group brings together various organizations with the goal of strengthening environmental education in Guatemala, promoting inter-institutional collaboration to maximize the impact of actions each entity develops in favor of conservation and the sustainable use of natural resources.

Through this strategic alliance, FLAAR Mesoamérica reaffirms its commitment to environmental awareness and education, contributing with its expertise in scientific outreach, visual documentation, and sustainability education. The goal of joining this platform is to develop joint programs, knowledge exchange, and initiatives that promote greater ecological awareness among the population. FLAAR Mesoamérica attended 6 meetings in 2024.

Capacitación de calidad total y preparación para gira en Europa

The FLAAR Mesoamérica team had the opportunity to participate in a Total Quality workshop, conducted by the Pro Verde Foundation. Over three sessions, we explored key topics such as total quality fundamentals, teamwork, effective communication, and the importance of designing a life plan.

Total Quality is a management approach that seeks continuous improvement in all processes within an organization. It is based on principles such as excellence, resource optimization, and collaborative work, ensuring each team member actively contributes to the success of the institution.

In addition to strengthening our professional skills, this training left a significant personal impact. We reflected not only on our work roles but also on the importance of personal development and how our personal goals can align with institutional growth. This workshop reaffirmed the importance of adopting a mindset of continuous improvement, not only in our daily tasks but also in how we work as a team and face new challenges within the organization.

As a result, the FLAAR Mesoamérica team experienced greater enthusiasm, participation, and commitment, promoting a more collaborative, dynamic, and efficient work environment. Additionally, it prepared the team for seeking new opportunities that benefit the organization's growth and the amplification of our projects.

Second edition of FLAAR Fest

FLAAR Fest is an event designed to share knowledge about the biodiversity of Guatemala and the Mesoamerican region, aiming to raise awareness of its importance and encourage conservation actions. In its second edition, held in June 2024, the festival adopted the theme "Descubre Mesoamérica", bringing together specialists, environmental institutions, and nature enthusiasts in a series of interactive and educational activities.

The event took place over three days, offering various learning and participation spaces:

- **Day 1 (June 28):** Conference series at Parque Las Américas Shopping Center from 9:00 a.m. to 3:00 p.m., featuring experts in biodiversity, conservation, and ecology.
- **Day 2 (June 29):** Activities at Naciones Unidas Park from 7:00 a.m. to 1:00 p.m., where attendees participated in workshops, interactive activities, and an exhibition fair with displays on fauna, flora, and conservation projects.
- **Day 3 (June 30):** Festival closing at the Sky Lounge of Parque Las Américas Shopping Center from 4:00 p.m. to 6:00 p.m., providing a space for idea exchange and networking among participants.

Attendees could register with a donation of Q150 for the entire event or Q50 per day, contributing to the funding of children's educational materials (MayanToons) and other FLAAR Mesoamérica projects. Additionally, those who attended all three days received a certificate of participation.

Results of the Second Edition

FLAAR Fest 2024 was well received, with a total of 91 participants. The majority of attendees were women and men between the ages of 18 and 35, with diverse academic backgrounds:

- 23 students or professionals in Agricultural, Environmental, or Forestry Engineering.
- 22 from other unspecified disciplines.
- 10 from Pharmaceutical Chemistry or Pure Sciences, mainly Biology.
- 7 from Pedagogy or Communication Sciences.
- 4 from Graphic Design or Architecture.
- 3 from various Engineering fields.
- 3 from Business Administration, Economics, or Marketing.
- 2 from Political Science or International Relations.
- 1 from Social Sciences.
- 1 from Veterinary Science.

The primary means of event promotion was social media, highlighting the impact of digital communication in promoting environmental education.

Documentary presentations

This year, FLAAR Mesoamérica produced two high-quality cinematographic documentaries to share the natural and cultural richness of Guatemala.

The first, "Ibagari in the Guatemalan Caribbean", is a 45-minute feature film that transports viewers to Livingston, Izabal, a region known for its impressive biodiversity and invaluable cultural heritage. Livingston is home to the Garífuna community, whose identity is reflected in their language, cuisine, and artistic expressions. This documentary invites reflection on the interconnection between nature, culture, and protected areas, as well as their impact on the daily lives of its inhabitants. The film has reached diverse audiences, being screened at the closing of FLAAR Fest, the Spanish Cultural Center in Guatemala City, La Nueva Fábrica in Antigua Guatemala, and various educational centers.

The second documentary, "Macaws", is a 20-minute short film highlighting the importance of these majestic birds in Mesoamerican culture. Despite being iconic regional symbols, macaws face serious threats due to habitat loss in tropical America. Although conservation efforts have shown positive progress, much remains to be done to ensure their survival. Through stunning visuals and an engaging narrative, this documentary immerses viewers in the fascinating world of macaws, emphasizing their role in ecosystems and the urgency of their protection.

The impact of "Macaws" has transcended borders, being selected for the Wildlife Conservation Film Festival and awarded the prestigious Gabriel Figueroa Mateos Award in the documentary direction category.

Both productions reflect our commitment to conservation, environmental education, and cultural heritage dissemination, using film as a tool to inspire awareness and action.

Participation in "noche murcielaguera"

Each year, La Asunción Ecological Park organizes the "noche murcielaguera" (bat night), an event dedicated to promoting bat conservation and awareness, emphasizing their essential role in ecosystems. Often misunderstood, these flying mammals play key roles in pest control, pollination, and seed dispersal, contributing to natural balance.

One of the most anticipated moments of the event is the live bat observation, coordinated by the Bat Conservation Program. Through a controlled and monitored capture, attendees get a unique opportunity to see different bat species up close, breaking myths and learning about their importance in biodiversity.

Additionally, the noche murcielaguera features a series of educational booths, where various institutions provide materials to enrich the public's experience. FLAAR Mesoamérica has participated in this initiative by designing infographics for MayanToons and screening a documentary filmed in El Zotz, a region recognized for its bat population and significance in bat research.

This event not only brings the community closer to the world of bats but also strengthens the commitment to environmental education and wildlife conservation, promoting respect and admiration for these guardians of the night.

Rafael Landivar Workshops at Rafael Landívar University

The FLAAR Mesoamérica team conducted an ethnoecology workshop for students from the Faculty of Environmental and Agricultural Sciences at Rafael Landívar University on August 6, 2024.

The workshop had two parts: a virtual conference and an ethnobotanical tour. In the first session, researcher Alejandra Valenzuela explained the concept of ethnoecology, its relationship with other ethnoscientific disciplines, and its focus on the cultural interaction between human societies and biological systems.

In the second part, researcher Sergio Jerez led an ethnobotanical tour through the university gardens, highlighting the local use of various native and endemic Guatemalan species, such as: Esquisúchil (*Bourreria huanita*), Ceiba (*Ceiba pentandra*), Canak (*Chiranthodendron pentadactylon*), Matasano (*Casimiroa edulis*) During the tour, students completed a questionnaire to reinforce their learning.

This workshop allowed FLAAR Mesoamérica to expand its impact on environmental and ethnobiological education, strengthening students' knowledge of the importance of local flora and its connection to Guatemalan culture.

Lectures for Symposia at Museums and Universities

Two of the most prominent Maya-focused symposia held at museums and universities in Guatemala are the annual Simposio de Investigaciones Arqueológicas en Guatemala and the Seminario Internacional de *Epigrafía Maya en Guatemala*.

The Simposio de Investigaciones Arqueológicas en Guatemala takes place at the newly redesigned Museo Nacional de Arqueología y Etnología (MUNAE) in Guatemala City. The 2024 theme was DE MESOAMÉRICA A AMÉRICA: EL PRIMER CONTACTO ENTRE LOS PUEBLOS ORIGINARIOS DE GUATEMALA Y LOS ESPAÑOLES. Given that Dr. Nicholas Hellmuth conducted ethnohistorical research in the archives of Spain decades ago—funded by a grant from the American Philosophical Society—and has worked extensively with the Archivo General de Centro América (AGCA) on the Cholti Lacandon of Chiapas and other Maya cultures of Petén, the 2024 topic was a perfect fit for his expertise.

Hellmuth delivered a lecture in Spanish, titled in English as: **Construction Materials for Native Maya Houses of Alta Verapaz: Besides Guano and Corozo, What Plants Were Used for Roof Thatch, and What Were Walls Built Of?** (Guarumo, Tanil, Bajareque). His presentation included full-color photographs of traditional Maya roof thatch, which are not available in any monograph or PhD dissertation on the subject. The PDF version of this lecture is available in English for free online.

Another highly regarded symposium in Guatemala is the *Seminario Internacional de Epigrafía Maya en Guatemala*. The seventh edition in 2024 was held at the Museo Popol Vuh, Universidad Francisco Marroquín, with an additional day at MUNAE. Hellmuth presented a lecture titled Iconografía y epigrafía de jeroglíficos de figura completa de Copán, Honduras (Iconography and Epigraphy of Full-Figure Hieroglyphs of Copán, Honduras).
Most Maya glyphs can be written in multiple ways, including as head variants (depicting the head of a bird, reptile, mammal, or deity) or as full-figure personified variants (showing the complete body of the animal or deity). This conference, organized by epigrapher Camilo Luin, curator of the Museo Popol Vuh, provided an opportunity to showcase new research on these elaborate hieroglyphic forms. The English version of the presentation is available online as a PDF: Full-Figure Personified Maya Hieroglyphs (Many with Tlaloc), Copán Temple 26.

To obtain high-quality close-up images of each full-figure hieroglyph, FLAAR Mesoamerica conducted two field trips to Copán, Honduras, in 2024. This effort ensured that the PowerPoint presentation and the PDF feature high-resolution macro photographs of exceptional digital quality. The final FLAAR Reports PDF is 108 pages long—the most extensive collection of full-figure Maya hieroglyphs available online to date.

For this project, FLAAR Mesoamerica transported a complete portable photography studio to Copán, including specialized soft lighting, tripods, and high-resolution digital cameras from Nikon, Canon, and Sony. All the photographs are best viewed in the PDF, which is available for download online.

Expanding Our Reach: Web & Social Media Impact

Web Team Key Achievements

Throughout 2024, the Web Team focused on optimizing and strengthening FLAAR's digital infrastructure. Significant improvements were made to website performance, security, and search engine visibility, ensuring a better user experience and increasing audience engagement. Efforts included CMS updates, SEO strategies, server optimization, and enhanced content management. Below are the key achievements of the year.

Key Achievements

1. **Website Optimization and Updates:** significant improvements were made to the structure and performance of the websites, including CMS updates in WordPress and Joomla, loading speed optimization, and resolution of technical issues.
2. **Web Security Enhancements:** Security patches, plugin updates, and constant monitoring were implemented to protect the websites against vulnerabilities and ensure system stability.
3. **Continuous Web Traffic and SEO Monitoring:** Through content optimization, data tracking in GA4 and Search Console, and improved SEO strategies, there was a notable increase in web traffic and search engine visibility.
4. **Efficient Content Management:** Numerous blogs, reports, and news articles were published, ensuring a continuous update of relevant content for the audience.
5. **Digital Infrastructure Optimization:** Server cleanup and optimization, removal of outdated backups, and improvements in cloud storage management were carried out to enhance performance and resource usage.
6. **Migration of Maya-Ethnobotany.org:** The Maya-Ethnobotany.org platform was migrated to a newer version of Joomla, featuring a modern and mobile-friendly design to improve security, reach, and search engine ranking.
7. **Coordination and Teamwork:** Internal communication was strengthened through regular meetings, project tracking with management tools, and collaboration with other departments to align objectives and improve operational efficiency.

Social Media Strategy Overview

In 2024, our social media strategy focused on developing content to diverse audiences interested in Mesoamerican flora, fauna, ecosystems and culture. By segmenting our audience and aligning content with their interests, we enhanced engagement, expanded our reach, and reinforced our education mission. Below is an overview of our key audience groups and the content strategy designed for each.

Audience Segmentation and Content strategy

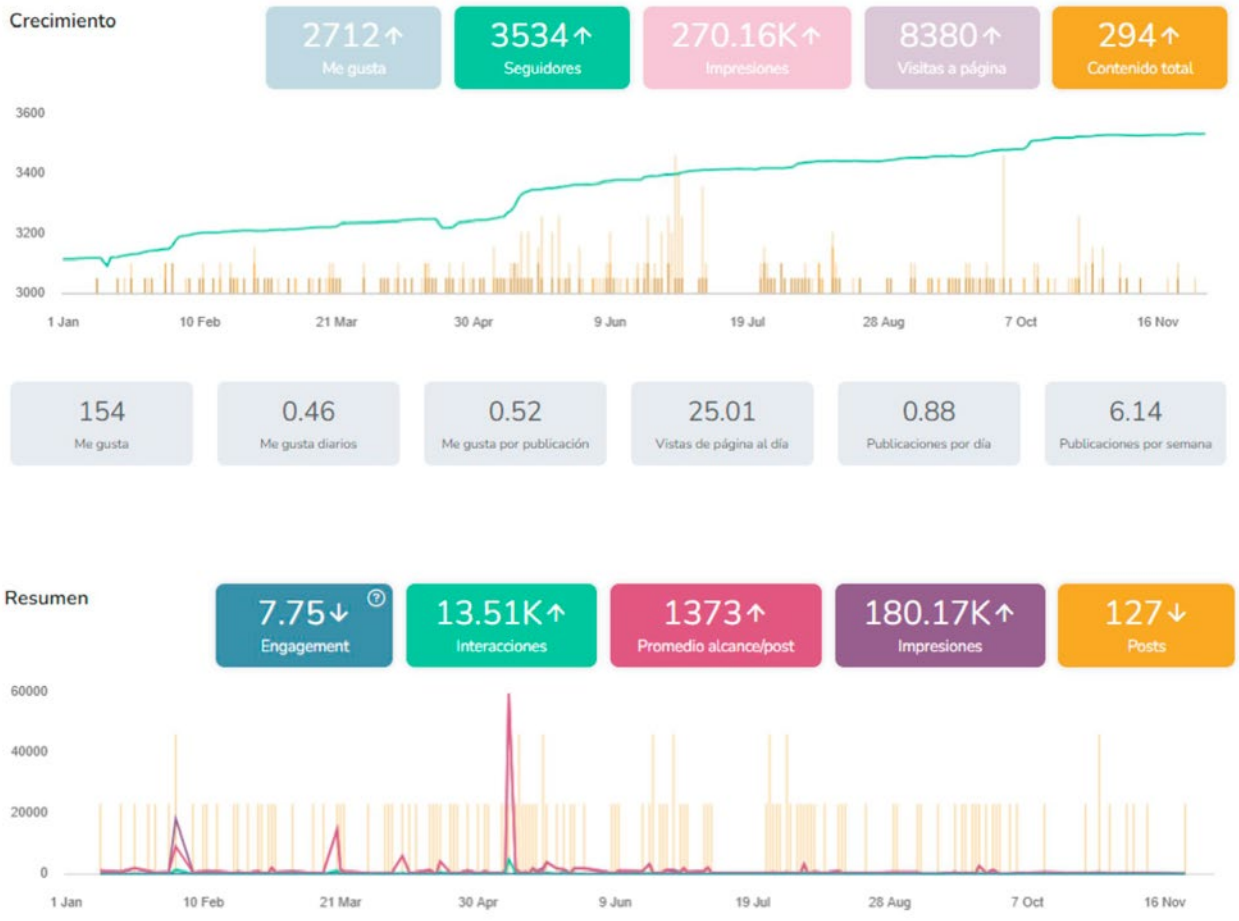
- **Academics:** Researchers, students, and university professors interested in Mesoamerican archaeology, history, anthropology, and information technologies.
  - ◊ Photo essays, blogs and new findings.
  - ◊ Collaboration opportunities.
  - ◊ Activities and events, especially conferences.
  - ◊ Documentaries.
  - ◊ Photos and videos on flora, fauna, ecosystems and culture with relevant information.
- **History Enthusiasts:** Individuals fascinated by ancient history, especially Mesoamerica and the Maya civilization.
  - ◊ Promotion of photo essays on archaeology topics.
  - ◊ Archaeological information.
- **Tourists:** Travelers eager to visit archaeological sites and learn about Mesoamerican culture. Travelers interested in outdoor experiences in Guatemala.
  - ◊ Recommendations of tourist places.
  - ◊ Outreach of unique flora, fauna and cultural practices in specific areas.
- **Students:** High school and college students with a passion for nature and culture.
  - ◊ Interactive learning materials.
  - ◊ Activities and events.
- **General Public:** Individuals interested in nature, culture and heritage without specialized knowledge.
  - ◊ Engaging visual content such as infographics, short videos, and reels.
  - ◊ Articles on different topics to learn more about biodiversity and culture.
  - ◊ Activities and events.

Platforms & Content Formats

To maximize impact, we leveraged multiple platforms based on audience preferences:

- **Facebook** for news, photos, videos, and community interaction.
- **Instagram** for visually engaging content and behind-the-scenes insights.
- **YouTube** for video documentaries and interviews.
- **TikTok** for creative and accessible storytelling aimed at younger audiences.
- **LinkedIn** for networking with academics and professionals in the field.
- **Blog** for in-depth articles and specialized research findings.

Facebook



Instagram


Crecimiento
3400
Seguidores
807
Siguiendo
654↑
Contenido total
3500
3000
2500
1 Jan
10 Feb
21 Mar
30 Apr
9 Jun
19 Jul
28 Aug
7 Oct
16 Nov
489
Seguidores
1.46
Seguidores diarios
0.75
Seguidores por publicación
5
Siguiendo
1.95
Publicaciones por día
13.67
Publicaciones por semana


Perfil
11.82K↑
Impresiones
273↑
Promedio alcance/día
250↓
Vistas del perfil
8↑
Clics en la web
16↓
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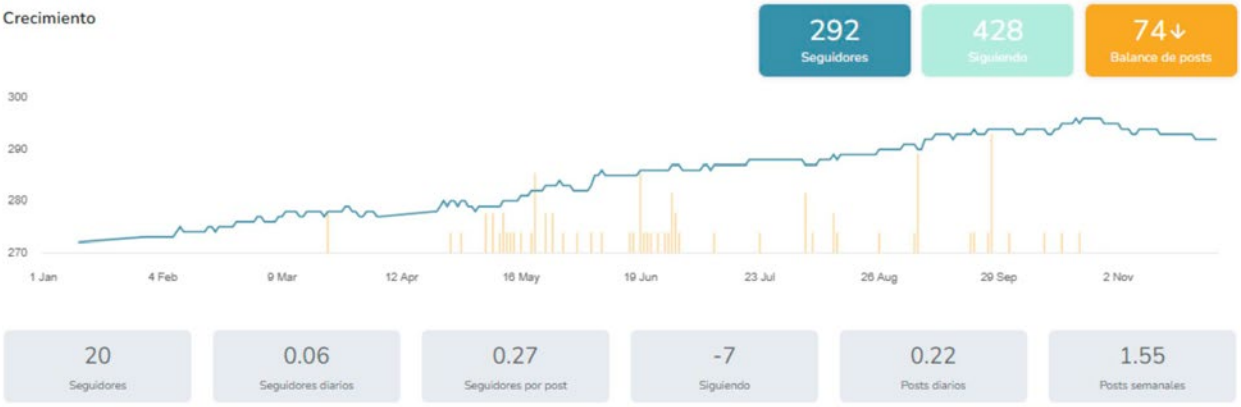
1 Nov
5 Nov
9 Nov
13 Nov
17 Nov
21 Nov
25 Nov
29 Nov

“X” / Twitter



LinkedIn

MayanToons

MayanToons is dedicated to creating educational books and animated videos for children, focusing on authentic representations of Mesoamerican flora, fauna, and ecosystems. Our approach ensures accuracy—so, for example, we do not depict monkeys eating bananas, as bananas were not present in the Maya region a thousand years ago.

In addition to storybooks and animations, the MayanToons team develops coloring books specifically designed for children, particularly those in rural communities. We extend our gratitude to the institutions mentioned below for their support in increasing our impact.

Educational material

Coloring Book: Exploring the Biodiversity of Parque Naciones Unidas

In partnership with Defensores de la Naturaleza, MayanToons developed a coloring book designed to help children and young people learn about the flora and fauna of Parque Naciones Unidas in a creative and interactive way. Through detailed illustrations, users can identify animal, insect, and plant species that inhabit the park, as well as locate their distribution on a world map. This material aims to inspire an interest in environmental conservation from an early age.

Biodiversity Passport: Discovering new native spacies

Also in collaboration with Defensores de la Naturaleza, this educational passport allows children to record the flora and fauna species they identify during their visits to Naciones Unidas Park. Inspired by a travel passport, each page includes information on native species, space for notes, and interactive activities that encourage observation and learning about Guatemalan biodiversity.

Fanzines and specialized materials

Fanzine and infographic: "Abronias de Guatemala"

In collaboration with **La Aurora Zoo**, these materials are dedicated to abronias (*Abronia spp.*), a group of arboreal lizards endemic to Mesoamerica. Their striking appearance, with shiny scales and colors ranging from green to turquoise, has made them a target of illegal wildlife trafficking, endangering their existence. This material explains their unique characteristics, their role in cloud forest ecosystems, and the threats they face due to deforestation and illegal capture.

Fanzine and infographic "Salvando el Océano"

Developed in collaboration with La Aurora Zoo, this material highlights the importance of marine conservation and oceanic biodiversity. Through illustrations and key facts, it explains how the oceans cover more than 70% of the planet, host an impressive diversity of life, and regulate the global climate. Additionally, it addresses current challenges such as pollution, overfishing, and the urgent need to expand marine protected areas.

Production and impact of the Materials

During 2024, MayanToons successfully printed 2,250 copies across different editions. These books were distributed as follows:

780 books were donated to schools in Petén and Izabal, benefiting hundreds of children with educational materials that strengthen their connection to local biodiversity.

A portion of the remaining copies will be sold at Sophos and La Nueva Fábrica to ensure the project's sustainability and continue producing new educational materials in the future. The rest will be distributed in other schools in Petén as part of our project in the Maya Biosphere Reserve.

Environmental and Educational Impact

The materials developed by MayanToons have played a key role in raising awareness among new generations about the importance of conserving Guatemala's ecosystems. From recognizing species in Naciones Unidas Park to protecting marine habitats, each material aims to increase environmental awareness and promote respect for nature in an engaging and accessible way.

Workshops

Character Creation Workshop and Exploration of Native Orchids of Guatemala at Vértice Festival 2024 in Rafael Landivar University

In October 2024, a character design workshop was held as part of the Vértice 2024 Festival, hosted at Rafael Landívar University (URL) and its Landívar Orchidarium in Guatemala City by Isabel Trejo of the MayanToons team and Sergio Jerez of the Research team of FLAAR Mesoamérica.

This event brought together Graphic Design students, who shared their creative processes and projects in development, focusing on Guatemala's flora and fauna, particularly the country's native orchids.

The workshop began with a talk by members of the MayanToons and FLAAR Mesoamerica teams, who shared their experiences and methodologies in character design. They explained how they drew inspiration from Maya culture, local biodiversity, and natural elements to develop their projects. Through their creations, they demonstrated how cultural and natural elements can serve as starting points for generating unique and representative characters.

Following this, Byron, one of the team members, gave an informative talk about the biodiversity of Guatemala's native orchids. He explained their vital role in the local ecosystem and emphasized the importance of their conservation to preserve the country's biodiversity. He highlighted the symbiotic relationships orchids maintain with other species and how their growth depends on specific environmental factors.

After the talks, participants took a guided walk to the Landívar Orchidarium, which houses a collection of over 200 orchid species. Located on the university's central campus, this orchidarium aims to promote knowledge and conservation of Guatemala's orchids. During the walk, students observed different species, learned to differentiate them from other flowers, and gained insight into how environmental conditions influence their development. They also discussed the ecological importance of orchids and their symbiotic relationships within their habitat.

Back in the classroom, students began the workshop's main activity: character creation. Using their creativity, they developed stories and detailed profiles for characters inspired by Guatemala's native orchids. Each student chose a design technique they found suitable for their creation, and collaboratively, they produced characters that reflected both Guatemala's cultural richness and the natural beauty of its orchids.

The workshop not only allowed students to learn about local biodiversity but also encouraged them to integrate this knowledge artistically into their design projects. The combination of cultural inspiration and direct observation of nature resulted in the creation of innovative characters deeply connected to Guatemala's natural environment.








Appreciation to FLAAR Board Member, Nancy Dwyer

Nancy Dwyer and Joseph Dwyer have generously supported FLAAR in numerous ways over the years. In fact, when Hellmuth first used a computer—a Kaypro from decades ago—it was Joseph Dwyer, then under 10 years old, who taught him how to operate it. Today, Joseph Dwyer is an expert in digital equipment and software.

For 2025 and beyond, Nancy Dwyer will oversee FLAAR's accounts and manage grants from FLAAR (USA) to FLAAR Mesoamérica (Guatemala). Given the team's extensive experience in flora, fauna, biodiverse ecosystems, iconography, and now epigraphy, sustaining ongoing research, fieldwork, and the production of FLAAR Reports remains a key priority.

Appreciation for the Investment Team

We also extend our gratitude to the Investment Team, whose efforts provide the monthly returns that fund the majority of our research.

In past years, we sought advice from friends on where to find a secure and trustworthy investment firm—one with integrity and transparency. This search was crucial after experiencing excessive fees and poor results from the investment department of a previous bank. Thanks to the guidance of several individuals in the USA, we found a reliable and ethical investment company that has provided steady support every month, every year. Their assistance has been invaluable, and we sincerely appreciate their commitment.

Additionally, having a dependable investment firm has allowed benefactors to donate stock, offering them a more favorable tax deduction compared to traditional monetary donations.

Donation of the FLAAR Photo Archive by Nicholas Hellmuth and FLAAR to the Dumbarton Oaks, Image and Archival Collections, Trustees for Harvard University, Washington, DC (Noviembre, 2024)

For several decades Dumbarton Oaks, Image and Archival Collections, Trustees for Harvard University, Washington, DC has had about 10,000 35mm color slides and about 5,000 black-and-white negatives of photographs by Nicholas Hellmuth mainly from the 1980's. **Between September-October 2024, FLAAR donated the entire FLAAR Photo Archive, 1960's-1990's,** of color and black-and-white 35mm, medium format, and large format film to Dumbarton Oaks. We appreciate Dumbarton Oaks covering the cost of shipping the entire 124 boxes of circa 2-tons of negatives, slides, contact sheets, photos and prints from Missouri to Washington, D.C. during November 2024. The donation process started in September when Dr Mary Miller, Getty Research Institute, suggested that Dumbarton Oaks would be the best place to donate the FLAAR Photo Archive since they already have the thousands of rollouts and photos from Justin Kerr.

This donation is to make the images available of decades of photography in museums around the world and at sites across Mesoamerica to students for theses and dissertations, and to epigraphers, iconographers, and other archaeologists for their scholarly research and classroom PowerPoint presentations plus presentations at symposiums around the world.

We thank Nancy Dwyer and her son and friend who helped prepare the tons of archival material for the truck to transport to Dumbarton Oaks. We thank Camila Morales, Edwin Solares, and Vivian Hurtado for sorting and packing the 124 boxes to prepare the donation shipment. We also thank Camila Morales for assisting the FLAAR Photo Archive literally for decades, scanning thousands of the slides so that FLAAR Reports can be prepared on each topic: iconography of armadillos in Maya art, iconography of peccary in Maya art, iconography of deer, iconography of monkeys, iconography of the Bufo Toad, iconography of insects, etc.

The FLAAR Photo Archive consists of two segments: monumental Maya architecture and Maya art. The architecture component covers primarily Puuc, Chenes, and Rio Bec style pyramids, temples, palaces and ballcourts but also monumental architecture of the Central Maya Lowlands. The other great photo archives of Maya architecture are those of the Carnegie Institution of Washington (at the Peabody Museum, Harvard), and the years of photography field work by architectural historian George Andrews (at University of Texas at Austin - Alexander Architectural Archive) and decades of Maya architectural research by Paul Gendrop (photos we estimate are archived in Mexico). The advantage of the architectural photos by Nicholas Hellmuth are: a sturdy tripod was used, plus for inside photos and also for facades hidden in the shade of trees, portable lighting was used. Plus at least half the architectural photos are with a medium-format Hasselblad camera with Zeiss lenses. Although the three other architectural archives may be larger, the FLAAR archive has views not available from any earlier photographer and noticeably better lighting. So for a student doing a thesis or PhD dissertation, or for an

architectural historian, it is essential to have available the new archive at Dumbarton Oaks in addition to the other excellent photo archives of Maya architecture by CIW, George Andrews and Paul Gendrop. The FLAAR Photo Archive has photographs of Tzikin Tzakan in Peten and Dzibanche, Quintana Roo. The Hellmuth photos inside a Dzibanche building show one of the few monumental Maya temples or palaces that had a wooden ceiling—that was still preserved when Hellmuth took the photos a quarter-century ago.

The Hellmuth photos of Maya ceramic art and associated artifacts are well known and are a helpful educational asset to have in the same physical location as the Justin Kerr photo archive. The Hellmuth photos obviously need to be organized, scanned, cataloged, and made available in digital format. This will obviously take several years and during these years Hellmuth is working on photo essays to show image-by-image for selected Maya deities, for fauna in Maya art, and other comparable iconographic topics. These FLAAR Reports are to assist the team at Dumbarton Oaks to have accurate and accepted nomenclature for many of the deities and fauna in Classic Maya art. Not many iconographers have worked as many years studying actual birds, actual felines, actual snakes, actual insects so these species can be recognized and documented in Classic Maya art.

Another advantage of the architectural segment of the Hellmuth photos is that they document several buildings in the previous century that collapsed in recent years, so are no longer available to photograph.

Since Ian Graham and his colleagues of the CMHI at PMAE, Harvard and also Karl Herbert Mayer focused on photographing Maya stelae, altars, lintels, etc. the FLAAR Photo Archive is primarily ceramic artifacts, but does include stelae and hieroglyphs at Nim Li Punit, Belize. Plus Hellmuth was keen to find and photograph as many sculptures as possible that showed the Maya ballgame, so he photographed these literally around the world.

The current donation is the traditional film archive; as soon as we catalog the digital era photos, taken with digital cameras, and with a digital rollout camera, we will work out donating these digital images also to Dumbarton Oaks.
For epigraphers the Hellmuth photos include up to a thousand 35mm 1:1 macro close-up views of each individual hieroglyph of dozens of Primary Standard Sequence dedicatory inscriptions on vases, bowls, and plates. Some of these glyphs were photographed at medium format size with a Hasselblad. The idea is to assist epigraphers to have material to literally rewrite knowledge of the PSS dedicatory inscriptions. It is essential for epigraphers that they now have photos of good resolution for each individual hieroglyph of scores of PSSequences.

For iconographers there are close-up macro photos of headdresses and other key aspects of complex mythical and historical scenes on Maya vases, bowls, and plates.

Although the archive is primarily Maya topics, it also includes the most extensive photography of Costa Sur area ceramics of the Early Classic, ceramics on trade routes from Teotihuacan and Oaxaca through Guatemala to Costa Rica. There are mythical personages pictured in this corpus, such as Curly Face and the

other two personages of the Tiquisate Trinity, that document cultural exchanges between the Zapotecs, Tiquisate area, and Peten. And obviously there is a lot of Teotihuacan symbolism on these cylindrical tripods and incense burners.

Hellmuth and FLAAR are also working on finding all 1970's-1990's iconographic reports and architectural publications (such as on Santa Rosa Xtampak) and scanning each document to make available as a PDF. There are between 4,000 and 5,000 pages of these research reports from these decades. On the Maya ballgame iconography there are about a dozen FLAAR publications from the 1970's through 1990's that total over 2,300 pages. We are working to scan all these and make them available as PDFs for easy downloads

Objectives and Work Plan for 2025

For 2025, FLAAR USA and FLAAR Mesoamérica (Guatemala) have set a series of strategic objectives to diversify its funding sources, strengthen its team's capacities, increase its visibility, and consolidate its research and communication projects. Through various strategies, the organization aims to ensure its sustainability and enhance the impact of its initiatives.

We are organizing a new Board of Directors for FLAAR Mesoamerica to feature experts in various aspects of research and management since it is valuable to have innovative ideas from different people that have decades of experience in their fields.

One of the main objectives is to diversify funding sources to execute new projects and ensure the organization's long-term sustainability. A fund-raising trip to Europe is planned for March to present projects to potential donors. Additionally, calls for national and international grants will be identified, and new strategic partnerships will be sought with other organizations to strengthen capabilities and ensure greater impact in their activities.
Another key focus is training the FLAAR Mesoamérica team. A diagnostic will be carried out through surveys and meetings with coordinators to identify priority training areas. Once these areas are determined, experts will be contacted or virtual training opportunities will be explored. This will help strengthen staff capabilities and improve performance in their respective areas of work.

The organization also aims to increase its visibility and positioning through updating and revitalizing its websites and social media. User interaction will be encouraged, and partnerships with organizations and media outlets previously collaborated with will be strengthened to expand the dissemination of FLAAR Mesoamérica's projects and content. At the same time, new strategic alliances with other media will be sought to increase the organization's reach.

In the research field, studies aligned with FLAAR Mesoamérica's mission will be promoted, utilizing available resources. In the first quarter of the year, research opportunities and problems will be identified through a SWOT analysis of the team. Expected outcomes will be defined, and the most suitable methodology will be chosen to develop the studies. Efforts will also be made to secure funding for these initiatives through monthly planning and follow-up meetings and establishing partnerships with universities and other key stakeholders.

Another challenge for 2025 will be improving content planning and production for social media. A working structure will be established to deliver materials one month in advance, streamlining publication times and ensuring a more efficient communication strategy. Planned content includes a monthly reel for social media, a monthly blog, and a video similar to Animalogic during the first half of the year.

The Mayan Toons project will also have an active agenda in 2025, integrating into the fundraising tour in Europe, resuming monthly team meetings, and participating in strategic events. Additionally, partnerships will be strengthened and expanded to enhance the dissemination and impact of the projects. Regarding production, the book "Buscando

Plantas Medicinales para la Abuela" will be officially launched, animated episodes will be translated and published, and new books and audiobooks will be produced.

In design and social media, publishing times will be optimized through bi-weekly reviews of scheduled content. The number of shared images will be increased, and the workflow in Notion will be strengthened. Furthermore, a key date schedule will be established for publishing content related to flora and fauna, ensuring better alignment with the organization's communication strategy. Specific objectives have been set for each social media platform, such as increasing followers, improving engagement, and optimizing user interaction.

On the web front, platform functionality and security will be ensured through a periodic update schedule for Joomla, WordPress, and its components. Monitoring tools will be implemented to detect vulnerabilities, and regular backups will be made. Additionally, process manuals will be updated, and obsolete platforms will be merged to improve operational efficiency. Efforts will also focus on optimizing mass email campaigns through segmentation strategies and personalized content.

In audiovisual production, the tour for screening the macaw documentary will continue in various venues, including a presentation in Honduras with the support of IHAH and Macaw Mountain, and a screening at the Centro Cultural de España. The documentary on mangroves will also be finalized and distributed, registered for international festivals, and screened in collaboration with strategic allies. Additionally, new documentary projects will be developed, such as a video on cacao and a video on palm. Efforts will also focus on reactivating the YouTube channel with the production of educational and outreach content.

With these initiatives, FLAAR USA and FLAAR Mesoamérica are preparing for 2025 focused on consolidating our funding model, strengthening its team, and expanding its impact on research, communication, and the conservation of the region's natural and cultural heritage.

Expanding Conservation Research with Advanced Drone Technology

A high-quality drone is essential for all field work

We began using a drone several years ago to document the *Ceiba pentandra* tree, the national tree of Guatemala, because this tree is so high that a photo from the ground is distorted. We also found that a drone was helpful to document the kind of plants used to thatch Maya houses in really remote areas—we had found houses thatched with heliconia leaves, plant thatch in remote areas of the Maya Highlands not pictured in any book or dissertation on traditional Maya house architecture (because no researcher has visited these remote areas). Since we did not own a drone in those years we hired drone operators. But every drone that they had were too wide-angle—like GoPro cameras (for hikers and bikers to record weekend adventures). And all the cameras were low resolution. So we researched and found that the Mavic 2pro had the quality that would be much much better. Then when the Mavic 3 came out we acquired one—it captures professional quality photographs.

These better-than-average drone cameras allowed us to document remote biodiverse ecosystems in the Reserva de la Biosfera Maya that were so far away that no professor or even student had ever hiked anywhere near. We thank Joseph and Nancy Dwyer for the helpful donation that facilitated our purchase of the high-resolution drone. They and their son came along on a FLAAR research field trip all the way to the remote Savanna East of Nakum to experience what it's like to see parts of a rain forest that not many other people have seen in person. In the 1970's-1990's many benefactors covered their own costs and the field trip expenses—so that they could see how their donation was helping scientific research in remote areas.

Now that the Mavic 4 and Mavic 4pro will be available later in 2025, we would appreciate a tax deductible donation to make it possible for us to purchase that. Plus there are multi-spectral drones that can map each species of plant that is in an area—this would be a super asset to our on-going field work documentation of biodiverse ecosystems in remote areas of the Maya Biosphere Reserve area of Peten, Guatemala. For example, it would be great to be able to map all plant species within each grassland savanna in Parque Nacional Yaxha, Nakum and Naranjo (PNYNN) and all the tasiste savannas within Parque Nacional Laguna de Tigre (PNLT). Plus, for our project Palm Paradise Peten we would like to map how many kinds of palm trees are in a corozera or a escobal "island" within a bajo or forest. These are literally islands of solid palm trees—often 80% just palms—of several species. So when you stand there, all you see is solid palms so thick you can hardly imagine such a rain forest—not shown on any TV documentary.

Drone photos
of Savanna East of Nakum

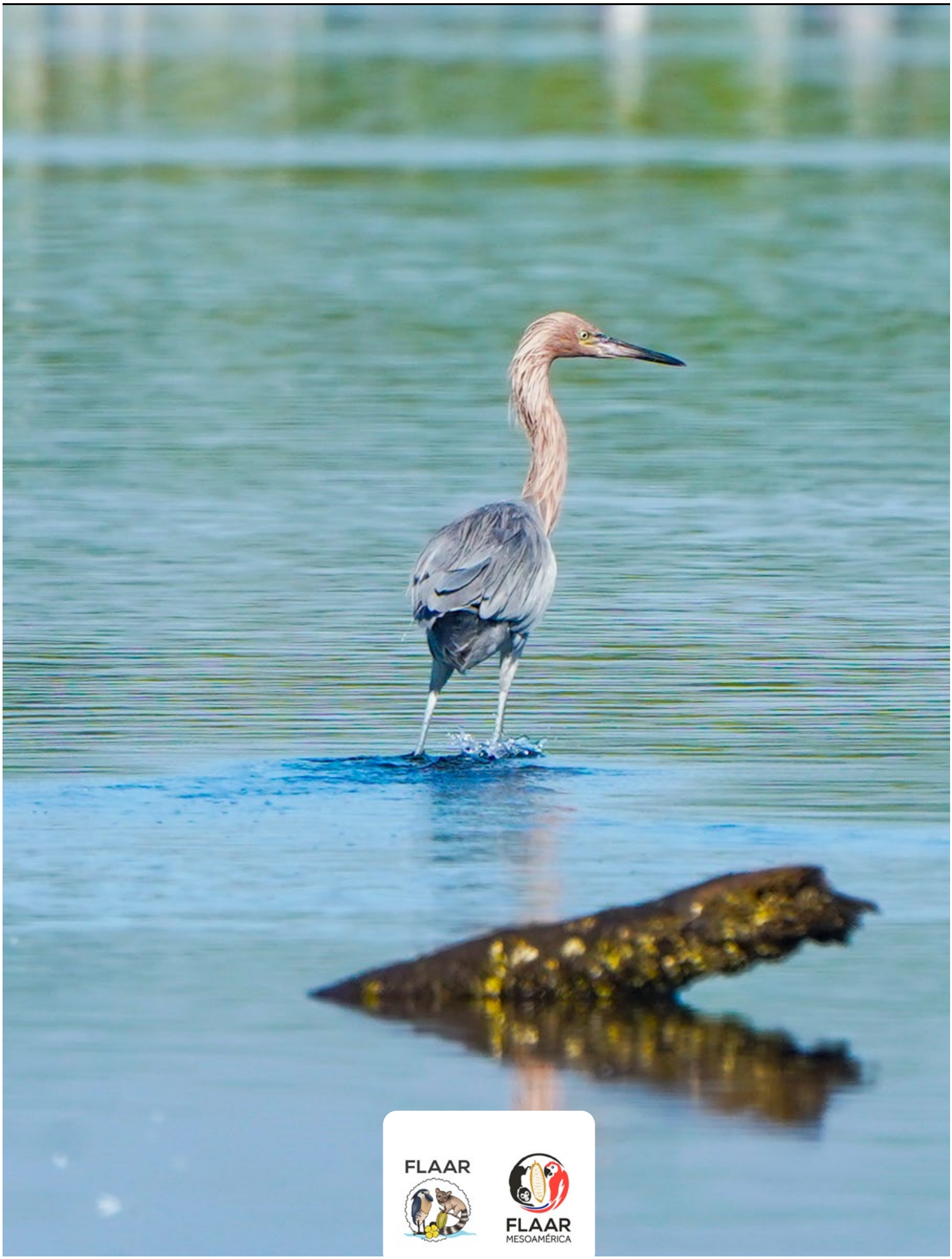
Corozera between
Yaxha and Nakum

These show samples of drone photos from recent field trips—without having a multi-spectral drone camera and without yet having a Mavic 4 or 4pro. We can achieve much better photos with newer drone camera technology.

We thank the drone pilots of recent years and 2024 for their ability to achieve helpful aerial photography so that we can prepare FLAAR Reports to show biologists, ecologists, and archaeologists what is available for them to study on their own future research projects.
Haniel Lopez, Emmanuel Chocooj, Brandon Hidalgo, and currently Edwin Solares

Panorama Photography

On every field trip in recent years, especially for the project of cooperation and coordination with CONAP for the Reserve de la Biosfera Maya of the north half of Peten, Guatemala, we have accomplished high quality panorama photos using an iPhone and occasionally a Google Pixel Phone. A panorama view is absolutely essential for documenting a biodiverse ecosystem.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