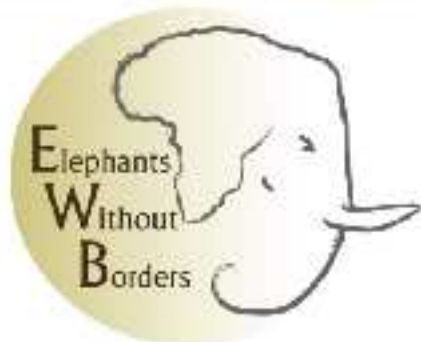


Status of Wildlife Populations and Land Degradation in Botswana's Forest Reserves



Presented to: Stakeholders Meeting
Tlotlo Gaborone
23 April 2013

Presented by: Michael Chase
Elephants Without Borders

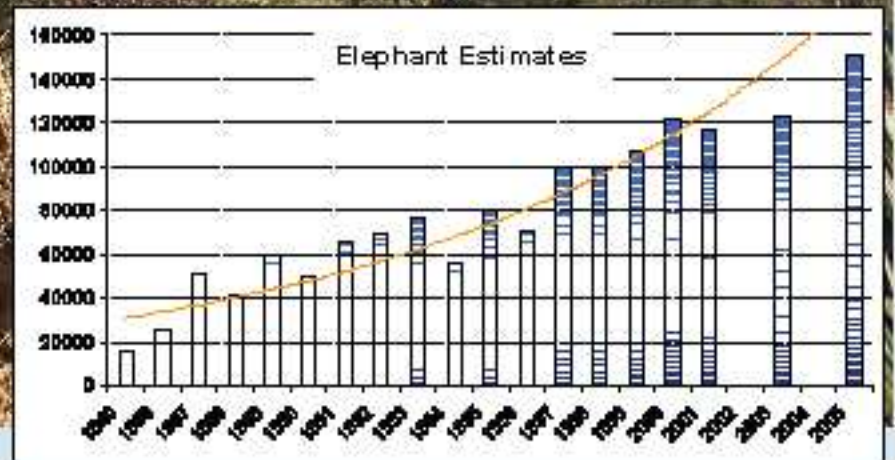
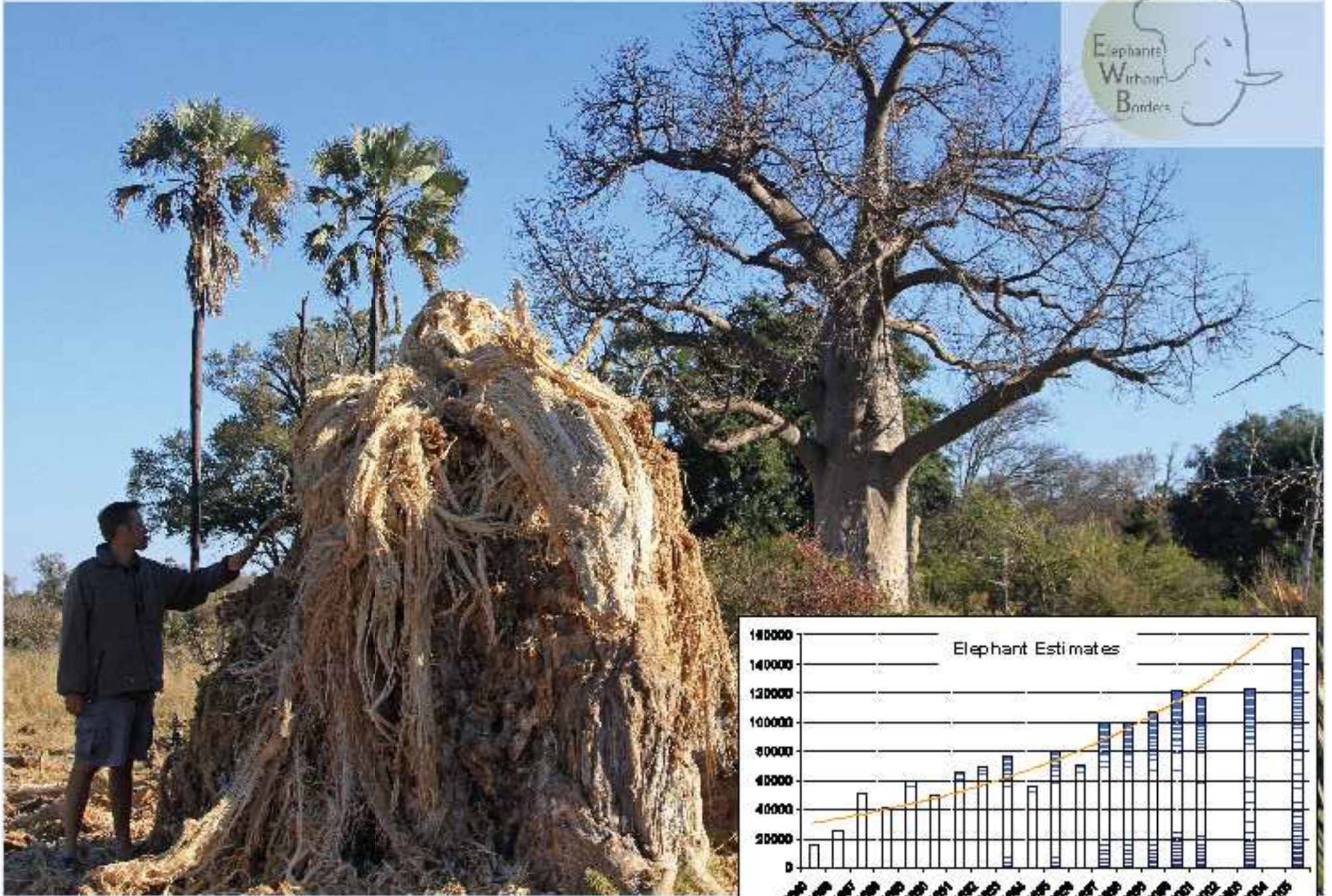


JUSTIFICATION – Study



- Concern about the status of wildlife in Botswana
- There are no estimates for wildlife numbers in Forest Reserves
- What is the current population status of Wildlife?
- Tourism congestion along the Chobe Riverfront
- Wildlife tourism is important to the economy of N. Botswana
- Determine key drivers of land degradation
 - Construct enclosure plots











OBJECTIVES - Aerial Survey



- To provide relatively accurate and precise wildlife estimates
- Survey flown within a reasonable time and cost
- Repeatable and technically robust
- First wildlife aerial survey over the Forest Reserves
- Survey provide baseline for monitoring future trends



METHODS – Aerial Survey





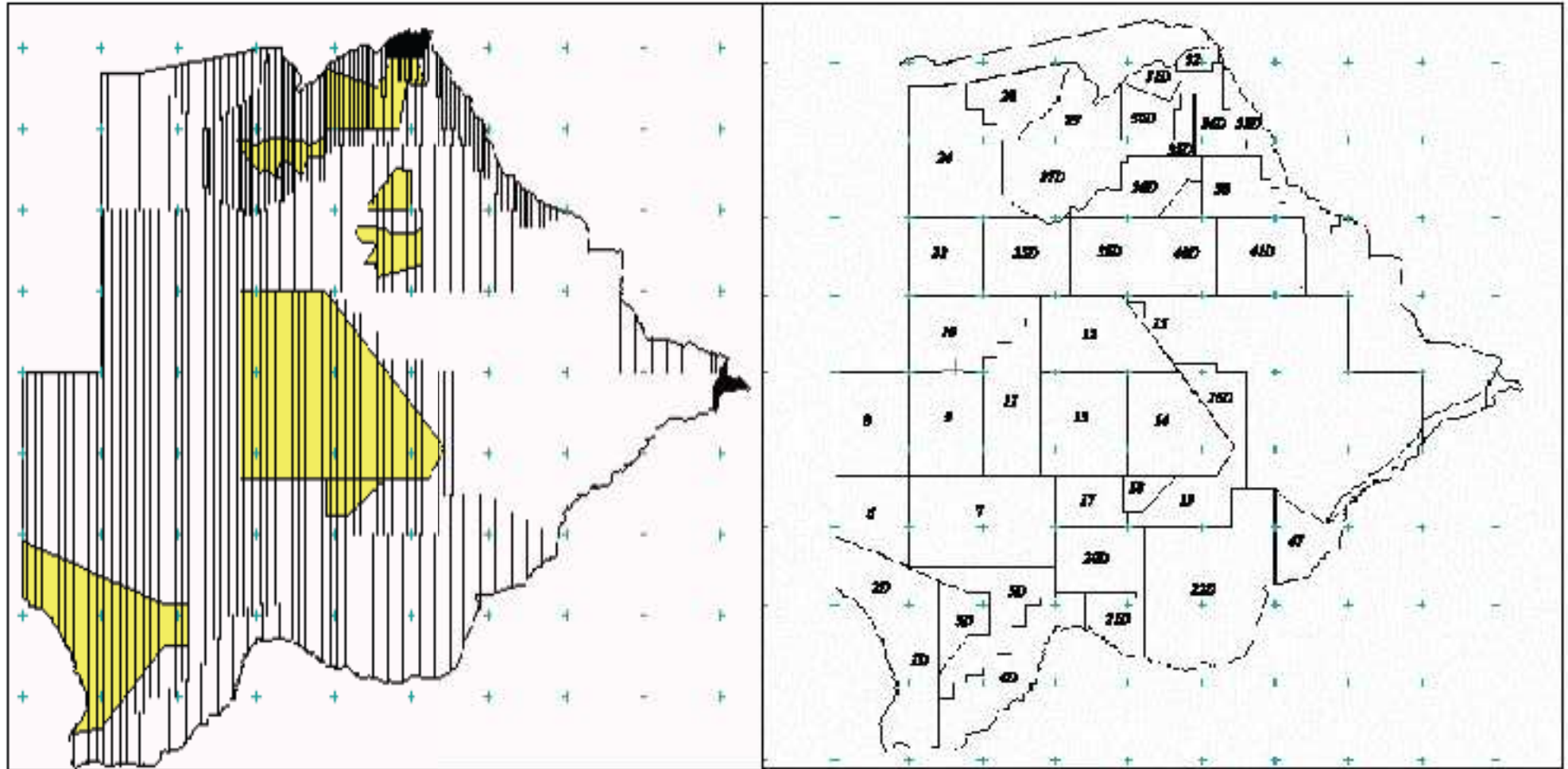


DWNP – Survey Method



DWNP Aerial Transects

DWNP Survey Grid



METHODS – Data Analysis



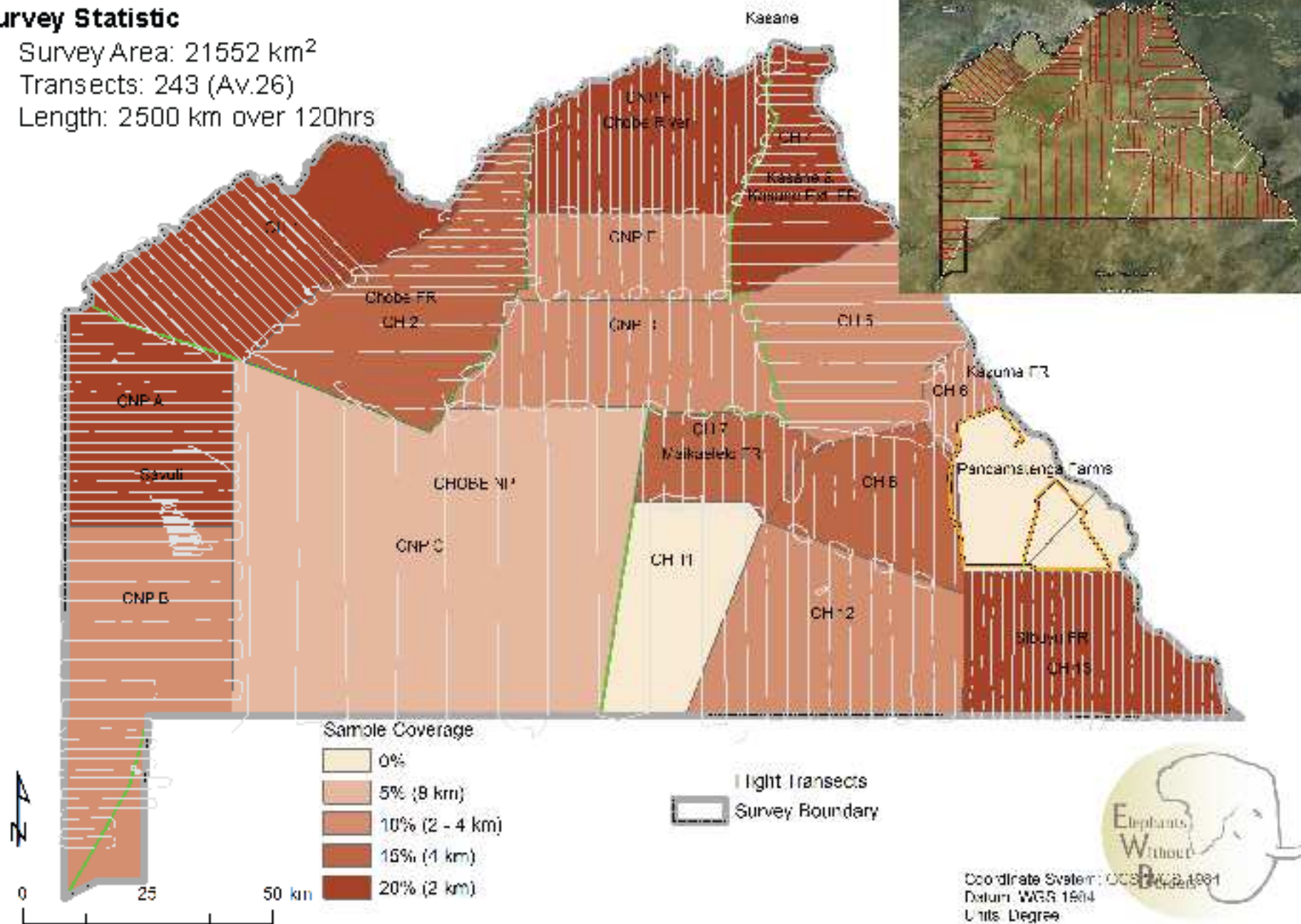
- Jolly's Method II (1969) to calculate population estimates and v
- DWNP aerial survey data base (1993 – 2004)
- Linear regression, Caughley (1977) was used to conduct our trend analysis, calculate growth rates (r)



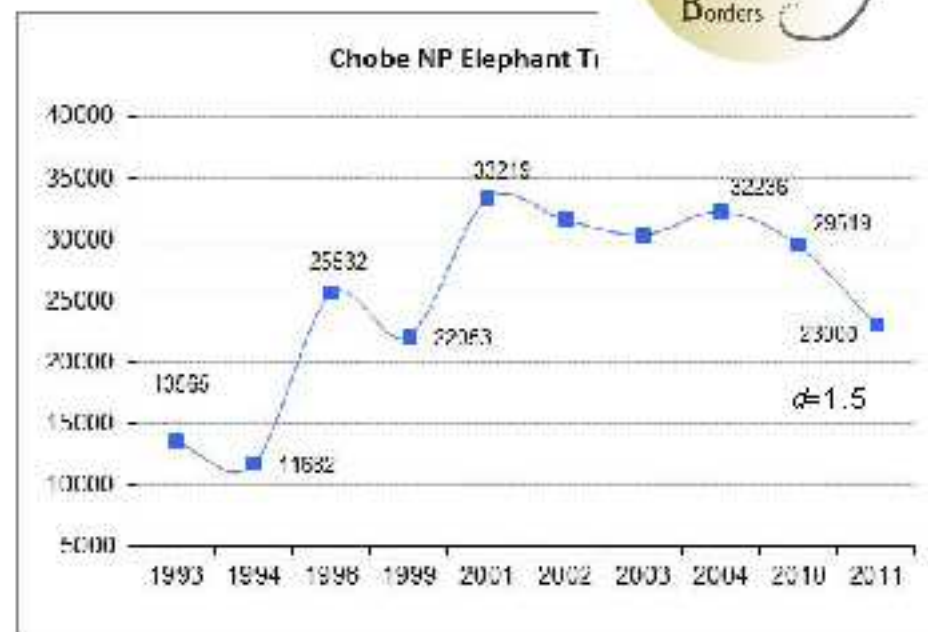
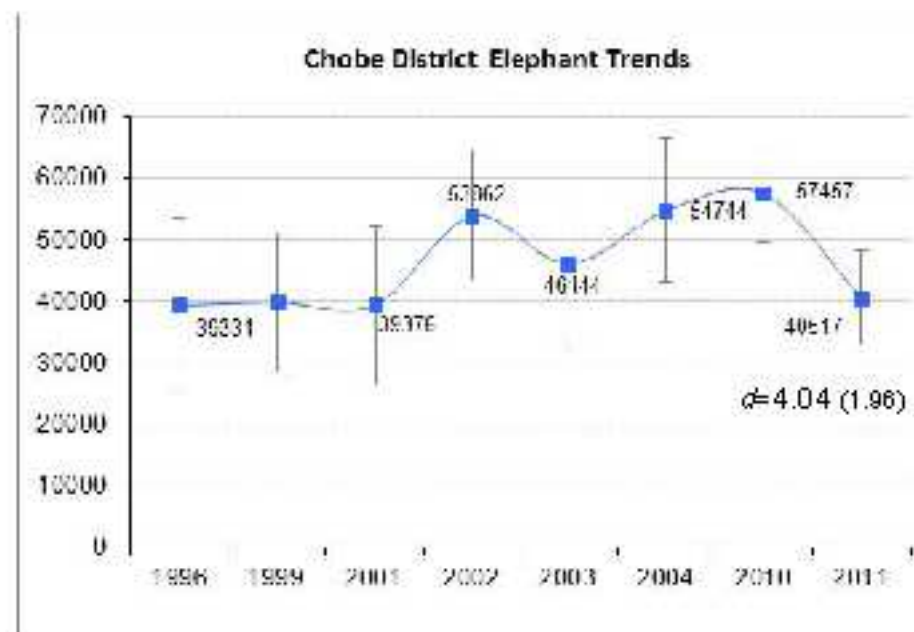
RESULTS - Aerial Transects

Survey Statistic

- Survey Area: 21552 km²
- Transects: 243 (Av.26)
- Length: 2500 km over 120hrs



RESULTS – Elephant Population Estimates



Stratum	2011 Dry Estimate	No. Seen	Variance	CI	% CI	Lower CL	Upper CL	Density (km ²)
Elephant Family	35578	5988	13723843	7292	20%	28280	42875	1.64
Elephant Bull	4942	757	229263	943	19%	3999	5885	0.23
Chobe District	40517	6745	14891623	7601	19%	32915	48118	1.89

Sex ratio of 2:3 bulls to cows within family groups, suggests there were 14231 bulls in family groups

ELEPHANTS – Chobe District Dry Season Survey Comparison

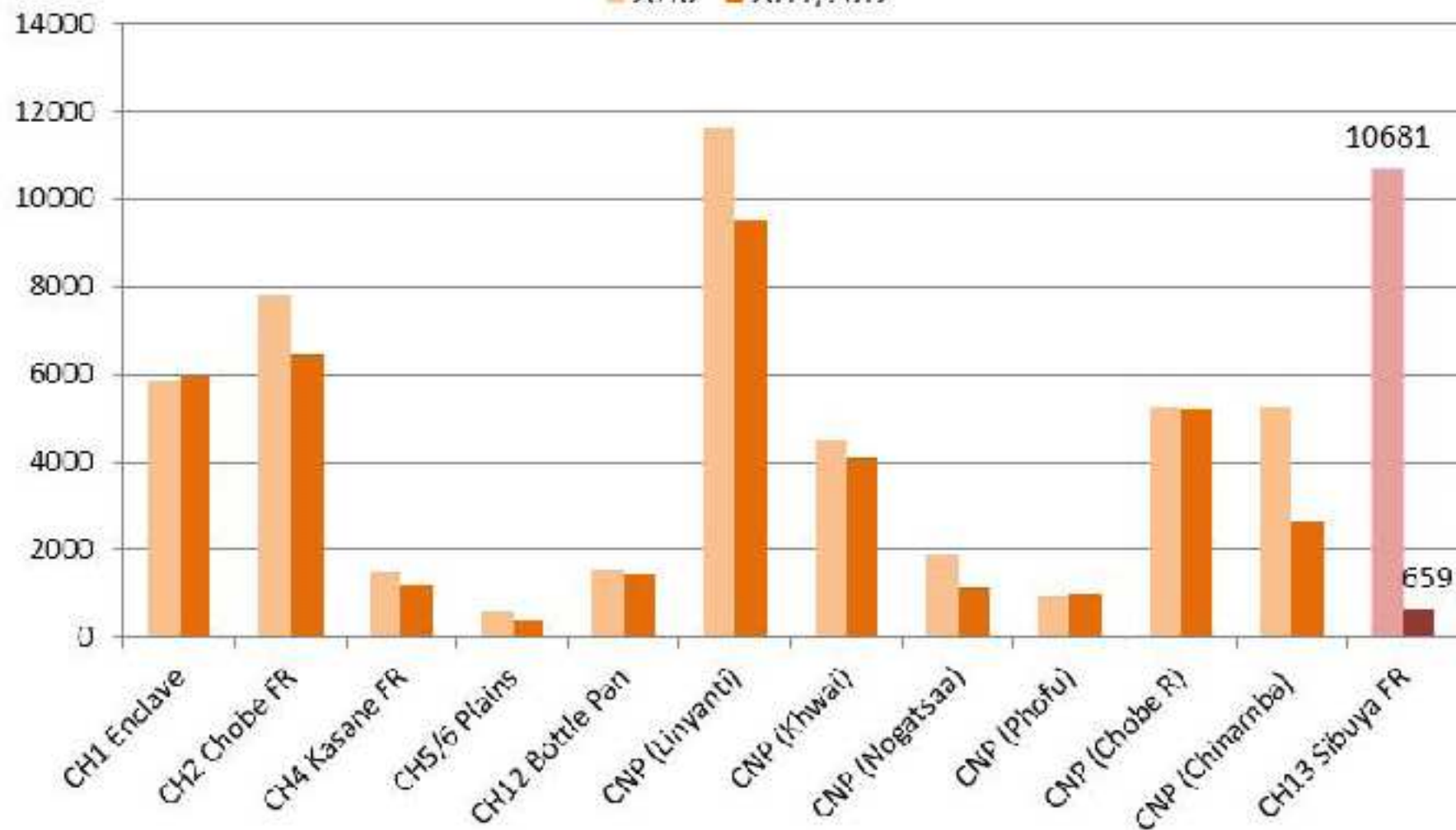


Chobe District Dry Season Elephant Estimates

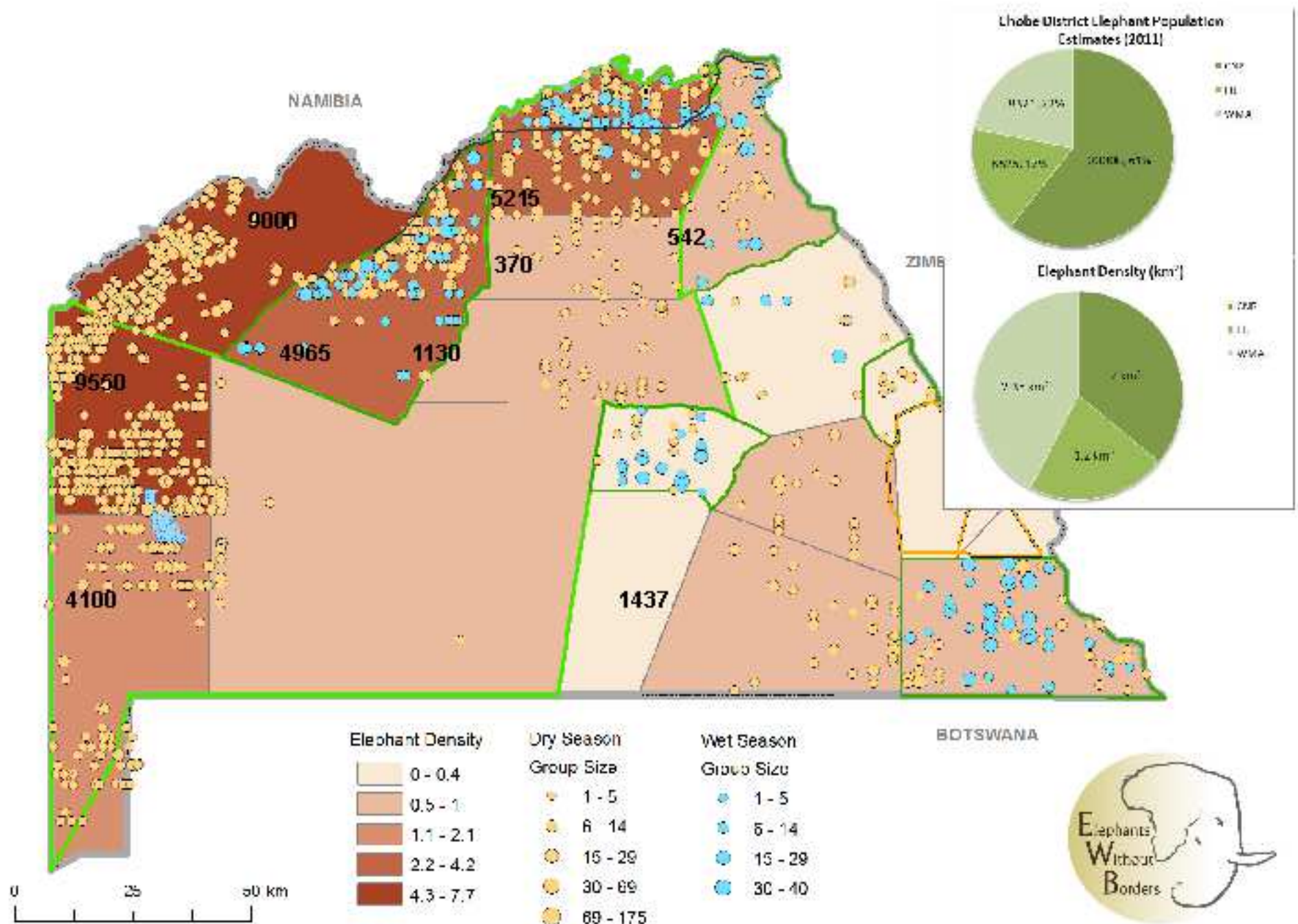
2010 46000

2011 40000

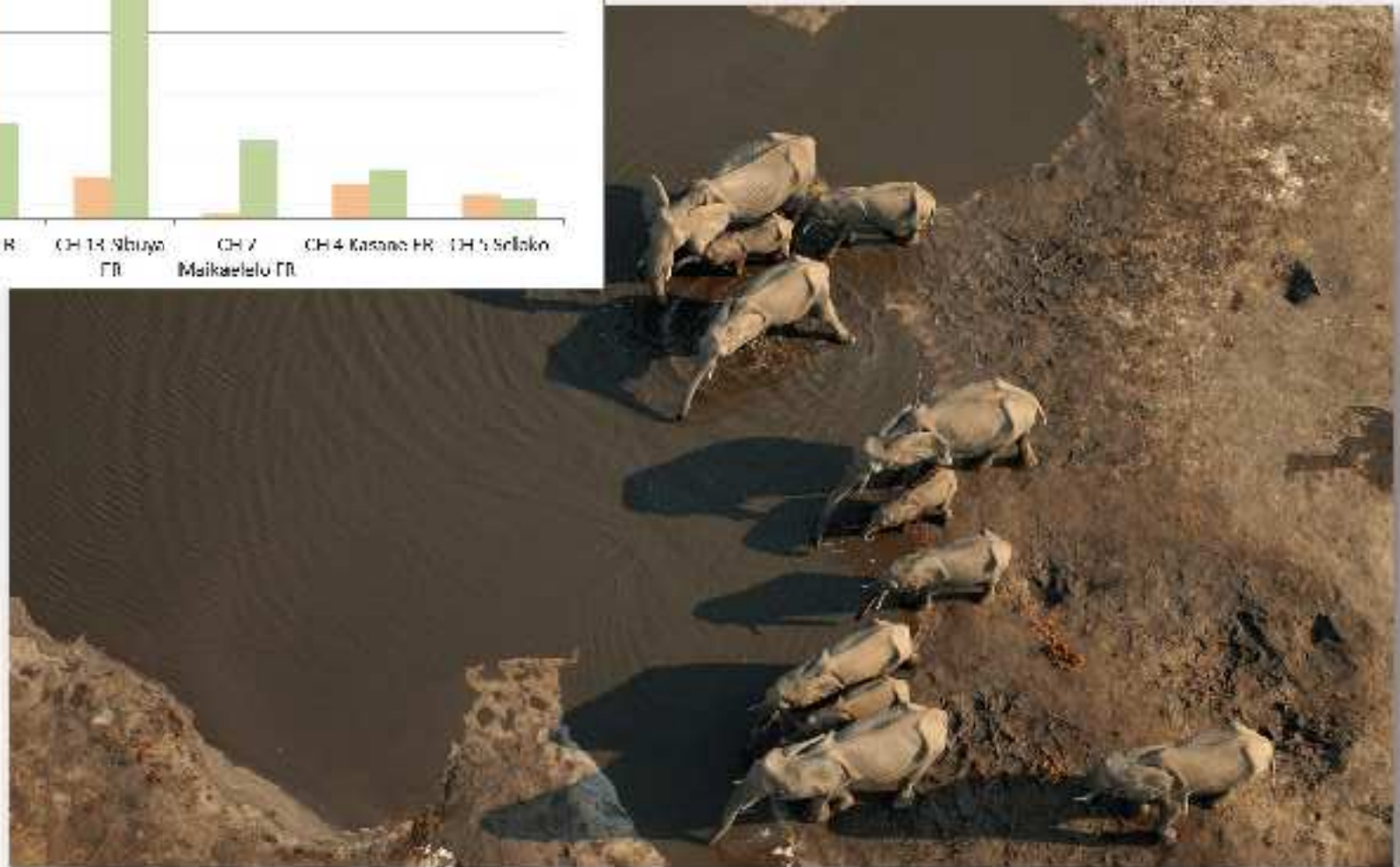
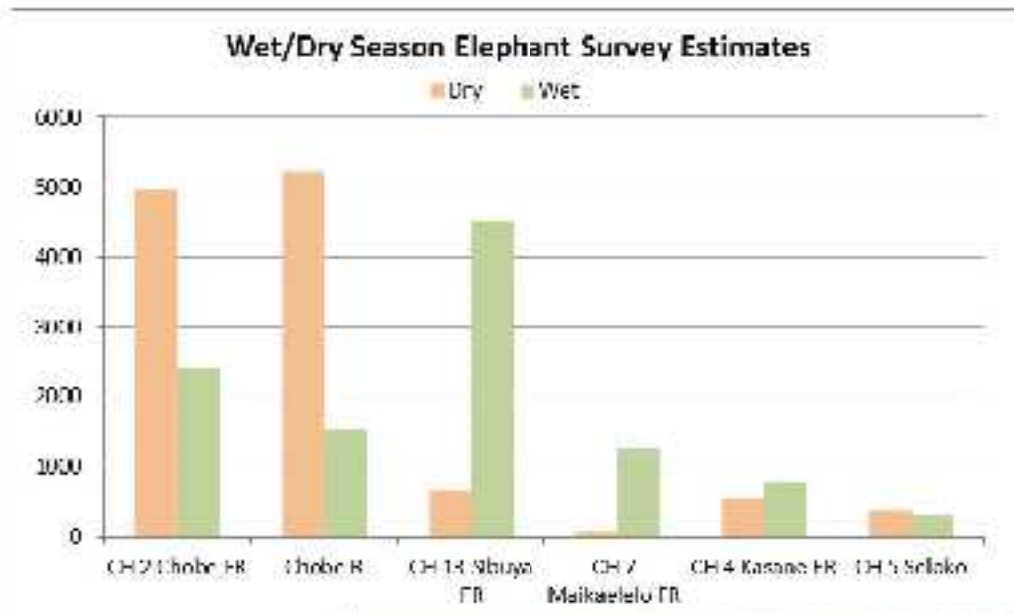
2010 2011/2012



ELEPHANTS - Distribution



ELEPHANTS – Dry Wet Season Estimates





October Monthly Mean Maximum Air Temperature at Maun, Botswana



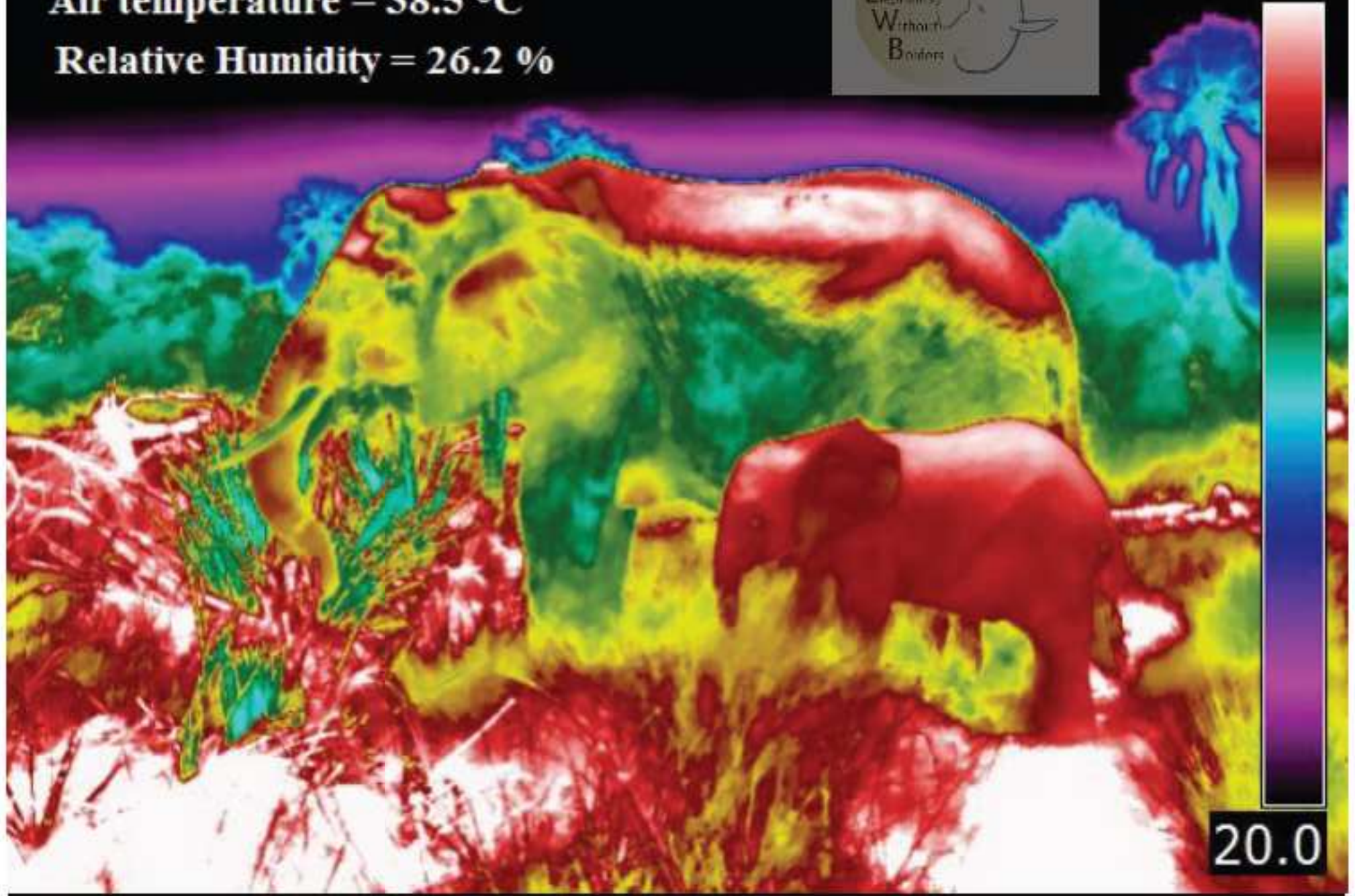
01/11/2012 12:00 PM

Air temperature = 38.5 °C

Relative Humidity = 26.2 %



40.0 °C

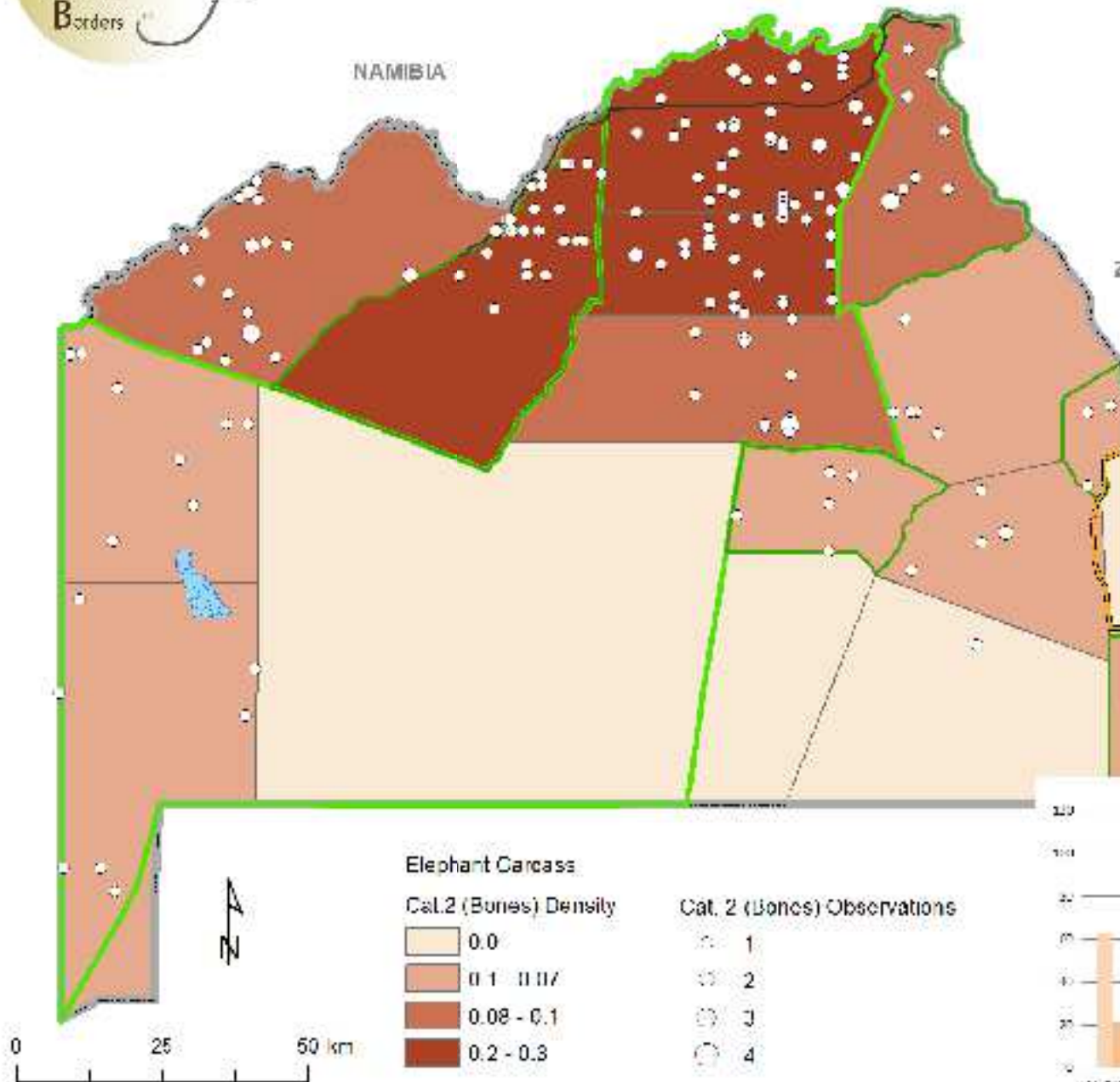
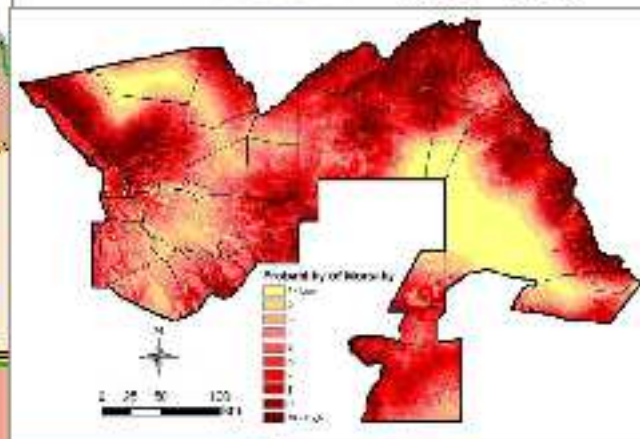
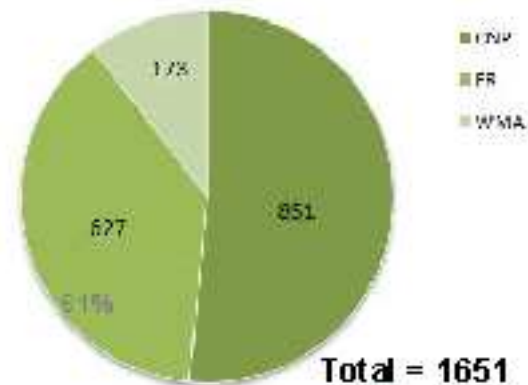


20.0



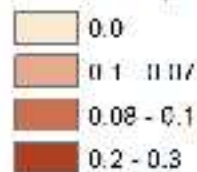
ELEPHANTS - Mortality

Number of Elephant Carcass/Bones (2011)

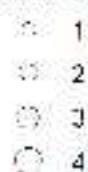


Elephant Carcass

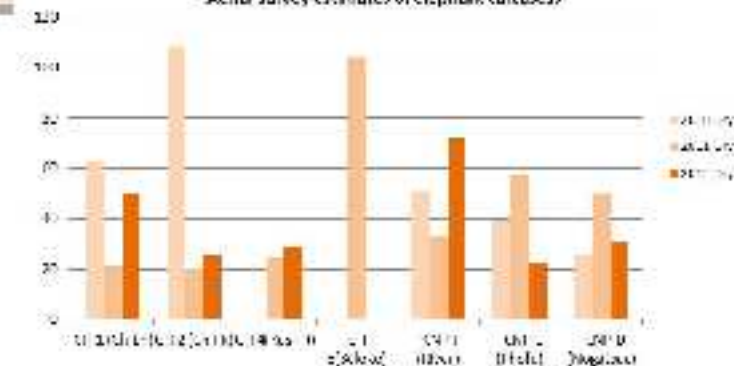
Cat. 2 (Bones) Density



Cat. 2 (Bones) Observations

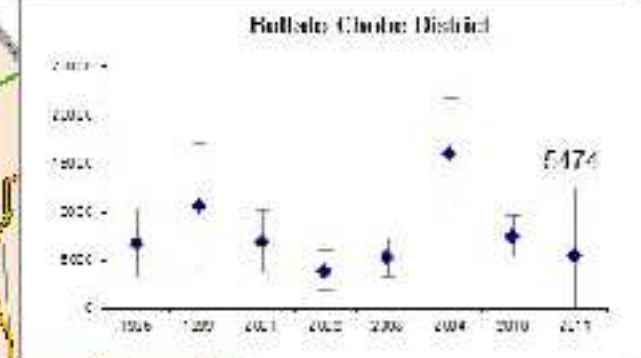
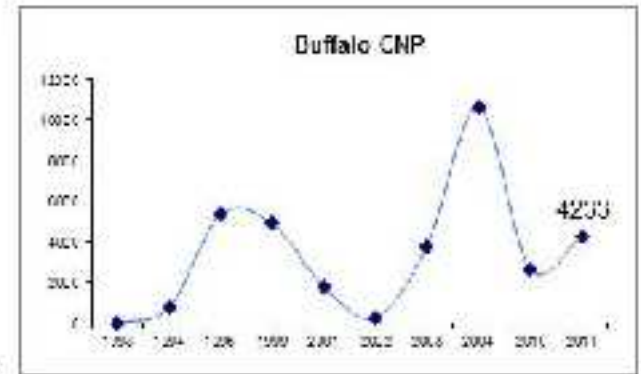
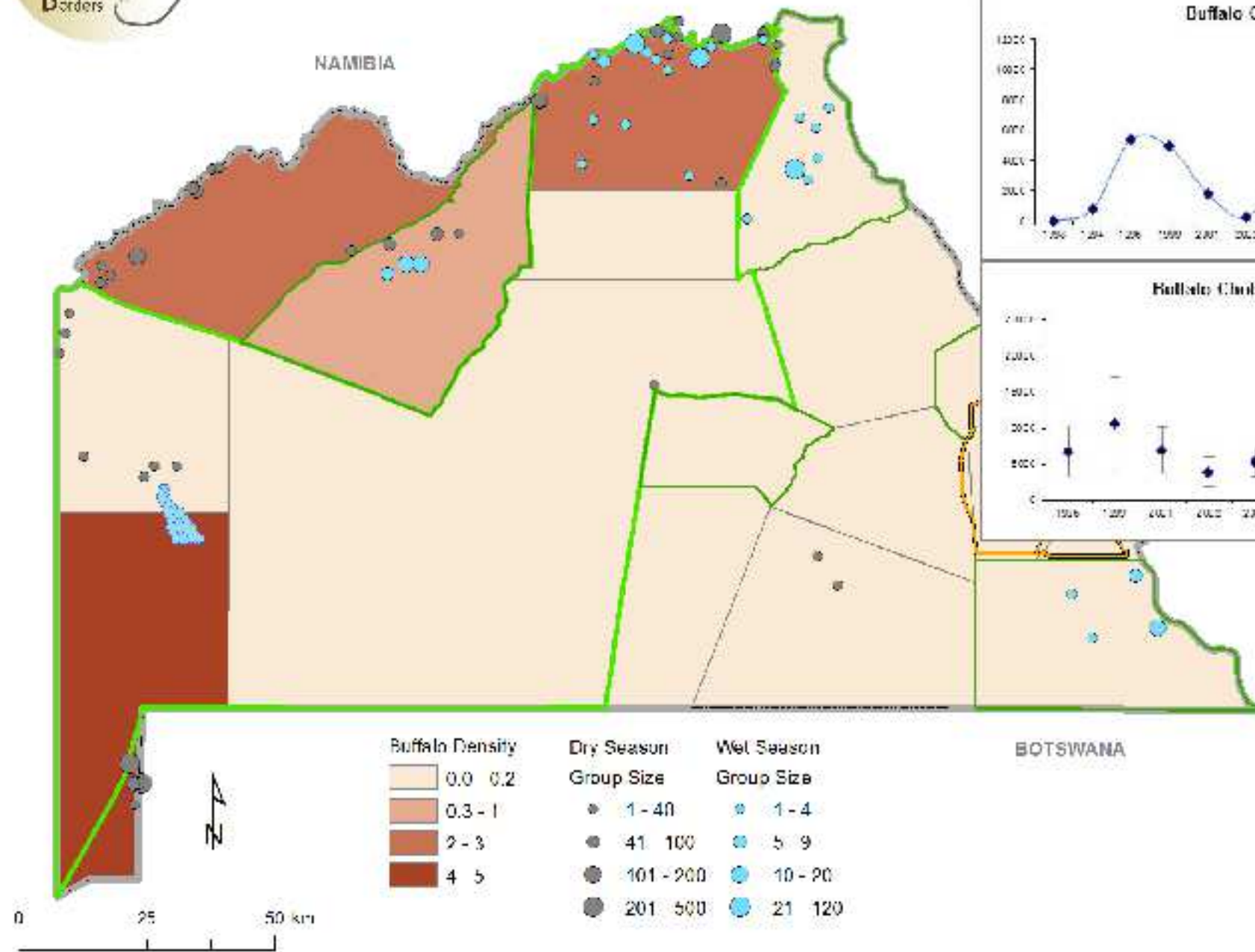


Aerial survey estimates of elephant carcasses



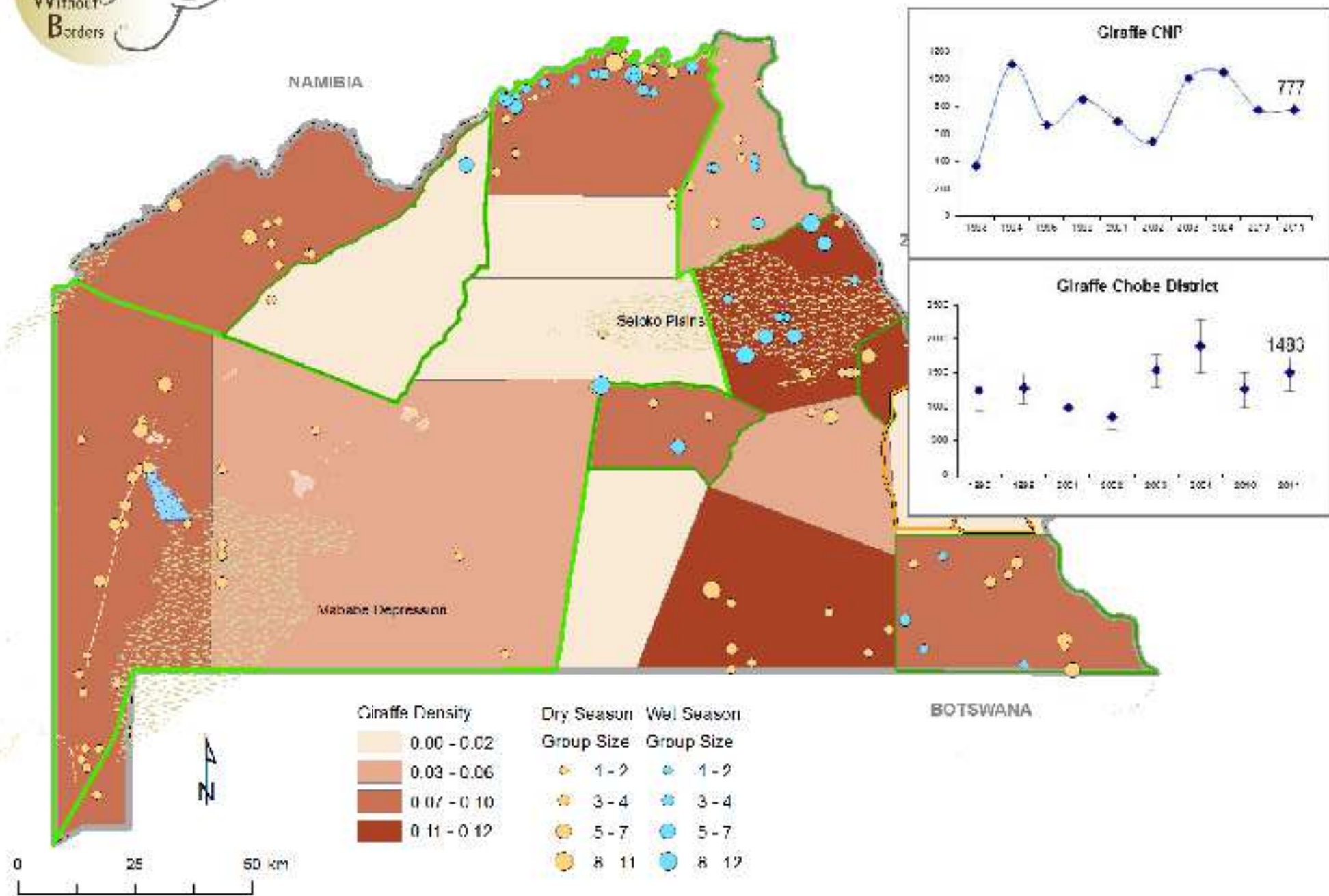


BUFFALO



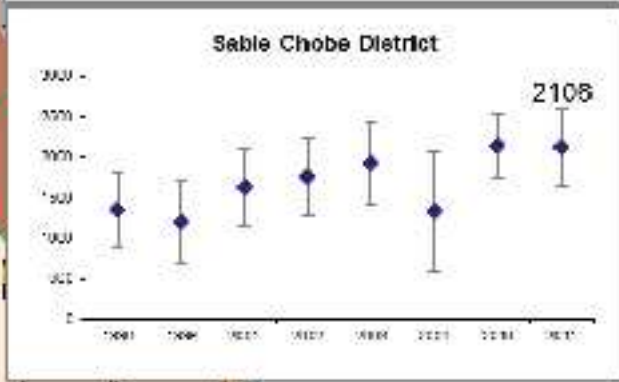
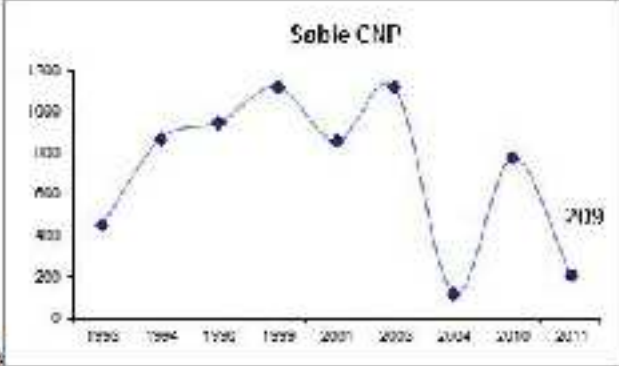
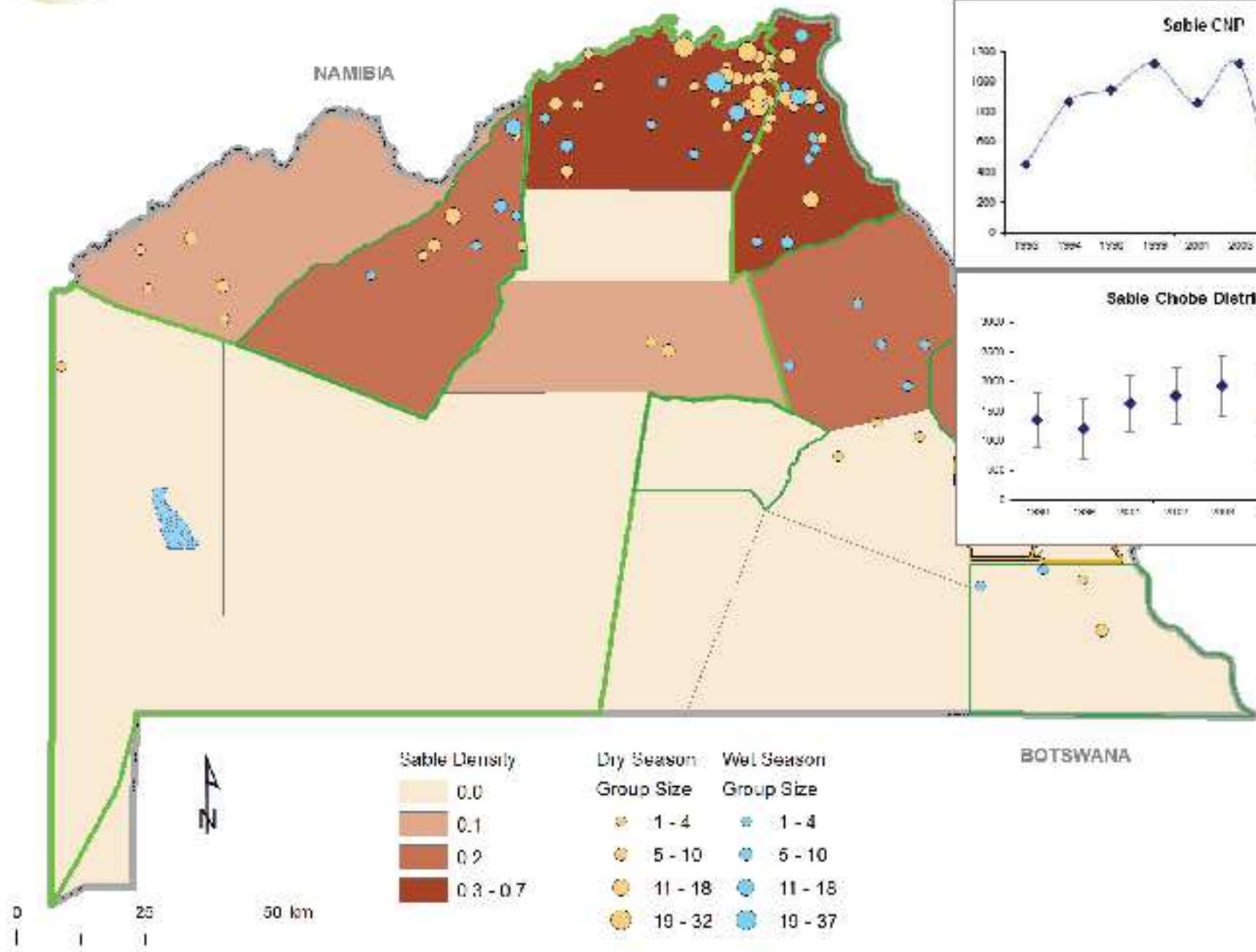


GIRAFFE





SABLE



0 25 50 km

BOTSWANA

NAMIBIA

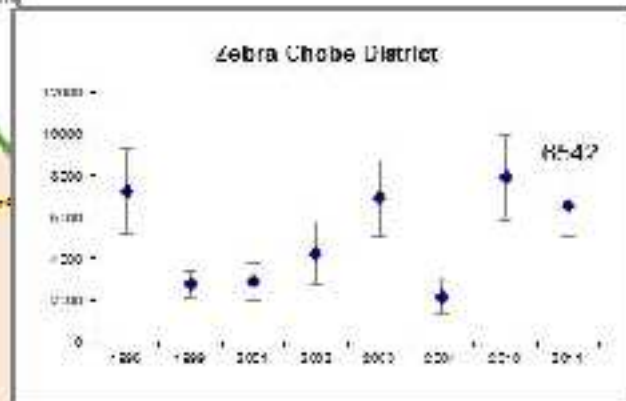
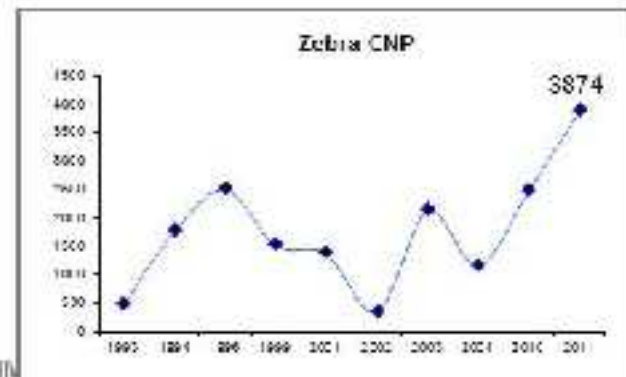
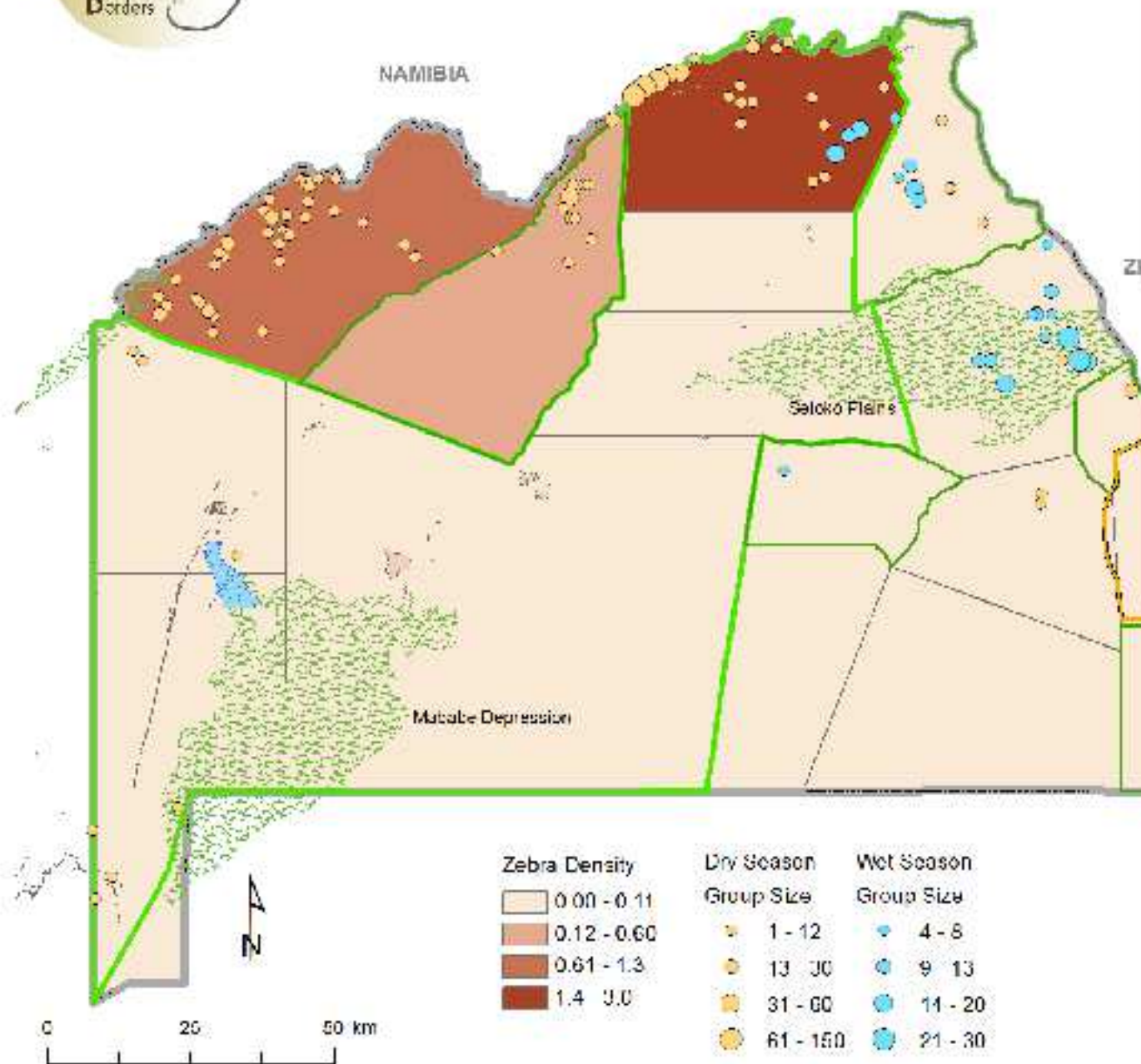


Sable Density	Dry Season Group Size	Wet Season Group Size
0.0	1 - 4	1 - 4
0.1	5 - 10	5 - 10
0.2	11 - 18	11 - 18
0.3 - 0.7	19 - 32	10 - 37

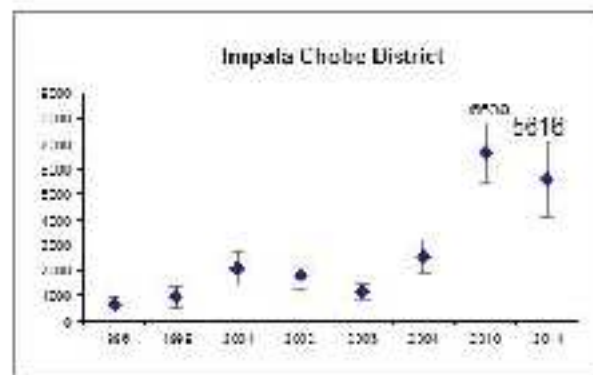
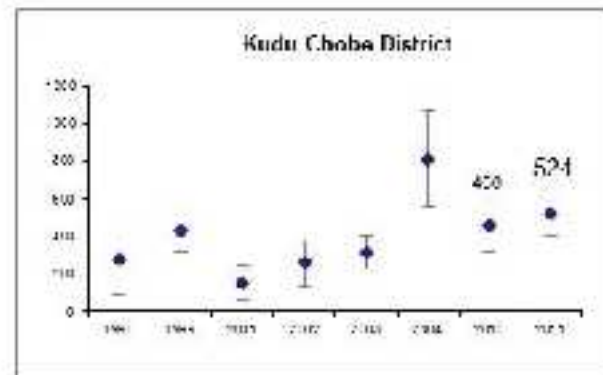
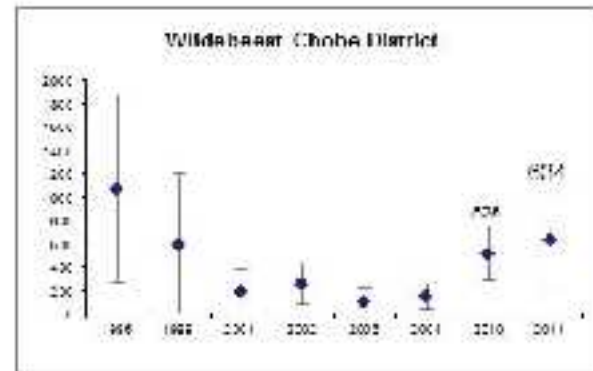
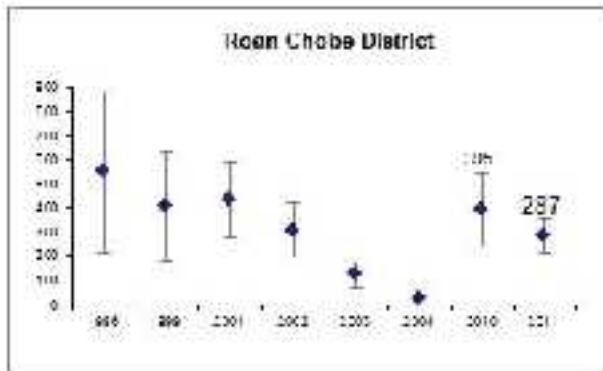
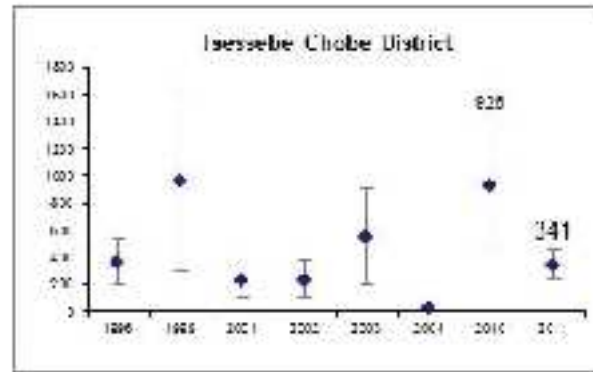
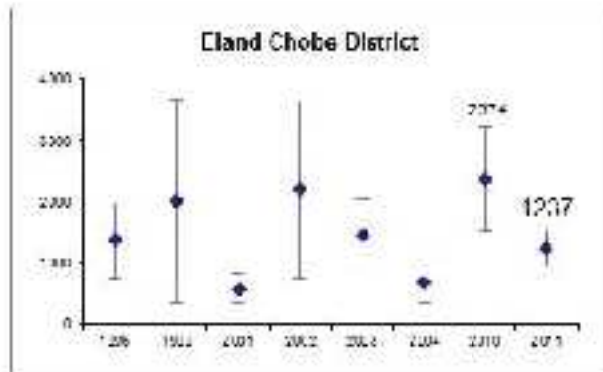




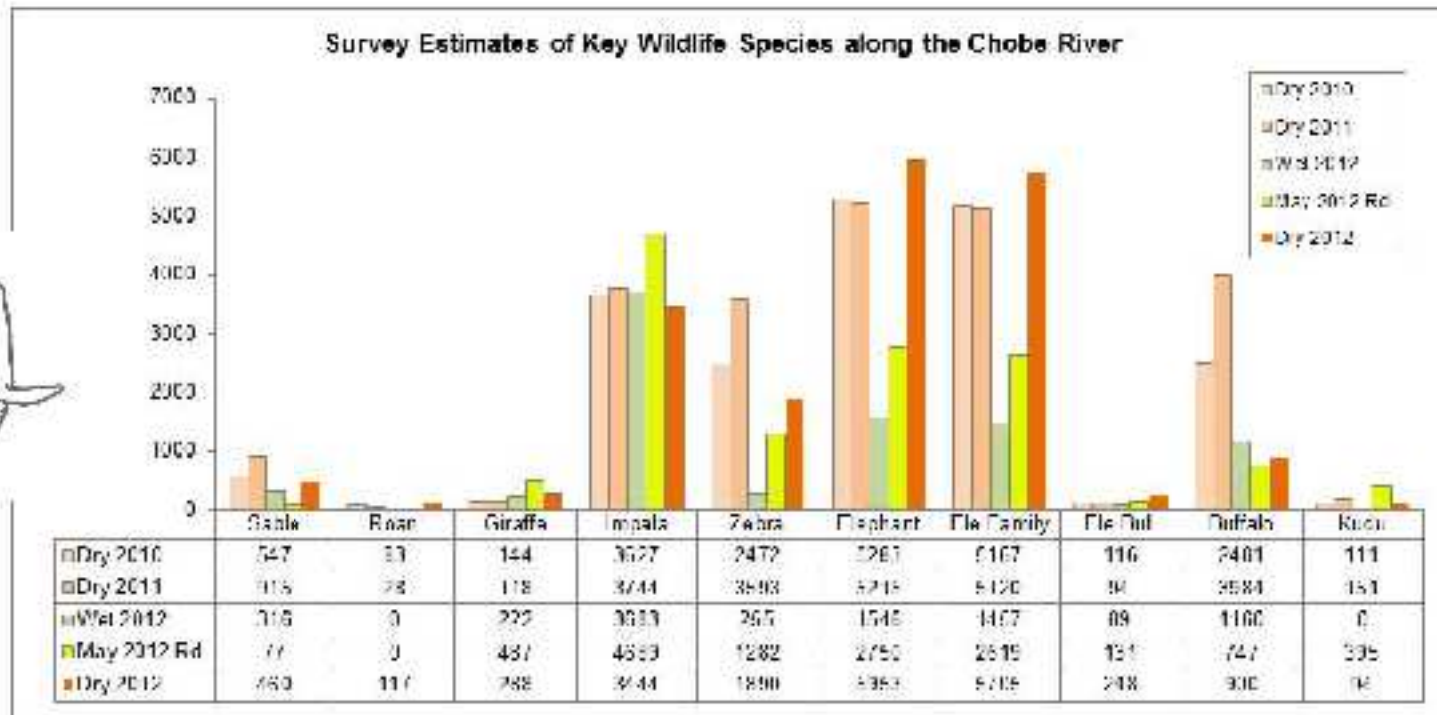
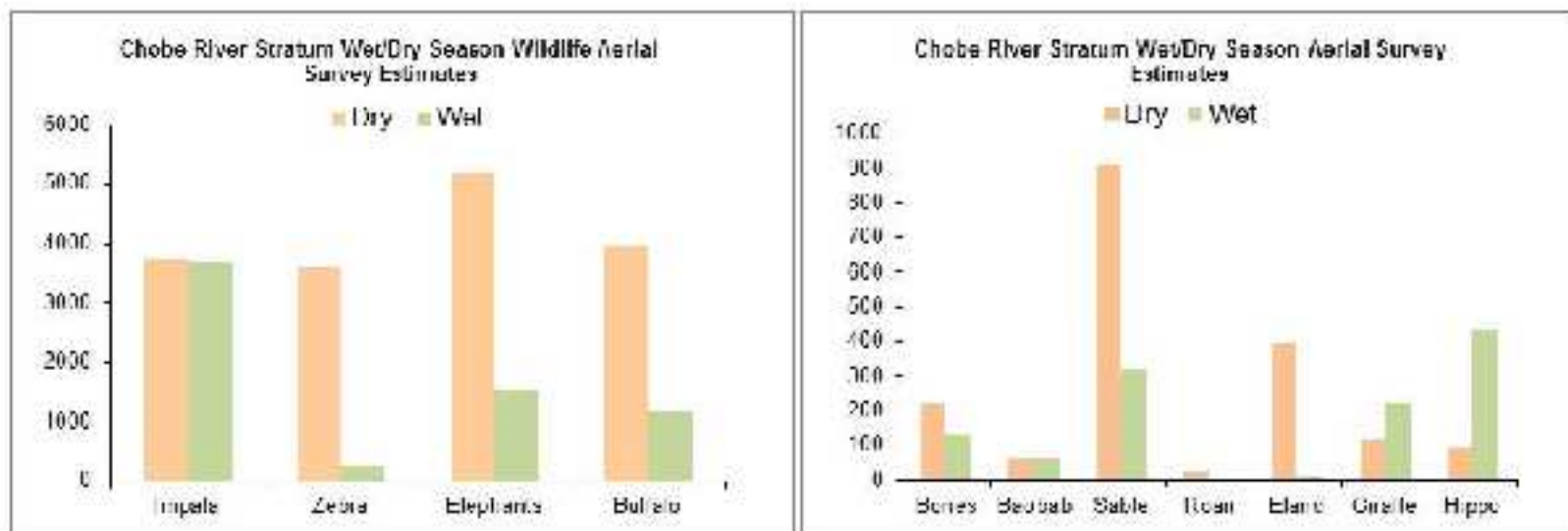
ZEBRA



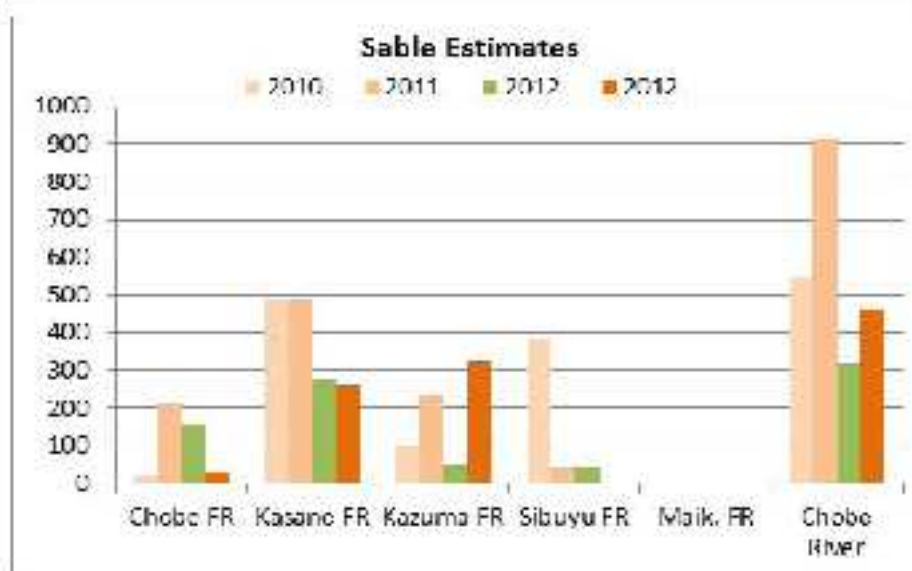
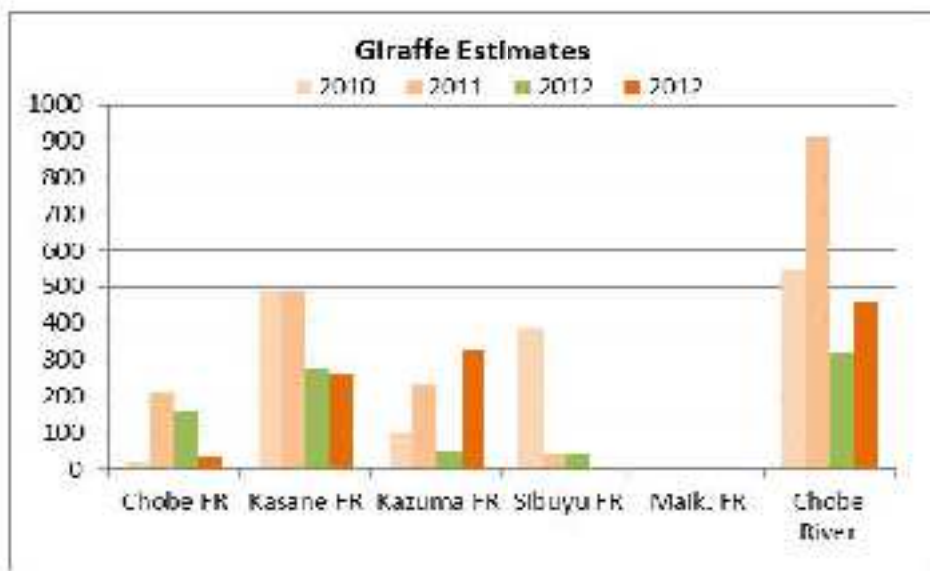
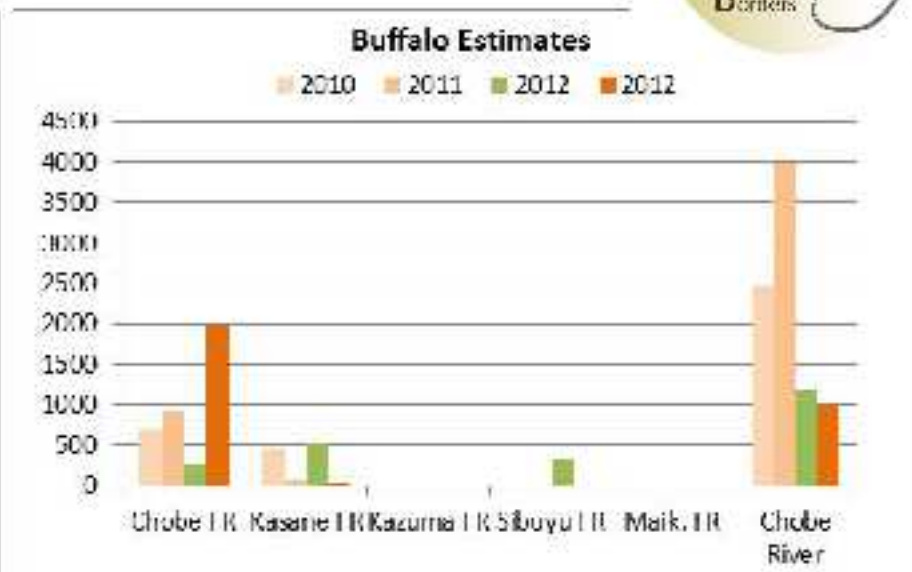
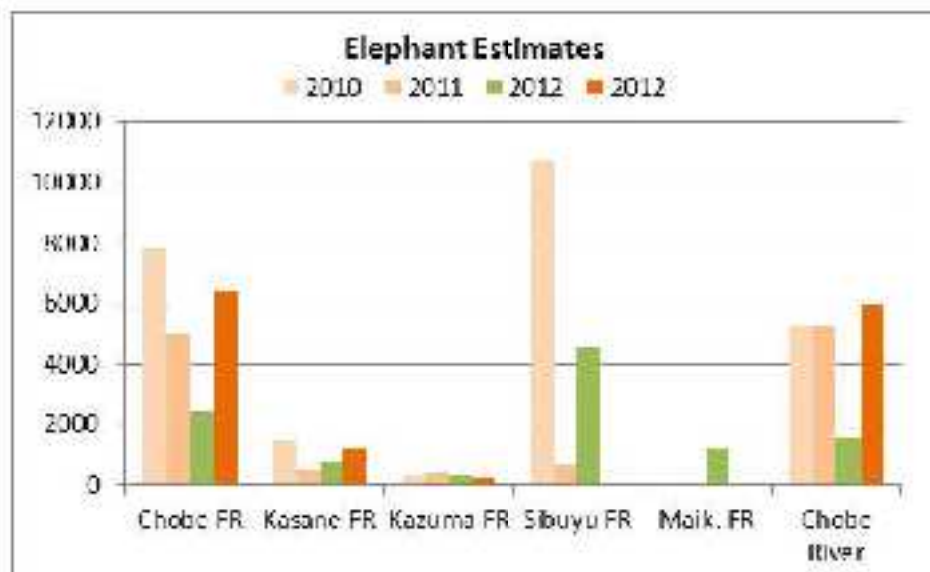
CHOBE DISTRICT – Wildlife Estimates



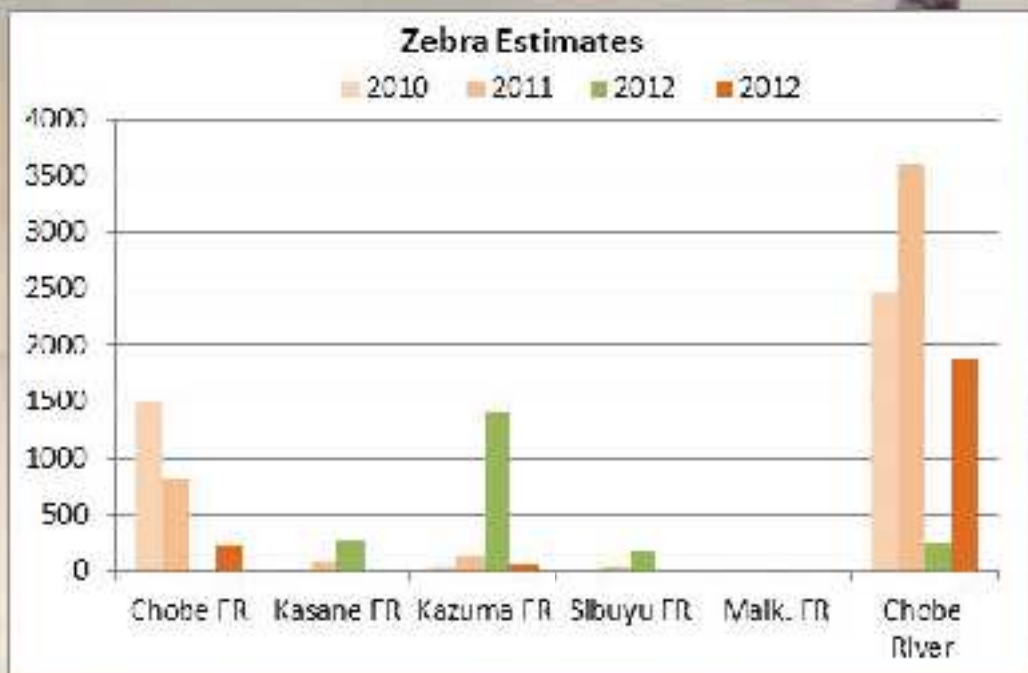
WILDLIFE DISTRIBUTION – Chobe Riverfront, Wet vs Dry Season



WILDLIFE – Forest Reserves



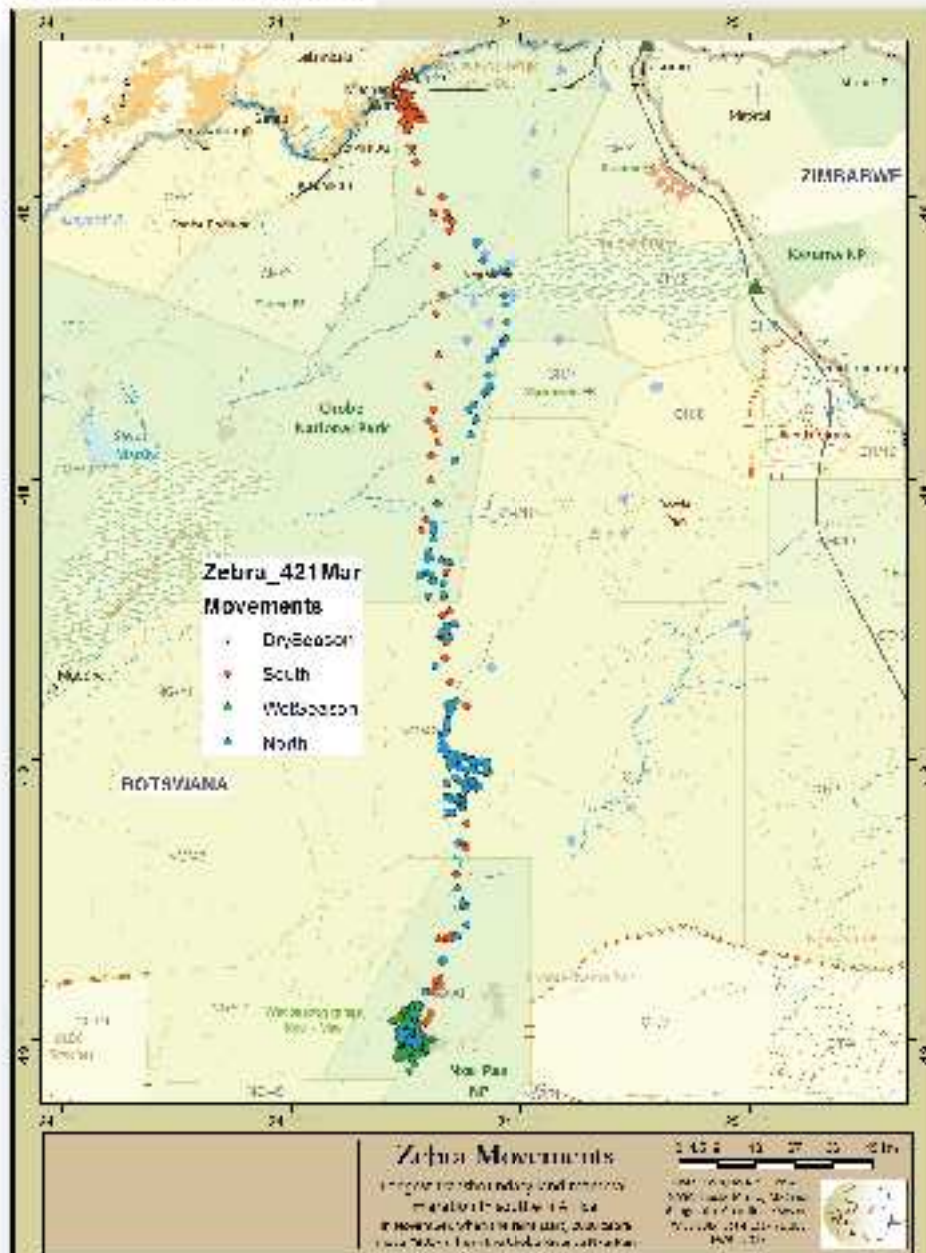
ZEBRA – Where do they move to?



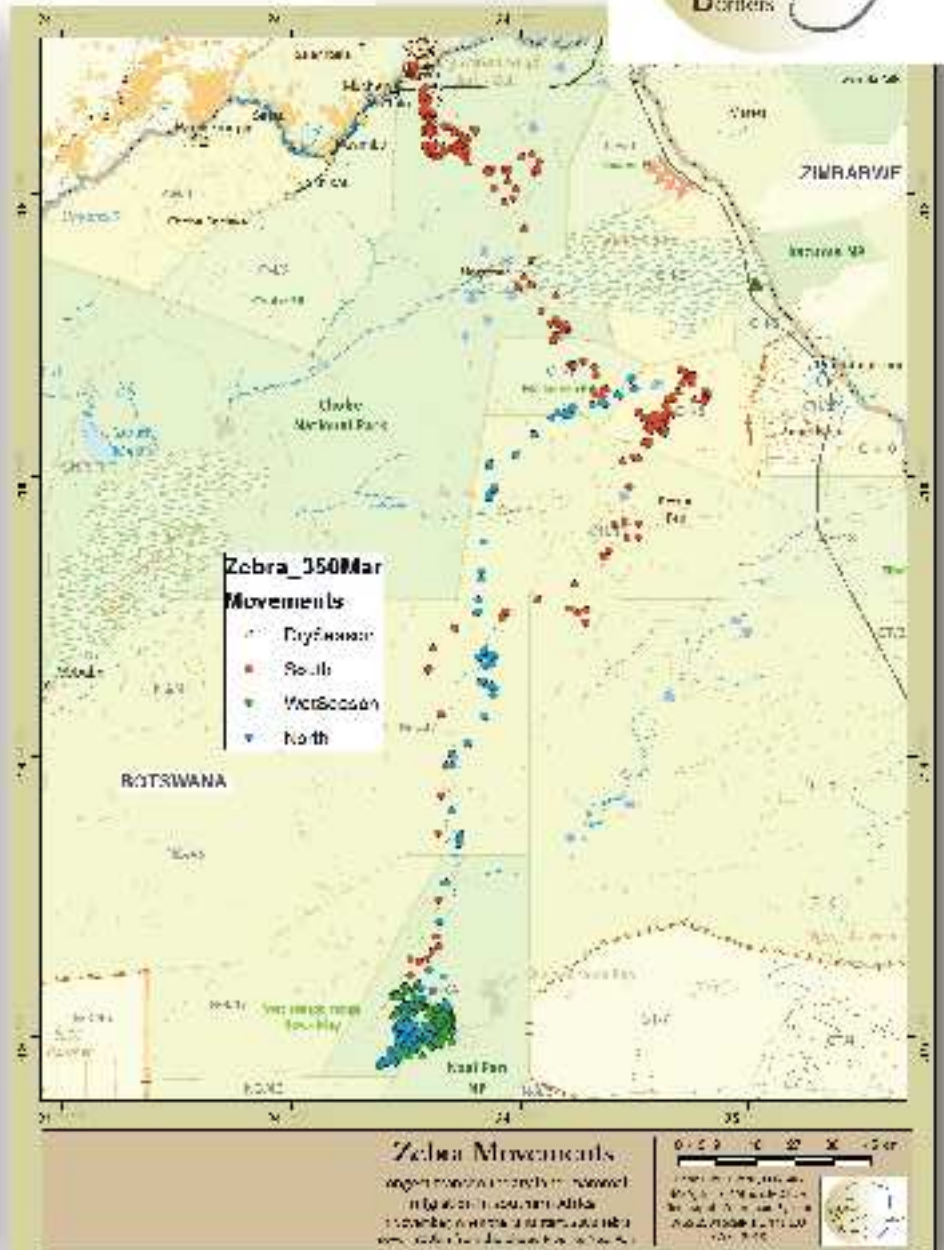
ECOSYSTEM – Ecological Networks, Zebra Migration



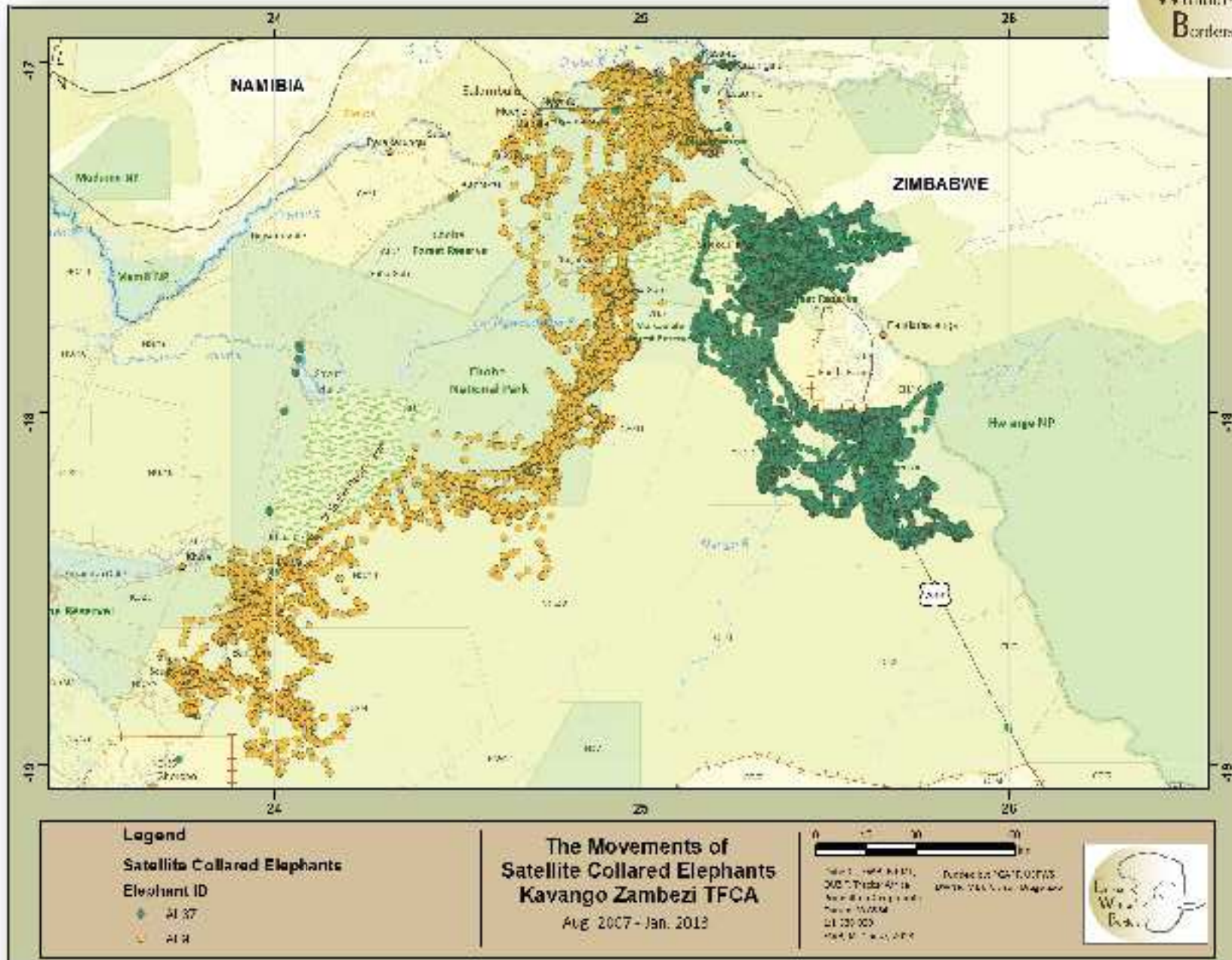
Movements of Zebra 421



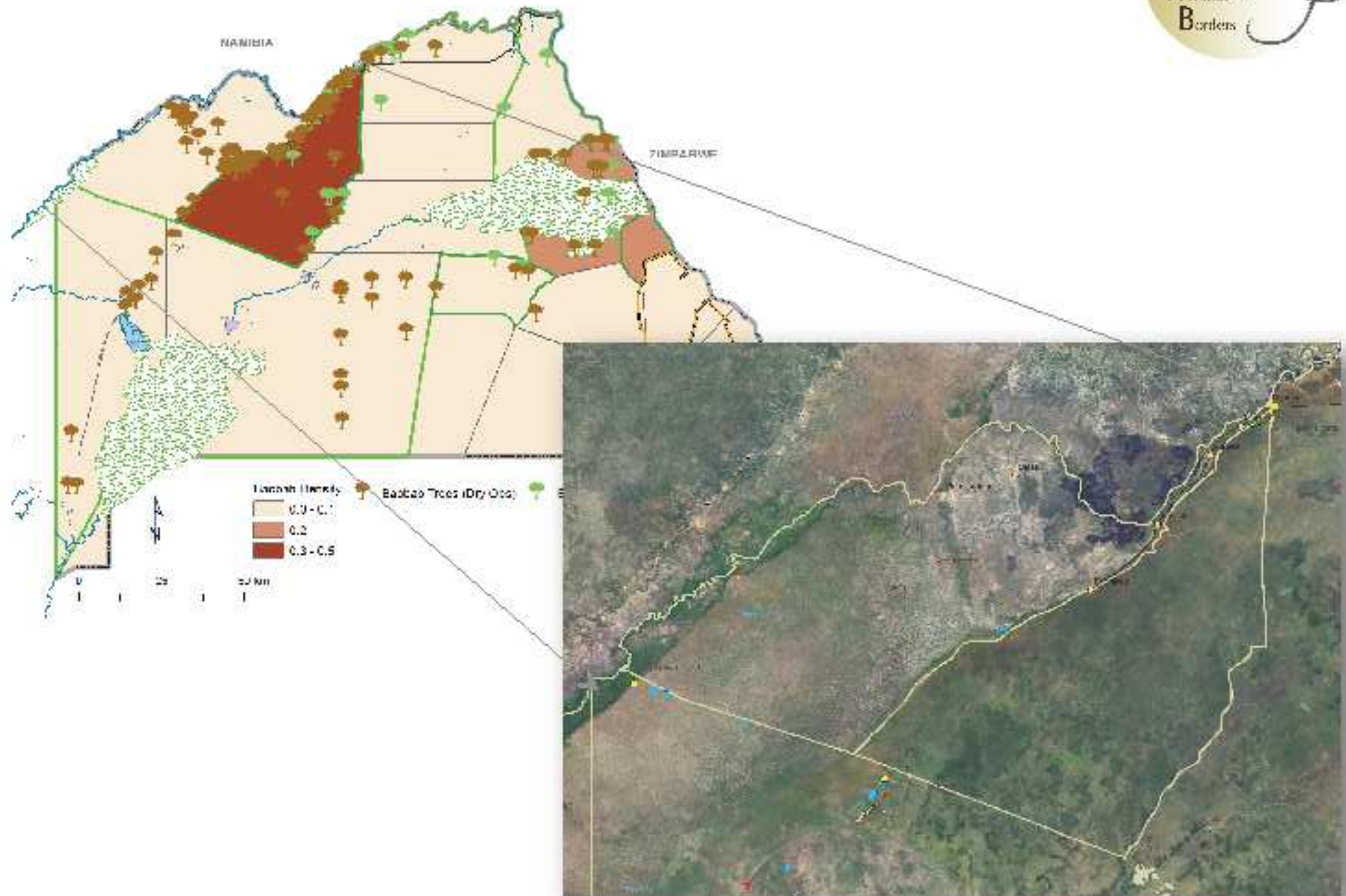
Movements of Zebra 350



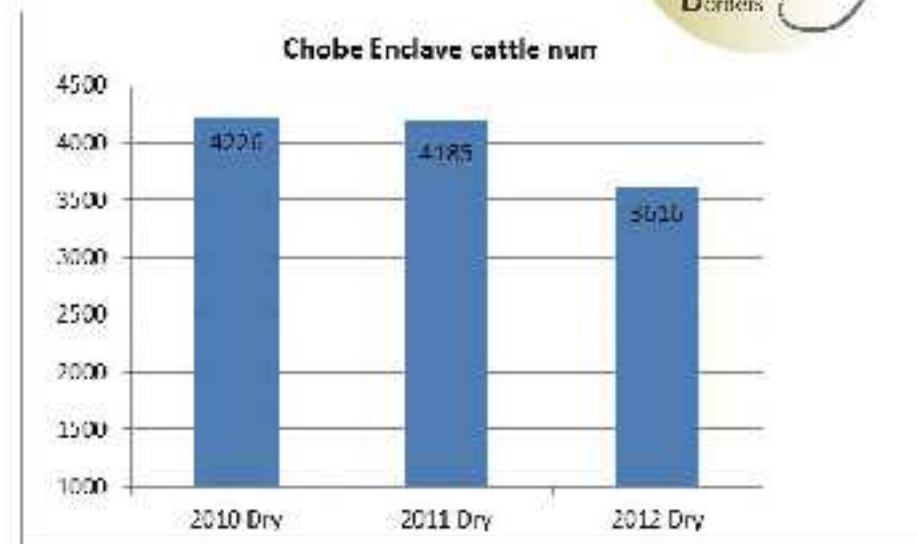
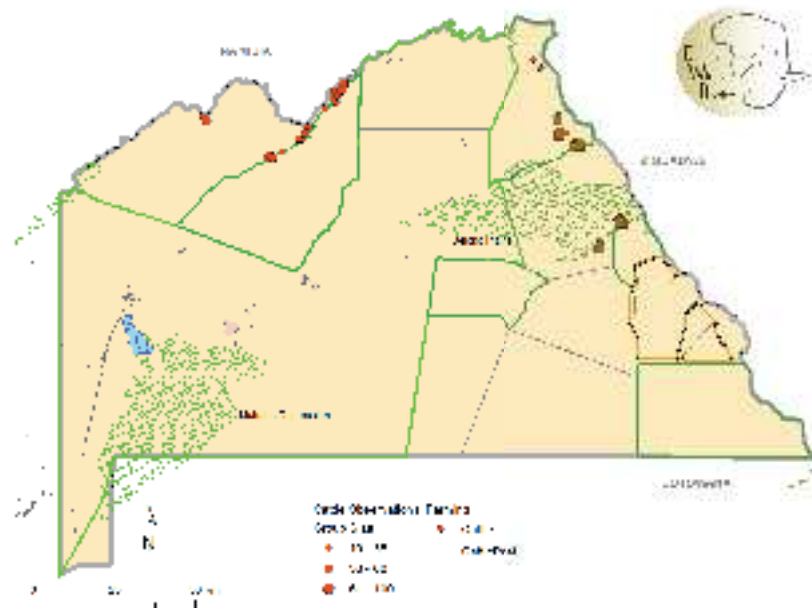
ECOSYSTEM – Ecological Networks, Elephant Move



HABITATS



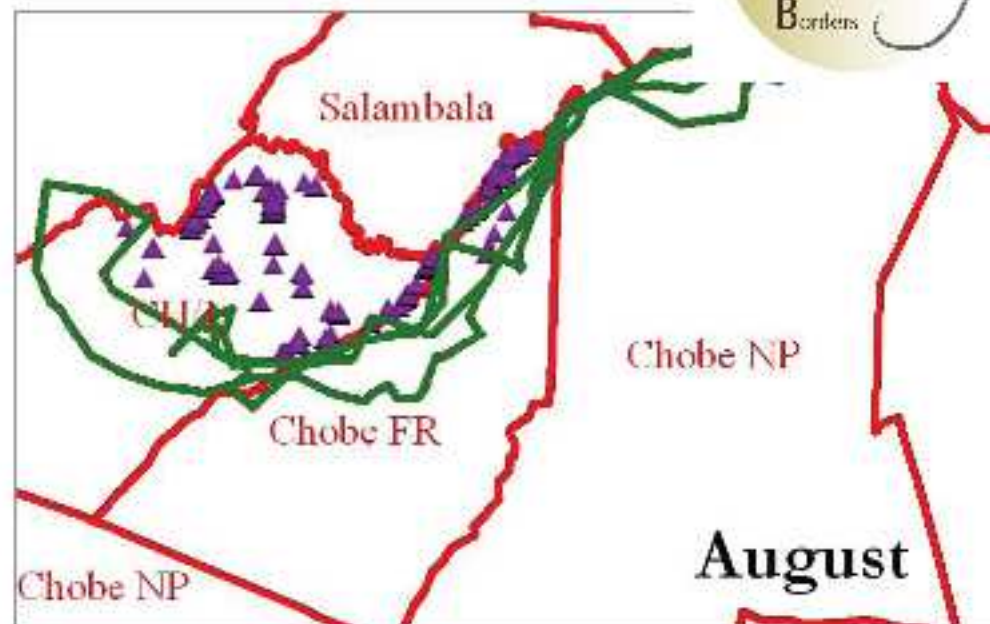
THREATS – Wildlife Corridors and Barriers



- While several factors limit livestock farming, there is an increase in cattle farming activity:
 - Shortage of grazing land
 - Declared a Foot and Mouth Disease red zone
 - Small market, long distance, and
 - Livestock predator conflict
- Despite these limitation there is increasing application and allocation of cattle posts

“To date more than 20 applications for boreholes in KM 256 have been received by Chobe Land Board, but not allocated awaiting a land use plan for the area”

THREATS – Predator Livestock Conflict

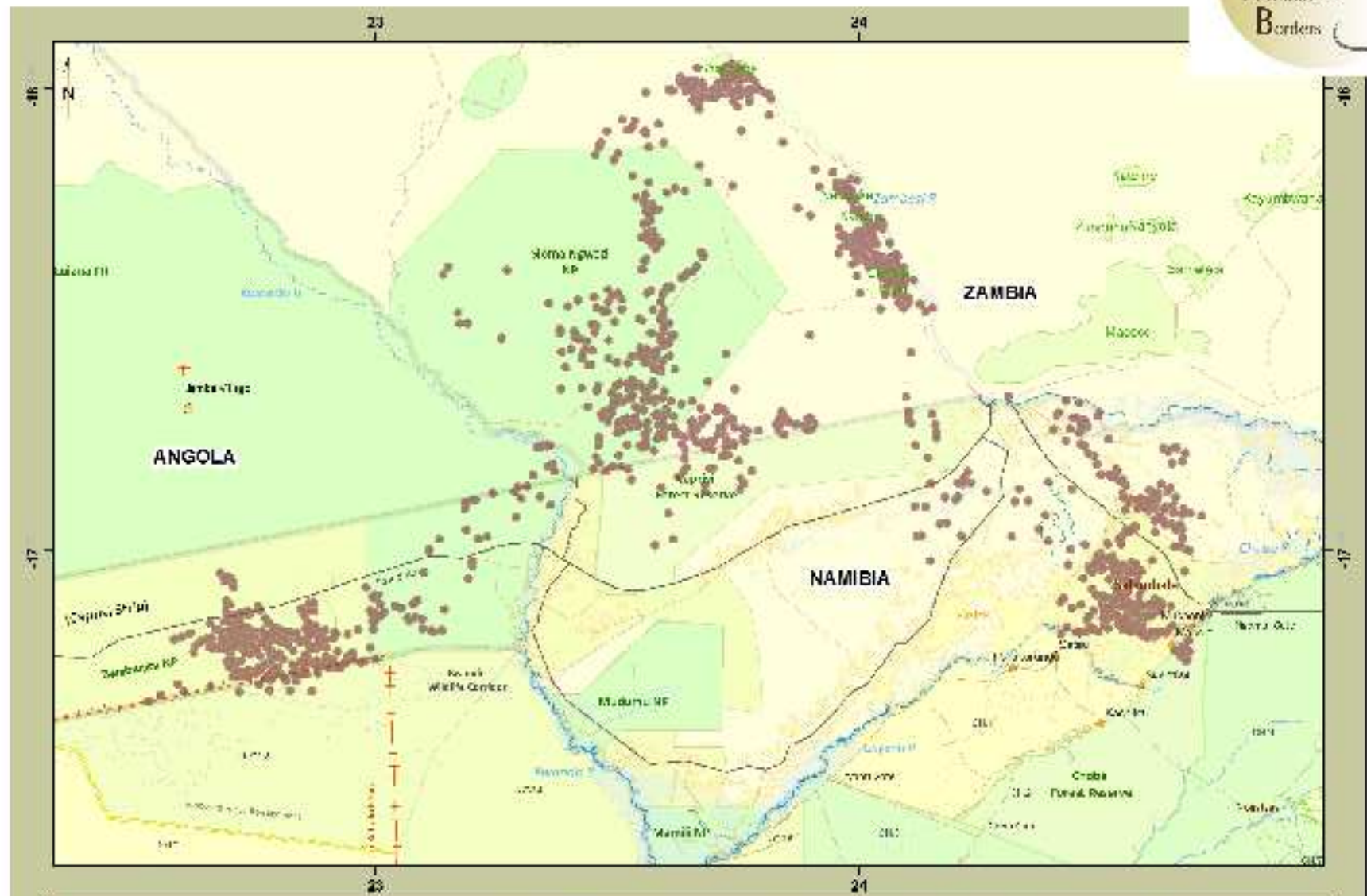


- Habitat preference by cattle owners and large carnivores
- Farmers kill problem lions
- Land being allocated in wildlife habitat and corridors

Source: S. Nijhawan, AWIF 2008

'Reduction in carnivore population due to extermination by farmers can lead to decreased revenue from safaris and related activities'. S. Nijhawan, 2008

FOREST RESERVES – Ecological Linkages



<p>Legend</p> <ul style="list-style-type: none"> Mute mwaCH66 	<p>The Movements of one Satellite Collared Elephant Kavango Zambezi TFCA</p> <p>Aug 2007 - Jan 2009</p>	<p>Scale 0 500 1000 2000 m</p> <p>Map prepared by: Mute mwaCH66 Date: 10/2009 Version: 1.0</p> 
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SUMMARY



- Basis for wildlife numbers needed to follow population trends
- Similar estimates for elephants over a 10 year period
- Hands off management approach to FR
- FR critical wet season habitats for wildlife
- Wildlife numbers in Chobe District appear to be stable



ACKNOWLEDGEMENTS

Forest Conservation Botswana
Botswana Government
San Diego Zoo Institute for
Conservation Research
Paul G. Allen Family Foundation

DWNP: Dr. Cyril Taolo
Madeleine & Jerry Delman-Cohen
Brett Warren
Mike Holding
Civil Aviation Authority of Botswana

