

## Project Update: August 2022

Period: 14<sup>th</sup> February – 2<sup>nd</sup> August 2022, Progress of activities of the first main objective:

### 1. Development of protocols for the generation of seedlings of *Myrica parvifolia* and other forest species *in vitro* and in nursery

Related projects:

Tentative Title	<i>In vitro</i> multiplication of woody species for reforestation purposes in the Tambillo Community Protected Area
Institution:	Universidad Técnica de Manabí
Modality:	Undergraduate thesis
Principal Researcher:	Ph.D. Liliana Corozo - Researcher and Lecturer Ph.D. (c) Fátima Macías - Researcher

**Important note:** in project 35230-1 it was mentioned to develop the proposal with the plant species *Myrica parvifolia*, according to a literature review and the opinion of professionals have suggested the name *Morella* sp., it is necessary to mention that it is the same plant. With a future botanical study, the species of the genus *Morella* will be established.

#### 1.1 *In vitro* establishment of *Morella* sp. cultures

##### 1.1.1 Protocol for the disinfection of apical shoots

The apical shoots of *Morella* sp. were obtained from 9-month old seedlings maintained in the nursery of the University of Cuenca. In the Biotechnology laboratory of the Universidad Politécnica Salesiana, undergraduate students of the Universidad Técnica de Manabí carried out the disinfection protocol. Firstly, the explants were washed with liquid soap and running water, then disinfecting agents were used, such as a solution of Tween 20 and 70% ethanol, at constant concentrations and times, and sodium hypochlorite at variable concentrations and times (Image 1).

##### 1.1.2 Culture media

Aseptic explants were placed in sterile Murashige & Skoog (MS) and Woody Plant Medium (WPM) supplemented with Gamborg's vitamins, cysteine, sucrose and agar.

##### 1.1.3 Incubation conditions

The samples were deposited in the growth chamber of the Universidad Técnica de Manabí, the growth conditions were photoperiod 12 hours light - 12 hours dark and temperature 20 °C ±2.

### Partial results

As of the date of this report, there are no results that can be reported, because the *Morella* sp. in *in vitro* cultures shows a response between 2-4 months.



Image 1: Undergraduate students of the Universidad Técnica de Manabí preparing *Morella* sp explants for sowing in sterile MS and WPM culture medium, In the Biotechnology laboratory of the Universidad Politécnica Salesiana. © Mateo León.

**2. Intensify actions that involve the Jima Community and the teams of the collaborating universities (researchers – lecturers and students)**

Related projects:

Title	Reforestation of areas degraded by forest fires in the Tambillo Community Protected Area
Institution:	Universidad de Cuenca
Modality:	Social Outreach Hours

Principal Researcher:	Ph.D. Juan Pablo Iñamagua – Researcher and lecturer
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Tentative Title	<i>In vitro</i> multiplication of woody species for reforestation purposes in the Tambillo Community Protected Area
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## 2.1 Local trips to the Tambillo Community Protected Area (TCPA)

During the period February to July 2022 in the middle zone of the TCPA, mother trees of the species *Morella* sp., *Clusia* sp., *Hedyosmum* sp., and *Weinmannia* sp. were identified, which will serve as seed sources for obtaining future seedlings. The local trips and seed sources identified are detailed below.

February 19th, 2022: a field visit was made with Dr Juan Pablo Iñamagua and undergraduate students of agronomy at the Universidad de Cuenca. The objective was to identify seed sources of *Morella* sp. and *Clusia* sp. (Image 1).

March 25th – 26th, 2022: field visits were conducted with Dr Juan Pablo Iñamagua, undergraduate students of agronomy at the Universidad de Cuenca and a student of biotechnology at the Universidad Politécnica Salesiana. The objective was to identify seed sources of *Morella* sp., *Clusia* sp. and *Hedyosmum* sp. (Image 2).

April 08th – 09th, 2022: field visits were conducted with Dr Juan Pablo Iñamagua and undergraduate students of agronomy at the Universidad de Cuenca. The objective was to identify seed sources of *Weinmannia* sp. (Image 3).

April 29th – 30th, 2022: field visits were conducted with Dr Juan Pablo Iñamagua and undergraduate students of agronomy at the Universidad de Cuenca. The objective was to identify seed sources of *Weinmannia* sp. and *Clusia* sp. (Image 4).

June 10th, 2022: a field visit was made by Dr Liliana Corozo, Dr (c) Fátima Macías and undergraduate students of agronomy at the Universidad Técnica de Manabí. The objective was to collect seeds of *Morella* sp. (Image 5 – 6).

July 08th, 2022: a field visit was made with Dr Juan Pablo Iñamagua and undergraduate students of agronomy at the Universidad de Cuenca. The objective was to verify the geolocation of individuals considered and the characterisation of the mother trees of the species *Morella* sp., *Clusia* sp., *Hedyosmum* sp., and *Weinmannia* sp. (Image 7).

## 2.2 Participation of the Jima Community in Environmental Education Classes

May 20th and April 22<sup>nd</sup>, 2022: MSc. María Elisa Durán and undergraduate students of environmental programme at the Universidad de Cuenca visited the schools 20 de Abril,

Marco Antonio Toral, and Lorenzo Piedra belonging to the Carmen de Zhipta Community in the parish of Jima. The objective was to teach teachers and children students at the different schools about the different ecosystem services, through a didactic and interactive methodology (Image 8 – 10).

### **Partial results**

2.3 Intensify actions that involve the Jima Community and the teams of the collaborating universities (researchers - professors and students).

#### 2.3.1 Local trips to the Tambillo Community Protected Area

Between February and July 2022, 11 local trips have been made to the TCPA, this represents 100% of the committed local trips. In addition, four additional trips have been made to date, representing an increase of 30.76%.

#### 2.3.2 Identification of seed sources

In the area selected for the search of the different specimens were found: *Morella* sp. 25 trees, *Hedyosmum* sp. 22 trees, *Clusia* sp. 20 trees, *Weinmannia* sp. 20 trees (Image 11).

#### 2.3.3 Participation of the Jima Community in Environmental Education Classes

The members of the Jima Community, particularly the Carmen de Zhipta Community, learned about ecosystem services, such as support, regulation and cultural services. 21 children and two teachers attended the workshops from the 20 de Abril school; eight children and one teacher from the Lorenzo Piedra school; and 24 children and one teacher from the Marco Antonio Toral school.

The teachers received printed material on the different ecosystem services to include in the education of future students (Image 12 – 14).



Image 1: Identification of seed sources of *Morella* sp. © Mateo León



Image 2: Identification of seed sources of *Hedyosmum* sp. © Mateo León



Image 3: Identification of seed sources of *Weinmannia* sp. © Mateo León



Image 4: Identification of seed sources of *Clusia* sp. © Mateo León



Image 5: Visit to the TPCA by teachers and undergraduate students of the Universidad Técnica de Manabí. © Mateo León



Image 6: Dr Liliانا Corozo collect seeds of *Morella* sp. © Mateo León.



Image 7: Characterization of the mother trees of *Morella* sp. © Mateo León





Image 9: Children's participation in environmental education classes, Lorenzo Piedra school. © María Elisa Durán



Image 10: Children's participation in environmental education classes, Marco Antonio Toral school. © María Elisa Durán

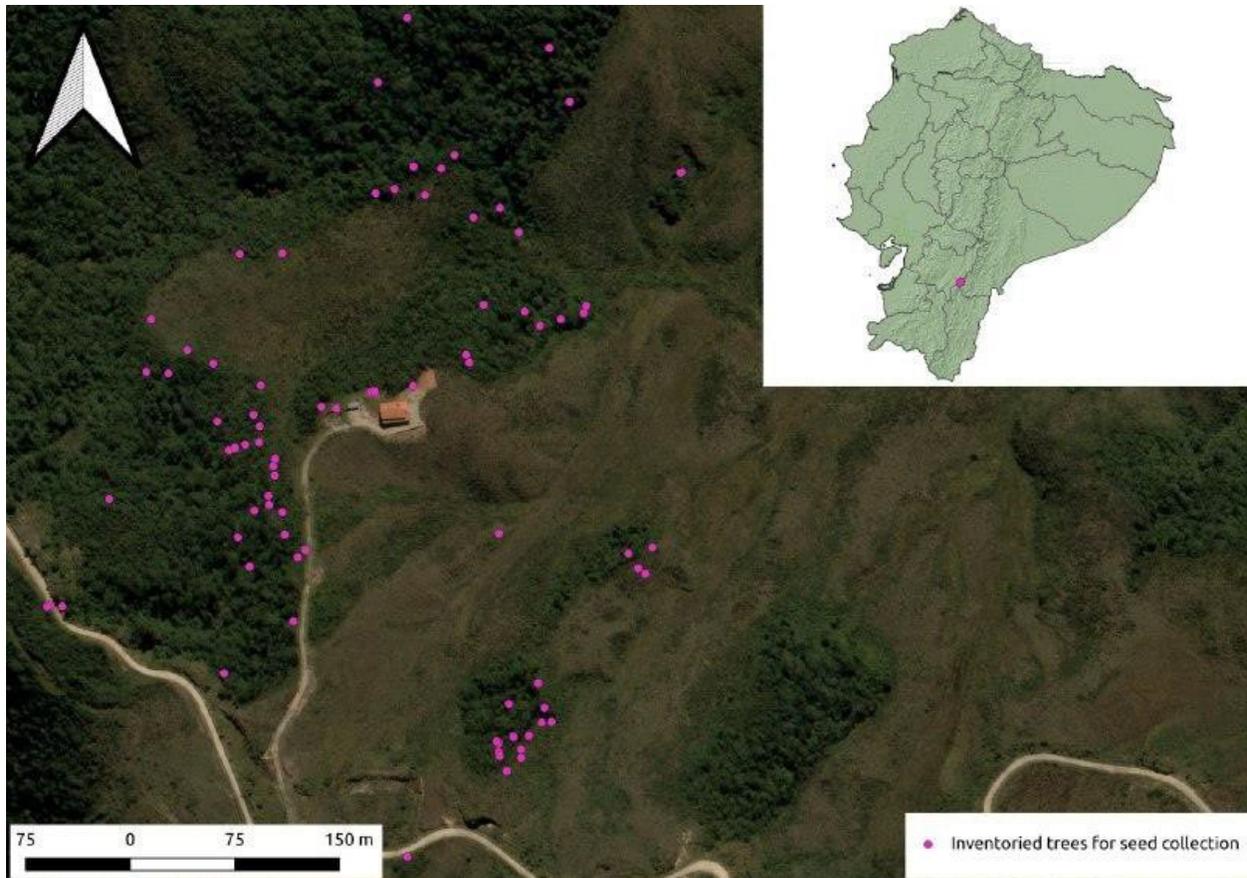


Image 11: Location of *Morella* sp., *Clusia* sp., *Hedyosmum* sp., and *Weinmannia* sp trees in the middle zone of TPCA. © Juan Pablo Iñamagua

# APRENDAMOS SOBRE EL SERVICIO ECOSISTÉMICO DE SOPORTE



Universidad de Cuenca  
Proyecto de vinculación con la sociedad:  
"Reforestación de áreas  
Degradadas por incendios forestales en el Área  
Protegida"  
Comunitaria Tambillo  
Docente tutor: Blg. María Elisa Durán

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Este material se imprimió con el apoyo de:



Image 12: Didactic material – Supporting ecosystem service. © Mateo León



# EL BOSQUE MÁGICO

**Créditos:**

**Proyecto de Vinculación**

**"REFORESTACIÓN DE ÁREAS DEGRADADAS POR INCENDIOS  
FORESTALES EN EL ÁREA PROTEGIDA COMUNITARIA  
TAMBILLO"**

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Este material se imprimió con el apoyo de:



Image 13: Didactic material – Regulating ecosystem service. © Mateo León

# APRENDIENDO CON TAMBITO



## EL SERVICIO ECOSISTÉMICO CULTURAL

PROYECTO: "REFORESTACIÓN DE ÁREAS  
DEGRADADAS POR INCENDIOS FORESTALES EN EL ÁREA PROTEGIDA  
COMUNITARIA TAMBILLO"



## PRESENTACIÓN.

Hola, este material que tienes en tus manos es una herramienta que te servirá para aprender sobre el servicio ecosistémico cultural que nos brindan los árboles. Este material contiene 2 partes.



La primera parte se trata de un cómic con el que te divertirás leyendo una historia de nuestro héroe Tambito y sus aventuras.



La segunda parte se trata de un juego de dados en el cual podrás compartir y divertirte junto a tus amigos.



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Cuenca, Marzo 2022

Este material se imprimió con el apoyo de:



Image 14: Didactic material – Cultural ecosystem service. © Mateo León