



Flora & Biodiverse Wetlands Ecosystems of Municipio de Livingston, Izabal, Guatemala

Introduction
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FLAAR
MESOAMÉRICA



Aspects of Flora and Ecosystems of Interest

Wetlands

(swamps, marshes, riversides, sides of lagoons, coastal areas)

Río Dulce, El Golfete, Cañón de Río Dulce, Bahía de Amatique

Summary of Proyecto FLAAR Mesoamerica with the Municipio de Livingston, Izabal, Guatemala
Feb-Mar 2020, Oct-Nov-Dec 2020, and January through December 2021

TOPICS MENTIONED IN THE FOLLOWING PAGES OF THIS PPTX:

Cauliflorous and Ramiflorous Trees of the Municipio de Livingston

Trees that can throw off their entire bark layer to get rid of encircling vines

Trees with conical spines on their trunk (more than just *Ceiba*)

Trees with impressive flowers: *Pachira aquatica* and *Pseudobombax ellipticum*

Wild plants of wetlands that are edible

Wetlands are essential ecosystems to study: 1: coastal ecosystems



Bahía de Amatique, “Caribbean” coast of Izabal area of Guatemala. FLAAR drone photo by Haniel Lopez.

Wetlands are helpful to study in-person: 2: marshes and riversides



Riverside marsh of El Golfete – Río Cáliz

**It helps to get away from your office to learn in-person:
Edges of Rivers have notable species.**



Río Chocón Machacas enters north side of El Golfete. FLAAR drone, photo by Haniel Lopez.
I estimate we went up each river an average of 3 times during the project (different trees flower).

Aerial photos are essential. Need registered drone and experienced full-time pilot:

Marshes (wetlands with few trees)



Coast, then inland marsh, then swamp (the part with trees). Tapón Creek – Aldea Buena. Vista



Edible Plants of the Municipio de Livingston

We are dedicated to learn which wild plants, native to Guatemala, are edible. “Edible” does not require that people in Guatemala today still eat these wild plants. Edible means that the same species is eaten elsewhere in the Americas or anywhere in the world)

More than 80% of the wild edible plants are no longer eaten because local people prefer chemical flavorings, excess sweeteners, salt, and all the other unhealthy ingredients that make junk food so desired today (these are the foods and bottled drinks that produce Diabetes 2 and rot your teeth).

In order to show that wild native alternatives exist we have done library research for over a decade, assisted by university students Marcella Sarti, Cristian Garcia, Vivian Hurtado and presently by Belén Chacón.

Realizing that the majority of the Municipio de Livingston are wetlands: riversides, sides of lagoons, marshes and swamps, for our project here I have focused on learning which plants are edible.

This focus is also helpful because thousands of years before “Classic” Maya culture was developed, there were already people living along the coast and inland. This is before Maya maize was readily available. So local people in these early times had dozens of local wild plants available (plus crabs, fish, etc.)

Edible Plants of the Municipio de Livingston, Izabal, Guatemala

This is a tabulation of long-range work-in-progress of figuring out which plants of which kinds of wetland is edible. Then finding and photographing each species.

Edible Wetlands Plants of Municipio de Livingston, Izabal Wetland Series 1: from Swamps, Marshes and Seasonally Inundated Flatlands of Izabal



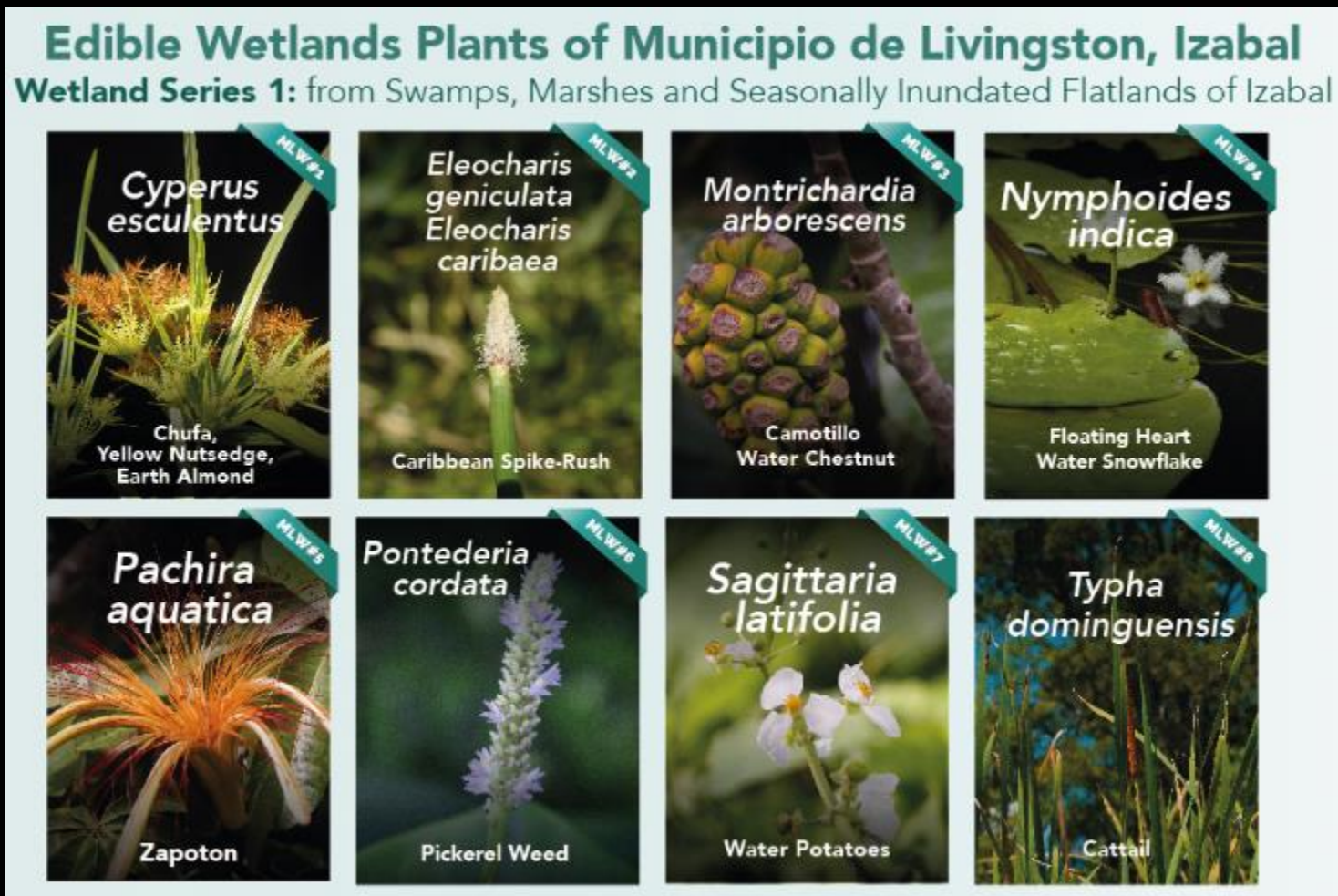
Wetland Series 2: plants that grow along the beach shore of Amatique Bay



Wetland Series 3: plants that grow alongside water: rivers, lagoons, swamps, or ocean

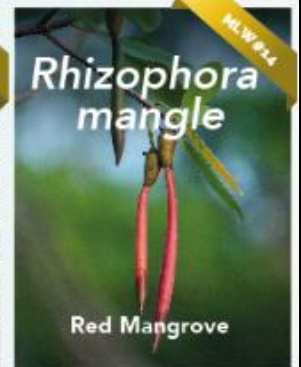
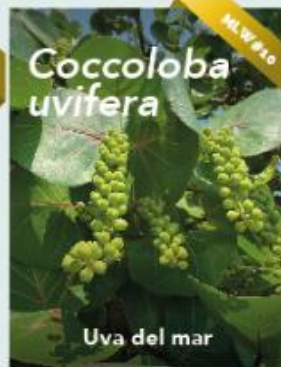


Front covers of work-in-progress on edible plants of swamps, marshes, and seasonally inundated flatlands of the Municipio de Livingston



Edible plants that grow either along the actual sand beaches or inland a few meters in areas that are flooded during storms.

Wetland Series 2: plants that grow along the beach shore of Amatique Bay



Edible wild plants that grow along the edge of creeks, rivers, lakes, lagoons, or swamps, Municipio de Livingston

Wetland Series 3: plants that grow alongside water: rivers, lagoons, swamps, or ocean



Montrichardia arborescens is an Aroid, family Araceae. Looks like a philodendron vine until you see it actually growing; then you realize it is really a tree. Playa Blanca, Municipio de Livingston. Very common along edges of marshes or swamps.



It is amazing the quantity of plants, native to marshes, that are edible. Río Chocón Machacas, Municipio de Livingston. Almost 50% of this marsh is solid wild edible plants.



The fruit of this flower, *Passiflora biflora*, is potentially edible. Rio Chocon Machacas, Municipio de Livingston, Photo by Nicholas Hellmuth with Nikon D810 camera, sun as backlighting plus flash from the front, September 6, 2021.





Lots of trees and plants that grow along the edges of rivers, lagoons, swamps and marshes have edible parts. Here is *Inga vera* flower and mature (now dry) seed pods. Photo by Nicholas Hellmuth, Rio Chocon Machacas, Municipio de Livingston, September 6, 2021.



Almost everything in this part of a typical swamp has edible parts. This swamp is along the shore of Lagunita Creek, Municipio de Livingston, Izabal, Guatemala. October 7. 2021. You can see the water in front of you. When it rains the water level rises over a meter. Confra palm, *Manicaria saccifera* is found only near the sea or in brackish water. *Acoelorrhapha wrightii*, tasiste palm, is found only along edges of rivers and lagoons in this part of Guatemala. This palm can handle brackish water. In Peten this palm is only found in seasonally inundated savannas, associated with *Crescentia cujete* and other savanna plants. In Peten tasiste palm does not grow along the edges of rivers or lagoons; and obviously has no brackish water.



To learn about, to study, to find edible wild plants in swamps and marshes, the Municipio de Livingston is a place that we recommend for botanists, ecologists, zoologists, for in-depth studies. And also for students to accomplish field work for their MS theses or PhD dissertation. Plus these areas are so bio-diverse that people interested in Neotropical plants should consider adding the Municipio de Livingston to their "we will visit here" list.

Acrostichum aureum, leather fern, has edible parts. Creek Blanco, Municipio de Livingston, Izabal, Guatemala. Photo by Nicholas Hellmuth.



Spathiphyllum blandum, gushnay, grows wild in humid areas of the Municipio de Livingston (and other humid parts of Guatemala). Parts are edible.



Most of these wetlands plants have edible parts, especially here, *Pontedaria cordata*. Good view of a marsh; lots of swamps nearby. Rio Pedernales, Rio Dulce, Municipio de Livingston.

Pontedaria cordata is one of several plants that are very common along the edges of rivers, lagoons, marshes, in many areas of the east half of the Municipio de Livingston, where rivers flow into Río Dulce and flow into El Golfete.



Sagittaria latifolia can be found in many wetlands of the Municipio de Livingston, and in wetlands elsewhere in Guatemala. Parts of this marsh and swamp edge plant are edible. You can find *Sagittaria latifolia* in front of the bungalow where we stayed in the Hotel Marina Tortugal, along the edge of Rio Dulce/Lake Izabal.



Several of the plants in this area near mangrove swamps are edible; the most obvious one is *Acoelorrhaphe wrightii*, Tasiste palm. Rio Sarstun, Laguna Grande, Municipio de Livingston.

But do not eat any part of these white water lily plants! They were the #1 flowering plant featured for many centuries in the art (and festivals) of the Classic Maya.

This brief resume was a 15 minute presentation on March 17th, 2022 (for 17 weeks of fieldwork). We worked an average of one-week out in the field per-month; plus the time to prepare each field trip; plus the time to process all the digital photos, to find the names for as many of the plants as possible, etc.

The results of our project was learning that lots of wild plants of the wetlands are edible. You do not need to cultivate them. These are native and grow by themselves in the wetlands.

Many of these same plants also flourish in the wetlands of the Reserva de la Biosfera Maya (RBM) in Peten. Obviously plants such as confra palm that need salt water or at least brackish water; so do not grow far inland.

The advantages of doing field work in the Municipio de Livingston is that you don't need 4WD with mud-tires to reach your study area: you simply sit in a motor boat that takes you up every creek, up every river that traverses the swamps and marches. All the lagoons are accessible by lancha. Plus you have shade over your head (on the boat).

What we have shown in this brief summary of 17-weeks of field work, an average of one week per month, is that dozens of wild plants of the wetlands of the Municipio de Livingston are edible. All these plants were available to the Maya: no need to farm them: they are native and grow all over the wetlands. Many of these same plants were available to the Classic Maya of Peten. But since wetlands of the Municipio de Livingston are easier to reach (by motor boat), this is a good place that we recommend for botanists, ethnobotanists and ecologists to come to the Municipio de Livingston for your own field work research projects.



The previous page shows the Beach Spider Lily, probably *Hymenocallis littoralis*. This is another very common wetlands plant. You find this along the coast (facing Amatique Bay). You find this along rivers and lagoons. We find the same plant in savannas of the Reserva de la Biosfera Maya, Peten. (we found one savanna in PNLT that had so many white spider lilies flowering and fruiting that we named this “White Spider Lily Savanna.” Google that and you will find it.

Here are the seed pods (in Izabal).

Like most wetlands plants, parts of this white spider lily plant are edible.

In some wetland plants it's the roots; others it's the seeds; others it's the entire fruit.



Personal curiosity: I like to learn new things; here, to learn how many trees evolved the ability to throw off their own bark to try to get rid of vines (and lichen).



Bursera simaruba – Palo de jiote





Guettarda combsii, Guayabillo

Over ONE METER of the bark of this Guayabillo tree has been thrown off by the tree, trying to get rid of the vine, *Monstera tuberculata*.



This species of tree has no way to throw off the vines. It has other ways to survive.



Some tree trunks are totally covered by vines or lianas.



Guettarda combsii, Guayabillo working to throw off lichen and vines (is not always fully successful).

This tree is common on hillsides of areas of the Municipio de Livingston.



What thrives on tree and palm trunks would make a great MS thesis or PhD dissertation.

Another personal curiosity: size and shape differences in buttress roots.

Buttress roots are especially common in areas of muddy soil such as wetlands.

The remarkably photogenic roots of mangrove trees are well known. The buttress roots of *Ceiba pentandra* (that do not grow in most swamps) are also well known. So we are working to find all the additional species of trees with buttress roots, such as here.



Pachira aquatica trees, zapoton, have roots of different kinds, sizes, and shapes

Pachira aquatica is a relative of *Ceiba pentandra*, *Pseudobombax ellipticum* and *Quararibea funebris*. *Pachira aquatica* is very common along the sides of rivers, especially in swamps.

Pachira aquatica has rounded buttress roots that we show in a new book we are preparing on this tree. In the photo at the right we show the adventitious roots that you see as you traverse swamps by means of the rivers and creeks that flow through the swamps.




The flowers of *Pachira aquatica* and the flowers of relative *Pseudobombax* I consider as the most beautiful individual tree flowers of Guatemala and Mesoamerica.



Flowers of *Pachira aquatica* are visible most (but not all) months of the year, along Río Dulce, El Golfete and the majority of the creeks and rivers that flow into Río Dulce and El Golfete



The *Pseudobombax* flowers that are native to the Municipio de Livingston are all White. The *Pseudobombax* of intense deep pink-red are found around Ciudad Vieja and Antigua Guatemala.



Curiosity: how many trees have developed conical spines (prickles) to make sure that animals can't climb up their trunk to eat leaves or fruits of this species

Ceiba pentandra is the best known tree with conical spines. The botanical word is prickles. We have found prickles on the close relative *Ceiba aesculifolia* with spines almost 5 centimeters long (bosque seco area parallel to highway CA-9).

In wet areas (not necessarily in swamps or along rivers) we find species of *Zanthoxylum* and other trees with spines in patterns different than *Ceiba*.

I am working towards preparing an entire conference presentation to show all the sizes, shapes, patterns of prickles and spines on trees and also on palms, plus on thick woody vines (some of their woody spines curl and coil at their ends). So a lot more to come.

***Zanthoxylum* spines are “conical” but a tad flattened on top and bottom. But they come in very diverse sizes, shapes and patterns.**



Zanthoxylum sp.



Lacmellea species, probably *L. standleyi*.

This tree is known as lechemiel because of the sweet latex that you can drink out of the trunk.

If I had been a Classic Maya ruler or high priest thousands of years ago, I would want to drink nectar of *Ceiba*, *Pachira*, and *Pseudo-bombax* flowers, and latex of *Lacmellea standleyi*. (I have taste-tested the latex of lechemiel and the nectar of *Ceiba pentandra*). These are so tasty you don't need any drugs (the nectar and lechemiel are not hallucinogenic; we do not taste-test drugs). Warning: lechemiel is the strongest natural glue I have ever touched)



Pithecellobium sp. You find these in seasonally inundated bajos and other ecosystems.

Cauliflorous: trees that flower from the trunk.

The most common tree that flowers from its trunk along rivers and lakes is *Grias cauliflora*. Thousands of these trees grow in the swamps along rivers that feed into El Golfete (and along the edge of Rio Dulce and El Golfete and Canyon Rio Dulce).



Local people said it flowered in April, 2021. But when we arrived in April we learned that the 99% of the flowers from the trunk had already fallen off. We could only one flower on one trunk and a few flowers on limbs. So we need to return earlier.

Zygia sp. Is a tree species that I was not aware of until I spent a week every month hiking through rain forests of nature reserves in the Municipio de Livingston.

Subsequently we have found other *Zygia* species in the Reserva de la Biosfera Maya (RBM) in Peten.





The fruits of this tree grow directly from the main trunk (and obviously the flowers several months before were also cauliflorous). Reserva Lagunita Creek nature reserve, July 2, 2021. Photo by Nicholas Hellmuth.

Ramiflorous: trees that flower from limbs and branches

We found one large low tree with scores of flowers on the limbs and trunks atop a hill overlooking the outside of the town of Livingston. This hill is part of “Where the Pirates Hide.”



Bellucia pentamera



Since no funding was available at the start of the year 2021 project, we sincerely appreciate when hotels kindly provide our team with complimentary lodging. So we thank Daphne Becker, owner of the Tortugal hotel and marina for providing a comfortable place for our team for two different field trips to this part of Lake Izabal and Rio Dulce. This hotel is surrounded by Mother Nature: this is not a plastic commercial hotel garden!



When you stay at the Hotel y Marina Tortugal you are surrounded by wild native plants. This is the bungalow where are team stayed during two different field trips.

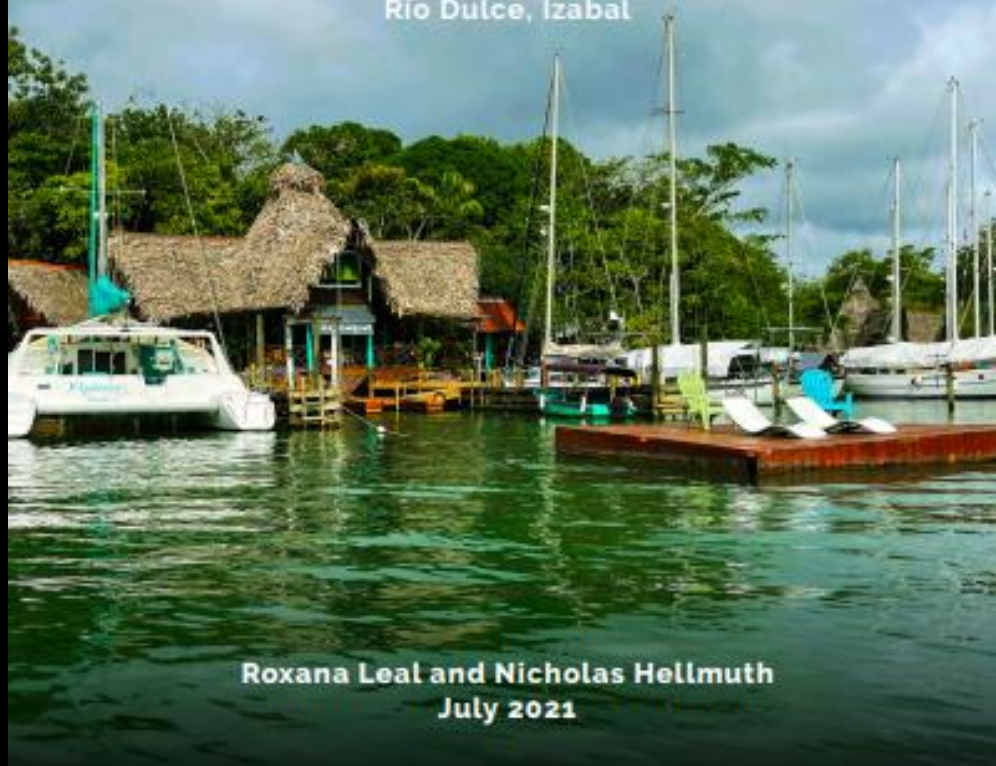


- Review of our several days stay at -

TORTUGAL

**BOUTIQUE HOTEL,
RESTAURANT AND MARINA**


Rio Dulce, Izabal



**Roxana Leal and Nicholas Hellmuth
July 2021**

[Free download](#)

<https://flaar-mesoamerica.org/wp-content/uploads/2021/07/Tortugal-Hotel-Review-botanical-garden-Rio-Dulce-Lake-Izabal-Leal-and-Hellmuth-FLAAR-2021.pdf>



We need photos of additional species of Ramiflorous & Cauliflorous trees of the Municipio de Livingston

Amphitecna of various species (relatives of *Crescentia*, jicaro y morro)

Clidemia capitellata, *Clidemia fulva*, *Clidemia hirta*, *Clidemia rubra*,
Clidemia septuplinevia: we need to learn which of these trees are
cauliflorous and which grow wild in the Municipio de Livingston.

Grias cauliflora is the easiest to find and most common cauliflorous tree
in the entire area. But we need to be out in the swamp edges of the
Municipio de Livingston during the quick weeks that this tree flowers.

Appreciation

ASSISTANCE FOR LOCAL ACCESS, MUNICIPIO DE LIVINGSTON

Daniel Esaú Pinto Peña, Alcalde de Livingston (Izabal, Guatemala).

INITIATION OF THE INITIAL MONTHS OF THE PROJECT IN EARLY 2020

Edwin Mármol Quiñonez, Coordinación de Cooperación de Livingston (Izabal, Guatemala)

PLANT SCOUTS: Lucas Cuz, Alexander Cuz, Cornelio Macs

LANCHEROS AND BOAT ASSISTANTS (Feb-Mar, Sept 2020)

Keneth William De La Cruz and Omar Suchite

FUNDAECO: Azucena Mejía y Emilia Pitan

FLAAR Mesoamerica **ORGANIZER** (María Alejandra Gutiérrez), **FLORA AND FAUNA RESEARCHER IN THE FIELD** (Víctor Mendoza), **GENERAL MANAGER:** Flor de María Setina; **FLORA AND FAUNA MANAGER:** Vivian Diaz; **BIBLIOGRAPHY AND RESEARCH:** Vivian Hurtado. **MAIN PHOTOGRAPHERS:** David Arrivillaga, María Alejandra Gutiérrez; **SOCIAL NETWORKS MANAGER:** Roxana Leal; **FIELD TRIP PREPARATION:** Senaida Ba (2020 - 2021); Byron Pacay and Norma Chu (2021). **DRONE PILOT AND AERIAL PHOTOGRAPHY:** Haniel López. **PHOTOGRAPHY ASSISTANTS** Brandon Hidalgo, Randy Norales. **COOK** Dora Le.