



SUPPORTING THE CHILDREN'S ETERNAL RAINFOREST SINCE 2002

Using GIS to Map the Forest!

Maggie Eisenberger, Science & Travel Director

Our student trips have added a new wrinkle – GIS! In order to accumulate data from one trip to the next, one year to the next, we now have a GIS app for students to use while walking the trails. Amy Work, of geoporter.net, adapted an ESRI program called Survey 123 and we have installed it on a number of devices students carry during their field work.

The photos are screenshots of just a couple portions of the app. When a student wants to record a species, they open the app and begin entering data into the prepared fields. Each entry is thus attached to information about the date of the observation, the station and trail, time and weather conditions, and other details. If they know the name of the species, or just what group it belongs to (e.g. woodpecker, palm, etc.), they include that. The app even allows students to attach a photo or sound file, if they are able to capture a bird's song or take a picture of a flower. A space for comments offers students the opportunity to describe any behaviors they observe, such as nest-building, feeding, mating displays, and so on.

So far, two schools have collected data around the San Gerardo field station. Once repairs are completed on the Pocosol station, we will begin collecting data there, too. We will also be providing the app to the maintenance and guard staff of MCL so that they can enter their own observations. Clearly, this is still

a work in progress, but once we have been using the app for a couple of years we will have accumulated a significant data base of plant and animal species for several locations, plus associated weather conditions and behaviors that are like puzzle pieces, coming together to give us a more and more detailed picture of the biological communities throughout the Monteverde-Arenal region. Honestly, as important as that is, it's only secondary to the great number of students we hope will have participated in the data collection and their unique experience in using technology to contribute to a critical body of scientific knowledge.

CER Biodiversity Survey

Method of detection *

Did you see, hear, or have other evidence of the observation?

☐ Visual ☐ Auditory

☐ Tracks (footprints, dung, feathers, etc) ☐ Other Evidence

Primary Taxa (classification group) of the principle organism for this observation *

Identify to which group the principal organism in this observation belongs.

☐ Fungi ☐ Plant

☐ Arthropod ☐ Amphibian

☐ Reptile ☐ Bird

☐ Mammal ☐ Other

Species or organism type

If you know a more specific name, group, or the actual species of the main organism in this observation, add it here. If you do not, type **unknown**.

How confident are you of your observation? *

CER Biodiversity Survey

No Location

Press to capture location using a map

© Esri contributors

Sun *

Describe the **sun** conditions

☐ Night ☐ Pre-Dawn ☐ No sun ☐ Little sun ☐ Moderate sun ☐ Heavy sun

Wind *

Describe the **wind** conditions

☐ No wind ☐ Little wind ☐ Moderate wind ☐ Heavy wind

Rain *

Describe the **rain** conditions

THESE GRANTS NEED YOUR HELP!

Whether it's for a much needed protection vehicle or repairing the damage from earthquakes please visit www.friendsoftherainforest.org/grants to find out how you can make a difference!



WHAT ARE YOU DOING ON OCTOBER 7TH?

Do you live in the St Louis Area and want to have a little fun? Come to our 4th Annual Trivia Night! Visit www.friendsoftherainforest.org/trivianight to reserve your seats today!

Tapir Captured on Tape

Lindsay Stallcup, Executive Director - Monteverde Conservation League

We are excited to report recent video footage of **Baird's tapir** (*Tapirus bairdii*) on the trails near our San Gerardo Station! The tapir is one of many endangered species protected within the Children's Eternal Rainforest. The video was taken by the CSU-Monterrey Bay study abroad program in July using a motion sensor camera.

At up to 660 pounds, the tapir is Costa Rica's largest land mammal. Tapirs are primitive mammals that resemble the ancestors of horses and rhinos. Baird's tapir occurs only in Central America, where it is estimated that fewer than 5,500 tapirs remain (fewer than 1,000 in Costa Rica).

Tapirs are shy and typically stick to more remote areas of forest. They are rarely seen even by our forest guards! Despite their unwieldy appearance, tapirs are surprisingly agile, moving through dense forest and across steep slopes with ease. Tapirs are strong swimmers and often wallow (and take refuge) in rivers and streams.

As is the case with many endangered species, tapirs have been most affected by poaching, habitat fragmentation, and habitat loss. Successful tapir conservation requires the protection of large areas of forest - such as the Children's Eternal Rainforest - as well as securing connectivity to other areas of suitable habitat.

We are always heartened when we see tapir footprints or get a photo on our camera traps. Our conservation efforts are paying off!



Tapir video footage new San Gerardo



Night video footage of Baird's Tapir

Friends of the Rainforest

Our mission is to promote a sustainable world by educating and inspiring children and adults to take action to protect, support and expand the Rainforest in Costa Rica and beyond.

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chelsea.raiche@friendsoftherainforest.org

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erica.twomey@friendsoftherainforest.org

Friends of the Rainforest

1324 Clarkson Clayton Ctr # 312
Saint Louis, MO 63011
314.941.1257
www.friendsoftherainforest.org

Make Friends with a Tree!

Being a scientist depends first and foremost on the ability to observe and record observations accurately. Fall offers a perfect time to begin working on this skill with your child, through a project that will last all year and can be done with a wide span of ages, maybe as young as four.

First, ask your child to pick a tree that's close to your home, if not in your own yard then in a place you can visit at least twice a month, if not weekly – say, at your church, neighborhood park, or grandma's house. It's helpful to pick a tree you can easily identify, if possible, but you can still do the project even if you don't recognize the species. Picking a tree in a wide open space will make other observations easier.

Arm your child with a journal, pencil, measuring tape, and camera. Make a list of observations and record the data for your child or let them write things down themselves. If there are terms your child isn't familiar with, be prepared to google them for explanations.

How tall is the tree?

How big around is the tree about 4 ft. above the ground? (diameter at breast height or d.b.h.)

How long is a leaf? Measure shortest and longest ones to give a range of length.

How wide is a leaf? Measure smallest and biggest to give a range of width.

Are leaves entire or compound? If compound, how many leaflets are there?

Are leaf margins smooth, toothed, or lobed?

Make a rubbing of a leaf, or more than one if there is variation among the leaves. Take photos, too.

Is there any fruit, nut, or cone on the tree? Take measurements and photos.

Describe the color of the leaf and whether it's the same color on both sides. Is the leaf hairy on either side?

Describe the bark color and texture and take photos.

Give your tree a name!

To measure the height of a tree, you can try any one of several methods:

1. Use a range finder to measure the distance to the top of the tree and also the distance to the trunk of the tree. This gives you a base and a hypoteneuse. Use the Pythagorean formula to find the height or try the calculator at <https://www.omnicalculator.com/math/right-triangle>

2. Measure your height and the length of your shadow. Measure the length of the tree's shadow and find its height by setting up a ratio. If your shadow is one fourth your height, the tree will be four times as tall as its shadow.

3. Stand at some distance from the tree and hold up a ruler or yardstick, vertically, at arm's length. Ask mom to walk away from you toward the tree until she looks like she measures six inches tall on the yardstick. Without moving your arm, see how many inches tall the tree looks. If the tree looks 24 inches tall, it's four times as tall as your mom!

4. If you are old enough to be doing trig, you can use the functions of cosin to find the height, but you'll also need to make a clinometer. <https://nrich.maths.org/5382>

Every week, or two weeks, or at least once a month, visit your tree and add to your observations. Have the leaves changed color? Take pictures! Have the leaves fallen off? Have the fruits or nuts fallen? Can you tell if any animals, even insects, are feeding on the fruits or nuts? When do signs of life appear in the spring? Do you see leaf buds first, or catkins, or flower buds? Take pictures! Do you see any insects visiting the flowers? When is the tree leafed out? When do new fruits or nuts start to grow? At the end of a whole year, make a book of your pictures with observations and call it A Year in the Life of a _____. You should be able to figure out what kind of tree you have by now, but if you can't, just call it A Year in the Life of George!





1324 Clarkson Clayton Ctr # 312
Saint Louis, MO 63011
Phone: (314) 941-1257
www.friendsoftherainforest.org

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Visit Paradise!

Travel with us to Costa Rica for an experience of a lifetime. Your group can have a variety of unique and magical experiences in the rainforest. From spending a morning at InBio Parque where you have the opportunity to photograph much of the iconic wildlife and gorgeous flowering plants of Costa Rica, to a hike up the Arenal Volcano, a chance to zipline in the canopy, and a pleasurable soak in hot springs, our trips have something for everyone!

Our trips are organized by Dr. Jeffery Norris, an expert in leading natural history tours in Costa Rica as well as an educator and ecological researcher with over 20+ years of experience. If you're looking for an experience that is both epic and educational, rousing and restorative, this is the trip for you!



Contact us today to organize a trip for your group! trips@friendsoftherainforest.org

*"I wanted to choose a highlight, but as each day ended I remember thinking, **'This was the best day ever!'**" How could I decide on a highlight when I'd have to choose among experiencing the peacefulness and power of a waterfall pool, the brilliant iridescence of the morpho butterfly's wings, the frisson of delight at catching sight of an agouti or coati at the station, the primal wonder at*

playful monkeys in the branches overhead, the silent grace of a swallowtail kite soaring overhead, the exquisite delicacy of the tiniest orchids and hummingbirds, the spiritual connection I felt during my solo time on the trail – I think you get my drift! The rainforests of Monteverde are like no where else on earth!" – Janet

Founded in 1986 by the efforts of school children from around the world, the Children's Eternal Rainforest in Costa Rica is a 55,000 acre reserve that protects some of our planet's most biodiverse habitat and endangered species. Friends of the Rainforest is a US non-profit dedicated to raising awareness about rainforest conservation issues, providing youth and adult education opportunities, and buying and protecting land as part of the reserve.