



# Informe 2018 Plantas amenazadas de Bolivia

ESPECIES EN ESTADO CRÍTICO: *SYAGRUS YUNGASENSIS* Y *MAGNOLIA MADIDIENSIS*

Mónica Moraes R. | Proyecto BGCI | Abril 2019

## **Antecedentes**

El proyecto “Plantas Amenazadas” es parte de un programa establecido por el Herbario Nacional de Bolivia con el Botanical Garden Conservation International (BGCI) para las plantas endémicas con categoría UICN en peligro crítico (CR), bajo el programa global “Global Trees Campaign”. Ese programa desarrollado en varios países procura alcanzar tres puntos clave: 1 Ampliar el número de sitios, especialmente en casos con distribución restringida, 2 Aplicar acciones de propagación *ex situ* con el fin de ampliar la superficie cultivada y 3 Desarrollar campañas de concientización para la conservación de las especies en sus localidades naturales.

Para el caso de Bolivia, se propuso iniciar experiencias en marzo/2018 con dos especies: *Syagrus yungensis* (Arecaceae) y *Magnolia madidiensis* (Magnoliaceae), mediante financiamiento obtenido por el BGCI para 2018 y con posibilidades de renovación por 1 -2 años más. La entidad ejecutora es el Herbario Nacional de Bolivia (LPB) y los fondos son administrados por la Fundación para el Desarrollo de la Ecología (FUNDECO), respaldado en un convenio interinstitucional con la Universidad Mayor de San Andrés (UMSA) y funciona en el campus universitario de Cota Cota. A través del financiamiento logrado, el LPB financiará su membresía anual para pertenecer al BGCI.

Para *Syagrus yungensis* se realizó un primer viaje en mayo/2018 por Freddy Zenteno-Ruiz, en que se recolectaron frutos para iniciar actividades de propagación. En principio se había planificado que los experimentos de germinación sean instalados en instalaciones del Jardín Botánico La Paz en el campus universitario. Sin embargo, por las condiciones necesarias para acondicionarlas más adecuadamente (suelo, clima, etc.), se decidió sea en el vivero de Chirca (a unos 25 km de Chulumani). La obtención de estos frutos fue mayormente realizada recogiendo del suelo porque las infrutescencias estaban inmaduras todavía.

Ese material obtenido fue preparado para ser plantado en el vivero de Chirca (a 110 km desde La Paz), donde funciona un proyecto adjunto al Herbario y que brindó la logística para esta instalación, que es un componente del proyecto. Se adquirió material con fondos del Proyecto y se acondicionaron las semillas para inicio de siembra desde julio/2018.

Posteriormente se elaboró el primer informe de avance al BGCI a fines de julio (que será parte de este informe), una segunda salida de campo en diciembre 2018 para incrementar el número de semillas maduras y una tercera en enero/2019 para registro fotográfico con personeros del BGCI que visitaron Bolivia. Estas actividades conforman los descargos de los fondos de 2018.

## **Objetivos del presente informe**

- 1 Respaldar las actividades y resultados del primer año para el proyecto Plantas Amenazadas (LPB-BGCI)
- 2 Compilar los documentos que han conformado el cronograma de actividades 2018 del Proyecto

## Cronograma del Proyecto

Enero a marzo 2018: Gestiones de registro del proyecto en FUNDECO, acuerdo a ser suscrito con BGCI, acuerdo del Herbario con la Fundación y planificación de gastos

Abril a julio: Organización de viajes, informes de dos viajes de campo por Freddy Zenteno -Ruiz (*Magnolia madidiensis*, *Syagrus yungasensis*), preparación de primer informe de avance para BGCI

Julio a septiembre: Organización de viajes, informe de un viaje de campo por FZ (*Magnolia madidiensis*), curso sobre cultivo de *Magnolia* en Yucatán (México) a FZ

Octubre a diciembre: Planificación de viajes, informe de un viaje de campo sobre búsqueda de *Magnolia madidiensis* (FZ), informe de viaje de campo sobre búsqueda de *Syagrus yungasensis* (Mónica Moraes), elaboración de informe anual para BGCI, planificación de visita para enero/2019 de personeros del BGCI y la dirección del Herbario Nacional de Bolivia para viaje a Chirca y a Wiri Nogalani, solicitud de renovación de financiamiento anual para 2019

Enero a abril 2019: Realización de viaje a Chirca y Wiri Nogalani para observación de *Syagrus yungasensis* (MM), elaboración de síntesis para página web del Proyecto en BGCI sobre *Syagrus yungasensis*, adquisición de material para acondicionar las siembras en Chirca (piedras, arena y bolsas) y equipo climático , redacción de ficha técnica sobre evaluación del estado de conservación de *Syagrus yungasensis* de Bolivia

## SYAGRUS YUNGASENSIS

### -Información y registro de presencia de *Syagrus yungasensis*

Gracias a los viajes de campo realizados para los relevamientos de palmares de *Syagrus yungasensis*, se ha incrementado la lista de registros georeferenciados que favorecen la exigencia del proyecto para ampliar a nuevos sitios, así como posiblemente replantear el estado de conservación porque se han incrementado los lugares y número de poblaciones. Desde el ingreso en el valle del río Asunta, se registró la presencia de esta palmera a lo largo del camino, en laderas tanto del camino como en las del frente (al otro lado del río). Se registró un total de 20 sitios con coordenadas geográficas de *Syagrus yungasensis*, varias fotografías y se incluyeron dos colecciones botánicas en sitios nuevos: Wiri Nogalani y San Juan Unidos. Esta actividad se complementa con la lista de registros realizados en el primer viaje, quedando pendiente todavía el relevamiento en Chamaca para un siguiente viaje (Tabla 1). En el punto 16°19.067'S, 67°25.710'W, alt. 915 m no se observó ningún individuo de esta especie.

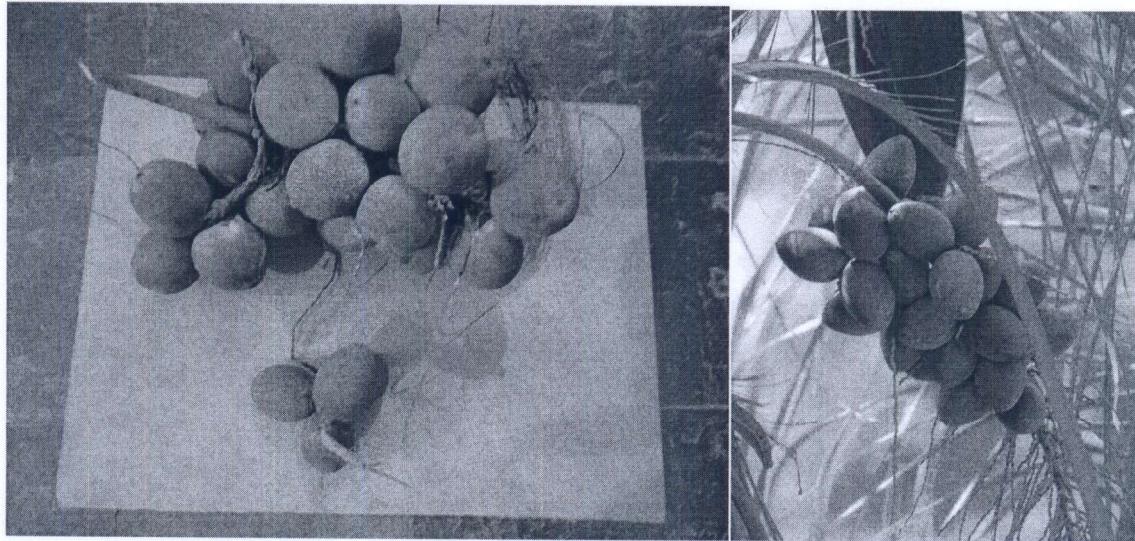
Se ha completado información sobre las pronunciadas pendientes, casi siempre asociadas a sustrato rocoso que pueden llegar hasta la orilla del río. Los comunarios mantienen las palmeras en las plantaciones de coca y cosechan los frutos maduros, especialmente los niños.

Eventualmente se encuentran individuos solitarios, pero también grupos de 8 -20. Los individuos reproductivos pueden tener desde 1.2 -2.5 m de altura. En cada individuo pueden presentar hasta siete infrutescencias en diferente estado de maduración y ocho inflorescencias viejas. El fruto maduro se distingue por presentar una forma casi esférica, mientras que los

inmaduros tienden a ser mayormente elipsoides o elípticos. Por primera vez se ha registrado que el mesocarpo tiene sabor: dulce y es parecido al durazno.

Tabla 1. Registros de *Syagrus yungasensis*.

1	16°23.434'S, 67°23.577'W. Alt: 995 m	
2	16°17.668'S, 67°20.935'W. Alt. 1000 m	Después del puente
3	16°18.114'S, 67°21.582'W. Alt. 1500 m	Nogalani
4	16°17.811'S, 67°22.894'W. Alt. 1480 m	Wiri Nogalani
5	16°23.896'S, 67°31.672'W. Alt. 800 m	
6	16°17.166'S, 67°15.476'W. Alt. 700 m	
7	16°15.983'S, 67°15.065'W. Alt. 800 m	
8	16°13.309'S, 67°13.502'W. Alt. 750 m	
9	16°09.058'S, 67°10.829'W. Alt. 745 m	San Juan Unidos
10	16°08.796'S, 67°10.848'W. Alt. 805 m	San Juan Unidos
11	16°08.904'S, 67°10.811'W. Alt. 825 m	San Juan Unidos
12	16°12.710'S, 67°09.170'W. Alt. 925 m	De La Asunta a Chirca
13	16°13.192'S, 67°13.371'W. Alt. 778 m	PENDIENTE Chamaca
14	16°13.318'S, 67°13.486'W. Alt. 782 m	
15	16°14.000'S, 67°13.893'W. Alt. 740 m	
16	16°16.975'S, 67°15.315'W. Alt. 790 m	
17	16°17.879'S, 67°17.556'W. Alt. 783 m	
18	16°17.463'S, 67°21.403'W. Alt. 835 m	
19	16°17.456'S, 67°21.498'W. Alt. 866 m	
20	16°17.325'S, 67°23.337'W. Alt. 970 m	Primera?

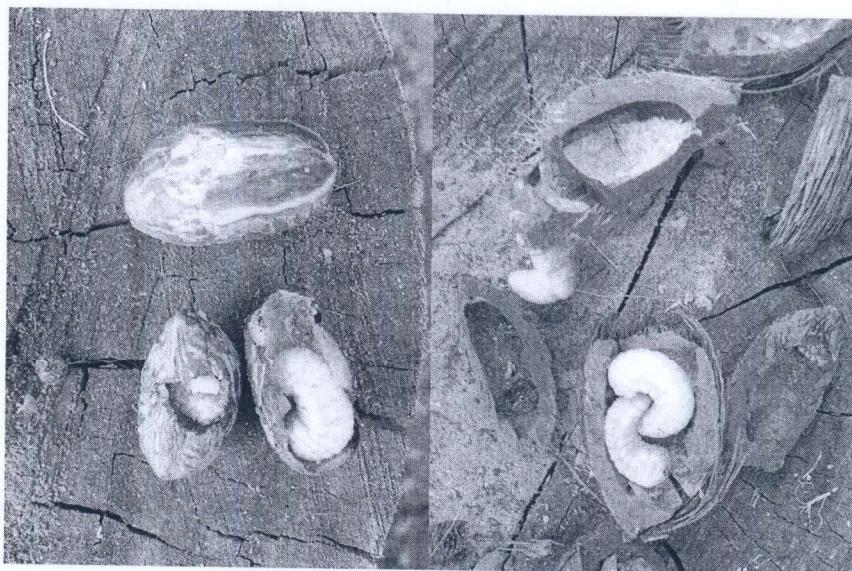


Frutos maduros (arriba) e inmaduros (abajo).



Poblaciones de *Syagrus yungasensis* en pendientes pronunciadas.

En la obtención de frutos del primer viaje en 2018 – que generalmente fue realizada recogiendo frutos del suelo - un 27% (del total de 180 frutos) fue atacado por larvas de Bruchidae (Coleoptera) y solo quedaron 132 para iniciar el experimento de siembra . Junto a la Dra. Gallegos y el encargado del vivero (Noel Taboada) se instalaron las siembras, bajo tratamientos que distingan que las semillas estén a profundidad, con suelo superficial, aisladas y en grupos. Por ello, en el segundo viaje recolectamos en Wiri Nogalani y San Juan Unidos un total 184 frutos maduros de la palmera y otros 40 inmaduros, los cuales fueron sometidos a pruebas de maduración por el encargado del vivero en Chirca. En este lote de frutos, aseguramos que sean maduros, sin haber caído al suelo y que sean aptos para el repique y posterior germinación.



Larvas de coleópteros que consumieron los embriones de la palma.

### -Vivero en Chirca

Gracias a la colaboración de la Dra. Silvia Gallegos, coordinadora del vivero de Chirca (Sud Yungas) mediante otro proyecto , se cuenta con las condiciones mínimas y adecuadas para instalar los experimentos de germinación de *Syagrus yungasensis*. Se han plantado cerca de 400 frutos de *Syagrus yungasensis*, de acuerdo a los tratamientos previamente definidos con el fin de contrastar la respuesta de germinación. Se han ajustado los tratamientos, acondicionando las semillas más profundas junto a piedras desmenuzadas, simulando mejor las condiciones observadas en campo.



Vivero en Chirca (Sud Yungas).



Experimento de frutos de *Syagrus yungasensis*.

Durante los viajes de campo se ha intentado extraer plántulas de *Syagrus yungasensis* para procurar transplantar al vivero de Chirca. Sin embargo, la base queda profundamente enraizada (mayor a 30 cm de profundidad) y existe el riesgo de romper la raíz. Por lo que descartamos esa opción , pero simulamos esas características junto a piedras y grupos de semillas para reacondicionar la siembra en el vivero.



Plántula de *Syagrus yungasensis*.

Se constató hasta enero/2019 los 400 frutos sembrados todavía no hubieron cambios y ninguno ha germinado todavía. Es un aspecto característico de las Arecaceae, pues generalmente las semillas tienen una extendida latencia y por ello demora mucho la germinación.

Finalmente, el proyecto ha adquirido dos equipos que favorecerán el monitoreo microclimático en Chirca para un data logger y un adaptador para activar el sensor y descargar los datos (ha sido ordenado por internet y tendremos la entrega para fines de la primera semana de mayo próximo, gracias a la gentileza del Dr. Miguel Fernandez de NatureServe).

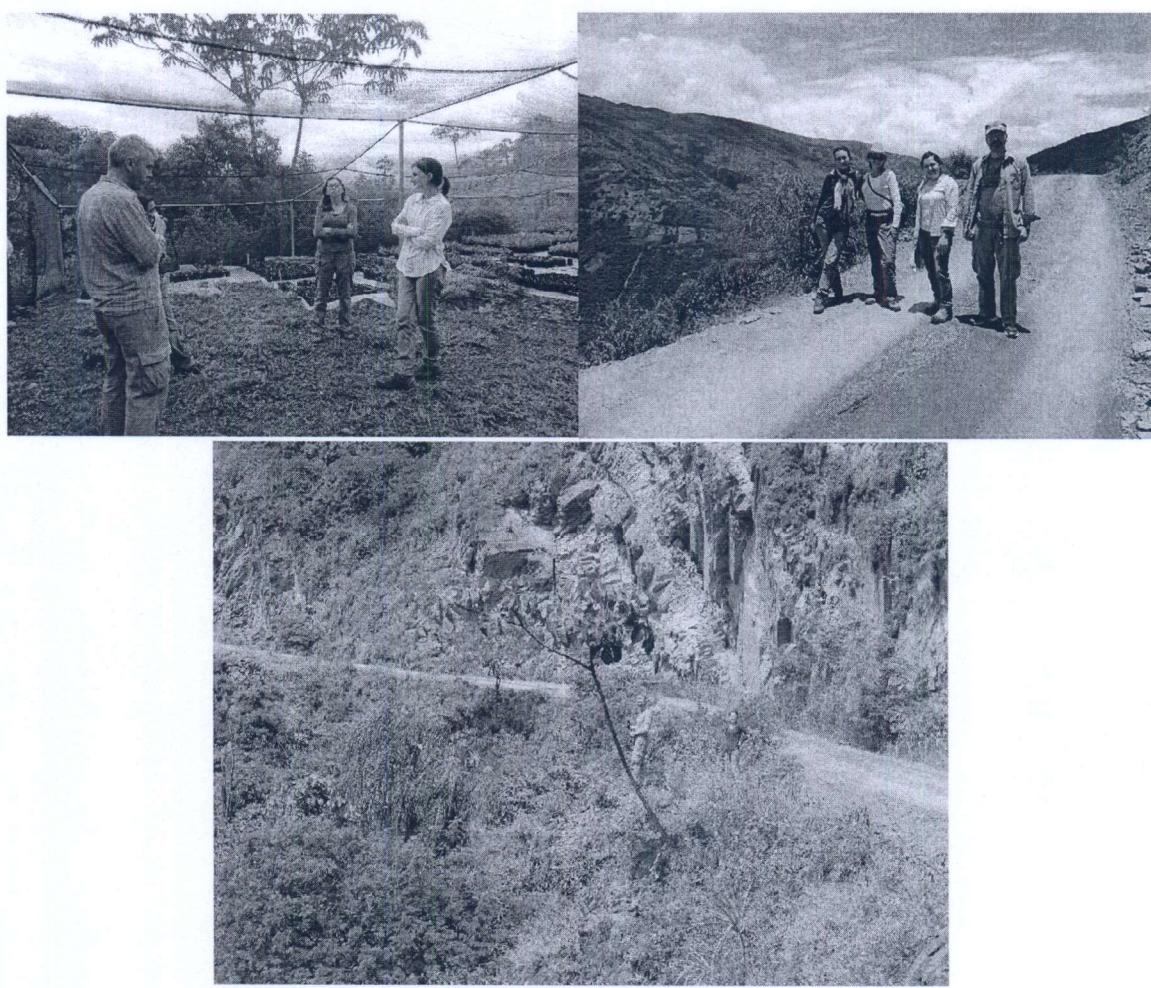
#### **INFORMES DE CAMPO Y DE AVANCE BGCI**

Cada viaje de campo cuenta con el respaldo de los informes que fueron entregados, junto al descargo financiero de los gastos. Al momento se realizaron cinco viajes de campo para los gastos de 2018 (dos para *Magnolia madidiensis* entregados por Freddy Zenteno y tres para *Syagrus yungasensis*: dos por Mónica Moraes y uno por FZ). Por lo que todavía está pendiente el cumplimiento de compromisos de colecciones frutos y semillas de *Magnolia madidiensis* porque todavía no se encontraron individuos reproductivos. Se espera que con fondos de 2019 podamos realizar esfuerzos similares para cumplir con las actividades comprometidas bajo el Proyecto y con BGCI.

Además de los descargos realizados con FUNDECO, también hicimos llegar dos informes de avance a BGCI, cuyos documentos adjunto a este informe, pues estuvieron a mi cargo y reportamos los avances logrados, así como con el respaldo fotográfico. En anexos 1 y 2 incluyo el informe de julio/2018 y el informe de diciembre/2018, respectivamente. Estos avances han garantizado que el financiador del Proyecto haya renovado el respaldo financiero para 2019, pues la conformidad ha sido planteada por BGCI y así se ha confirmado el depósito, que ha sido registrado por FUNDECO. La planificación para 2019 incluirá viajes de campo, recolección de frutos, siembra para la regeneración y trabajo con comunidades locales para incrementar el grado de capacitación, como el instalado en Chirca.

#### VISITA DE PERSONEROS DEL BGCI A BOLIVIA

Como parte de las actividades, organizamos el viaje de visita de dos personeros del BGCI a La Paz: Joachim Gratzfeld y Noelia Alvarez, junto a la directora del Herbario Nacional de Bolivia, Dra. Carla Maldonado. Este viaje incluyó la visita al vivero de Chirca en que se confirmó la instalación de los experimentos de germinación de los frutos de *Syagrus yungensis*, así como el viaje de registro fotográfico de los palmares de esta especie.



Visita al vivero de Chirca y relevamientos en campo .

Fue muy importante esta actividad para nuestro Proyecto porque a su vez el BGCI ha reportado los avances realizados y que se han constatado las condiciones de las poblaciones de palmeras, así como los experimentos de germinación para la propagación a mediano plazo, como parte del Programa que concentró la oportunidad de financiamiento, bajo modalidad anualizada.

### INFORMACIÓN DEL PROYECTO EN PÁGINA WEB BGCI

El componente que incluye a la palma endémica *Syagrus yungensis* ha sido ilustrado en la página web de esta institución privada (<http://globaltrees.org/projects/conservation-of-an-endemic-palm-in-the-mountains-of-bolivia/>). La redacción del texto y respaldo fotográfico fue basada en los avances logrados y ya están vigentes para su consulta, como otros Proyectos similares de la Red Global de Árboles Amenazados. El formato corresponde a una estructura estándar que es requerida a cada uno de los proyectos que está involucrado en esta Red.

The screenshot shows the Global Trees Campaign website. At the top right are social media links for Contact us, Facebook, Twitter, and Google+. Below that is the Global Trees Campaign logo with a stylized hand holding a leaf. A "Support us" button is also visible. The navigation menu includes About, Threatened Trees, Projects, News & Blog, Resources, and Global Tree Specialist Group. A search bar is on the right. The main content area shows the title "Conservation of an endemic palm in the mountains of Bolivia". Under "Conservation Problem", it states: "The Bolivian endemic palm *Syagrus yungensis* discovered in the Yungas Mountains of La Paz in 1996 and is threatened with extinction due to the deforestation for the cultivation of coca plantations. Known from only one location the risk of losing this endemic species due to fires and tree felling clearing the land is extremely worrying". Below this is a "Project Goal" section: "We aim to carry out comprehensive field surveys including the collection of seeds for propagation in order to establish *ex situ* conservation collections and reinforcement of the populations." To the right is a large image of a mountainous landscape with dense vegetation. Below the image are social media sharing icons for Twitter, Facebook, and Google+. In the bottom right corner of the main content area, there is a "Latest News & Blog posts" sidebar with two entries: "Transatlantic teamwork to complete Tovomita Red List" (Posted on April 10th 2019 by Megan Barstow) and "One third of *Nothofagus* species threatened in the wild" (Posted on February 25th 2019 by Megan Barstow).

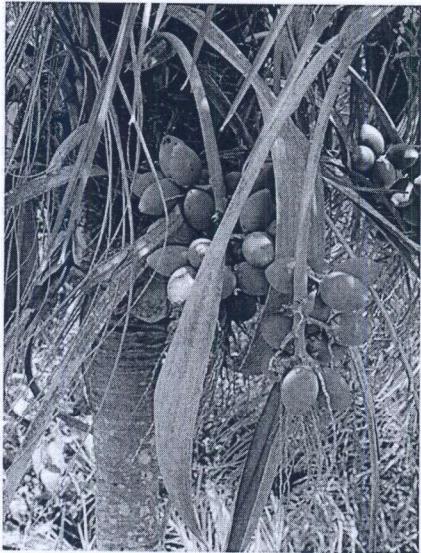
Primera vista del proyecto en la página web.

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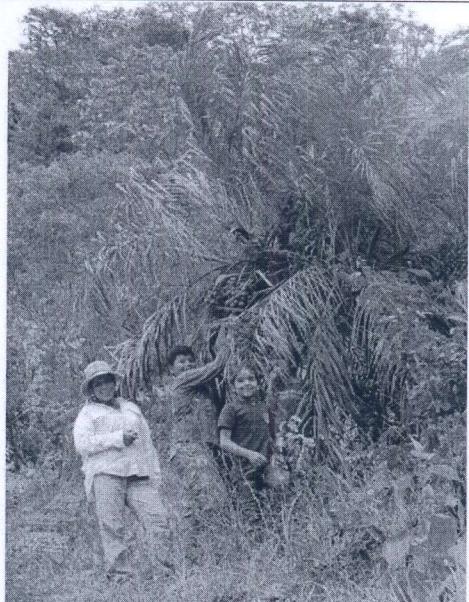
#### What are we doing about it?

Since 2018 GTC is working with our local partner, Herbario Nacional de Bolivia in La Paz with the aims of ensuring the participation of local communities in the *in situ* conservation and *ex situ* regeneration plan for this species. To achieve this, we are carrying the following actions:

- Field surveys to find out the full distribution and status of populations of this species
- Establishing an experimental nursery and producing a propagation protocol.
- Organizing engagement workshops with the local communities, authorities and schools with the aim of adopting strategies, actions and regulations for the protection of this species.



Fruits of *Syagrus yungasensis* (Credit: Mónica Moraes, Herbario Nacional de Bolivia)



Children harvesting the fruits (Credit: Mónica Moraes, Herbario Nacional de Bolivia)

#### Key achievements

In our first year of the project, we took important steps towards the project goals. Survey work has revealed new populations of *Syagrus yungasensis*, prompting the revaluation of its conservation status. Seeds were collected from the different populations and germination trials are being carried out at the experimental research station nursery in Chirca. The saplings will be planted at the selected reinforcement sites in the Yungas. There have been talks with community local leaders for the delivery of an engagement workshop to increase the awareness and the protection of this emblematic Bolivian species.

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Segunda y tercera vista s del proyecto en la página web.

#### MODIFICACIÓN DE LA CATEGORÍA DE CONSERVACIÓN

En 2012 se publicó el Libro Rojo de Plantas de Bolivia, para la zona andina, en que *Syagrus yungasensis* fue categorizada como en peligro crítico (CR). Sin embargo, gracias a los relevamientos en campo se han incrementado los puntos de presencia. Por ello, se encuentra en preparación la ficha técnica para asignar una nueva categoría de conservación de acuerdo a formato de la UICN (que se incluye en Anexo 3).

#### Conclusiones

Se cumplieron satisfactoriamente los objetivos previstos para el viaje. Sin embargo, se deberá replantear la categoría UICN de esta especie endémica porque su distribución es más amplia de lo que antes fue conocido. Además se deberá recolectar entre enero y febrero otro lote que favorezca el diseño experimental y podamos monitorear la germinación bajo los tratamientos programados.

#### Agradecimientos

Agradezco la colaboración de la Dra. Silvia Gallegos en su apoyo logístico en Chirca, así como a la Lic. Sofía Miguez quien colaboró con las actividades en trabajo de campo. También a la Dirección del Herbario y a FUNDECO.

## **Anexos**

## Anexo 1. Informe de avance a BGCI (julio/2018).

### BGCI Global Trees Campaign Project Report

#20

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, July 27, 2018 1:04:53 AM
Last Modified:	Friday, July 27, 2018 1:27:19 AM
Time Spent:	00:22:25
IP Address:	200.105.218.231

#### Page 1: Monitoring and Evaluation

##### Q1 1. Contact details

Project title	Ex situ conservation and population reinforcement of two Bolivian species in danger of extinction – <i>Magnolia madidiensis</i> (EN) and <i>Syagrus yungasensis</i> (CR)
Project partner	Herbario Nacional de Bolivia (LPB)
Project report completed by	Mónica Moraes R.
Email	monicamoraes45@gmail.com
Period covered by report	July/2018

##### Q2 2. Project target species

*Magnolia madidiensis*  
*Syagrus yungasensis*

##### Q3 3. Conservation problem the project is addressing

*Magnolia madidiensis* is an endemic tree of the Andean montane, pluvial forests, and sub-andean Yungas forests in Madid National Park. Fully developed flowers have not been recorded to this day. The species is known from four locations only with an estimated extent of occurrence less than 4,000 km<sup>2</sup>. The forest habitat is severely fragmented and is declining mostly due to logging and the rapid expansion of pastoral lands and agriculture. *M. madidiensis* has been assessed as EN (IUCN Red List of Threatened Species, 2016). *Syagrus yungasensis* is an endemic, solitary palm restricted to narrow valleys and steep slopes of the Yungas mountain ranges of La Paz (Real Cordillera), in the eastern Bolivian Andes. Known from only one location, forest clearing for coca plantations and fires hamper natural regeneration. In addition, seedlings and juvenile plants are exposed to grazing pressure from herbivores. As a result, the species has been included in the Red List of the Threatened Flora of Bolivia (2012) as CR.

##### Q4 4. Project goal and objectives

Development of integrated conservation action *Magnolia madidiensis* and *Syagrus yungasensis* by establishing ex situ conservation collections as well as collections for use in reinforcement programmes in situ for populations facing greatest threats. Objectives are as follows: 1 Develop integrated conservation actions of *Magnolia madidiensis* and *Syagrus yungasensis* through the establishment of ex situ conservation collections, 2 Consolidate outreach and awareness efforts on endemic species, 3 Support in situ reinforcement programs for populations facing the greatest threats.

## BGCI Global Trees Campaign Project Report

### **Q5 5. Summary of activities completed over the reporting period**

Two field trips have been carried out to gather seeds of both species. The first one was organized in May/2018 to Apolo in order to get *Magnolia madidiensis* seeds. The second one was in July/2018 to La Asunta to collect *Syagrus yungasensis* fruits.

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### **Q6 6. Summary of main results and achievements made during the reporting period. For projects in their final year, please also provide a summary of all main results and achievements made over the full project period.**

Some trees of *Magnolia madidiensis* were registered but unfortunately only sterile material. Photographic material was obtained in the field in different sites, although they are within the area reported for the species. It is not easy to recognize and less if it is not in bloom. In the case of *Syagrus yungasensis* we had more success in this trip and 230 fruits were obtained (some on the floor). There are several photographic records of the species and also news that grows in a site near La Asunta. In the fruits there were indications of herbivory and then it was found that there were larvae of bruchids. Therefore, the material available to be planted in the nursery of our botanical garden is only 105 seeds that will be subjected to several treatments. But we need to increase the number of seeds.

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Page 2

**Q7 Does the project have a practical ex situ conservation component?** Yes

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Page 3

**Q8 1. Types of ex situ conservation collections established for the target species.** Living plant collection

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**Q9 2. If living plant collections have been established for the different target species, have controlled isolation measures been applied to avoid cross pollination?** Respondent skipped this question

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**Q10 3. If living plant collections have been established for the different target species, please specify the number of individuals per species.**

Not yet ready to start

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**Q11 4. If living plant collections were established as one objective of the project, was genetic diversity/representativeness of the project populations of the target species considered?** No

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**Q12 5. If seed has been collected from wild populations, specify:** Respondent skipped this question

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**Q13 6. How many seeds of the target species are banked at present?** Respondent skipped this question

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BGCI Global Trees Campaign Project Report

**Q14 7.** What other data was collected during seed collection?      Respondent skipped this question

**Q15 8.** What challenges did the project encounter regarding ex situ conservation? (e.g. germination/propagation difficulties)

Not yet established the propagation actions

Page 4

**Q16** Does the project grow plants for in situ species recovery?      No

Page 5

**Q17 1.** What was the nature of the species recovery work?      Respondent skipped this question

**Q18 2.** How many saplings of the target species were out-planted in situ and what was the average survival rate?For example:Species 1: Polylepis pauta:1st year: 0 individuals out-planted2nd year: 35 individuals out-planted - 75% survival rate3rd year: 92 individuals out-planted - 60% survival rate Totals at the end of project: 127 individuals out-planted and 70 survived - 55% survival rateSpecies 2: Polylepis lanuginosa:1st year: 0 individuals out-planted2nd year: 145 individuals out-planted - 95% survival rate3rd year: 200 individuals out-planted - 90% survival rate Totals at the end of project: 345 individuals out-planted and 301 survived - 87% survival rateSpecies 3: etc.

**Q19 3.** If you are in the final year of your project what was the estimated percentage increase in the global population of the target species based on question 2?For example:Species 1: Polylepis pauta:Estimation of global population at the beginning of the project: 3000 individuals 70 surviving individuals representing a 2% increase in the global population after 3 years Species 2: Polylepis lanuginosa:Estimation of global population at the beginning of the project: 800 individuals301 surviving individuals representing a 38% increase in the global population after 3 years Species 3: etc.

**Q20 4.** Has the project removed or reduced the threats to the project populations of the target species? Please specify how.      Respondent skipped this question

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**Q21** 5. Are the project populations subject to official regulation or protection? If so, please specify.      Respondent skipped this question

**Q22** 6. What challenges did the project encounter regarding in situ conservation? (e.g. local community resistance to the species recovery work)      Respondent skipped this question

Page 6

**Q23** Does the project improve horticultural best practice of the target species?      No

Page 7

**Q24** 1. Can you provide details of best practice of propagation of the target species? Including facilities such as wind and sun protection, heating benches, sand beds etc.      Respondent skipped this question

**Q25** 2. If possible, please upload propagation protocol/s. If you have more than three please send them to yvette.harvey-brown@bgci.org      Respondent skipped this question

**Q26** xx      Respondent skipped this question

**Q27** xx      Respondent skipped this question

**Q28** 3. What challenges did the project encounter regarding horticultural practices of the target species? (e.g. non-viable seeds)      Respondent skipped this question

Page 8

**Q29** Does the project provide training?      No

Page 9

**Q30** 1. How many people has the project trained so far, who are they and in which disciplines have they been trained? (e.g. 50 horticulturists were trained in seed conservation techniques)      Respondent skipped this question

BGCI Global Trees Campaign Project Report

**Q31 2.** How many trained people are using the skills learnt? If exact figure is not known, can you give an estimate?

Respondent skipped this question

Page 10

**Q32** Does the project have an education and/or public outreach component?

No

Page 11

**Q33** Please describe the nature of the activities and the numbers of the people engaged? (e.g. 50 school children were engaged in the preparation of herbarium specimens; 10 interpretation panel displays describing the target species and the project established at the botanic garden; etc.)

Respondent skipped this question

Page 12

**Q34 1.** Have any conservation problems been solved through this project so far?

No

**Q35 2.** Are there management plans in place for the target species as a result of the project that are being implemented?

No

**Q36 3.** Does your organisation use any of the Global Trees Campaign resources (<http://globaltrees.org/resources/>) listed below?

Red lists (<http://globaltrees.org/resources/resource-type/red-list/>)

**Q37 4.** What challenges have been encountered in the reporting period and how can they be resolved?

The main difficulty we had was the impossibility of making the first trip since March / 2018 to La Asunta to collect *Syagrus yungasensis*. This was due to local problems with road blocks and intermittently, so our initial plans were not made viable. In addition to not finding reproductive material of *Magnolia madidiensis*. We wanted to deliver the report with a report of both species and therefore we do not send at the end of June, but now in July that we have information of both species.

**Q38 5.** What are the next steps and remaining activities until the end of the project contract period?

On the recommendation of the local people, another survey trip of *Magnolia madidiensis* will take place in November or December / 2018 to find flowers and fruits. In the case of *Syagrus yungasensis*, we will make another trip in the next two months because as we collect vouchers with immature fruits, we expect them to mature in two months. We will also visit another site to confirm the species, although it will not expand the geographical area much. In any case, we will start the planting of *Syagrus* seeds to propagate them, under controlled conditions in nurseries. The same action will be applied to *Magnolia*.

BGCI Global Trees Campaign Project Report

**Q39 6.** If available, please upload any current pictures related to the project. If you would like to send us more than six pictures please send them to [yvette.harvey-brown@bgci.org](mailto:yvette.harvey-brown@bgci.org)

[Magnolia madidiensis - Habit.jpg \(97KB\)](#)

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**Q40 xx**

[Magnolia madidiensis - Leaves.jpg \(119.3KB\)](#)

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**Q41 xx**

[Syagrus yungasensis - site.JPG \(4.3MB\)](#)

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**Q42 xx**

Respondent skipped this question

**Q43 7.** Please provide a report on expenditure for the reporting period and amount transferred according to the project contract. This can be submitted as a pdf or word document. If you would like to submit an excel spreadsheet please email it to [yvette.harvey-brown@bgci.org](mailto:yvette.harvey-brown@bgci.org)

[Expenditures LPB July 2018 to BGCI.pdf \(338.6KB\)](#)

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**Q44 xx**

[Syagrus yungasensis - immature fruits.JPG \(3.8MB\)](#)

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**Q45 8.** Please provide any other comments you would like to make

Respondent skipped this question

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**Q46 xx**

Respondent skipped this question

## Anexo 2. Informe de avance a BGCI diciembre/2018.



### BGCI Global Trees Campaign Project Report

#### Project summary

##### Contact details

Project title: *Ex situ* conservation and population reinforcement of two Bolivian species in danger of extinction – *Magnolia madidiensis* (EN) and *Syagrus yungasensis* (CR)

Project partner: Herbario Nacional de Bolivia (LPB)

Project report completed by: Mónica Moraes R.

Email: monicamoraes45@gmail.com

Period covered by report: December/2018

#### Project target species

*Magnolia madidiensis*

*Syagrus yungasensis*

#### Conservation problem the project is addressing

*Magnolia madidiensis* is an endemic tree of the Andean montane, pluvial forests, and sub-andean Yungas forests in Madidi National Park. Fully developed flowers have not been recorded to this day. The species is known from four locations only with an estimated extent of occurrence less than 4,000 km<sup>2</sup>. The forest habitat is severely fragmented and is declining mostly due to logging and the rapid expansion of pastoral lands and agriculture. *M. madidiensis* has been assessed as EN (IUCN Red List of Threatened Species, 2016).

*Syagrus yungasensis* is an endemic, solitary palm restricted to narrow valleys and steep slopes of the Yungas mountain ranges of La Paz (Real Cordillera), in the eastern Bolivian Andes. Known from only one location, forest clearing for coca plantations and fires hamper natural regeneration. In addition, seedlings and juvenile plants are exposed to grazing pressure from herbivores. As a result, the species has been included in the Red List of the Threatened Flora of Bolivia (2012) as CR.

However, perhaps one of the relevant problems to solve is the little biological and ecological knowledge available to both endemic species.

## **Project goal and objectives**

Development of integrated conservation action *Magnolia madidiensis* and *Syagrus yungasensis* by establishing ex situ conservation collections as well as collections for use in reinforcement programmes in situ for populations facing greatest threats. Objectives are as follows:

- 1 Develop integrated conservation actions of *Magnolia madidiensis* and *Syagrus yungasensis* through the establishment of ex situ conservation collections,
- 2 Consolidate outreach and awareness efforts on endemic species,
- 3 Support in situ reinforcement programs for populations facing the greatest threats.

## **Summary of activities completed over the reporting period**

Two additional field trips have been carried out to gather seeds of both species. The first one was organized in November/2018 to Apolo in order to get seeds of *Magnolia madidiensis*. The second one was in December/2018 to La Asunta to collect *Syagrus yungasensis* fruits.

**Summary of main results and achievements made during the reporting period. For projects in their final year, please also provide a summary of all main results and achievements made over the full project period.**

Trees of *Magnolia madidiensis* already registered during the first fieldwork are included in permanent plots of floristic inventory of the Madidi National Park. But still no fertile material was found. It seems that the flowering period was anticipated for September and October, although no trace of old infrutescences was found. Two botanical collections and photographic material were obtained in the field near Apolo town, although they are within the area reported for the species. To plan a next collection trip, local staff will communicate about the flowering period to ensure the presence of fruits and seeds.

In the case of *Syagrus yungasensis* we were able to settle 132 seeds under different treatments in the nursery of Chirca (South Yungas province, La Paz department) ca. 2.5 hours from La Paz city. We decided to change the site of the nursery because in Chirca (at 1,650 m altitude in the montane forest) the conditions are similar to the area of distribution of this palm tree; afterwards when seeds germinate we can transplant them to La Paz botanical garden at 3,400 m elevation. Two botanical collections and foliar material were obtained for DNA analysis in both populations surveyed: Wiri Nogalani and San Juan Unidos.

We have also increased a new set of 184 mature fruits from two localities and have not chosen those fallen on the floor. Additionally, we collect approximately 80 immature fruits that will be subjected to artisanal ripening tests in Chirca. We have registered 20 GPS points of occurrence and taken several photographic records of the species. We learned from local community members that the fruits are very popular with children. The mesocarp is sweet with a slight peach flavor when fully ripe. To complete the experimental design, we will need to add some 150 ripe fruits, which will be obtained by the end of January / 2019.

Finally, we tried to extract germinated seedlings in natural sites, but it was not possible because the level of rooting is very deep.

**1. Did the project have a practical *ex situ* conservation component?**

- Yes – please answer questions in Section 2 ‘*Ex situ* conservation’
- No – please answer question 3

**2. *Ex situ* conservation**

**2a. Types of *ex situ* conservation collections established for the target species**

- Living plant collection from wild collected seed
- Living plant collection from vegetative material taken from the wild
- Living plant collection from cultivated material originally collected from the wild (Indirect Natural Source)
- Living plant collection from cultivated material with no data provenance
- Seed banked using wild collected seed
- Seed banked using seed harvested from cultivated plants raised from vegetative material taken from the wild
- Seed banked using seed harvested from cultivated plants grown directly from wild-collected seed
- Seed banked using seed harvested from cultivated material with no data provenance
- Cryopreservation
- Tissue / *in vitro* culture
- Other (please specify)

**Conservation living collections**

**2b. If living plant collections have been established for the different target species, have controlled isolation measures been applied to avoid cross pollination?**

- No
- If yes – what measures have been implemented?

**2c. If living plant collections have been established for the different target species, please specify the number individuals per species.**

Approximately 400 fruits of *Syagrus yungasensis* have been repotted in the nursery but no seeds have germinated yet, as is normal in the Arecaceae family that have a prolonged dormancy.

**2d. If living plant collections were established as one objective of the project, was genetic diversity/representativeness of the project populations of the target species considered?**

No

If yes, could you specify how the genetic diversity of the population of the target species will be preserved?

The search for ripe fruit seeks to get from different populations separated from each other. At the moment we have identified two populations (Wiri Nogalani, San Juan Unidos). It remains to relieve the town of Chamaca.

### Seed collections

**2e. If seed has been collected from wild populations, please specify the following:**

Number of populations sampled

Two

Locality and habitat for each of the populations

Wiri Nogalani and San Juan Unidos on steep rocky montane forest for *Syagrus yungasensis*

Number of individuals sampled at each collection

Ca. 400 for *Syagrus yungasensis*

- Estimate size of the populations (number of total plants found)

150 in Wiri Nogalani and 50 in San Juan Unidos for *Syagrus yungasensis*

**2f. How many seeds of the target species are banked at present?**

Ca. 400

**2g. What other data was collected during seed collection?**

- Herbarium specimens  
 Material for DNA analysis  
 Photographs  
 Other (please specify)

**2h. What challenges did the project encounter regarding *ex situ* conservation? (e.g. germination/propagation difficulties)**

No seed of *Syagrus yungasensis* has germinated. Maybe there are techniques or chemical reagents that accelerate germination and we can get guidance from nurseries with palm trees?

**3. Did the project grow plants for *in situ* species recovery?**

- Yes - please answer questions in Section 4 '*In situ* conservation'  
 No – please answer question 5

**4. *In situ* conservation**

**4a. What was the nature of the species recovery work?**

- Protection *in situ* e.g. fencing  
 Reinforcement (planting within an already present population)  
 Reintroduction (planting a new population where it formerly existed)

- Conservation translocation (planting a new population where it was not recorded before)

**4b. How many saplings of the target species were out- planted *in situ* and what was the average survival rate?**

For example:

Species 1: *Polylepis pauta*:

1<sup>st</sup> year: 0 individuals out-planted

2<sup>nd</sup> year: 35 individuals out-planted - 75% survival rate

3<sup>rd</sup> year: 92 individuals out-planted - 60% survival rate

Totals at the end of project: 127 individuals out-planted and 70 survived - 55% survival rate

Species 2: *Polylepis lanuginosa*:

1<sup>st</sup> year: 0 individuals out-planted

2<sup>nd</sup> year: 145 individuals out-planted - 95% survival rate

3<sup>rd</sup> year: 200 individuals out-planted - 90% survival rate

Totals at the end of project: 345 individuals out-planted and 301 survived - 87% survival rate

Species 3: etc.

**4c. If you are in the final year of your project what was the estimated percentage increase in the global population of the target species based on question 4b?**

For example:

Species 1: *Polylepis pauta*:

Estimation of global population at the beginning of the project: 3000 individuals

70 surviving individuals representing a 2% increase in the global population after 3 years

Species 2: *Polylepis lanuginosa*:

Estimation of global population at the beginning of the project: 800 individuals

301 surviving individuals representing a 38% increase in the global population after 3 years

Species 3: etc.

**4d. Has the project removed or reduced the threats to the project populations of the target species? Please specify how.**

**4e. Are the project populations subject to official regulation or protection? If so, please specify.**

**4f. Are the project populations subject to official regulation or protection? If so, please specify.**

**4g. What challenges did the project encounter regarding *in situ* conservation? (e.g. local community resistance to the species recovery work)**

**5. Did the project improve horticultural best practice of the target species?**

- Yes - please answer questions in Section 6 'Horticultural best practice'
- No – please answer question 7

## **6. Horticultural best practice**

**6a. Can you provide details of best practice of propagation of the target species? Including facilities such as wind and sun protection, heating benches, sand beds etc.**

**6b. If possible, please send propagation protocol/s.**

**6c. What challenges did the project encounter regarding horticultural practices of the target species? (e.g. non-viable seeds)**

**7. Did the project provide training?**

- Yes - please answer questions in Section 8 'Training'
- No – please answer question 9

## **8. Training**

**8a. How many people did the project train, who are they and in which disciplines have they been trained? (e.g. 50 horticulturists were trained in seed conservation techniques)**  
A local farmer has been trained for the maintenance and establishment of the seed planted of *Syagrus yungasensis* in Chirca.

**8b. How many trained people are using the skills learnt? If exact figure is not known, can you give an estimate?**

Only one.

**9. Did the project have an education and/or public outreach component?**

- Yes – please answer questions in section 10 ‘Education/public outreach’
- No – please answer questions in section 11 ‘General’

**10. Education/public outreach**

**10a. Please describe the nature of the activities and the numbers of the people engaged? (e.g. 50 school children were engaged in the preparation of herbarium specimens; 10 interpretational panel displays describing the target species and the project established at the botanic garden; etc.)**

**11. General**

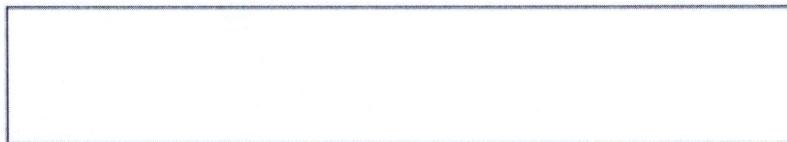
**11a. Have any conservation problems been solved through this project so far?**

- Yes
- No
- If yes, please specify



**11b. Are there management plans in place for the target species as a result of the project that are being implemented?**

- Yes
- No
- If yes, please specify



**11c. Does your organisation use any of the Global Trees Campaign resources (<http://globaltrees.org/resources/>) listed below?**

- Ex situ surveys ([http://globaltrees.org/resources/resource-type/ex\\_situ\\_survey/](http://globaltrees.org/resources/resource-type/ex_situ_survey/))

- Tree conservation briefs (<http://globaltrees.org/resources/resource-type/practical-guidance/>)
- Red lists (<http://globaltrees.org/resources/resource-type/red-list/>)
- Reports (<http://globaltrees.org/resources/resource-type/reports/>)
  - Integrated Conservation of Tree Species by Botanic Gardens: a reference manual ([http://globaltrees.org/wp-content/uploads/2013/11/tree\\_species\\_low.pdf](http://globaltrees.org/wp-content/uploads/2013/11/tree_species_low.pdf))

**11d. What challenges have been encountered in the reporting period and how can they be resolved?**

The main difficulty in the case of *Magnolia madidiensis* is not having yet obtained fruits or seeds. The next field trip will only be organized if there is a local statement about the flowering of the species. However, unfortunately this delays a lot that we present results for this species.

In the case of *Syagrus yungasensis*, the July / 2019 seeds are not yet germinating and although the total of 600 seeds has not yet been completed, we hope to have new techniques to accelerate germination.

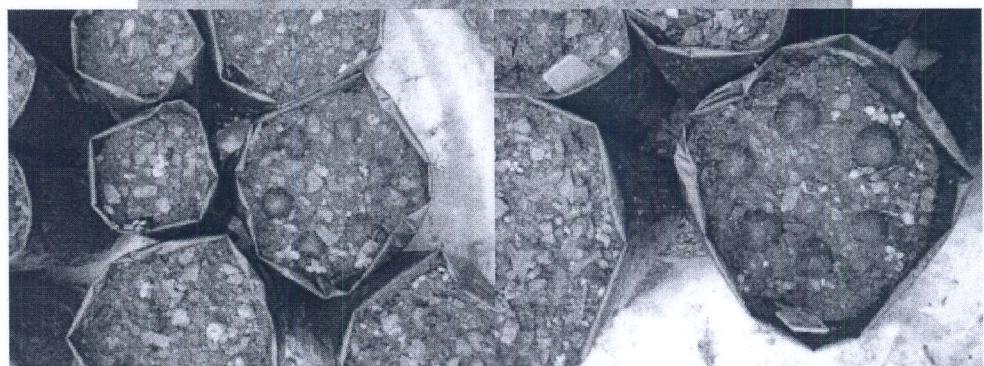
**11e. What are the next steps and remaining activities until the end of the project contract period?**

For *Magnolia madidiensis* it is expected to have flowering information. More seeds of *Syagrus yungasensis* will be obtained in a third identified location. In addition, local awareness activities will be planned, as well as the relationship with the municipalities of La Asunta and La Paz for the propagation of the species.

**11f. If available, please send BGCI current picture related to the project**



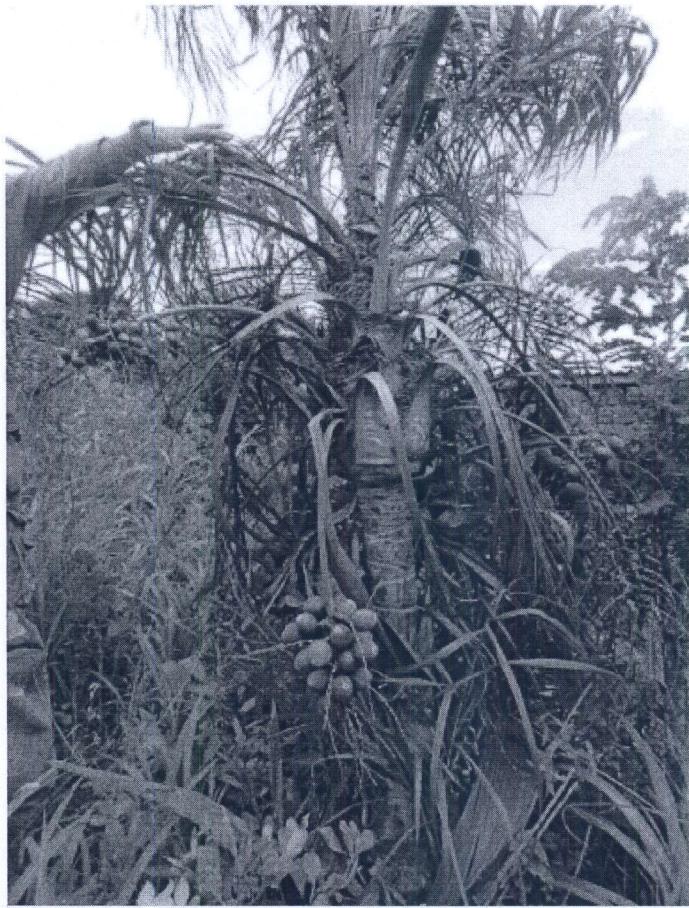
Nursery in Chirca.



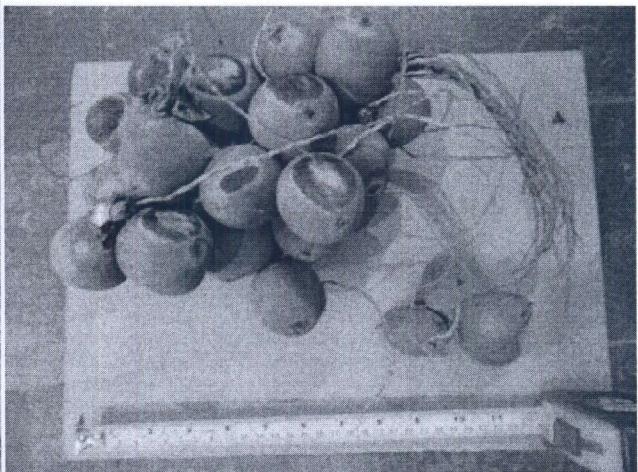
Fruits experiment of *Syagrus yungensis*.



Stands of *Syagrus yungensis* in Wiri Nogalani.



Reproductive plant of *Syagrus yungasensis* with ripe infructescence in San Juan Unidos.



Natural rocky and steep sites with this endemic palm. Ripe and immature fruits.



Colleagues that helped in field work, children enjoying ripe fruits and me.

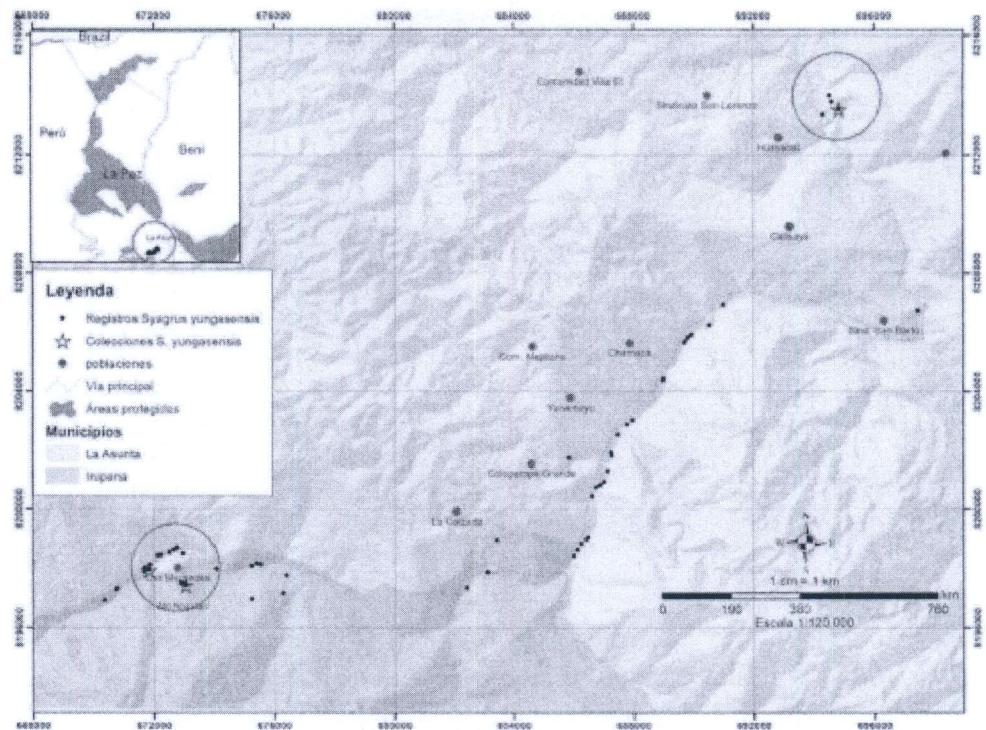
**11g. Please provide a report on expenditure for the reporting period and amount transferred according to the project contract.**

Please find attached to the report.

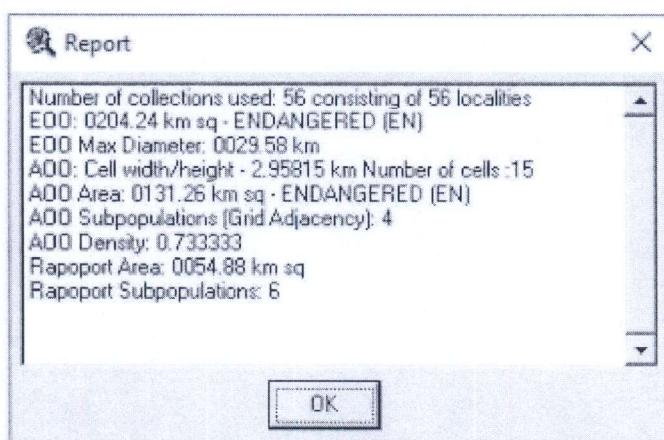
**11h. Please provide any other comments you would like to make**

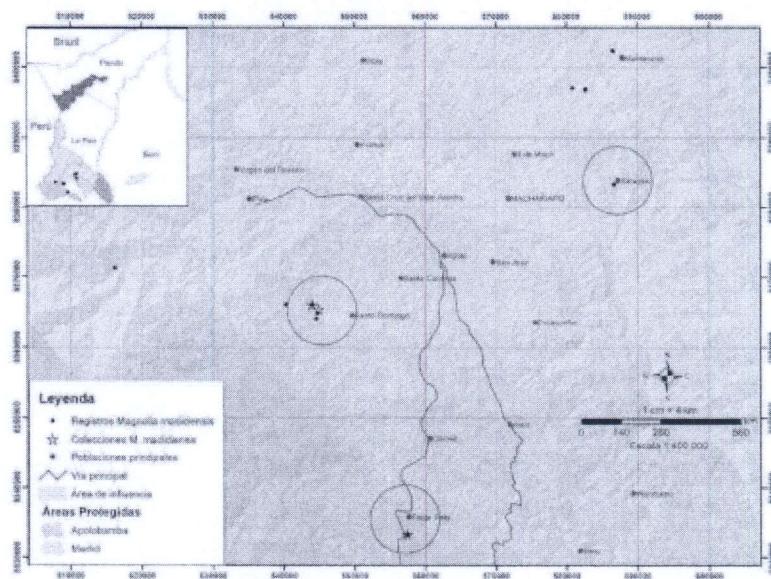
*Magnolia madidiensis* has very low densities, it is a species found in two protected areas (Madidi and Apolobamba) in the rainforests of Yungas montane slopes (see map) and its areas of influence. It is a very difficult species to detect and it seems very rare and with a very wide distribution among individuals.

They are not monumental trees so people prefer to cut other species, but their biggest threat is the change in land use. It requires annual monitoring to detect fruiting that now appears to be at the end of September.



Distribution of *Syagrus yungasensis*.





#### Distribution of *Magnolia madidiensis*.

Whereas *Syagrus yungasensis* in the study area has high and low densities, the biggest threat is the change in land use (agriculture, housing and coca crops) but it is very local and not spread throughout its geographical area. It seems that its optimal site is in the xeric Yungeñan humid forest between Irupana and La Asunta, which is more semideciduous. The species grows in very rocky steep places and that gives it a natural protection. In general, the population does not use it and rarely eat the seed.

This species is not found in any protected area. However, we have been surprised that it is distributed in several points (see map). Therefore, when applying the Cats-IUCN program, it results in an EN category and not in critical danger (CR).

### Anexo 3. Ficha técnica para categorización UICN de *Syagrus yungasensis*.

#### ***Syagrus yungasensis* Moraes**

Common Names: Umuto, coquito

Synonyms: None

Taxonomic Note

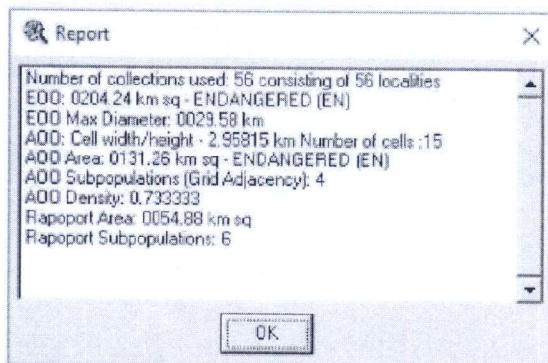
Assessor (Name): Mónica Moraes R.

Date of Assessment: 25/04/2019

#### Distribution

- Where (geographically) is the species found?
- Is its geographic range fragmented/ large/ small etc.?
- Which countries is the species native too (List all)?
- What is the species area of occupancy/ extent of occurrence?

This palm species is only found in Bolivia. Its fragmented distribution is very restrictive to inter Andean humid valleys in montane forests between 700 and 1,500 m altitude of La Paz department. It is used for mature edible fruits by local people, but only occasionally. The current threat derives from the cultivation of coca crops (*Erythroxylum coca*) and intensive road construction in the mountains of the Yungas region, although it does not occur in all its extension. The area of occupancy is 131,25 km<sup>2</sup>. It is therefore suspected that this species has experienced a historical population decline of at least 10% over the last three generations. It is globally assessed as Endangered.



#### Population

- Do we know anything about population size/ density/ decline/ fragmentation/ genetic isolation?
- Can we estimate the percentage of decline in population size or habitat (historically or in the future)? And over how many years? (Think of criteria A)
- **Key Words-** Mature individuals/ subpopulations/ generation length/ reduction/ continuing decline

This species is found in four populations which possibly still maintain a gene flow, namely Yanamayo, San Juan Unidos, Wiri Nogalani, and Machaca. The population structure evaluated in Yanamayo follows the inverted "J" model, indicating a constant regeneration -and is confirmed with the regeneration index (IDR = 7), for each adult there are seven seedlings (Blacutt & Moraes 2011). The spatial distribution is mostly grouped with stands of 3 to 20 adult individuals when grow less of 7 m high, whereas they exceed that height (up to 9 m), then the spatial pattern becomes random. The regeneration index varies between 1.14-24.33 (Blacutt & Moraes 2011).

When the populations are found in deforested areas to plant coca leaves, it is estimated that the impact is 10-30% because they are not removed from the site, but can eventually be cut and the extraction of leaves results from an eventual use because they are defoliated for temporary roofing to cover agricultural products. The remaining is found in very inaccessible, steep and rocky sites that are not suitable for agriculture or for coca plantations.

The suspected reduction for the next 10 years or three generations may be 50% due to the decrease in habitat quality.

#### Population Information

**Current Population Trend:** Decreasing/Increasing/Stable/ Unknown (Delete as appropriate)

The population of Yanamayo has been evaluated as stable and with intense regeneration (Blacutt & Moraes 2011).

## Habitats and Ecology

- If available, include information on species habit/ species habitat/ associated species/ flowering time/ dispersal strategy

This species is 5-7 m tall, solitary and grouped individuals. It is located in an inter-Andean valley with mountainous slopes of semideciduous vegetation, where the population of *Syagrus yungasensis* stands out on the slopes of high inclination. It is part of a mosaic composed of fragmented dry forest, chaparral, scrub and eroded land with different ecological conditions and floristic plant communities. The main activity is agriculture, being the most popular coca monocultures (*Erythroxylum coca*) and citrus plantations. Among associated species are found Rubiaceae, Melastomataceae, Lauraceae, Fabaceae, Myrtaceae and cacti are found; while also are characteristic *Tecoma*, *Parapiptadenia excelsa*, *Anadenanthera colubrina*, *Maclura tinctoria*, *Hymenaea courbaril*, *Cortaderia* sp., *Schinopsis haenkeana*, *Ceiba mandonii*, *Dodonaea viscosa*, *Amburana cearensis*, *Myroxylon balsamum*, *Caesalpinia pluviosa*, *Aspidosperma cylindrocarpum*, *A. rigidum*, *Oxandra espihana*, and others. This species blooms and fructifies throughout the year, although there is more abundance in the dry season (May to September). Medium to small rodents are responsible for dispersing endocarps, although squirrels are seed predators.

**Habitat decline?** Yes/ No

## Use and Trade

- Uses- future/historical/ current?
- Any measures of the extent of use?

## Threats

- Are there any species-specific threats or regional/local actions causing decline e.g. is its habitat at risk?
- What scale of loss has this caused to the species- is it a major or minor threat?

The threats that influence a percentage of the population of *Syagrus yungasensis* are the following: 1 Particularly the places where agriculture expands, 2 also in places where new roads are opened for the commercialization of products and 3 the increase of local settlements that are a consequence of regional development.

**Number of locations** (areas of single threatening events): four

## Conservation

- Is the species in any ex situ collection or are there in situ actions in place?
- What conservation actions would be beneficial to the species?

Through a project of the National Herbarium of Bolivia in La Paz with BGCI under the program of Global Trees Assessments, the work of sowing and treatments of fruits has been started in 2018 to be used for propagation in the Chirca nursery (110 km east of the city of La Paz). It is expected the training and installation of practices to expand ex situ collections, but also the awareness and care at the level of the localities where it grows naturally.

## Red List Assessment & Rationale

		Critically Endangered	Endangered	Vulnerable	Not threatened
<b>A</b>	Population reduction		A3c		
<b>B</b>	AOO		B2aci		
	EOO				
	Severely fragmented (yes/no)				
	Number of locations				
	Continuing decline (which subcriteria)				
<b>C</b>	No. of mature individuals				

	Percentage continuing decline				
	No. of mature individuals per subpopulation				
	% mature individuals in 1 subpopulation				
<b>D</b>	Number of mature individuals				
	AOO/ No. of Locations				
<b>E</b>	Probability of extinction risk				

Red List Status
EN

### **Assessment Rationale**

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- Please summarise information provided above

The suspected reduction for the 10 years or three generations may be 50% due to the decrease in habitat quality (due to agricultural practices and road construction). The area of occupancy is 131,25 km<sup>2</sup> determined because its population is severely fragmented, due to habitat quality.