

Río de Hierba, Estilo Cubano

By Amy Ferriter



Ciénaga de Zapata

The Zapata Swamp is the Everglades, Cuban style. Located about 100 miles south of Havana, this southern coast of the island will forever be known for the infamous 1961 “Operation Zapata” or *Bahía de Cochinos* (Bay of Pigs) invasion. Now, however, it is home to the Ciénaga de Zapata Biosphere Reserve – Cuba’s largest protected area and a region designated as a Wetland of International Importance.

The Zapata is a 1.5 million acre mosaic of fresh and saltwater marshes, mangroves, palm savannahs and hammocks growing on a layer of peat covering a limestone plain. It includes vast expanses of sawgrass dotted with occasional tree islands, almost mirroring the Everglades. Nearly all of Cuba’s 25 endemic birds breed there. It’s a haven for the brown-eyed Cuban crocodile (*Crocodilus rhombifer*) and the world’s smallest bird, the 2-inch Cuban bee hummingbird (*Mellisuga helenae*).

The marshes are dominated by herbaceous species such as sawgrass (*Cladium jamaicense*), spikerush (*Eleocharis interstincta*), club-rush (*E. cellulosa*) and cattail (*Typha domingensis*). The coastal mangrove forests include red mangroves (*Rhizophora mangle*), black mangroves (*Avicennia germinans*), white mangroves (*Laguncularia racemosa*) and buttonwood (*Conocarpus erecta*). Hammock and forested areas in the Zapata consist of *roble de yugo* (*Tabebuia angustata*), beauty leaf (*Calophyllum antillanum*), cocoplum (*Chrysobalanus icaco*), tamarind (*Lysiloma latisiliqua*), gumbo limbo (*Bursera simaruba*), sabal palm (*Sabal maritima*) and royal palm (*Roystonea regia*), the national tree.

Llegando allí no es fácil

Getting there is no easy feat. Dr. John Thorbjarnarson, a Wildlife Conservation Society conservation biologist and an authority on the world’s 23 crocodylian species, has been working

in the Zapata since the late 1990s. “John T.” is an interesting person; Google his name and you’ll see. Okay – the weeds. As mentioned, John has been working with Cuban colleagues for several years. Over the past year or so, *Melaleuca quinquenervia* has become a top priority for the Cuban agencies charged with conserving the Zapata Swamp. Via a series of e-mails that spanned the better part of a year, John asked if it would be possible for us to share information related to the management of melaleuca. One thing led to another and we ended up headed to Cuba to give a workshop on invasive species.

Easier said than done, but this is part of the charm of the place. Obtaining a visa to travel from Miami to Havana is dicey, at best. As one of our Cuban colleagues advised during an anxious moment when our U.S. passports went the opposite way down a street in Old Havana: “You are now on Cuban time and, God willing, everything will work out.” And it did.

The Zapata melaleuca workshop was developed as part of a larger, annual “Taller Zapata” conference, roughly the equivalent of Florida’s Greater Everglades Ecosystem Restoration (GEER)

conference. It is hosted by the *Ministerio de Ciencia, Tecnología y Medio Ambiente* (CITMA) – a cabinet-level ministry for the environment. The annual meeting is a forum that the Cubans use to share information on Zapata restoration issues. It was attended by over 60 people, representing all of the provinces of Cuba.

Una mala hierba es una mala hierba

Weeds are weeds. Zapata scientists face many issues familiar to Everglades scientists – problems with water quantity, quality, timing, distribution and... invasive plants. Botanical enthusiasts introduced many nonindigenous forest species to Cuba in the 1800s, notably



Melaleuca infestation

Casuarina equisetifolia in 1830 and *Eucalyptus* in 1867. Production-oriented observation plots were started in the late 1920s with 54 *Eucalyptus* species from Australia. The exact introduction date for *M. quinquenervia* in Cuba is unclear. A TAME *Melaleuca* worldwide herbaria search conducted by the Institute for Regional Conservation revealed plantings dating back to the early 1900s. By most accounts, melaleuca was introduced to the Zapata in 1959 to stabilize canal banks (incidentally, the same year FLEPPC board member Tony Pernas was born in Havana Hospital).

The Zapata Swamp melaleuca population is thought to be the largest escaped population in the country. It is spreading quickly across the sawgrass marsh and, according to the Cuban National Park Service, it now occupies more than 50,000 acres along both sides of the main road that transverses the reserve. This popula-

tion is ominous because the trees in the larger heads are approximately 25-30 years old and are surrounded by a thick sequence of younger trees and saplings. Virtually all of the open space is peppered with seedlings: *Pelo del perro* (dog hair) melaleuca.

Management options

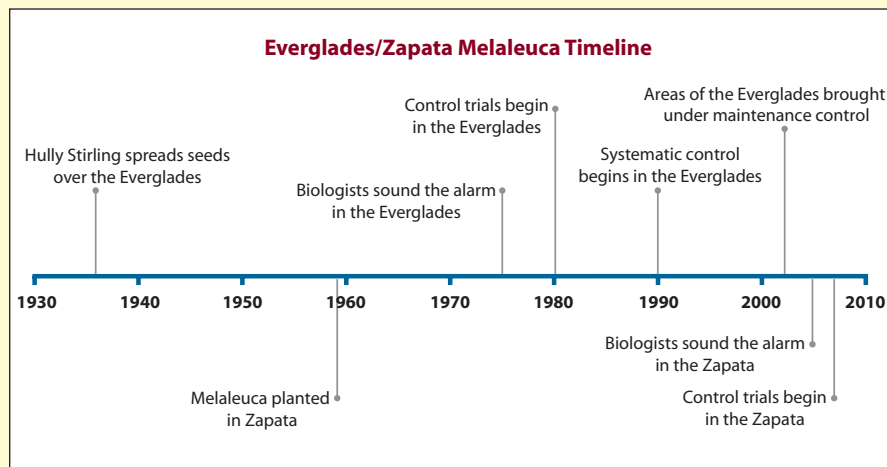
Cuando no hay perro, se monta con gato
If you haven't got a dog, a cat will do.
— Cuban proverb

Meeting organizers formed working groups to focus on topics and provide recommendations. We were asked to participate in the invasive species working group, which was made up of Cuban botanists, land managers and policy experts. As we know in Florida, the development of invasive plant lists often leads to a lively debate. No exception in the Zapata. The group discussed and debated, and debated and discussed, and finally agreed on a list of priority species that includes: melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina equisetifolia*), marabu (*Dichrostachys cinerea*), lead tree (*Leucaena leucocephala*), water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*).

The development of a sound management strategy for the Zapata melaleuca will take some creative thinking. The use of herbicides is extremely limited – because of both availability and cost. Furthermore, the use of field equipment that we so often take for granted (e.g. airboats, helicopters and ATVs) is not possible. Cuban National Park Service staff is in the process of establishing melaleuca control trial plots within the Park's boundaries. These plots will represent a combination of cutting, hand pulling and chemical control.



The chronology of the melaleuca invasion is interesting. It appears that the lag phase for melaleuca – or at least the time it takes biologists to realize a serious problem exists – is fairly consistent between Florida and Cuba. The Cubans may have the advantage because they are starting control operations earlier in the exponential curve.



FLORIDA

- Broward politician Hully Stirling distributes seeds over the Water Conservation Areas in the mid-1930s
- 40 years later, biologists sound the alarm in the Everglades in the mid-1970s
- 5 years later, initial control operations begin – 1980
- 10 years later, interagency, systematic control begins – 1990

CUBA

- Melaleuca planted in Zapata – 1959
- 46 years later, biologists sound the alarm – 2005
- 2 years later, initial control operations begin – 2007

Recommendations that we were able to make to the Zapata Melaleuca Management Plan include:

- Given the current limited availability of herbicides and the large number of seedlings surrounding the large heads, land managers should consider hand pulling as many of the seedlings as possible. This would accomplish two things: the current infestation is contained and the seedlings are prevented from flowering.
- Land managers should consider searching (on foot) along the edges of where they think melaleuca occurs and pull “outlier” seedlings in a quarantine-type strategy. Melaleuca management is most effective when it works inward from the areas where the trees are young and sparse to areas where the trees are mature and dense.
- When pulling seedlings, pile them in one area, with the seedlings stacked on top of each other to concentrate any possible re-rooting.
- Since water levels are somewhat predictable in the watershed, timing of control could play an important role in reducing post-treatment germination. Land managers should consider timing the control of large trees so that water levels are high following the operation. This will result in fewer seedlings the following year.
- Follow up monitoring and management is the most important component to consider. As we have learned in Florida, melaleuca

control is a perpetual process for land managers, and “one time” control programs often lead to worse infestations. As someone once said, “Kill a melaleuca and 10,000 seedlings will show up for the funeral.”

Summary

The Zapata Swamp is a unique area important not only to Cuba and its endemic species, but to additional species worldwide that use the wetlands during migration. Melaleuca, as it does in the Everglades, poses a serious threat to the health and function of the Zapata. The task of controlling melaleuca infestations in the Zapata Swamp and elsewhere in Cuba will be a difficult one. The Cubans have a limited number of tools and resources available, but they are highly motivated and keenly aware of the importance of invasive plant management. We were glad to have been able to share information we’ve learned from years of working with melaleuca in south Florida. We hope to continue our involvement with the Zapata Melaleuca Management Program because cooperation and the sharing of knowledge will bring us all that much closer to controlling this invasive pest worldwide.

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Comparing Our Weeds

By Ken Langeland, University of Florida

Brazilian pepper (*Schinus terebinthifolius*), by consensus one of Florida’s worst invasive plants, was conspicuous by its absence in Cuba. When we asked about this, we were informed that Brazilian pepper is grown in yards, and plant parts are used for medicinal purposes, but it does not cause problems. We could come up with no explanation for this and could only speculate; perhaps the harvest of berries limits spread, or vectors are not as prevalent (e.g., migrating flocks of robins in Florida). Another trip will be needed to try to answer this question.

Water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*), while considered invasive because of their growth potential, do not appear to reach the problem levels they do in the southeastern United States. Again, we can only speculate on reasons, such as lower nutrient loads in Cuban waters or lack of the microsporidian disease of the *Neochetina* biological control weevils, which limits

their performance in Florida (another reason for another trip).

The aquatic plant of greatest concern in Cuba is *Myriophyllum pinnatum*, considered native to both Cuba and the southeastern United States. *Myriophyllum pinnatum* proliferated in canals of la Ciénaga de Zapata following drought years and may be the result of natural environmental changes. In Florida, the species can be a problem in ponds.

Dichrostachys cineria, called marabu in Cuba, is probably the worst weed in the country. It is mostly a problem in abandoned agricultural fields but also threatens natural areas. While it has been reported in Florida, it has not reached problem proportions.

Catclaw mimosa (*Mimosa pigra*) was introduced to Florida before 1953 and has been the target of maintenance control ever since. It is native in Cuba but considered one of the worst weeds in the country. In relatively undisturbed



Mimosa pigra

habitats, it exists in only moderate populations but quickly colonizes and forms dense thickets following disturbance. It is also a weed in cultivated areas. In Cuba, it is called Weyler, relating it to a ruthless military general.

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KEN LANGELAND

Cuba at a Glance

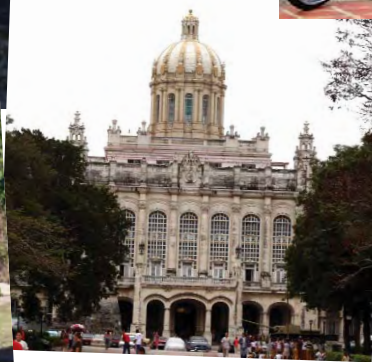
- Largest island in the Caribbean and western-most island of the Greater Antilles. It is 750 miles long and up to 150 miles wide—the 15th largest island on the planet.
- The land area is slightly smaller than the state of Pennsylvania.
- Cuba is ninety miles from Key West.
- The climate is tropical. Rainy season is May to October
- Twenty-five percent of Cuba is forested.
- Around a quarter of the country is mountainous. The rest of the island is mostly flat. Cuba has hundreds of rivers, most of them relatively shallow.
- Elevation extremes:
lowest point: Caribbean Sea 0 m
highest point: Pico Turquino 2,005 m
- Cuba's population was estimated at 11,382,820 in 2006.



black beans and rice



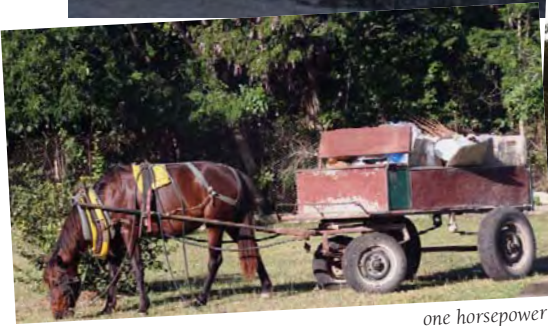
bicycle with mackerel



Museo de la Revolution (once the palace of Fulgencia Batista)



Havana intersection



one horsepower

The Cuban Boa - Maja de Santa Maria (*Epicrates angulifer*)

Another Everglades parallel – with a twist.

Cuba has an endemic constrictor snake, the Cuban boa, or the *Maja de Santa Maria*. The snake is found throughout Cuba, and also occurs on smaller nearby islands. Boas ranging from 5-12 feet are fairly common in Cuba, and there are anecdotal reports of Cuban boas reaching more than 20 feet long. The native snake prefers deep underground crevices, but often feeds on bats and birds while hanging from trees – this is how one might imagine the Burmese python (*Python molurus bivittatus*) is hunting birds in the Everglades. Another favorite prey item for the Cuban boa is the *hutia* (the endemic Cuban rat). Given the similarities in habitats, a comparative study of the Burmese python in the Everglades and the Cuban Boa might be warranted to better understand the potential for python expansion in Florida. – A. Ferriter



JAN SEVČÍK

Cuban boa constrictor, *Epicrates angulifer*