



# Habitat and population structure of *Magnolia cristalensis* in Sierra de Nipe and Alto de Iberia, Cuba



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# The genus *Magnolia* sl. in Cuba

## Seven endemic taxa

*M. cubensis* subsp. *cubensis*

*M. orbiculata*

*M. minor*



*M. cristalensis*



*M. virginiana* subsp. *oviedoii*



*M. cubensis* subsp. *acunae*



*M. oblongifolia*

# The genus *Magnolia sl.* in Cuba

## Two cultivated species



## Altitudinal range of cuban magnolias

*M. cubensis* subsp. *cubensis* (700-1800 m asl)

*M. cubensis* subsp. *acunae* (700-1000 m asl)

*M. cristalensis* (700-1100 m asl)

*M. minor* (300-900 m asl)

*M. orbiculata* (100-1100 m asl)

*M. oblongifolia* (20-1000 m asl)

**Highlands**



**Lowlands**



*M. virginiana* subsp. *oviedoii* (0-20 m asl)





*M. cristalensis*



*M. cubensis subsp. cubensis*



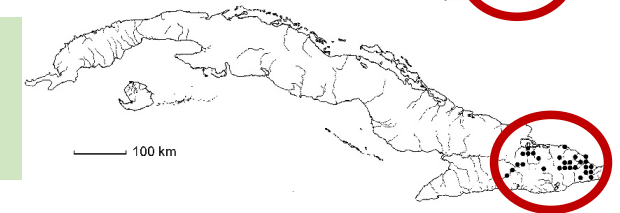
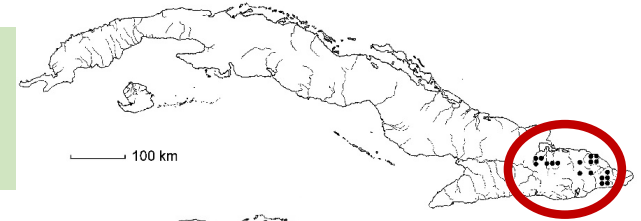
*M. minor*



*M. oblongifolia*



*M. orbiculata*





## *Magnolia cristalensis* Bisse

**The species is very rare in the field**

(Martínez 2002, Martínez & al. 2005, Sanchez-Abad 2008, Gómez & al. 2012; Gómez & al. 2015)



*M. cristalensis* vs. *M. cubensis*

More coriaceous leafs in *M. cristalensis* than in *M. cubensis*

Induplicate leafs in *M. cristalensis* vs not induplicate leafs in *M. cubensis*

Tertiary veins more visible in *M. cristalensis* than in *M. cubensis*

Floral receptacle pubescent in *M. cristalensis* vs floral receptacle glabrous in *M. cubensis*

*M. cristalensis*

*M. cubensis*

The habitats of *M. cristalensis* are strongly affected by human impacts



CR: B2ab(i,ii,iii,iv,v);C1+2a(i) (González-Torres & al. 2016)







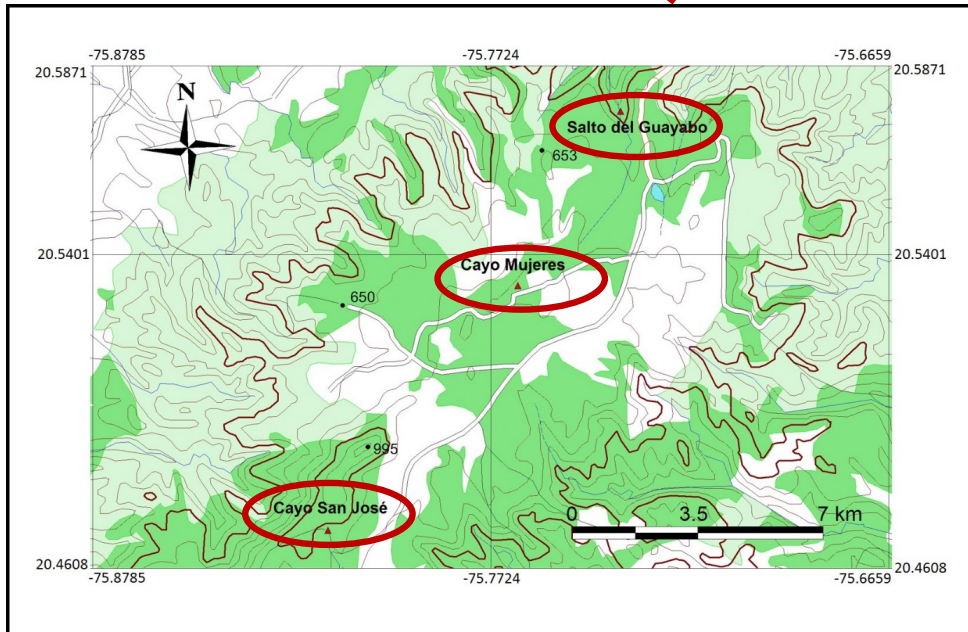
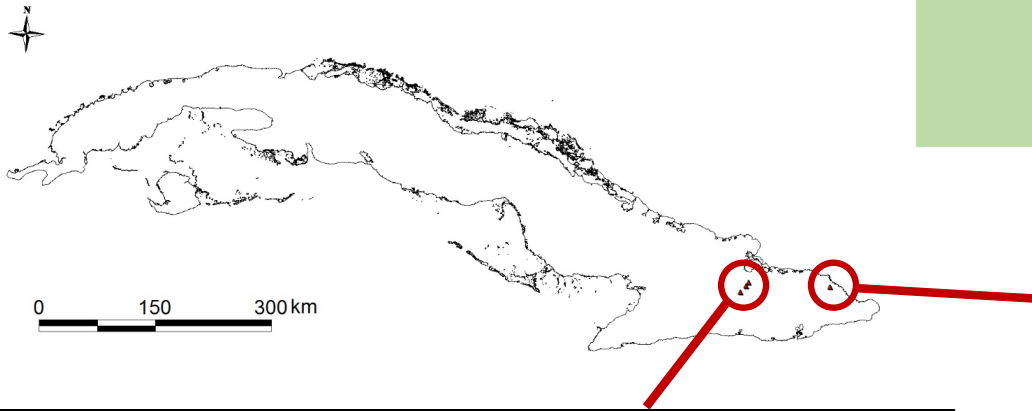
We know little about the ecology of *Magnolia cristalensis*

**Aims:**

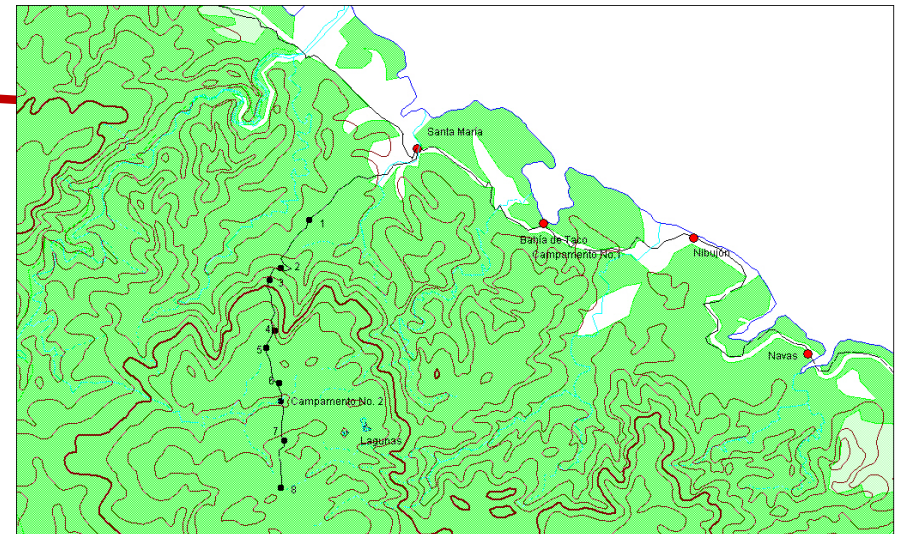
- To characterize the habitat of *Magnolia cristalensis* in Sierra de Nipe and Mina Iberia, Eastern Cuba
- To characterize the population structure of this species on each locality



# Methodology



**Sierra de Nipe, Holguín province**



**Mina Iberia plateau, Guantánamo province**



## Characterization of habitat of *Magnolia cristalensis*

Vegetation type according to Reyes (2011)

Vegetation stratification

Strata height and cover

Species composition

## Population structure of *Magnolia cristalensis*



An intensive search of the individuals of *Magnolia cristalensis* in the potential habitat of the species was conducted using the total count method (Bullock 1996)

The coordinates of each individuals was recorded using a GPS Garmin. In addition, the height, diameter, health and phenology for each individuals were recorded

The individuals were grouped in six-height class (< 1 m; 1.1-3m; 3.1-6 m; 6.1-9 m; 9.1-12 m; > 12 m) and four diameter class (< 1 m; 1.1-5 cm; 5.1-10 m; > 10 cm)

# Habitat of *Magnolia cristalensis* in Sierra de Nipe



**Vegetation type:** Tropical rainforest over serpentine soils in Cayo Mujeres

**Altitude:** 780 m asl

**Mean temperature:** 21.7°C

**Rainfall:** 2064 mm

**Height and cover of vegetation strata**

Trees layer: 20-25 m, 70-100% of cover

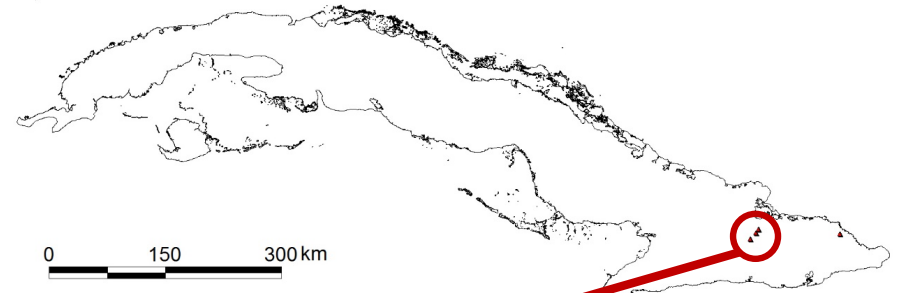
Bushes layer: 2-4 m, 60-80% of cover

Herbs layer: 0.5-1.5 m, 40-100% of cover

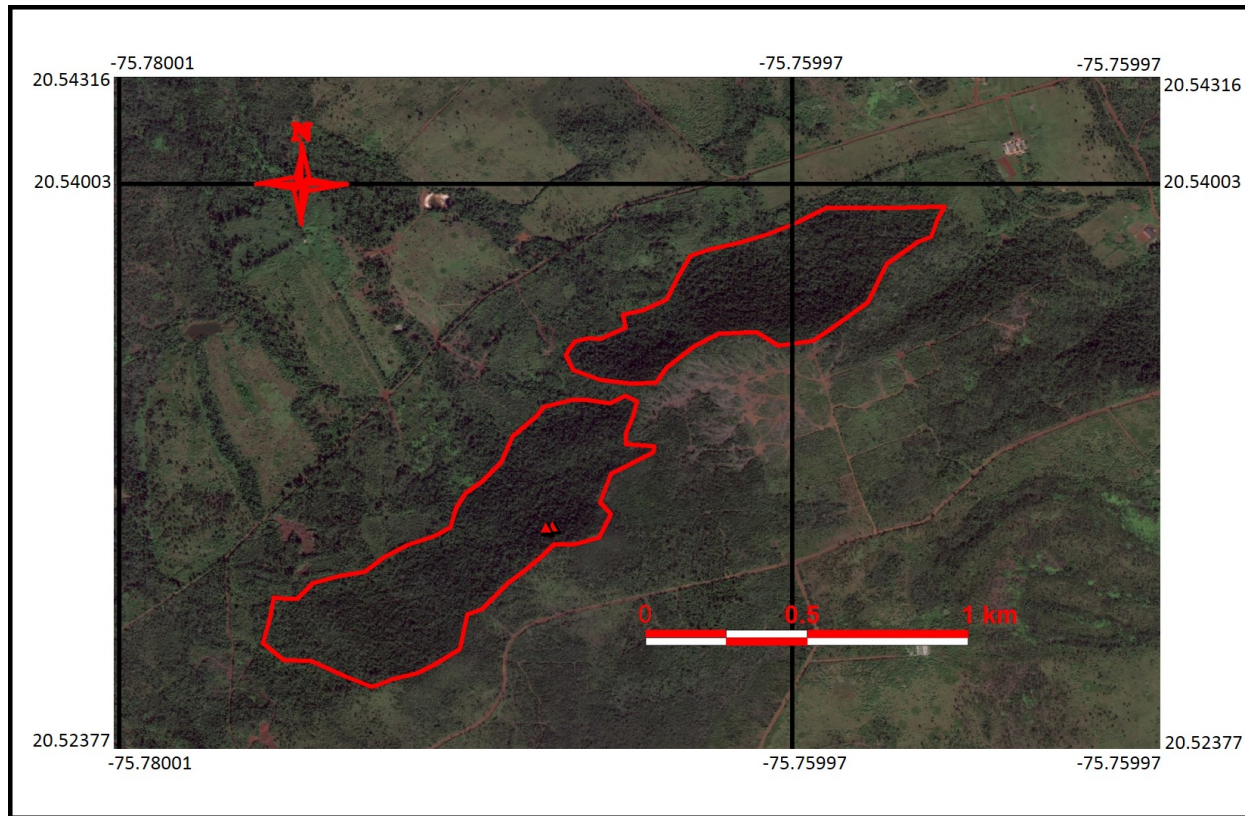


The suitable habitat for *Magnolia cristalensis* in Cayo Mujeres is less than 100 ha

## Population structure of *Magnolia cristalensis* in Sierra de Nipe



0 150 300 km



**We only found three adults  
individuals in Cayo  
Mujeres**

**Density:** 0.04 ind/ha.

**We did not find any individual of *Magnolia cristalensis* in Cayo San José and Guayabo river fall**



Cayo San José



Guayabo river fall



***Magnolia cristalensis* has a relict population at the edge of local extinction in Sierra de Nipe**



# Habitat of *Magnolia cristalensis* in Alto de Iberia



**Vegetation type:** Tropical rainforest over soils with deficient drainage

**Altitude:** 530 and 700 asl

**Mean temperature:** 22°C

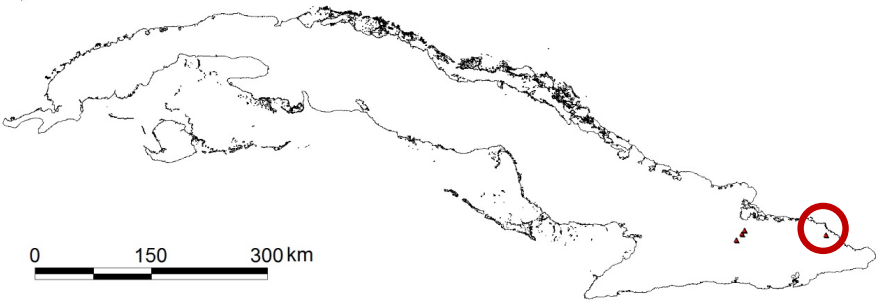
**Rainfall:** 3000 mm

**Height and cover of vegetation strata**  
Trees layer: 8-15 m, 80-100% of cover  
Bushes layer: 2-5 m, 40-60% of cover  
Herbs layer: 0.5-1 m, 50-100% of cover

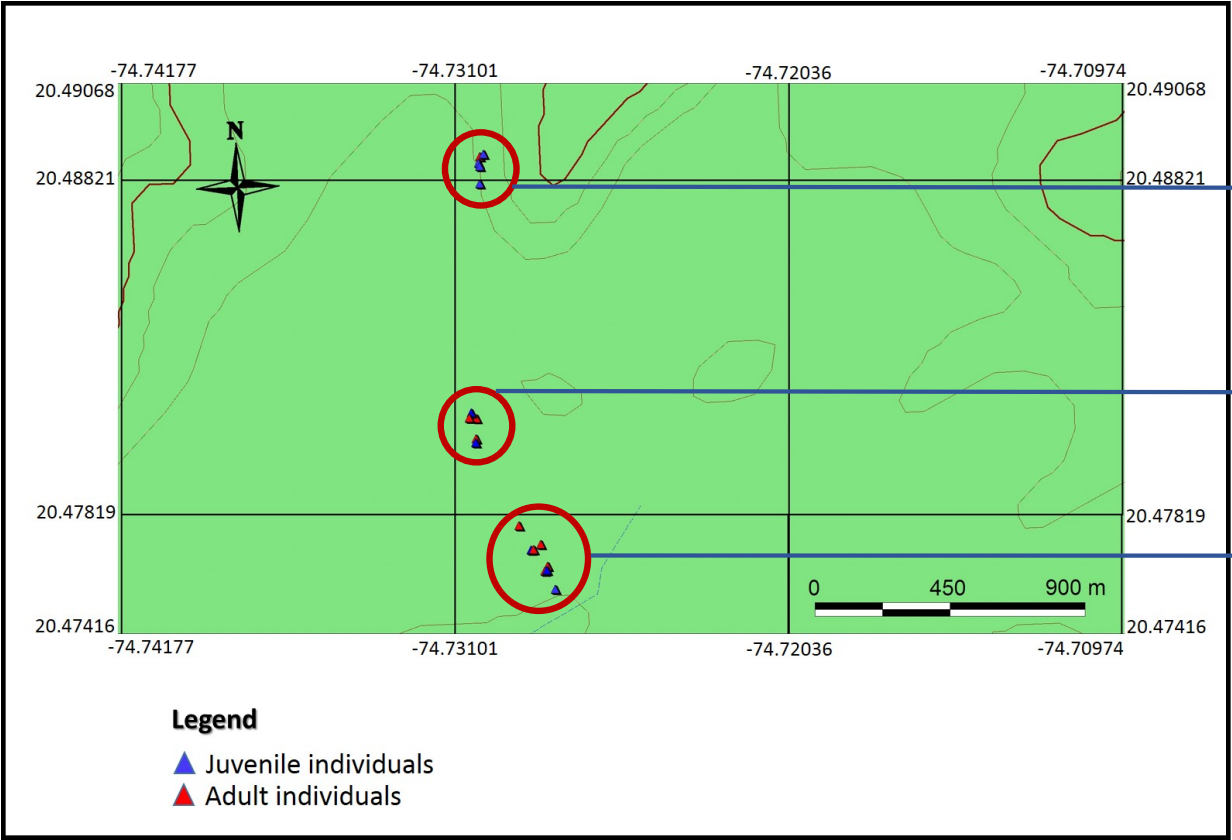
**Alto de Iberia, Guantánamo province**



# Population of *Magnolia cistalensis* in the Alto de Iberia plateau



**13 adults and 19 juveniles**  
**Density: 0.7 ind/ha.**

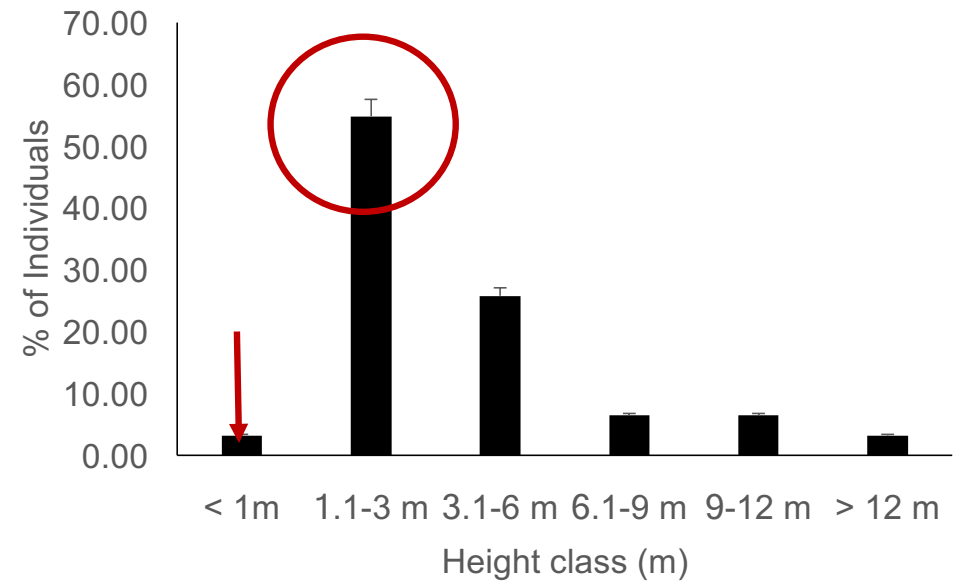
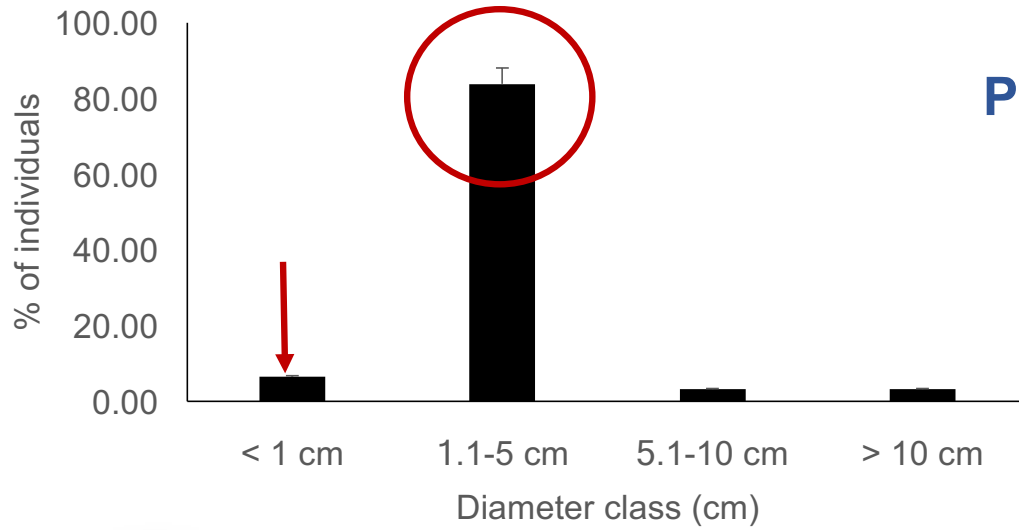


one adult and 14 juveniles

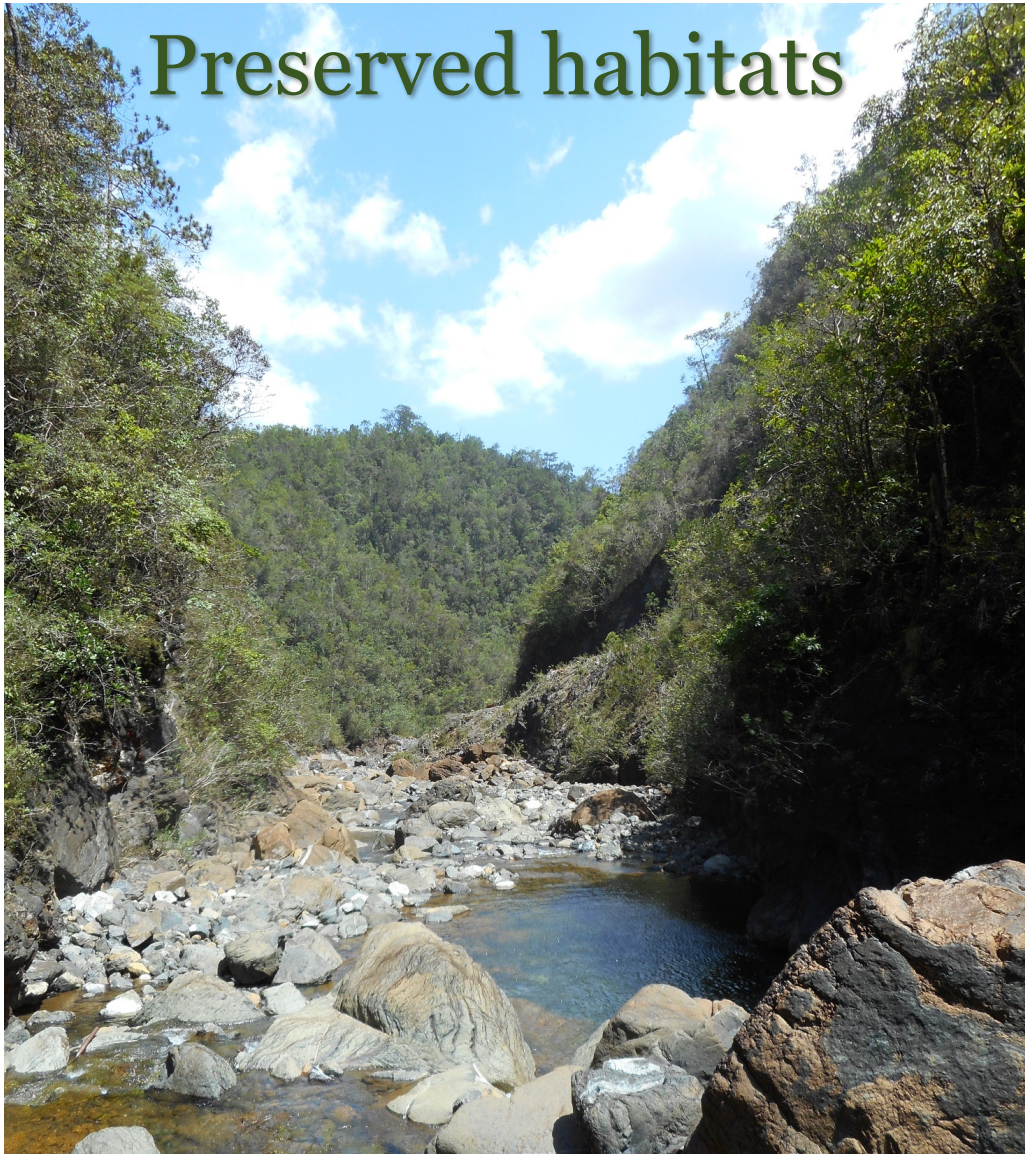
six adults and three juveniles

five adults and two juveniles

## Population structure in Alto de Iberia



Preserved habitats



VS

Degraded habitats





## Final considerations

In Sierra de Nipe and Mina Iberia, *Magnolia cristalensis* grows in tropical serpentine rainforests and it is an indicator of mature forest very well preserved.

The population of Sierra de Nipe is at the edge of extinction, and it will require immediate conservation actions to assure its persistence in the future. These actions may include the habitat management and reinforcement with new individuals.

The subpopulations of Mina Iberia is small but it has a relatively balanced structure and grows in very well preserved habitat, for these reasons it does not need active management actions for its conservation

The natural regeneration is deficient in both subpopulation of *Magnolia cristalensis* and the interaction of this low regenerative capacity with the fragmentation and habitat loss could be the main causes of threats for the species



صندوق محمد بن زايد  
للمحافظة على الكائنات الحية



The Mohamed bin Zayed SPECIES CONSERVATION FUND

