

Final Report

Project: **Programme for the conservation of Cuban cacti**

2007 Conservation follow-up Award

Submitted to

Conservation Leadership Programme

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I. Summary

The project started up on June 2007. Two workshops on environmental education were organized with a total attendance of around 55 environmental activists of the whole country. Fourteen graduate professionals and 21 undergraduate students received training on ecology and conservation techniques. Since the programme started a total of 27 field trips were made to 16 regions or localities. Collected data allowed identifying the important areas for cactus conservation and the elaboration of a proposal of an Action Plan for the conservation of Cuban cacti, elucidate which of them are out of the system of protected areas and propose 5 new localities for legal protection. The first enforcement of *Melocactus actinacanthus* took place, successfully. The visibility of the programme increased significantly with the publication of the quarterly newsletter Bissea, edited in Spanish and English, and with the website as well. Two exhibitions, four environmental festivals were organized and interviews and a documentary contribute to spread the programme actions in the country.

II. Project Progress

A. Goals and Objectives

The aim of this project is: **to enable the conservation and management of Cuban cacti and their habitats** by

1. **Capacity building**

Organizing training workshops for local technicians and 'cactus lovers' focused on ecological and conservationist techniques, and environmental education methodologies.

2. **Researching**

- 2.1. Surveying the relicts of natural vegetation in the north coast of Havana and Matanzas provinces to locate populations of *Leptocereus wrightii*.
- 2.2. Gathering data to identify important areas for cactus conservation and support their inclusion within the National System of Protected Areas.
- 2.3. Enforcing the population of *Melocactus actinacanthus* and monitoring it.

3. **Providing advice, information & awareness**

- 3.1. Write and publish the Action Plan for the Conservation of Cuban cacti.
- 3.2. Edit a quarterly newsletter on Cuban Plant Conservation
- 3.3. Write and publish the two booklet on Cuban cactus diversity and threats –one for children and the other for adults.
- 3.4. Design and upload a website for the Programme for the Cuban Cactus Conservation with information for stakeholders, scientists and people.

B. Results achieved

1. **Capacity building**

Workshop ‘Environmental Education for Conservation’. May 29 – June 1, 2007.

The workshop aimed to contribute to the training of facilitators/activists through instruction on education, participation and environmental protection. Topics like pedagogy and methodology related to awareness-raising and changing the attitude and behaviour of people were taught. During the workshop sessions the lecturer Dr. Miguel Bustos encouraged the exchange of ideas and experience between the participants. Dasmiliá Cruz, a team member and another workshop lecturer, worked deeply on didactic for environmental education. A total of 30 facilitators from protected areas and botanic gardens coming of the whole country attended to this workshop. This workshop was also sponsored by the National Botanic Garden and the National Museum of Natural History.

Ecology and conservation trainings

Trainings on ecological methodology and conservation techniques were conducted during field works or in the botanic garden grounds. We prioritized monitoring and census techniques, and habitat assessment methodologies rather than GIS analysis according to the necessities of our partners. At the present, seven techniques from protected areas, and four postgraduate students from universities and tree from botanic gardens and research institutions have taken the training. These trainings were also sponsored by the National Botanic Garden, the National Network of Botanic Gardens and the Enterprise for the Protection of the Flora and the Fauna.

Course ‘The Environmental Education: a challenge of the XXI century’ May 5-9, 2008

The course was taught by Dra. María Isabel Vera Muñoz, from the University of Alicante (Spain) in the National Museum of Natural History from May 5 to 9 2008. During the course interesting topics including designing methodologies for environmental education and for evaluating their achievements were discussed. The necessity of promoting creative thought and the ability to take decisions within the educational process at all levels was highlighted. The course was organized in partnership with the Faculty of Geography of the University of Havana.

2. **Researches**

2.1. Surveying the relicts of natural vegetation in the north coast of Havana and Matanzas provinces to locate populations of *Leptocereus wrightii*.

Surveys were carried out throughout the north coast from Cojimar Valley (Havana) to Punta Guano (Matanzas). The localities surveyed were Cojimar Valley, Boca Ciega, Bacunayagua and Punta Guano.

2.2. Gathering data to identify important areas for cactus conservation and support their inclusion within the National System of Protected Areas.

According to our data, there are six protected areas important for cacti conservation already approved (Table 1). Other seven areas are also important for cacti but they have not been approved and lack of legal status although they may have controlled access that provides some kind of protection.

Table 1. Protected areas important for cacti conservation in Cuba.

Name	Management category*	Province	Legal status
Baitiquirí	RN	Guantánamo	Proposed
Boquerón	RE	Guatánamo	Proposed
Caleta	END	Guantánamo	Proposed
Cerro Galano	RN	Holguín	Proposed
Desembargo del Granma	PN	Granma	Approved
Guanahacabibes	PN	Pinar del Río	Approved
Hatibonico	RE	Guantánamo	Approved
Imías	RN	Guantánamo	Proposed
La Coca	RE	C. Habana	In evaluation!
Maisí	RE	Guantánamo	Proposed
Sabanas de Santa Clara	RFM	Villa Clara	Approved
Tres Ceibas de Clavellinas	RFM	Matanzas	Approved
Viñales	PN	Pinar del Río	Approved

* END = Natural Monument, PN = National Park, RE= Ecological Reserve, RFM = Flora Managed Reserve, RN = Natural Reserve. ! The proposal is being analyzed by government authorities.

The data regarding cacti diversity and habitat quality was gathered from literature, herbarium specimens and/or interviews with field biologists. But for the 'proposed protected areas' (Baitiquirí, Boquerón, Caleta, Imías and Maisí) and for La Coca – a protected area in evaluation – we also collect field work data. Field work at Guantánamo was also supported by a Conservation grant of the British Cactus and Succulent Society.

Our data allowed identifying some small localities (Table 2) still well preserved which are feasible for protection. They will provide protection to another 7 cactus species (Table 3) all of them threatened (Berazaín *et al.* 2005). These areas have also other threatened endemic plants and animals as well as unique habitats.

Table 2. Proposed areas for protection under the National System of Protected Areas and their cacti associated.

Area/Locality	Unit of conservation
Pan de Matanzas	<i>Leptocereus scopulophilus</i> <i>Pereskia zinniflora</i>
Cejita de La Palma	<i>Escobaria cubensis</i> <i>Melocactus curvispinus</i>
Sierra de Anafe	<i>Leptocereus leonii</i>
Sierra del Chorillo, Najasa	<i>Leptocereus carinatus</i>
Habananilla	<i>Melocactus perezassoi</i>

Table 3. Cacti growing within the new proposed protected areas.

Unit of conservation	Baitiquirí	Boquerón	Caleta	Imías	Maisí	Cerro Galano	La Coca
<i>Cylindropuntia hystrix</i>	X	X		X			
<i>Escobaria cubensis</i>						X	
<i>Melocactus actinacanthus</i>							X
<i>Mammillaria prolifera</i>				X	X		
<i>Melocactus acunae</i>			X		X		
<i>Melocactus harlowii</i>	X	X		X			
<i>Opuntia triacantha</i>	X	X					
<i>Pilosocereus polygonus</i>	X	X	X	X	X		
<i>Stenocereus fimbriatus</i>	X	X	X	X	X		
<i>Consolea macracantha</i>	X	X		X			
<i>Consolea moniliformis</i>			X	X			
<i>Harrisia eriophora</i>	X		X	X	X		
<i>Melocactus curvispinus</i>						X	

2.3. Enforcing the population of *Melocactus actinacanthus* and monitoring it.

The wild population of *M. actinacanthus* at Sierra Alta de Agabama did not change its structure during the monitoring. The population is composed by six mature plants, 10 young plants and 15 seedlings. In November 2008, the first sowing of plants cultivated *ex situ* was carried out in the only known locality of this species in Sierra Alta de Agabama, Villa Clara. These plants come from seeds collected in the wild population or donated for this purpose by the Royal Botanic Gardens, Kew.

Note: *Ex situ* cultivation was supported by a Conservation grant of the British Cactus and Succulent Society.

3. Providing advice, information & awareness

3.1. Write and publish the Action Plan for the Conservation of Cuban cacti.

The Action Plan was design considering the different strategies or techniques available for plant conservation. The work is based on ‘units of conservation’ –delimited in the document– to avoid the instability or lack of agreement on taxonomic entities that make it difficult to address conservation work.

The Action Plan recognizes 27 units of conservation and set priorities for the conservation of them considering actual or potential threats, endemism and conservation category. The population size and species distribution is also taking into account but higher priority for conservation is giving to those species that are already facing any threat in all their populations or in the majority of them. It also proposes the establishment of 5 protected areas that will provide protection to 7 of the most threatened species.

The Plan was writing (see output folder/action plan for the conservation of Cuban cacti.pdf) and submitted to stakeholders and experts for feedback before publishing. The final version will be translated into the Spanish for facilitating the general use. Regarding printing the action plan see budget report.

3.2. Edit a quarterly newsletter on Cuban Plant Conservation

Bissea –the newsletter on Plant Conservation of the Cuban National Botanic Garden- was created on June 2007. Bissea publishes news on Cuban plant conservation but also training opportunities, reviews on publications, and meeting calls. It is spread by email but also a hard copy is sent to those researchers or institutions (protected areas mainly) that do not have electronic facilities. The electronic version is hosted at <http://www.uh.cu/centro/jbn/textos/publicaciones/bissea.html> but also at <http://groups.google.com/group/bissea/files>. It is published in Spanish and English. The English version (sent to conservationist abroad) is possible thanks to the contribution of our guest editors Richard Abbott (University of Florida), Collin Clubbe (Royal Botanic Gardens, Kew) and Rebecca Upson (Falkland Conservation).

3.3. Write and publish the two booklets on Cuban cactus diversity and threats –one for children and the other for adults.

The booklet for children was prepared in cooperation with the Department for Environmental Education of the National Botanic Garden. It includes topics on cactus diversity, distribution, threats, utility either worldwide and in Cuba. A last draft is being analyzed by environmental education activist and teachers for final suggestions. (see output folder/cactus for children final proof.pdf)

The text for the booklet ‘cactus for people’ is circulating between contributors. It has the same structure of children’s book but with much more information.

3.4. Design and upload a website for the Programme for the Cuban Cacti Conservation with information for stakeholders, scientists and people.

The site (<http://www.uh.cu/centros/jbn/texto/p3c.html>) contains the information generate by the project. It is organizing in four mayor area: diversity and distribution, habitats, threats and conservation. It also contains links to publications and news on the conservation of Cuba cacti.

Other project outputs regarding providing advice, information & awareness

The exhibition “Los cactus – conocer para conservar” [The cacti –learning to conserve] was organized and displayed at the National Museum of Natural History in June 2007, and at the National Botanic Garden in May-June 2008.

We promoted and co-organized Earth Day Festivals At Revacadero, Villa Clara and at the National Botanic Garden (Havana) and Environmental Festivals at both sites.

A National Drawing Juvenile Competition ‘Come and draw a cactus’ was organized. May-June 2008.

TV

Documentary: Salvemos al melocactus. [Let’s save the melocactus]. Agency: Tele Cubanacán. March-May, 2008. (see output folder/ salvemos el melocactus.mpg)

This 25 minutes documentary won the 2008 Annual Award on Scientific Journalism in Villa Clara and the 2009 Annual Award on Environmental Journalism call by the National Center of Information, Management and Environmental Education.

Interview: in ‘Verde Habana’ on the importance of amateur collections in cactus conservation. June 2007.

Report: in the Educative Channel on Cacti Conservation. September 2007.

Interview: in ‘Mundo Latino’ on the Programme for the Conservation of Cuban Cacti. February 2008.

News: Reintroduction of *Leptocereus wrightii* in the Old Havana. March 4, 2009.

Radio

Interviews: at Radio Rebelde (November 2007), at Habana Radio (February 2008), at COCO (February 2008)

Internet

News: Trabajan en conservación de cactus únicos en Cuba. [Works on the conservation of unique cacti in Cuba] Agency: Prensa Latina (on-line) Feb. 2006.

News: National Botanic Garden web site.

C. Difficulties

- The prices of gas increased from 0,95 CUC to 1,35 CUC after budget planning then we have to readjust the budget to prioritize field work and monitoring. Due to national regulations the prices of other products increase significantly as well.
- The protected areas have not enough technicians to guaranty long-term monitoring then we have to increase our work with local people and encourage local researches to get involve in the programme activities.
- It takes so much time to get feedback from experts, researchers and technicians regarding the action plan, booklets contents and design, and programme outputs in general. Notwithstanding this fact, the consultancy processes contribute to keep people involved with programme actions, to gather regional experience from the whole country and encourage these experts joining to the programme partnership.
- The host www.uh.cu has limited capacity and connectivity therefore the information we can upload is limited. Alternatively, we are using google facilities to enhance the access to project newsletter (Bissea).
- It took a lot of time to get the authorization to access to some critical areas in order to gather the field information for the action plan.

D. Impacts on conservation

- The most threatened cacti of Cuba have been monitoring and their surrounding communities know about their values.
- According to the Global Strategies for Plant Conservation, *ex situ* collections of all these most threatened species have been established (*ex situ* cultivation is supported by the grant of the British Cactus and Succulent Society, the National Botanic Garden and private funds).
- The number of teams and experts involved in cactus conservation increased in the whole country since the project began.

- Cuban plant conservationists are keeping up to date on what is going on plant conservation in Cuba and worldwide by the quarterly newsletter –*Bissea*. More than 10 Cuban plant biologists from small cities and villages have gotten fellowships and training announced in this newsletter.
- Conservationists from abroad have access to information on Cuban plant conservation through the English version of *Bissea*.
- More than 80 people (undergraduates, postgraduates, technicians) have received training in field work and/or environmental education techniques. These workshops and field trainings contribute to the conservation of plant species and plant communities in the whole country not only to cacti or cacti habitats.
- Local people and collectors are involved in the protection of some of these species.
- New populations have been discovered and are getting preliminary protection (*Melocactus actincanthus* unpublished).
- There is a proposal of action plan for the conservation of these species and their habitats.
- The important areas for cacti conservation have been identified.

E. Professional growth during reporting period.

Grants and Awards

We got a Conservation grant and a Research grant from the British Cactus and Succulents Society.

Symposiums and Meetings presentations

1. **XXI Annual Meeting of the Society for Conservation Biology.** South Africa. July 1-5, 2007. Lecture: A PROGRAMME FOR THE CONSERVATION OF CACTI IN CUBA.
2. **X Botanical Meeting “Johannes Bisse in Memoriam”.** Cuba. December 2007. Lecture: ESTADO DE CONSERVACIÓN DE *LEPTOCEREUS WRIGTHII* Y *L. SCOPULOPHILLUS* (*CACTACEAE*).
3. **Succulent Plants Conservation Symposium.** Monaco. 13th June 2008. Lecture: THE PROGRAMME FOR THE CONSERVATION OF CACTI IN CUBA, ACHIEVEMENTS AND PERSPECTIVE.
4. **III Conference of Caribbean Botanic Gardens for Conservation.** Cuba. March, 24-29, 2008. Poster: EL PROGRAMA DE CONSERVACIÓN DE CACTUS CUBANOS.

Publications

1. González-Torres LR & A. Palmarola. 2007. **Actividades del Programa de Conservación de Cactus Cubanos en el primer semestre del 2007.** *Boletín de la Sociedad Latinoamericana y del Caribe de Cactáceas y otras Suculentas* 4(2) Mayo-Agosto.
2. González-Torres LR & A. Palmarola. (eds.) 2007-. ***Bissea* –The newsletter on Plant Conservation of the Cuban National Botanical Garden.** Volume 1 issues 1-3; volume 2 issues 1-4+special issue; volume 3 issues 1-2.
3. Palmarola, A & Sorribes, B 2008. **Educación para la conservación de los cactus cubanos.** *Bissea* 2(2): 2.

4. Enríquez, A, Cruz, R, Robledo L 2008. **En peligro vegetación costera de Matanzas.** *Bissea* 2(2): 2.
5. González-Torres, LR 2008. **Participación de coleccionistas en el Programa de Conservación de Cactus Cubanos (P3C).** *Bissea* 2(3): 2.
6. González Torres, LR 2008. **Conservación *ex situ* de *Dendrocereus nudiflorus* (Cactaceae).** *Bissea* 2(4): 1.
7. Hernández, Y, Leyva, O, & Carmenate, W. 2008. **El Jardín Botánico de Holguín en la conservación de *Melocactus holguinensis* (Cactaceae).** *Bissea* 2(4): 2.
8. Reyes-Fornet, A, Fornet, E & Fernández, A. 2009. **Conservación de *Escobaria cubensis* (Cactaceae) en Holguín.** *Bissea* 2(4): 2.
9. González-Torres, LR & Matos J. 2009. **Fortalecimiento de la población de *Melocactus actinacanthus* (Cactaceae).** *Bissea* 3(1): 1.
10. Palmarola A. 2009. **Regresa *Leptocereus wrightii* a las costas de La Habana.** *Bissea* 3(1): 2.
11. Cactus for childrens. A book to learn to conserve. Edited. [Ready to be printed]
12. Cactus for people. Diversity, distribution and conservation. [in review]

Scientific Degrees

- One BA dissertation
- Two Ph.D. thesis in progress
- Two Ms thesis in progress
- Five undergraduate thesis in progress

III. FINANCIAL UPDATE (USD exchange rate: 1 USD = 0,80 CUC)

	Currency	Amount	Amount (USD)
Communication			
Internet access (12 months)	CUC	360,00	
Phone (12 months / 2 lines)	CUC	240,00	
Subtotal		600,00	750,00
Scientific/field equipment			
Laptop Dell latitude D530 (1)	USD	1080,00	
Laptop Dell latitude D630 (1)	USD	1599,99	
Tent (1)	USD	120,50	
Headlamps (5)	USD	55,00	
Measuring tape (2)	USD	38,00	
Batteries AA & AAA (3 & 3 packs)	USD	100,00	
Boots (7)	USD	350,00	
Subtotal		3343,49	4179,36
Field work transportation			
<i>Melocactus actinacanthus</i> monitoring (12)	CUC	2160,00	
<i>M. actinacanthus</i> population enforcement (2)	CUC	300,00	
<i>M. actinacanthus</i> surveys (1)	CUC	400,00	
<i>Leptocereus scopulophilus</i> monitoring (6)	CUC	660,00	
<i>Leptocereus wrightii</i> surveys (5)	CUC	630,00	
Cuban <i>Melocactus</i> survey (1)	CUC	3500,00	

	Currency	Amount	Amount (USD)
Subtotal		7650,00	9562,50
Field work rations (10 CUC/day per person)			
<i>M. actinacanthus</i> monitoring (24 x 2 people)	CUC	480,00	
<i>M. actinacanthus</i> population enforcement (6 x 4 people)	CUC	240,00	
<i>M. actinacanthus</i> survey (10 x 5 people)	CUC	500,00	
<i>Leptocereus scopulophilus</i> monitoring (18 x 2 people)	CUC	360,00	
<i>Leptocereus wrightii</i> surveys (15 x 5 people)	CUC	750,00	
Cuban <i>Melocactus</i> survey (1) (20 x 3 people)	CUC	600,00	
		2930,00	3662,50
Environmental education & media expenses			
t-shirts	CUC	400,00	500,00
Crayons, color pencils, aquarelle, etc.	CUC	200,00	250,00
Paper 8 ½ x 11	CUC	350,00	437,50
Food for Earth Day and Environmental festivals	CUC	300,00	375,00
Transportation for environmental education workshops	CUC	1500,00	1875,00
Transportation for Earth Day and environmental education festivals	CUC	1000,00	1250,00
HP LaserJet printer	USD	800,00	800,00
Color LaserJet Cartridges	USD	1000,00	1000,00
Subtotal			6487,50
Total expended			24641,86

Notes on budget use

Due to the significantly changes on the prices of gasoline, car rental fees, food, and other items that took place in September 2007 we prioritized some activities instead of other. In this case, we prioritized (1) monitoring and surveys, (2) environmental education in local communities and (3) training rather than printing project outputs (Action Plan, and booklets). Alternatively, with the support of so many voluntaries and the Enterprise for the Protection of the Flora and the Fauna we made a documentary on the achievements of older programme project (Conservation of *Melocactus actinacanthus*).The design of the exhibitions, booklets and webpage was made and has been made by voluntaries.

The budget presented here is only referred to the CLP support. To fulfill most of the activities we have to find extra-funds from the British Cactus and Succulent Society (surveys and monitoring), IdeaWild (equipment) and private donors (field work).

IV. Next Steps

1. Raise funds for keeping the Programme for the Conservation of Cuban Cacti running.
2. Focuses the programme on habitat conservation and environmental education.
3. Continues enforcing the population of *M. actinacanthus*
4. Continues involving local communities on cacti conservation and sustainable use of cactus habitats
5. Continue the studies on the ecology of this habitat to enhance restoring actions.