

HabitatNet Celebrates 2010 – International Year of Biodiversity



Convention on
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Biodiversity is life
Biodiversity is our life

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Field Report #2 – August, 2010 – El Eden Ecological Reserve Quintana Roo, Mexico



Beginning its' 15th year, HabitatNet (an informal science program committed to students and teachers world-wide documenting and researching local biodiversity) joins the United Nations Convention on Biological Diversity international activities celebrating global biodiversity in 2010. During the past 15 years, HabitatNet has involved over 600 students and teachers with long-term biodiversity (and on-going) monitoring projects in Mexico, Jamaica, Saba, Tahiti/ Moorea, USA, Ecuador, and the Galapagos. Additionally, HabitatNet hosted an International Youth Symposium in 2005 at the El Eden Ecological Reserve (Quintana Roo, Mexico) and assisted with a 2nd International Youth Symposium in 2009 (Ottawa, Canada).

Year-long festivities began January 2 – January 9, 2010 with 24 HabitatNet students and teachers establishing a second HabitatNet one hectare biodiversity plot at the El Eden Ecological Reserve located in Quintana Roo, Mexico. Students came from Souhegan High School (Amherst, NH), Classical High School (Providence, RI), The Metropolitan School (Providence, RI), and Brown University.

The field report for January, 2010 is available at:

http://www.sprise.com/shs/habitatnet.aspx?id=5366&ekmense=c580fa7b_244_0_5366_10

Field Report #2 represents the research and activities of teachers committed to learning about field research in biological diversity studies by doing field research at the El Eden Ecological Reserve August 7 – 14, 2010. The teachers came from Massachusetts, Ohio, New York, and California and will be developing authentic field research opportunities for their students at their home sites next year. This field report will be added to the HabitatNet website by September, 2010.

Plot Selection and Establishment of “EEF2” (the second forest biodiversity plot at El Eden Ecological Reserve):

Selection of the EEF2 site was determined by potential educational and research values. Consequently, site selection was based on the following criteria:

- The area contained species representative and endemic to the ecosystem.
- Common or dominant species were represented.
- The plot was located within one vegetation type to give a true representation of the area's diversity.
- The plot had access for future student groups.

Once a site is selected, the forest plot was defined using SIMAB protocols (Dallmeier, SIMAB,1992). As a new site, we first surveyed and delineated a one hectare plot (100 X 100 meters) into 25 quadrats, each 20 x 20 meters in size. The location of EEF2 is: N 21.21020, W 87.20869 and is located on the North side of the forest trail at the SW corner of line.

Field Measurements

Tree tagging and identification began after the corner stakes of the quadrats were set. The process included locating, measuring, marking, and mapping all trees with a diameter at breast height (DBH) of 10 cm or greater. Diameter tape was used to measure DBH, avoiding any protrusions on the trunk. Where multiple stems occurred on a tree, all individual stem diameters were measured. Trees were tagged with an aluminum label facing toward the base line of the plot and set with a nail 1.3 M above the ground. The nails thus serve as a general guide for future measurements regarding tree growth.

Trees were tagged with an individual number consisting of a sequence of two digits. Using (01-24) as an example, the first pair of numbers (02) identified the quadrat within the plot in which the tree was located, while the second pair (24) identified an individual tree within the quadrant. No other tree received that number. In each quadrat the tree numbers started at one and continued until the last tree was tagged.

Tree identifications have been verified by Juan Castillo (botanist/ field station manager at El Eden Ecological Reserve) with collections of all leaf types for each species of tree submitted to El Eden Ecological Reserve for future verification.

*EEF2 Quadrat 2 data is reported in Appendix 1. It is worth noting that there was an exceptionally high diversity of trees. Of the 31 trees that were tagged, 21 were unique species.

Concurrent Field Research Projects:

*Observations of fauna were noted and listed in Appendix 2. Weather data (temperature and humidity) was recorded for the week in Appendix 3.

**Additionally, a re-census of trees was conducted to determine the growth rates of trees since January, 2006. EEF1 was established in 1996. From 1996 – 2003, 500 trees (with a minimum DBH of 10 cm) were tagged in EEF1 (a 1 hectare plot). In January, 2006, a re-census was conducted two months after Hurricane Wilma (Category 5) struck the biodiversity plot. The resulting damage to the forest plot is recorded in a field report on the HabitatNet website (http://www1.spruce.com/shs/habitatnet/Post_Hurricane_Wilma_Report.pdf). It is important to note that not all trees were able to be re-measured in January, 2006 due to the existing field conditions and limited time in the field that project period.

However, this month (August, 2010) we were able to re-census 90 trees (approximately 20% of the plot EEF1) of which 14 of the trees were measured in January, 2006. The results are listed in Appendix 4. Continued analysis of 2005 – 2011 growth rates will continue during the next field session scheduled for January, 2011. In particular, Quadrats 6 and 11 will be the primary focus.

It is perhaps worth noting again that all tree DBH measurements were at 1.3 meters. Although there appears to be relatively little DBH growth at 1.3 meters, all of the trees measured in January, 2006 lost their top third of trunk (snapped off) and 100% of their leaves. Currently, 89 of the 90 that were measured in August, 2010 are alive and have secondary trunk growth at their snapped off points. It is possible that the low growth rates may be attributed to the overall density of tree saplings that have been competing with the mature tree survivors. Once the canopy was opened by tree falls and snaps, the available light for seedlings to grow increased significantly. It is possible that the saplings are sequestering the needed nutrients as well as light to grow.

Canopy density is also back to 85% (pre-hurricane Wilma average density for August) from the 60% canopy density measured in January, 2006.

Field Researchers who contributed to this project:

Juan Castillo (Biologist, El Eden Ecological Reserve), Linda Ford, Suzanne Guziec, Mike Hansen, Naomi Volain, Candida Valladares, and Dan Bisaccio (HabitatNet Project Director – Brown University).

Acknowledgements:

We could not have conducted our quadrat projects and re-census analysis without the support and botanical expertise of Juan Castillo. Thank you. The ongoing (since 1995) welcome from the El Eden Ecological Reserve that has encouraged HabitatNet to develop student and teacher researchers is, without doubt, the under-pinning to all of our work. Thank you, Marco Lazcano-Barrero (Director, El Eden Ecological Reserve) and Dr. Arturo Gomez-Pompa (Founder of El Eden Ecological Reserve, University Professor & Distinguished Professor of Botany - UC/R and National Autonomous University of Mexico, Tyler Environmental Prize Awardee).

Finally, we are indebted to the United Nations Convention on Biological Diversity. In particular to Dr. Ahmed Djoghlaif (Executive Secretary of the Convention on Biological Diversity) and Ms. Franca D’Amico (CBD Program) for their recognition and support of grass root projects that are working to support children in becoming spoke persons for conserving biological diversity for their future and beyond.

Resources Used in Compiling this Progress Report and Field Data Submitted to El Eden:

Bisaccio, D. “Field Report Numbers. 1-7: El Eden Ecological Reserve” HabitatNet website

Dallmeier, F. SIMAB Website – Smithsonian Institution, Washington, DC

Emmons. Neotropical Rainforest Mammals. University of Chicago Press: Chicago, IL

Howell, Webb. A Guide to the Birds of Mexico and Northern Central America.

Will, T. Checklist of Birds/ Yucatan. Gettysburg University, PA

“If the land mechanism as a whole is good, then every part of it is good, whether we understand it or not. If the biota, in the course of eons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering”

A SAND COUNTY ALMANAC – Aldo Leopold

Appendix I

Table 1 – El Eden Quadrat Data (EEF2 – Quadrat 2)

Date: August, 2010 BioPlot: EEF2 - 2010 Quadrat: 02 Canopy Density: 85%

Species	N	Total DBH (cm)	Density	Frequency
<i>Metopium brownei</i> (jacq.) Urban	2	47.7	.0050	.06
<i>Manilkara sapota</i> (L.) P. Van Royen	2	48.4	.0050	.06
<i>Vitex gaumeri</i>	2	56.7	.0050	.06
<i>Bursera simaruba</i> L. Sarg.	2	47	.0050	.06
<i>Brosimum alicastrum</i> Swartz.	1	35.15	.0025	.05
<i>Sabal yappa</i>	1	19.6	.0025	.05
<i>Esembeckia pentaphylla</i> (McFad) Griseb.	1	13.1	.0025	.02
<i>Sapranthus campechianus</i>	1	11.1	.0025	.02
<i>Gymnopodium floribundum</i>	1	11.0	.0025	.02
<i>Caesalpinia gaumeri</i> Greenm.	1	20.0	.0025	.05
<i>Hamphea trilobata</i>	1	11.0	.0025	.02
<i>Hippocratea celastroides</i>	2	42.0	.0050	.06
<i>Albizia tomentosa</i> (Micheli) Standl.	3	44.8	.0075	.09
<i>Lonchocarpus rugosa</i>	1	16.7	.0025	.03
<i>Lonchocarpus castilloi</i> Standl.	1	12.1	.0025	.03

Unknown – Dead Standing	2	48.3	.0050	.06
Pouteria campechianum	1	10.9	.0025	.03
Dyospiros verae-crucis	1	10.1	.0025	.03
Pouteria campechianum	2	35.8	.0050	.03
*Gse cen (to be field verified)	1	11.8	.0025	.03
Sideroxylon mastichodendrum	1	17.6	.0025	.03
*Cop tou (to be field verified)	1	15.4	.0025	.03
Total Trees (minimum DBH of 10 cm)	31			
Number of Species	21			

Appendix II – Vertebrate / Invertebrate Fauna Observed

Mammals:

Nasua nasua (Coati mundi)	Sciurus yucatensis (Yucatan squirrel)
Mazama Americana (Brocket deer)	Urocyon cineroargenteus (Grey fox)
Artibeus jamaicensis (Fruit bat)	Glossophaga soricina (Long tongued bat)
Camera Trap:	
Felis pardalis (Ocelot)	Panthera onca (Jaguar)

Reptiles:

Crocodylus moreletti	Drymobius margaritiferus
Eumececes schwartzei	Laemanctus serratus
Kinosternum creaseri	Hemidactylus frenatus

Amphibians:

Bufo marinus	Smilisca baudinii
Hypopachus variolosus	Scianax stoufferi
Buffo vallicaps	

Birds:

Coragyps atratus	Cathartes aura	Buteo magnirostris
Buteo albonotatus	Herpethotheres cachinnas	Ortalis vetula
Agriocharis ocellata	Aramides cajanea	Aratinga nana
Amazonia xantholora	Crotophaga ani	Chaetura vauxi

Trogon melancephalus	Chloroceryle aenea	Chloroceryle Americana
Dendrocolaptes certhia	Pitangus sulphuratus	Myiozetetes similis
Stelgidopteryx ridgwayi	Cyanocorax morio	Cyanocorax yucatanicus
Mimus gilvus	Euphonia affinis	Euphonia gouldi
Habia fuscicauda	Dives dives	Quiscalus mexicanus
Icterus auratus	Melanerpes aurifrons	Egretta thula

*Fregata magnificedns (observed flying over wetland @El Eden)

Notable Invertebrates:

Morpho butterfly	Centroides sp. (Scorpion)	Red-Kneed Tarantula
Army ants (Eciton sp.)	Leaf-cutter ants (Atta sp.)	Whip-scorpion

Appendix III – Weather Data

August 5-13, 2010	Maximum	Minimum
Temperature	35° C	22° C
Humidity	88%	44%

Appendix IV – EEF1 Tree Re-Census Data (2005 – 2010) Post-Hurricane Wilma

Tree Species	N (# of re-census trees)	Avg. DBH Growth in cm
Ficus yucatanensis	6	.4
Lonchocarpus castilloi	4	.1
Manilkara sapota	2	.2
Burera simaruba	1	.2
Metopium brownei	1	.2

Avg. Canopy Density EEf1	Year 2005	Year 2010
	60%	85%