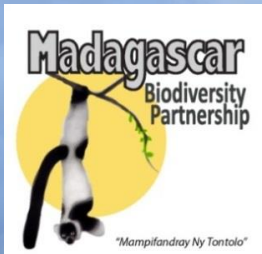


Driving Community Revitalization by Balancing Conservation and Commerce in Kianjavato, Madagascar

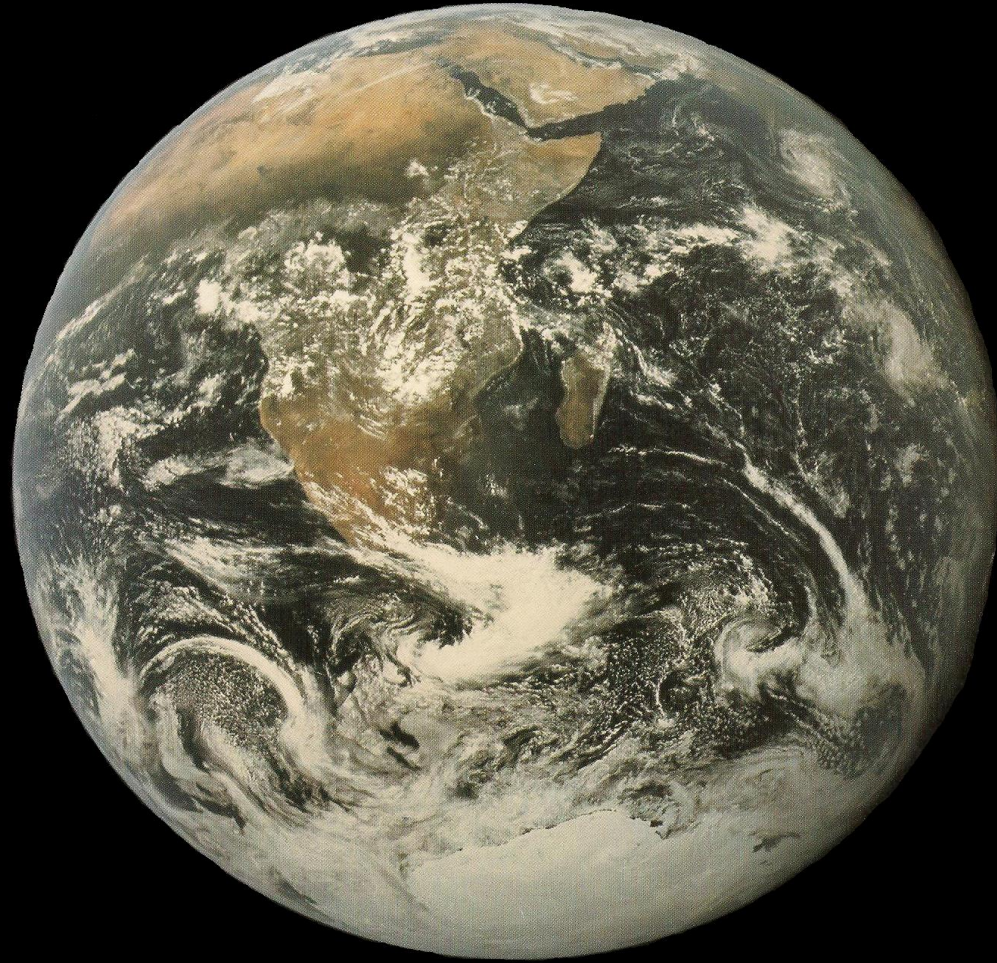


Edward E. Louis, Jr., DVM, Ph.D.
Omaha's Henry Doorly Zoo, Director of Conservation Genetics
Madagascar Biodiversity Partnership, Director General

COMMUNITIES, CONSERVATION, AND LIVELIHOODS
CONFERENCE

St. Mary's University, Halifax, Nova Scotia, May 28, 2018

Apollo 17 Snapshot of Planet Earth and Madagascar



December 7, 1972

TRIASSIC
250 - 200,000,000
years ago



JURASSIC
200 - 145,000,000
years ago



CRETACEOUS
145 - 65,000,000
years ago



EARLY TERTIARY
65,000,000
years ago

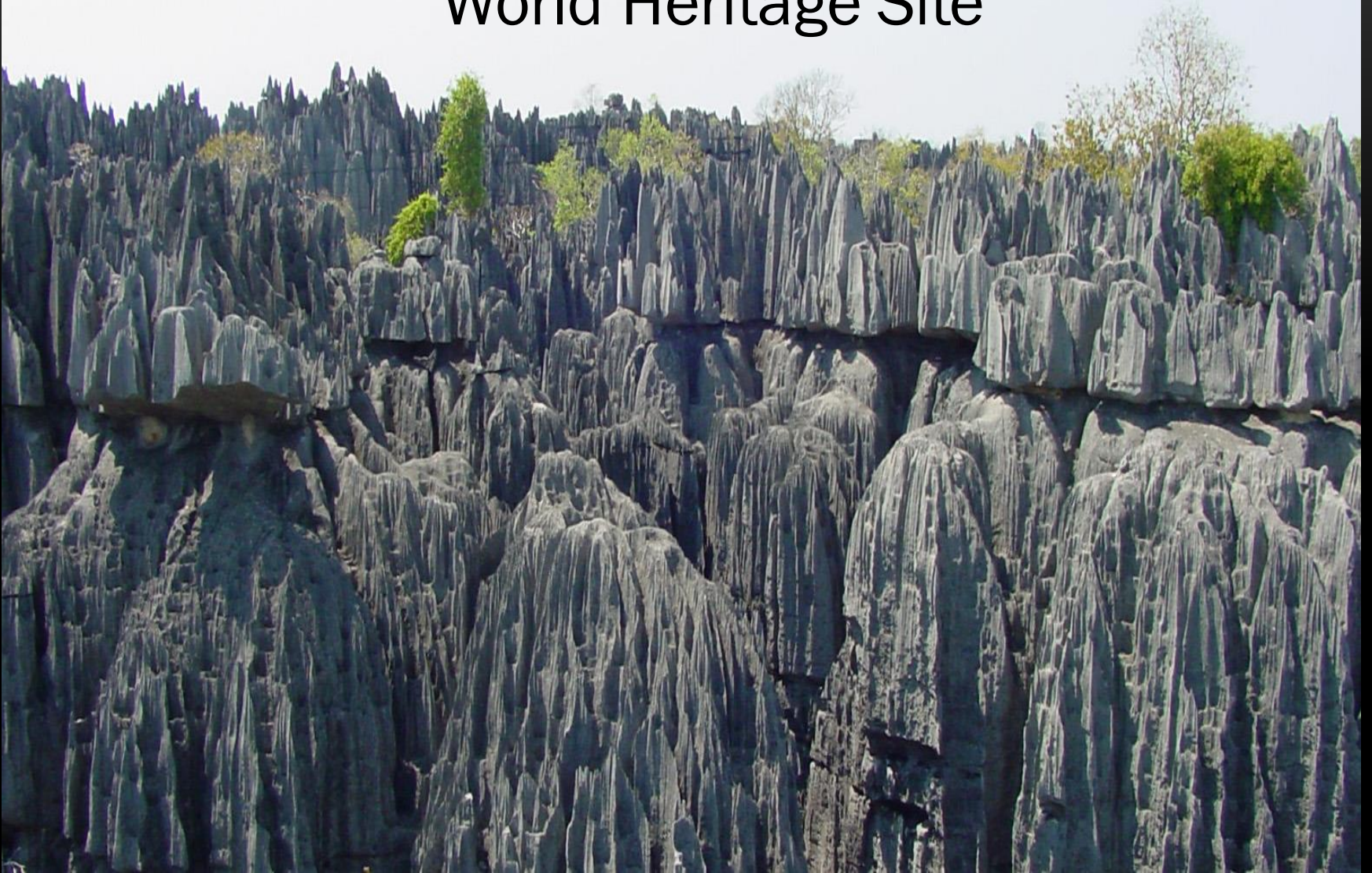


PRESENT



Lemur Ancestor Arrives!

Tsingy de Bemaraha National Park World Heritage Site



Andohahela National Park World Heritage Site



Menabe National Park
“Baobab Alley” Iconic Ecotourism Site



Anjanaharibe-Sud National Park World Heritage Site



Estimated 800 Species of Amphibians

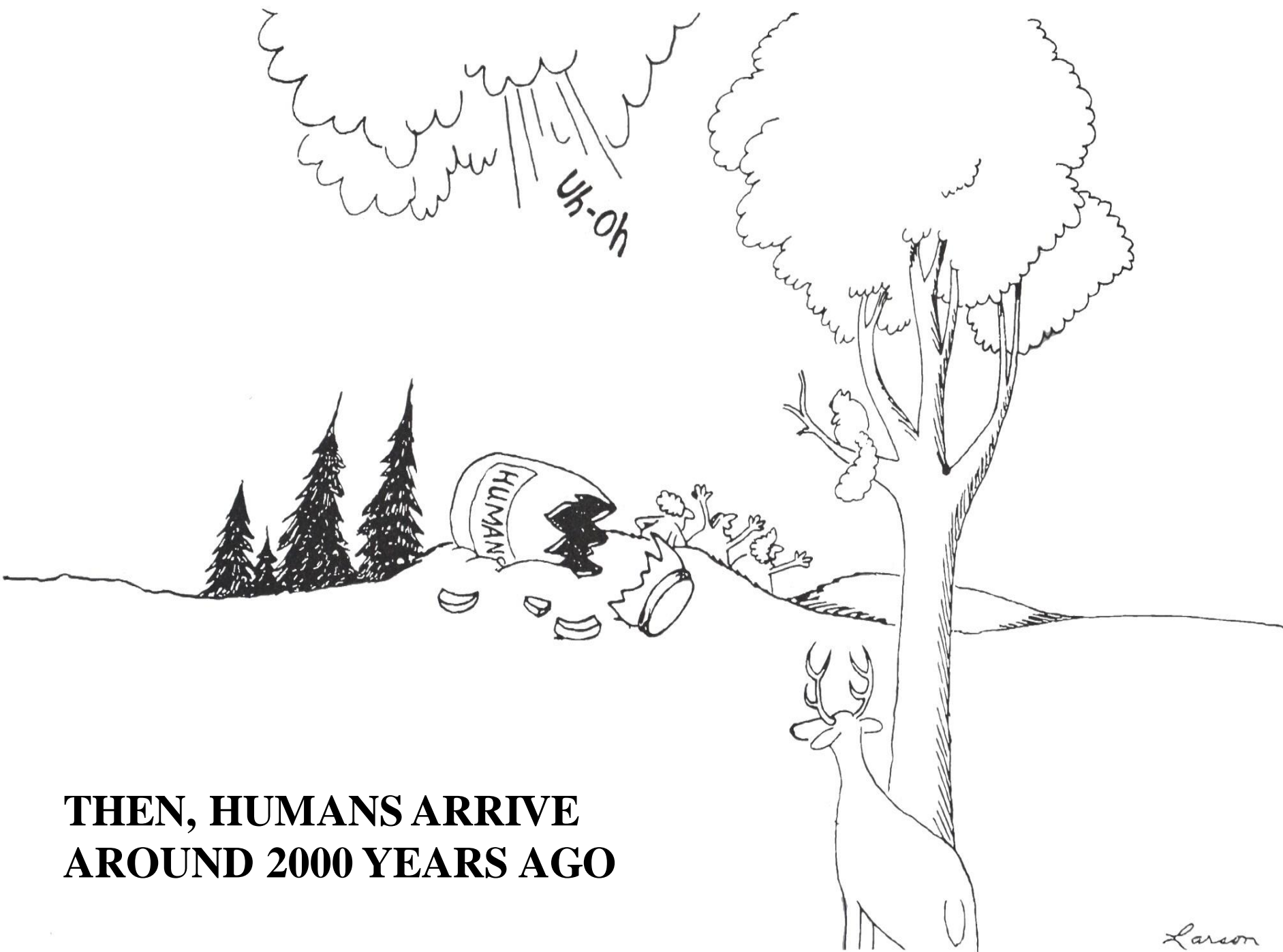


85% of all Chameleon Species



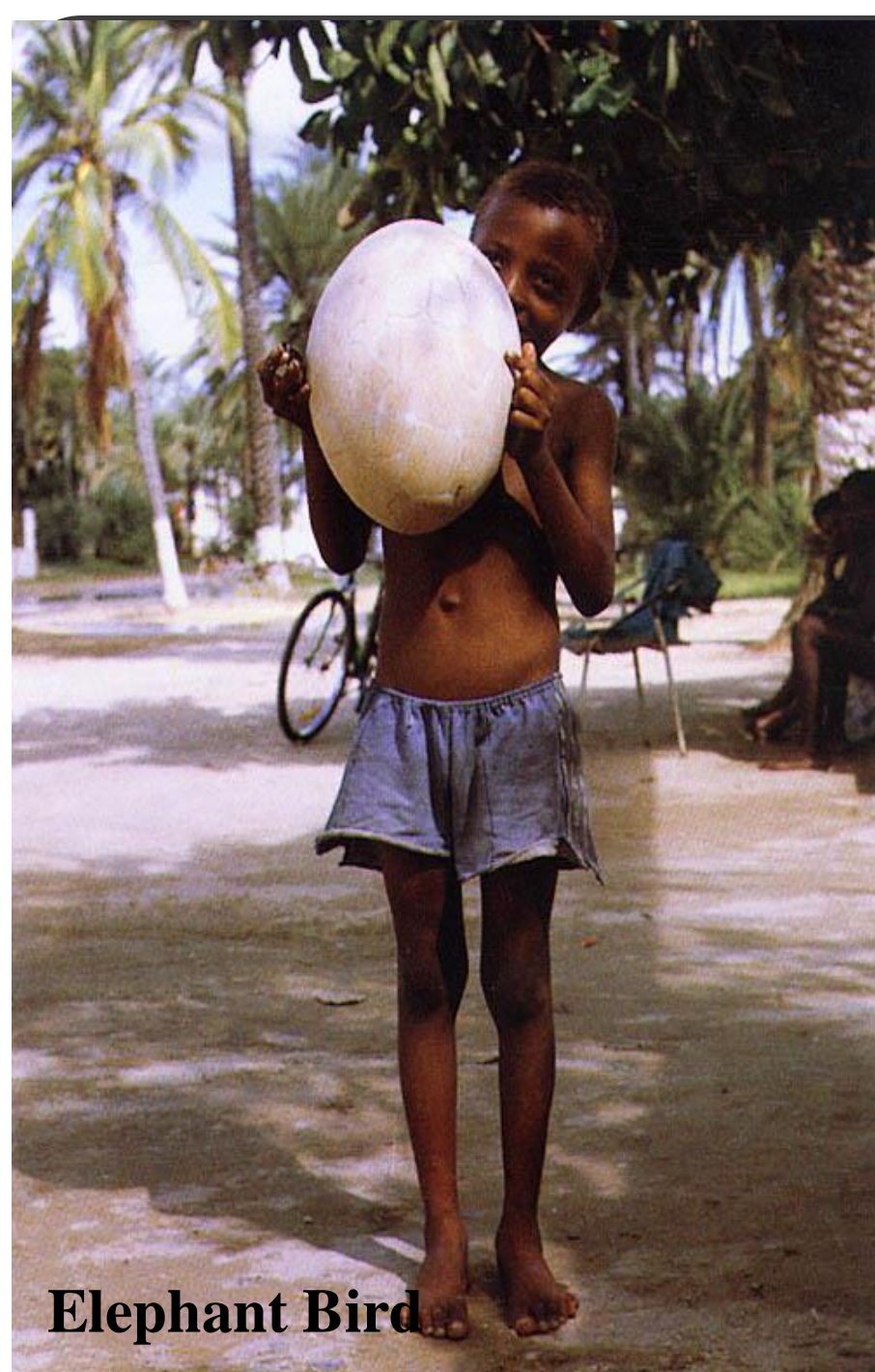
100% of all Lemur Species





**THEN, HUMANS ARRIVE
AROUND 2000 YEARS AGO**

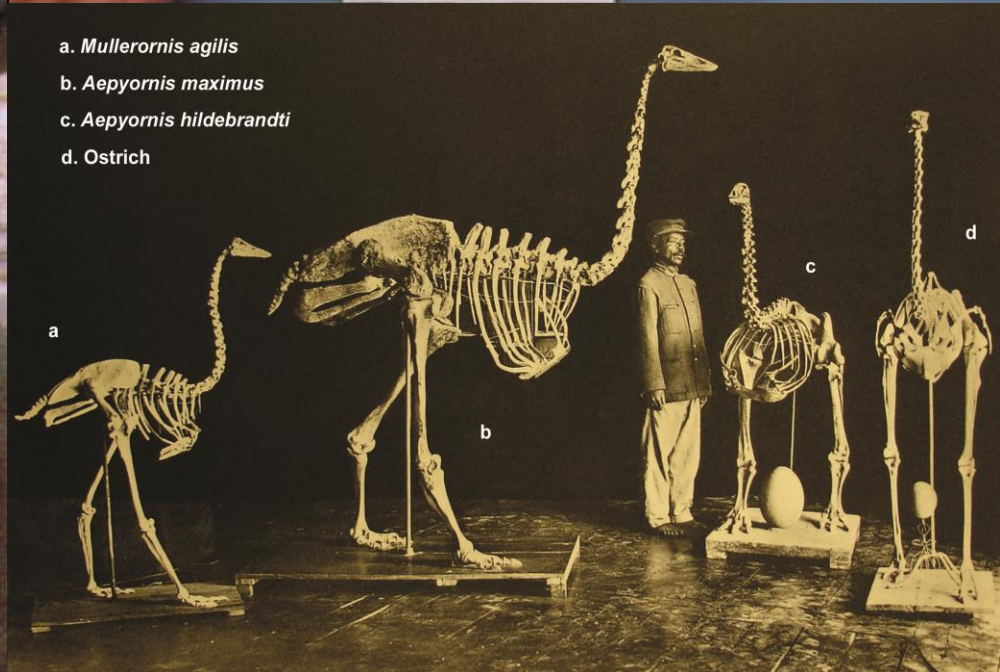
Larson



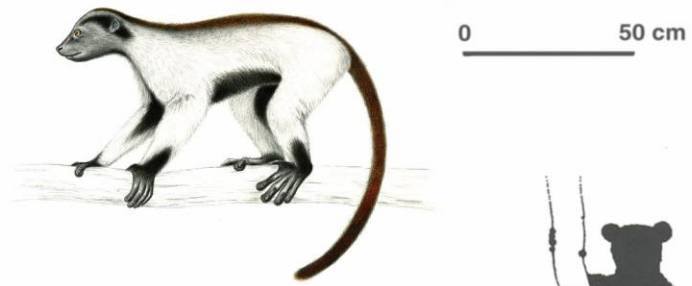
Elephant Bird



**Historic
Extinction
Events
3,000 to 1,000
years ago**



- a. *Mullerornis agilis*
- b. *Aepyornis maximus*
- c. *Aepyornis hildebrandti*
- d. Ostrich



Indri indri



IUCN Red List Lemur Species Status

2006

10 Critically Endangered

17 Endangered

12 Vulnerable

2012*

23 Critically Endangered

52 Endangered

19 Vulnerable

***91% all lemurs**

2018**

23 Critically Endangered

52 Endangered

19 Vulnerable

****94.6% all lemurs**



2012
23 Critically Endangered
52 Endangered
19 Vulnerable

The Madagascar “Gold Rush”

Kianjavato March 2011



The Madagascar “Gold Rush”

Daraina May 2011



Madagascar – Poverty Driven Deforestation/Slash & Burn or *Tavy*

Madagascar's population is estimated at 25 million.
15.0 million (60%) of this total are 18 years or younger.



CONSEQUENCES OF POLITICS

Harper et al. 2007



50% Forest Has Been Lost
in last 60 years

What has been lost since 2009?

MAP KEY

Green – Existing Forest

Orange – Forest Lost 1995-2000

Red – Forest Lost 2000-2005

**WITHOUT MAINTAINED
CORRIDORS OR
CONNECTIVITY BETWEEN
FOREST FRAGMENTS,
WHAT CHOICES ARE LEFT?
“MEGA-ZOOS”**

OPTIONS

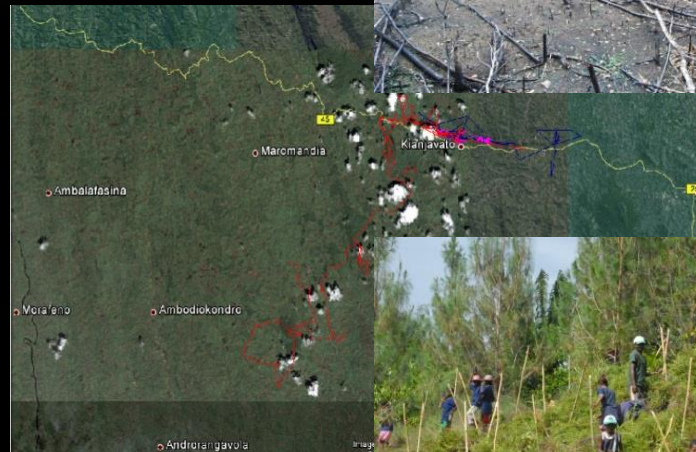
Re-introduction and
Translocation Programs



Maintenance of Existing Habitat
Locally and Nationally



Development of Corridors
Through Reforestation



Revitalization of Existing Habitat
through Restoration



Community-Based Guide Book – On the Job Training

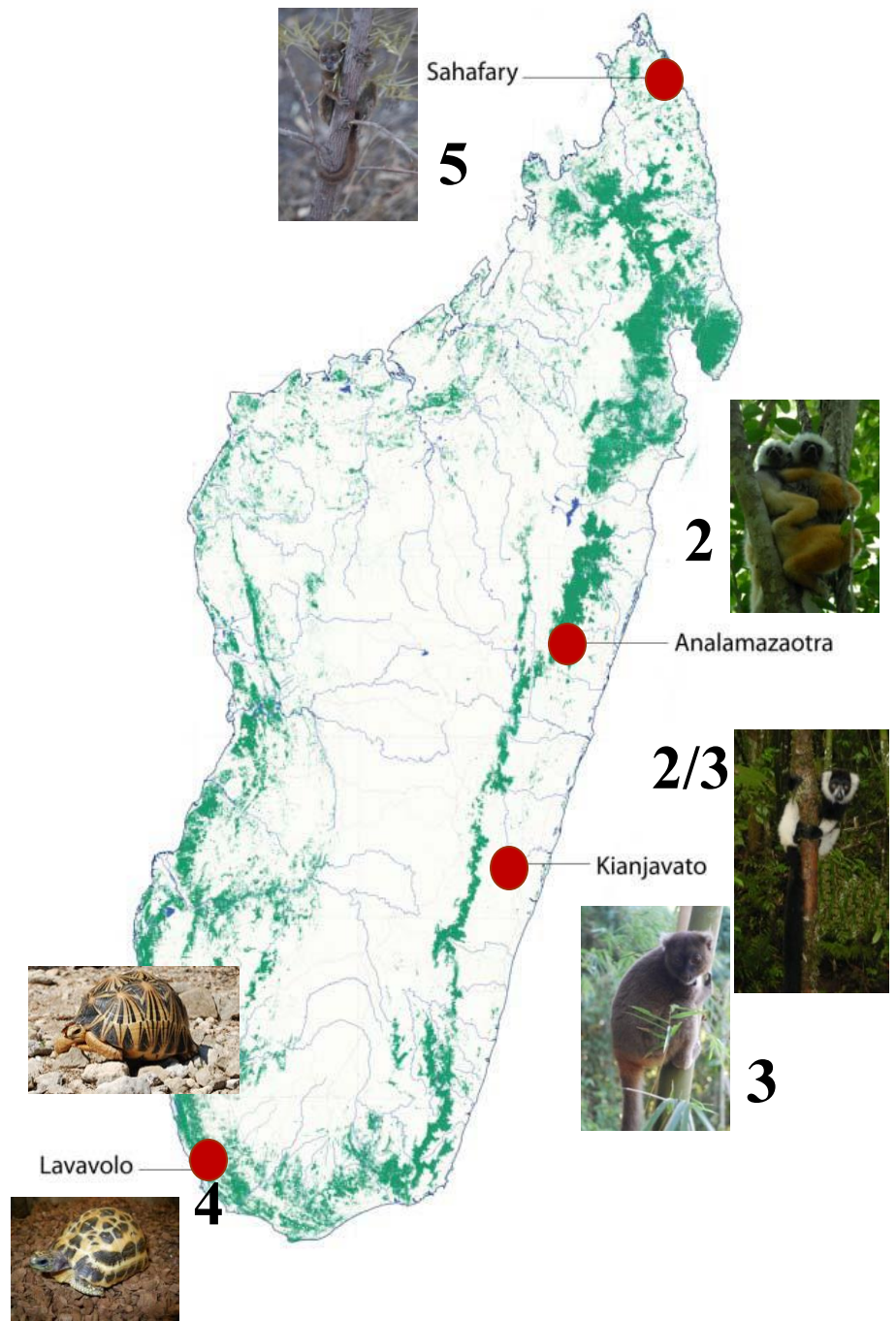
- Leverage your asset(s) - conservation dollars are a highly competitive resource.
- Need to Commit – 365 days a year – Build Foundation.
- Provide multiple layers of economic resource opportunities
- Collaborate especially with conservation educators willing to get on the ground.
- Listen to the local people's requests, but you have to put together a program that requires and encourages participation, even cultural changes.
- Community-based programs grow if they are going to be successful so be prepared to grow with them.
- Success can bring new hurdles.
- Think of succession and sustainable self-reliance early on.
- All businesses have an exit plan for good or bad reasons.

Madagascar Biodiversity Partnership (MBP)

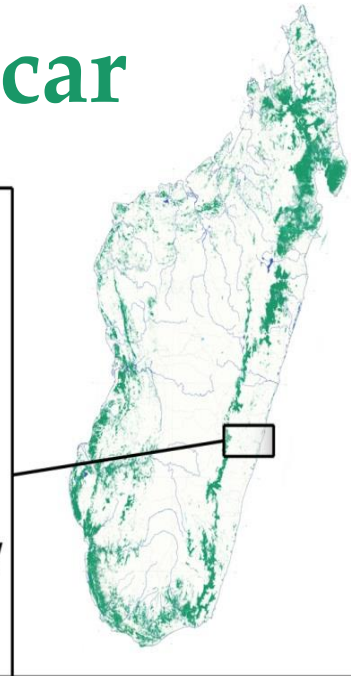
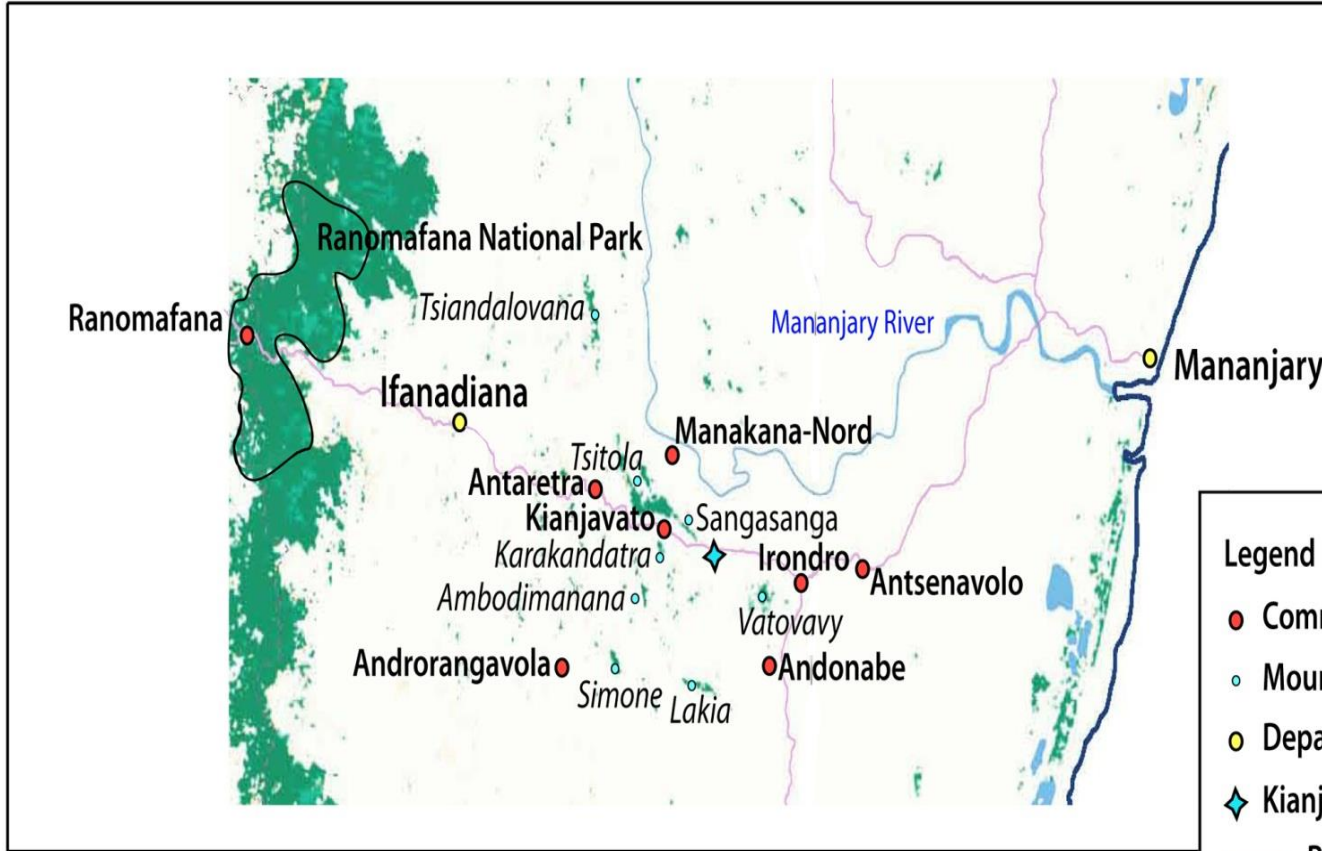
Five Programs

All Taxon Wide
Biogeography / Biodiversity Program
and
4 Permanent Program Sites

1. Biogeography and Biodiversity Program
2. Andasibe RT and Torotorofotsy Project
3. **Kianjavato Project**
4. Lavavolo Project
5. Montagne des Français Project



Kianjavato Region, Madagascar



Kianjavato Ahmanson Field Station (KAFS)



June 23, 2009

Kianjavato Ahmanson Field Station (KAFS)



August 2009

Kianjavato Ahmanson Field Station (KAFS)



November 2009

Kianjavato Ahmanson Field Station (KAFS)



November 2017

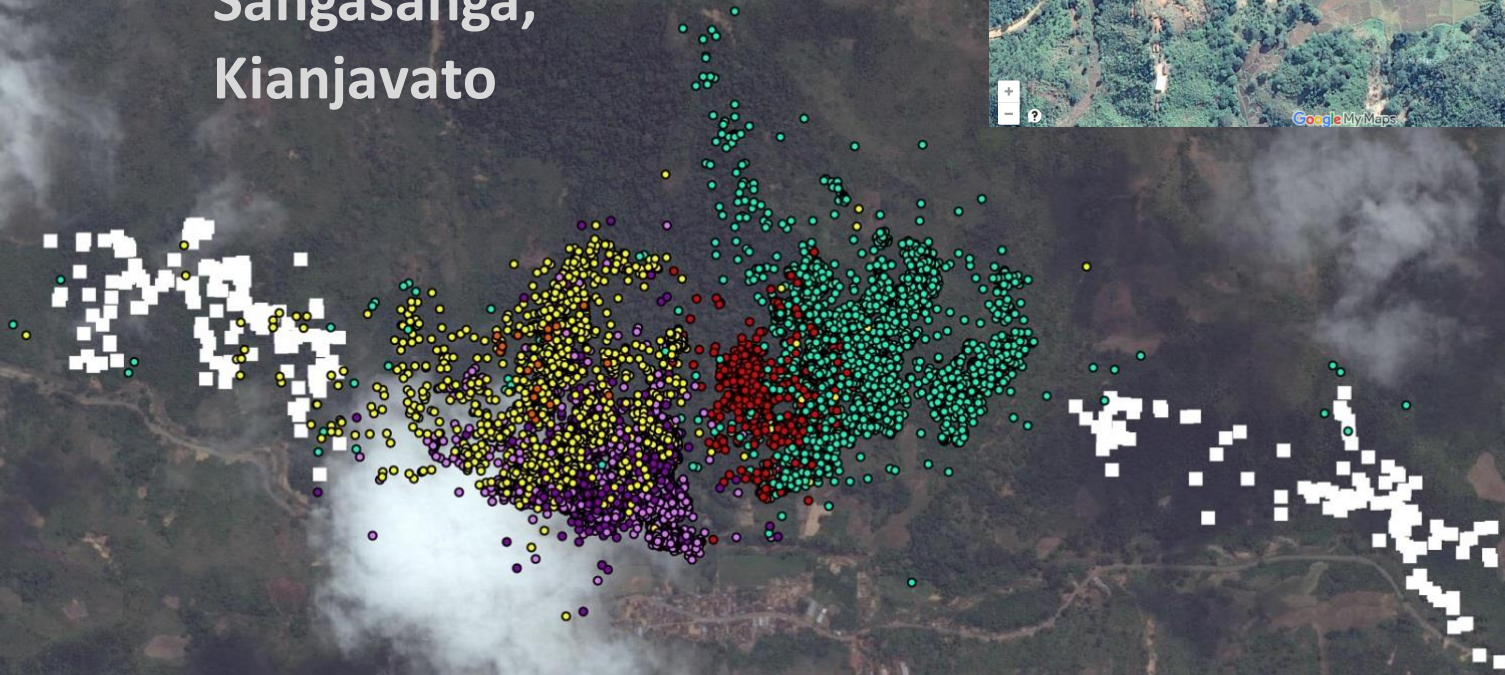
Kianjavato Ahmanson Field Station (KAFS)



November 2017



Current Community of
Greater bamboo lemur,
Prolemur simus, in
Sangasanga,
Kianjavato



Greater Bamboo Lemur Feeding Traces



Bamboo harvesting for baskets to transport litchi products to the interior major cities (collected in November thru February which is same time as the weaning season of the Greater Bamboo lemur).



Commercial Crop Production

Litchi, Cocoa, Ravinsara, Cannelle, Coffee, and Bamboo







**Reforestation Project
Kianjavato, Madagascar**



Seed Collection

Science Behind the EPRP

Initial 37 Endemic Tree Species
Currently over 110 species

SW: scarified and washed

SNW: scarified not washed

NSW: not scarified and washed

NSNW: not scarified & not washed

CS: control scarified

CNS: control not scarified

Scientific name	Seeds planted	Treatment (average % germination)						Seedlings planted	Seedling survival (%)	Average growth rate (cm/month)	
		SW	SNW	NSW	NSNW	CS	CNS			Basal diameter	Height
<i>Abrahamia aff. sericea</i>	600	100	70	70	70	92	92	340	78.33/58.3	0.06	4.00
<i>Ampalis mauritiana</i>	650	NA	NA	78	85	NA	31	265	100.0	0.06	6.82
<i>Anthoecista longifolia</i>	300	39	43	36	35	0	0	6	100.0	0.08	3.66
<i>Bathiorhamnus louvelii</i>	1,000	39	63	60	50	28	22	400	47.7	0.05	2.80
<i>Bathiorhamnus macrocarpus</i>	450	51	69	65	55	24	20	17	33.3	0.05	2.50
<i>Beilschmiedia opposita</i>	650	50	58	48	44	0	0	50	80.0	0.03	2.00
<i>Burasaia madagascariensis</i>	600	69	91	57	88	6	4	26	49.0/60.4	0.05	2.60
<i>Canarium boivinii</i>	1,000	73	74	75	71	23	8	305	85.9	0.11	7.01
<i>Canarium madagascariense</i>	1,100	38	77	46	44	34	26	357	81.4	0.10	7.28
<i>Chrysophyllum boivinianum</i>	1,900	62	65	72	72	22	16	534	13.9	0.05	1.60
<i>Chrysophyllum perrieri</i>	800	73	77	82	80	45	36	185	11.5	0.04	1.80
<i>Coffea perrieri</i>	600	48	75	65	67	16	13	72	60.0	0.04	2.40
<i>Cryptocarya aff. perrieri</i>	1,500	36	36	45	51	35	45	101	50.9	0.05	3.61
<i>Cryptocarya ovalifolia</i>	800	40	46	66	33	31	39	105	57.1	0.06	2.64
<i>Cryptocarya dealbata</i>	800	47	41	53	59	41	41	43	86.2	0.06	2.80
<i>Cryptocarya thouvenotii</i>	1,200	44	32	33	34	39	59	117	58.5	0.05	2.56
<i>Dichapetalum chlorinum</i>	1,200	70	73	72	67	17	11	113	5.7	0.03	4.30
<i>Dupuya haraka</i>	600	NA	NA	NA	NA	56	44	42	22.2	0.04	3.00
<i>Dypsis fibrosa</i>	800	32	24	48	32	7	3	25	42.4	0.03	1.02
<i>Dypsis mananjarensis</i>	800	22	21	12	13	1	0	25	67.5	0.02	0.20
<i>Landolphia aff. gummifera</i>	600	71	89	71	48	59	48	15	33.3	0.06	2.80
<i>Macphersonia gracilis</i>	800	80	92	72	72	8	9	25	32.0	0.05	3.00
<i>Mendoncia cowanii</i>	1,000	60	57	61	52	23	17	412	11.4	0.03	4.10
<i>Noronhia introversa</i>	600	100	90	100	100	100	90	20	47.1	0.05	3.10
<i>Noronhia urceolata</i>	1,400	96	100	98	100	94	92	712	46.6	0.05	3.58
<i>Ocotea nervosa</i>	1,600	43	72	72	29	0	0	702	22.5	0.05	3.24
<i>Poupartia chapelieri</i>	600	67	73	65	69	0	0	17	66.7	0.06	2.80
<i>Protium madagascariensis</i>	600	50	66	56	64	10	8	46	84.2	0.06	2.60
<i>Salacia madagascariensis</i>	600	91	73	91	82	50	62	15	40.0	0.03	4.30
<i>Sideroxylon betsimisarakum</i>	200	44	36	38	40	9	5	10	37.5	0.05	2.00
<i>Suregada celastroides</i>	2,000	85	91	73	76	31	33	124	81.3	0.05	2.30
<i>Syzygium bernieri</i>	?	94	94	90	90	47	37	130	100.0	0.06	5.20
<i>Tina apiculata</i>	1,200	78	51	68	70	20	14	228	10.2	0.05	1.80
<i>Treculia madagascariensis</i>	600	44	62	36	58	20	17	81	93.8	0.06	5.25
<i>Trophis montana</i>	500	78	82	54	56	32	21	20	35.0	0.06	4.71
<i>Upaca thoursii</i>	3,000	67	73	67	67	50	43	720	92.6	0.08	5.33
<i>Uvaria combretifolia</i>	500	76	88	68	68	7	8	42	18.8	0.03	4.50

SW: scarified and washed; SNW: scarified not washed; NSW: not scarified and washed; NSNW: not scarified and not washed; CS: control scarified; CNS: control not scarified

Seeds of secondary species, the majority of which germinated better after gut passage, were extracted from fecal samples from wild, free-ranging Black and white ruffed lemurs. The most effective pretreatment that enhanced germination in a nursery setting was to scarify seeds, but not wash them.

Science Behind the EPRP

Pioneer species were fast-growing and selected based on their tolerance to unfavorable environmental conditions. Most of these were introduced, but four native species are recommended in this study as possible pioneers: *Ampalis mauritiana*, *Syzygium bernieri*, *Treculia madagascariensis* and *Uapaca thouarsii*.



Kianjavato Ahmanson Field Station (KAFS)



Vatovavy



KAFS

Create a Forest Corridor between KAFS and Vatovavy

Approximately 7 kilometers straight line between the two sites.

Reforestation Project

**AIM: Create Corridor for Wildlife and
Establish Platform for Tenure for Local Community
Members**

Permanent Tier

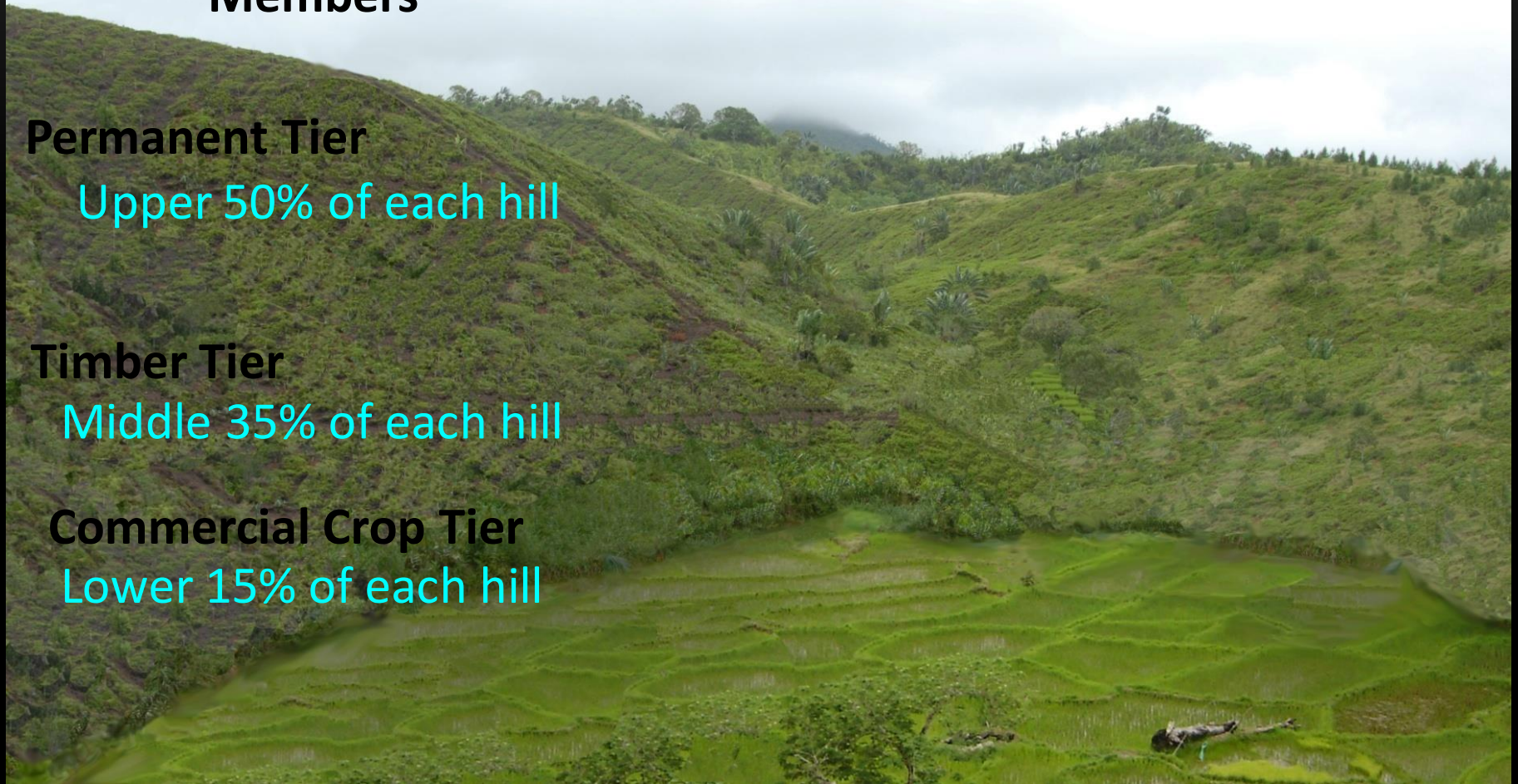
Upper 50% of each hill

Timber Tier

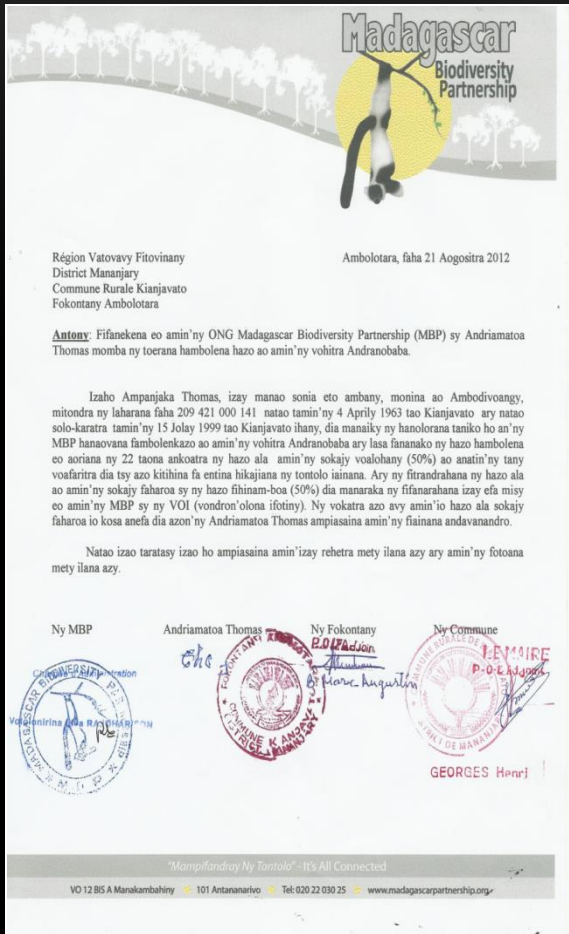
Middle 35% of each hill

Commercial Crop Tier

Lower 15% of each hill



A contract is signed and stamped for each "Hill"



Région Vatovavy Fitovinany
District Mananjary
Commune Rurale Kianjavato
Fokontany Ambohitsara

Object: Nursery Contract between Madagascar Biodiversity Partnership (MBP) and Ambohitsara Fokonolona.

We, Fokonolona of Ambohitsara, agree to give land to be used by MBP as a nursery to support the reforestation program for up to 22 years (see the attached GPS coordinates). MBP will give land and all structures to the Fokonolona at the conclusion of the program.

We agree on this contract to be used anytime, anywhere and for future reference by all involved parties and for further inquiries.



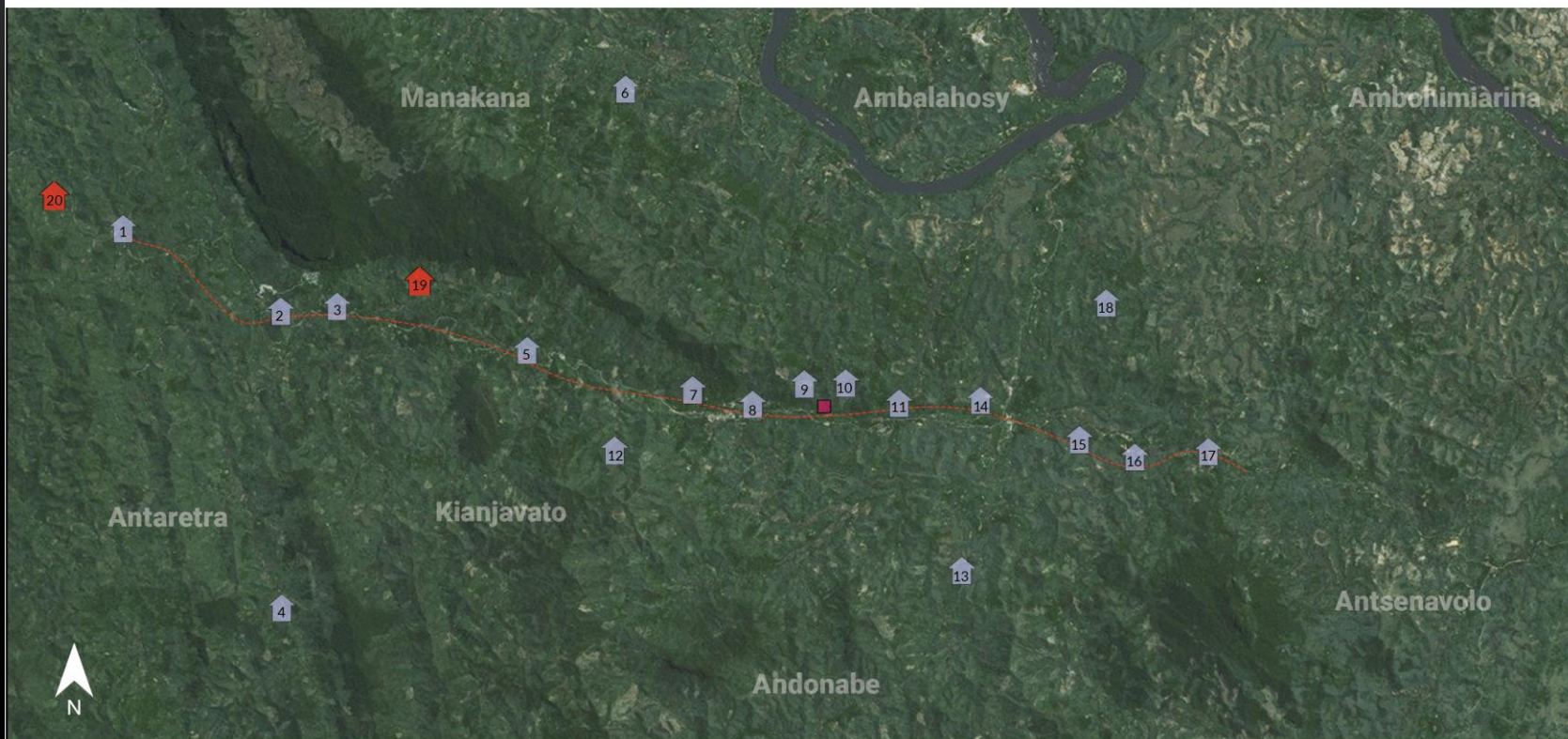
"Mampifandray Ny Tontolo" - It's All Connected

VO 12 BIS A Manakambahiny 101 Antananarivo Tel: 020 22 030 25 www.madagascarpartnership.org

Planting Event Day – Local School Children or Local Community Members

~7000 Seedlings Planted Per Event Day





MBP Tree Nurseries

 Established Nursery  Under Construction Nursery

 Kianjavato Ahmanson Field Station (KAFS)

 National Highway 25 (RN25)

- | | | | |
|-----------------|------------------|----------------------|---------------------------|
| 1. Antaretra | 6. Manakana Nord | 11. Ambolotara | 16. Ambodifandramanana |
| 2. Morarano | 7. Kianjavato | 12. Antanan'i Beloha | 17. Tanambao Besakay |
| 3. Ambohitsara | 8. Ambodibonary | 13. Vintanona | 18. Vohipotsy |
| 4. Ambohimanana | 9. CEF | 14. Andalamahitsy | 19. Tsitola |
| 5. Fotobohitra | 10. Denver | 15. Vatovavy | 20. Andranomaitso (Skutt) |

Antananibeloaha Nursery



November 2011

KAFS CEF Nursery



New Seed Germination Nursery Design

KAFS Denver Zoo Nursery



New Hardening Nursery Unit Design

KAFS Denver Zoo Nursery



New Hardening Nursery Unit Design

Kianjavato Nursery



New Growing Nursery Unit Design

“Drones Flying over Kianjavato and Surrounding Communes”



Ambohitsara Nursery



Ambohitsara Nursery



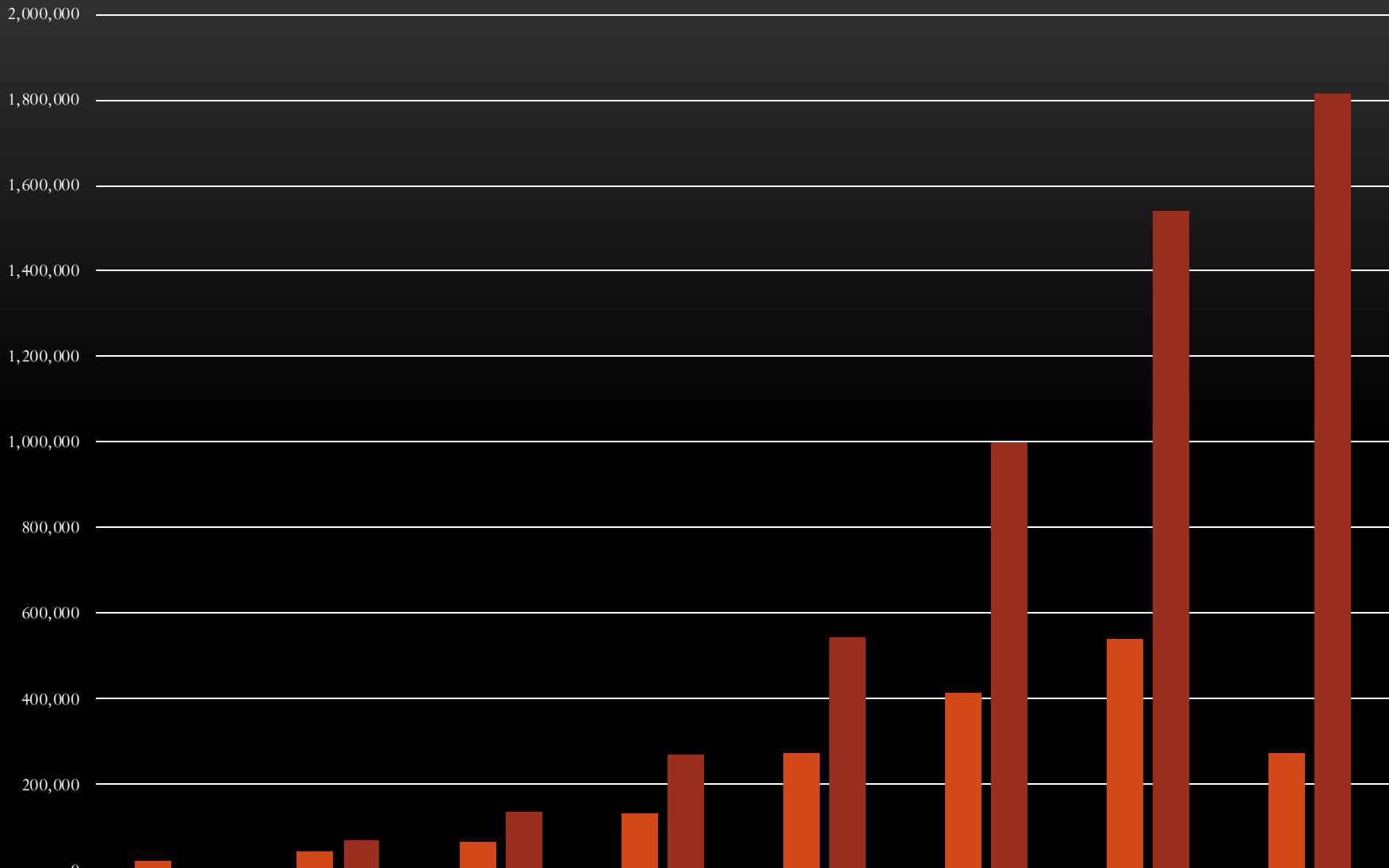
20 nurseries have been installed across Kianjavato and two other communes





Between January 21, 2012 to May 24, 2018, **1,813,291** trees have been planted in Kianjavato, Madagascar.

Kianjavato Reforestation Project



■	23,095	45,067	67,275	134,135	272,961	412,550	539,318	273,660
■		68,162	135,437	269,572	542,533	1,000,313	1,539,631	1,813,291

Conservation Credit Program

COMMUNITY LONG-TERM PARTICIPATION AND SOCIO-DEVELOPMENT



“Saving for a Future”



Vatovavy Nursery

Conservation Credit Programs



**Reward
Conservation
Credit Program
(RCC)**

**Incentive
Conservation
Credit Program
(ICC)**

**Hero
Conservation
Credit Program
(HCC)**

**MBP Employee
Conservation
Credit Program
(MECC)**

**Special Program
Conservation
Credit Program
(SPCC)**



Conservation Credit Computer Package

Fokontany ID	Even Date	Location	Fokontany	Planned Trees	Final Trees	Update?	
26	2014-09-12	Hill S	Ambolotara - Ambolotara, Ambodivoangy, Safoindrano ▼	1500	1503	Update Event	Delete Event
28	2014-09-11	Hill S	Ambolotara - Ambolotara, Ambodivoangy, Safoindrano ▼	1500	1503	Update Event	Delete Event
25	2014-09-10	Hill S	Ambolotara - Ambolotara, Ambodivoangy, Safoindrano ▼	3000	2999	Update Event	Delete Event

[Home](#) [Logout](#) [Catalog](#)



History:

Event Date	Location	fokontany	Villages	Trees	Signed up on
2014-09-12	Hill S	Ambolotara	Ambolotara, Ambodivoangy, Safoindrano	1503	2014-09-10 13:33:53
2014-09-10	Hill S	Ambolotara	Ambolotara, Ambodivoangy, Safoindrano	2999	2014-09-09 19:09:46

Salama BAOTODY!
You have 45 CC!

Manao inona ianareo? No Events Today

[Home](#) [Logout](#) [Catalog](#)

Individually tracks
CC member's earned
credits directly.

Event History					Top Volunteers	
Event Date	Location	Planned Trees	Final Tree Count	Total Workers	User Name	Number of Events Attended
2014-09-12	Hill S	1500	1503	13	HARIMALALA Nomenjanahary Erica	3
2014-09-11	Hill S	1500	1503	11	BAOTODY	3
2014-09-10	Hill S	3000	2999	29	RAKOTONAINA Anjarimalala Enosy	3
					RASOAMAVO Elisabeth	3
					DILISIA Paulette	3

Yearly Stats					
Year	Number of Events	Users at Events Each User Counted once	Planned Trees	Actual Trees Planted	Total CC Earned
2014	3	40	123000	123043	65212.79

Items On Order		
Item Number	Item Description	Total Needed
<input type="button" value="Orders Report by Volunteer"/> <input type="button" value="Delivered"/>		
<input type="button" value="Export Profiles"/> <input type="button" value="Export Event List"/>		

[Home](#) [Logout](#) [Catalog](#)

RCC – 1% of
Total trees planted
during every
Scheduled Wednesday
and Friday planting
events.

Conservation Credit Program



Conservation Credit Program



Conservation Credit Program Catalogue Incentive Items



Conservation Credit Rewards Catalog
Katalaogy Mirakitra Ny Valisoa Avy Amin'ny "Conservation Credit"



Sewing Machine- Models will vary
MILINA FANJAIRANA
MARIKA SAMIHAFANA

1088 cc



Bicycle- Models will vary
BISIKILETA
MARIKA SAMIHAFANA

1240 cc



Solar Panel with Battery and Two Lights- Models will vary

SOLAR PANEL AMIN'NY BATTERY SY ROA JIRO

MARIKA SAMIHAFANA

2000 cc



Solar panel with Battery, Radio and Two Lights- Models will vary

SOLAR RAFITRA AMIN'NY BATTERY, RADIO ARY NY ROA JIRO

MARIKA SAMIHAFANA

3600 cc



Conservation Credit Rewards Catalog
Katalaogy Mirakitra Ny Valisoa Avy Amin'ny "Conservation Credit"



SOLAR COLLECTOR PANELS
MASOANDRO HETRA KOBANY HAFANA

10 WATT PANEL, 37CM X 24CM
10 WATT PANEL, 37CM X 24CM
560 cc

20 WATT PANEL, 45CM X 43CM
20 WATT PANEL, 45CM X 43CM
880 cc

30 WATT PANEL, 63.5CM X 34CM
30 WATT PANEL, 63.5CM X 34CM
1200 cc

40 WATT PANEL, 66CM X 45CM
40 WATT PANEL, 66CM X 45CM
1440cc

MODELS VARY - MARIKA SAMIHAFANA

Conservation Incentive Items



Fuel Efficient Rocket Stove
100 Conservation Credits



Hippo Water Roller
500 Conservation Credits

Conservation Incentive Items



Manual Sewing Machine
1,088 Conservation Credits



Bicycle
1,240 Conservation Credits

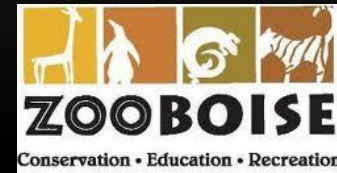
Conservation Credit members “Cashing” in Their Credits!



3,107 Conservation Credit participants currently enrolled



Zoo Boise Conservation Fund connects the Black and white ruffed lemur to the Reforestation Program to Solar Power Lighting for Kianjavato Schools



University of Nebraska Lincoln & University of Nebraska Omaha Engineers Without Borders Student Chapter



Single Mother's Club *Vehivavy Vonona* or “The Ready Women”

The Ready Women work only in the afternoon doing various tasks in and around the nursery (cleaning compost, collect composting greens, weed the seedling bags, etc...)



107 Ready Women are working in the nurseries currently



CONSERVATION EDUCATION



CONSERVATION

FUSION



Leona, no onantsy
hanampana, ny biby?

- LOVISA
- LEONOR
- FRIZ
- JULIE
- NICOLE
- ESTELLA
- E-LISA
- NONIQUE
- ELLIANE
- TAMIRY

KIANJAVATO

-World Lemur Day



-“Little Bamboo Lemur” Books

-12 schools, multiple visits + evaluations

-1,500 Workbooks to 12 schools

-Teacher Workshops, 80+ educators





SOS support allowed us to engage more than 1,000 new students at 4 remote schools (in addition to our 8 core schools = 12 schools total).

Results:

Lemur hunters (1st visit)= <60%

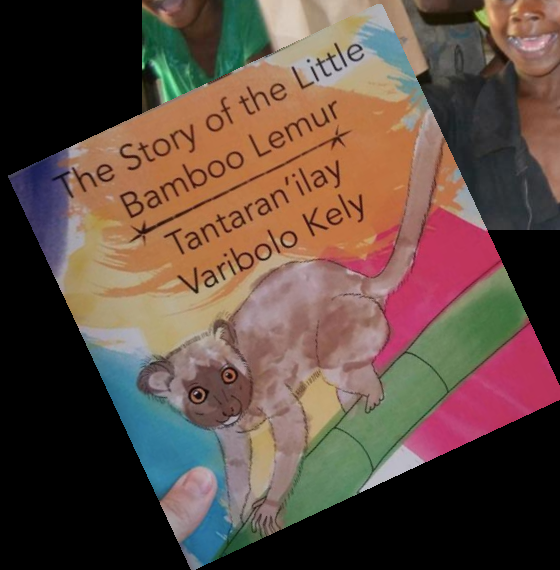
Profess to **Protect Lemurs** (2nd, 3rd and 4th visit)= <96%

Changing attitudes and behaviors through education and awareness.

Connecting people to the science of conservation.



Protecting Lemur populations by connecting communities to conservation through education.



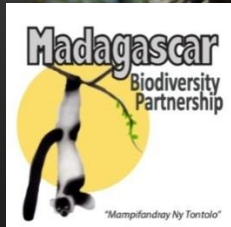


Lessons are taught by local leaders, next, students become the experts, and it's all backed up with ACTION~ Tree planting and sharing the message with parents and peers. (tangible benefits)

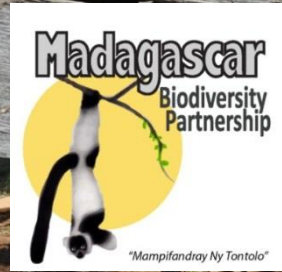




Creating educational experiences through hands-on business training, new agricultural techniques and fuel efficient stove production.



"HAZO-O-RAMA" Tree Conservation Day Parade



“HAZO-O-RAMA” Tree Conservation Day Parade

Community-Based Guide Book – On the Job Training

- Leverage your asset(s) - conservation dollars are a highly competitive resource (in kind (OHDZA); grants and partnerships (Calgary Zoo, IAP))
- Need to Commit – 365 days a year – Foundation Built. (Kianjavato Ahmanson Field Station; ground-breaking Tsitola Bioreserve Station and Ecolodge)
- Provide multiple layers of economic resource opportunities (Ecotourism, commercial crops, timber resources).
- Collaborate especially with conservation educators willing to get on the ground. (Conservation Fusion)
- Listen to the local people's requests, but you have to put together a program that requires and encourages participation. (Automated Conservation Credit Program)
- Community-based programs grow if they are going to be successful so be prepared to grow with them. (20 Nurseries and expanding reforestation efforts; expanding monitoring programs)

Community-Based Guide Book – On the Job Training

- Success can bring new hurdles. (Bamboo baskets – commercial crop)
- Think of succession and sustainable self-reliance early on. (Ecotourism, ecolodge, commercial crops, timber resources, TRAINING...)
- All businesses have an exit plan for good or bad reasons. (At some point, we all have to stop, one way or another)

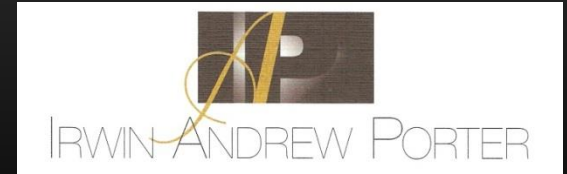
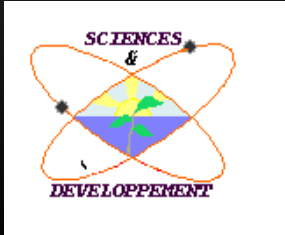
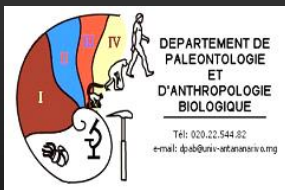


Thank you for this opportunity to tell you about our program in Madagascar.

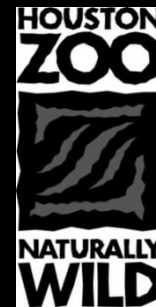
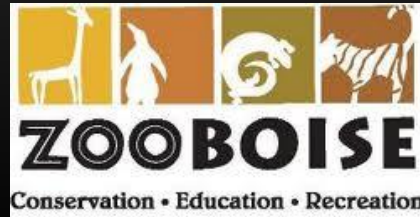
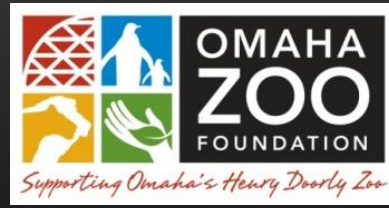


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Acknowledgments to Our Partnerships



Acknowledgments to Our Zoological Partnerships



Questions?



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