

Remote methods to determine the diet and movement of lions

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Studying lions?

- Continuous observations
 - Best method
 - Note all prey encounters
 - Note all behavioural components
 - Tough (“Into Africa” – Craig Packer, pg 91-93)



Alternatives

- Carcass returns



Alternatives

- Scat analysis

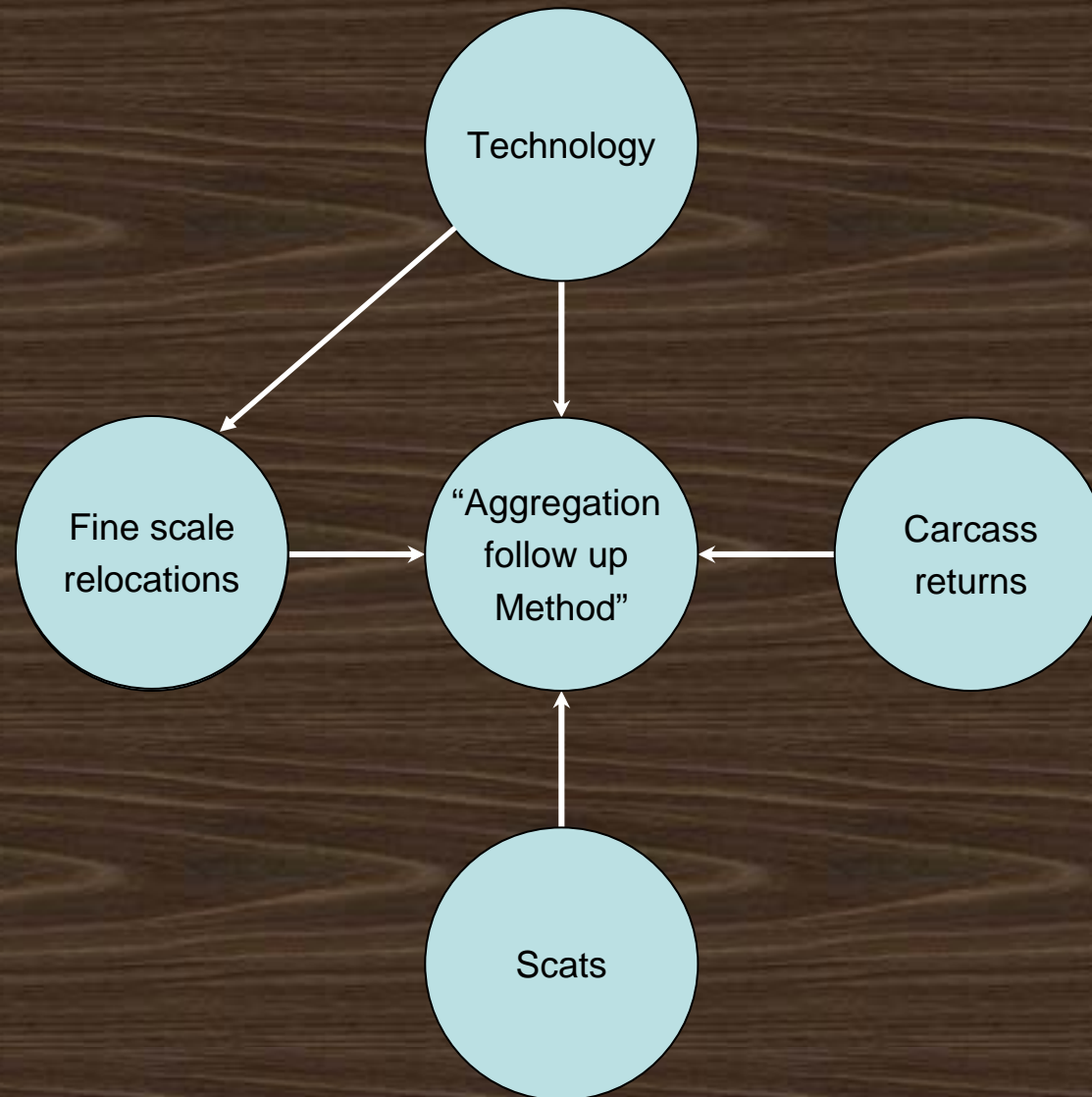


Possible advancements

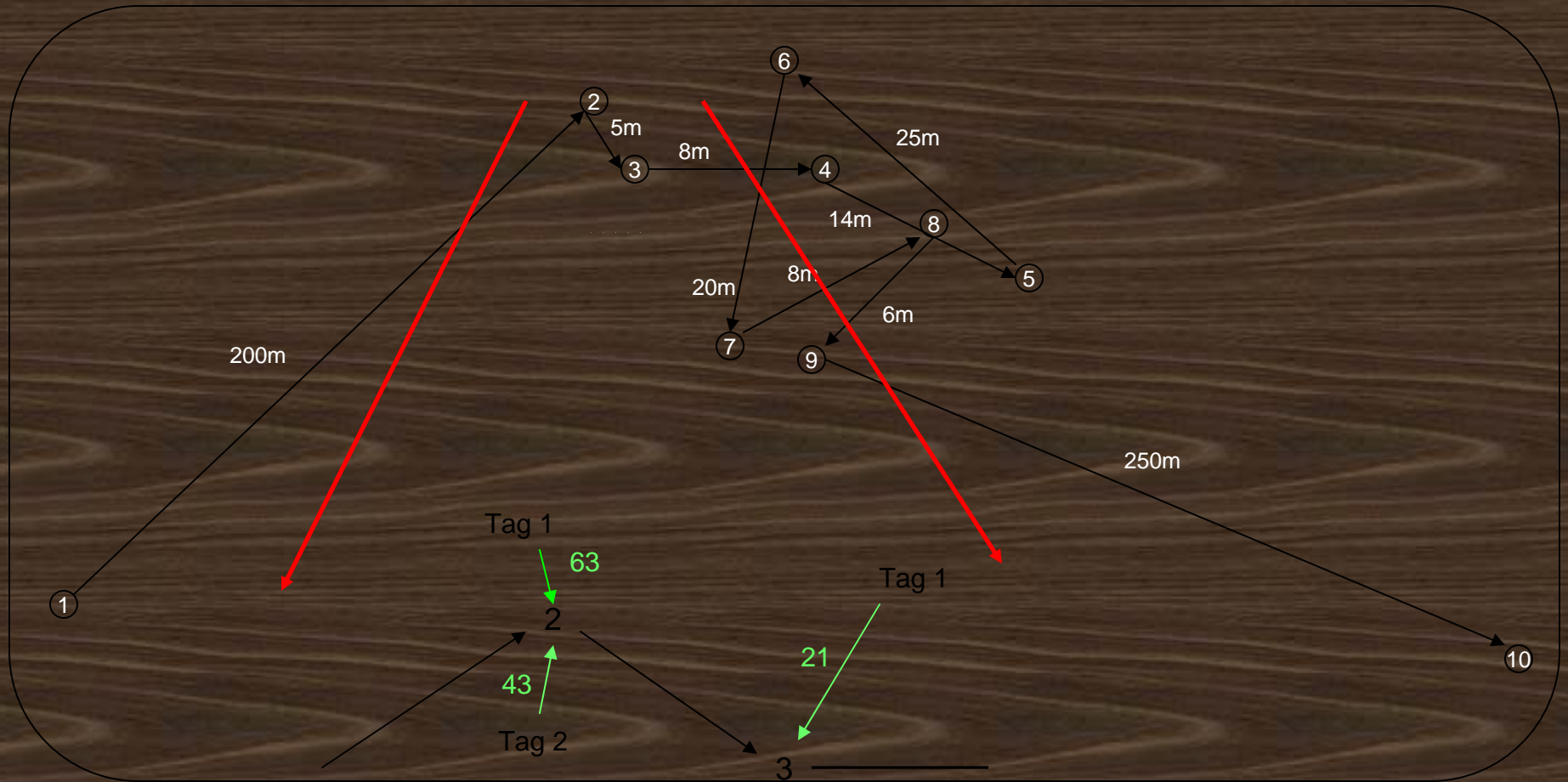
– Technology



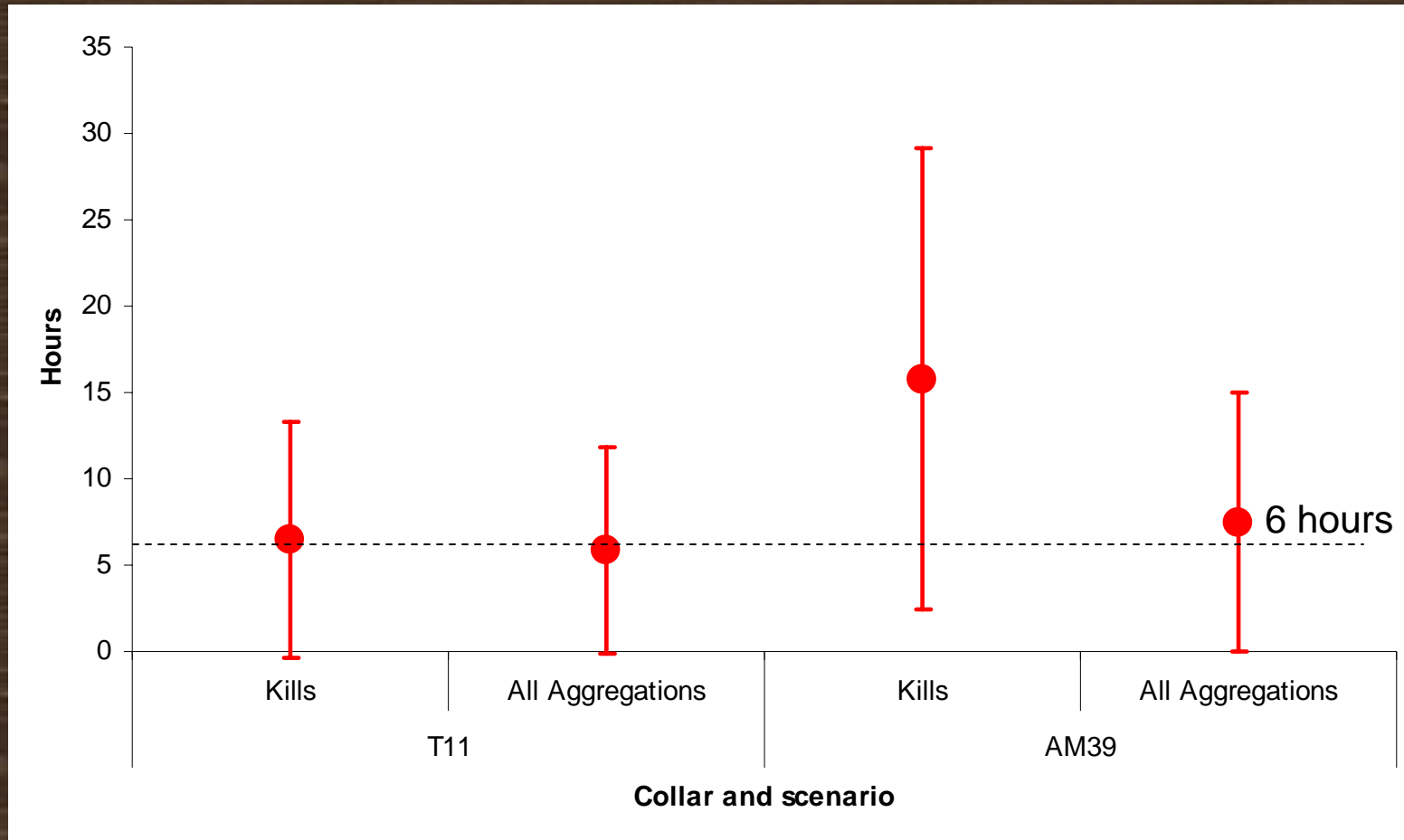
Combining methods



Aggregations in time and space



Aggregations in time



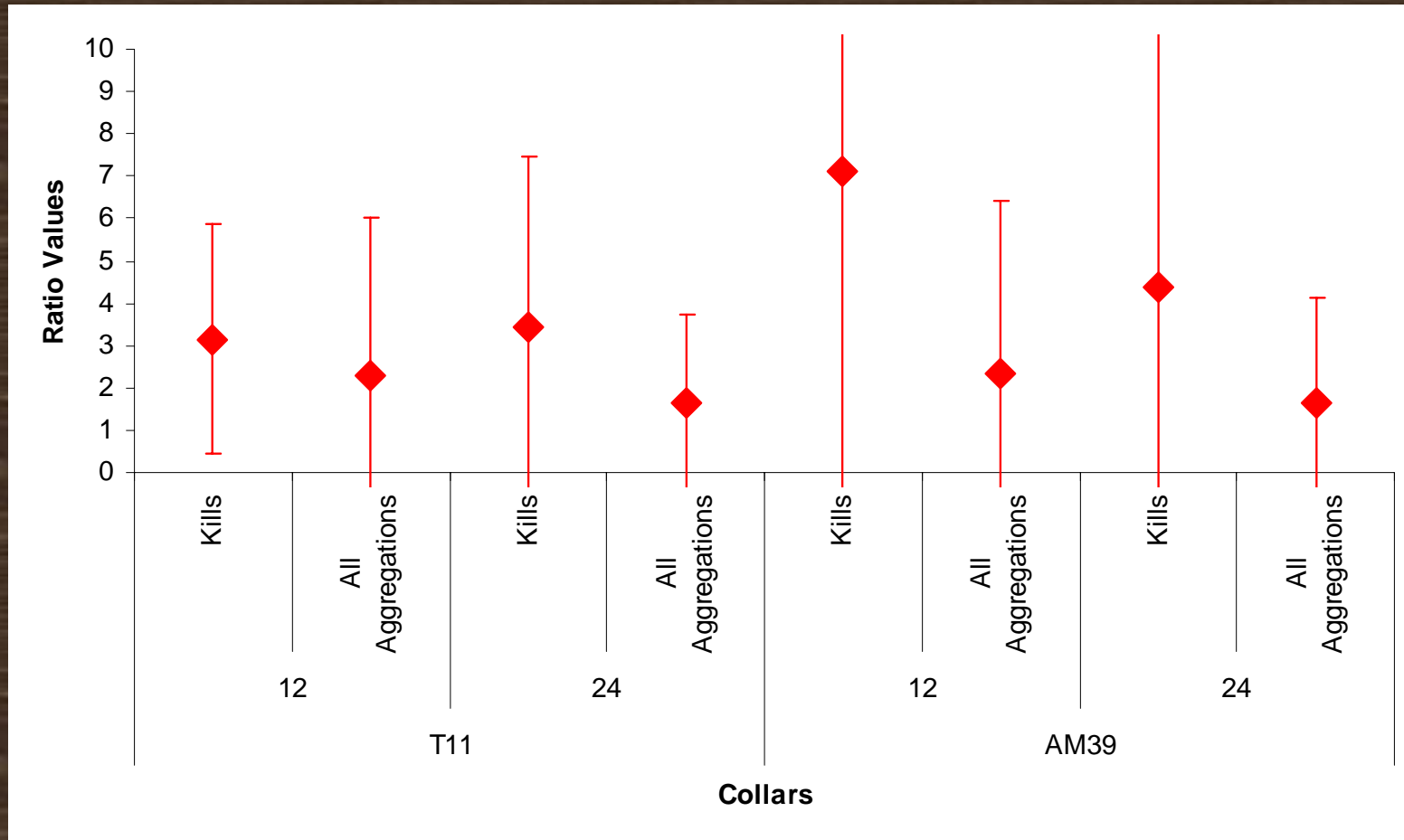
$n_{\text{kills}} = 39$
 $n_{\text{agg}} = 454$

$n_{\text{kills}} = 12$
 $n_{\text{agg}} = 247$

Aggregations in space

	Mean (1)	Mean (2)	t-value	df	p	N (1)	N (2)
All_21 vs. Kills_21_1	40.21685	51.31034	-4.70110	2591	<u>0.000003*</u>	2564	29
All_21 vs. Kills_21_2	40.21685	51.78571	-4.83434	2590	<u>0.000001*</u>	2564	28
All_21 vs. Agg_21_1	40.21685	40.67341	-0.62724	2908	0.530551	2564	346
All_21 vs. Agg_21_2	40.21685	42.45048	-2.95734	2875	<u>0.003128*</u>	2564	313
All_22 vs. Kills_22_1	41.07303	48.30000	-1.66321	857	0.096635	849	10
All_22 vs. Kills_22_2	41.07303	42.60000	-0.35200	857	0.724921	849	10
All_22 vs. Agg_22_1	41.07303	42.02727	-0.68714	957	0.492162	849	110
All_22 vs. Agg_22_2	41.07303	43.62617	-1.82489	954	0.068330	849	107
Kills_21_1 vs. Agg_21_1	51.31034	40.67341	4.058766	373	<u>0.000060*</u>	29	346
Kills_21_1 vs. Agg_21_2	51.31034	42.45048	3.546141	340	<u>0.000446</u>	29	313
Kills_21_2 vs. Agg_21_1	51.78571	40.67341	4.257909	372	<u>0.000026</u>	28	346
Kills_21_2 vs. Agg_21_2	51.78571	42.45048	3.770255	339	<u>0.000192*</u>	28	313
Kills_22_1 vs. Agg_22_1	48.30000	42.02727	1.305368	118	0.194307	10	110
Kills_22_1 vs. Agg_22_2	48.30000	43.62617	1.006308	115	0.316380	10	107
Kills_22_2 vs. Agg_22_1	42.60000	42.02727	0.120480	118	0.904308	10	110
Kills_22_2 vs. Agg_22_2	42.60000	43.62617	-0.223587	115	0.823476	10	107
All_21 vs. All_22	40.21685	41.07303	-1.68038	3411	0.092974	2564	849

Playing with the ratios



$$n_{\text{kills}} = 39$$

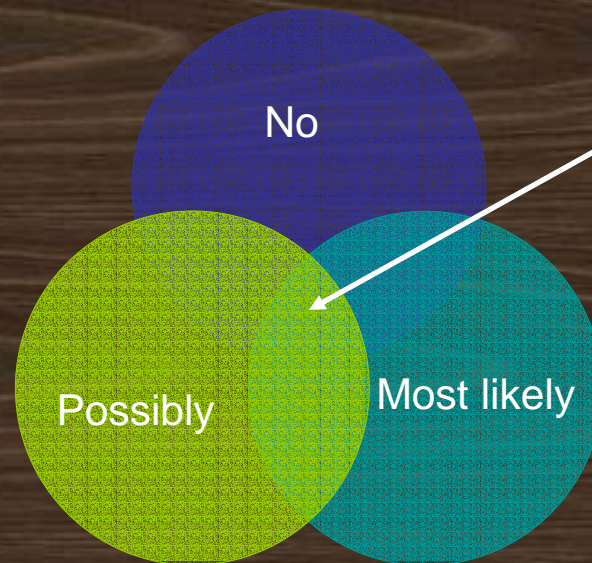
$$n_{\text{agg}} = 454$$

$$n_{\text{kills}} = 12$$

$$n_{\text{agg}} = 247$$

Does it work?

- Aggregation in time?

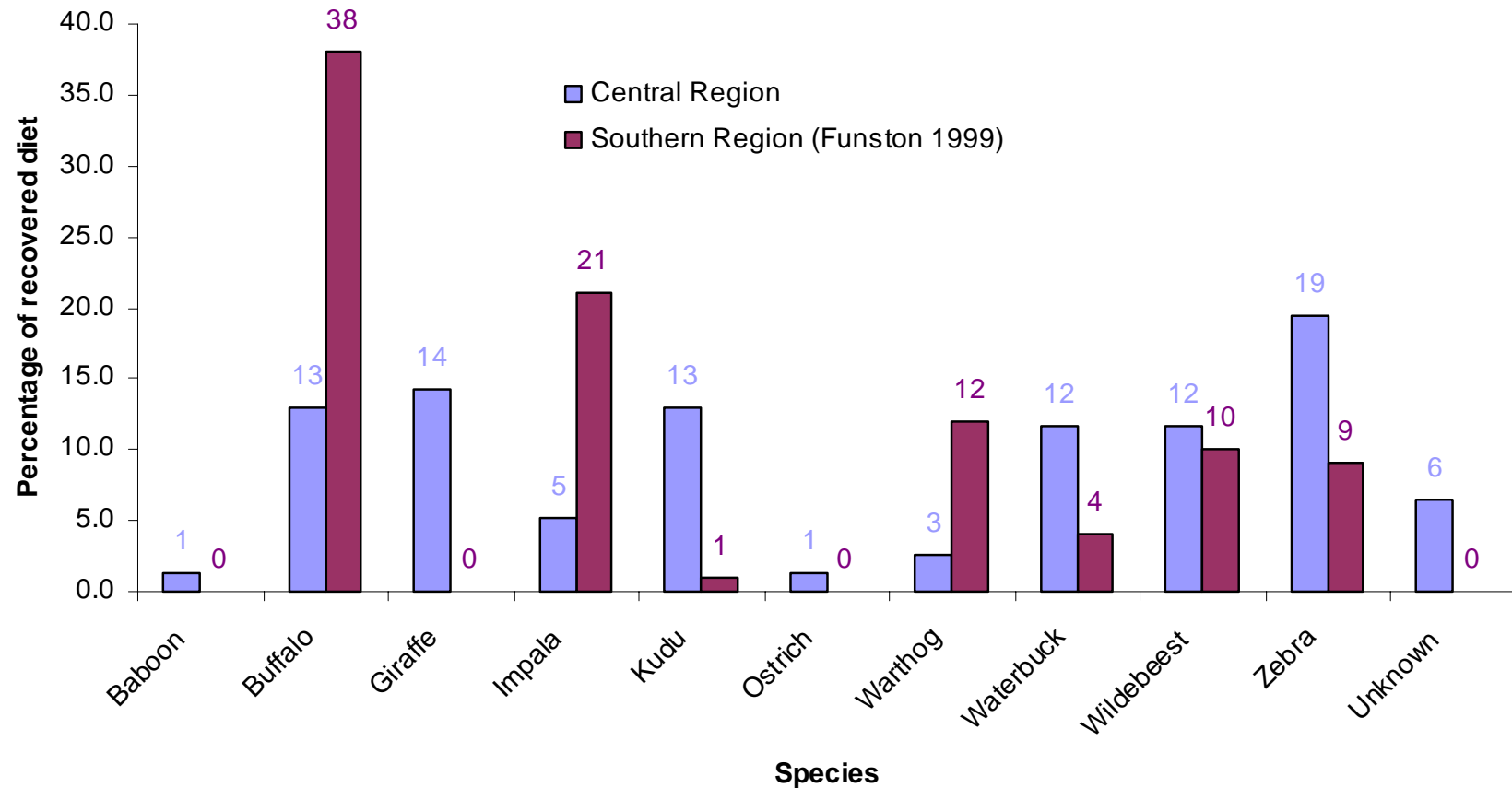


Using all three it shows promise (reduction in time Spent following Up possible kill sites)

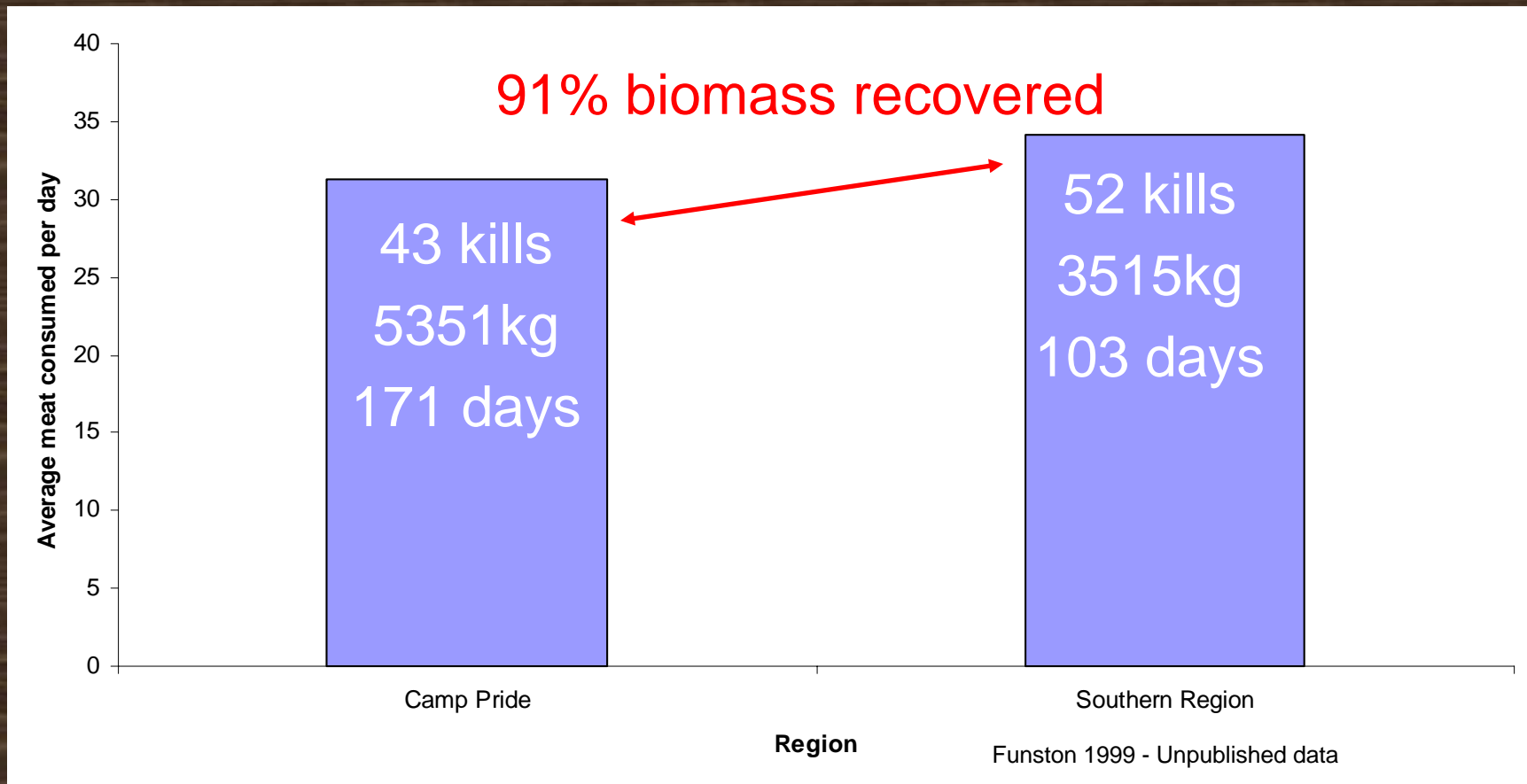
- Ratio investigation

- Aggregation in space

Diet compared to the South



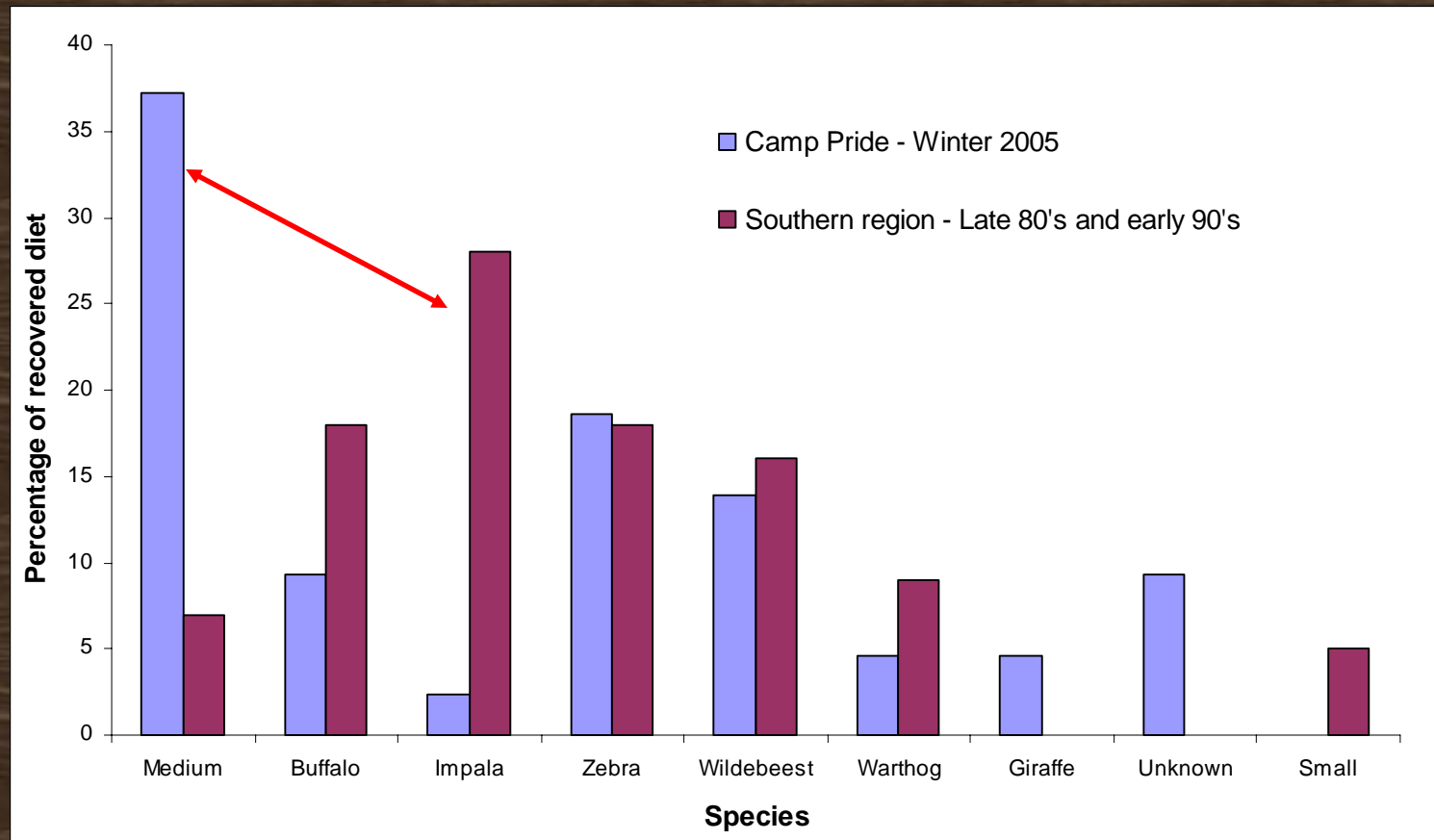
Biomass recovered



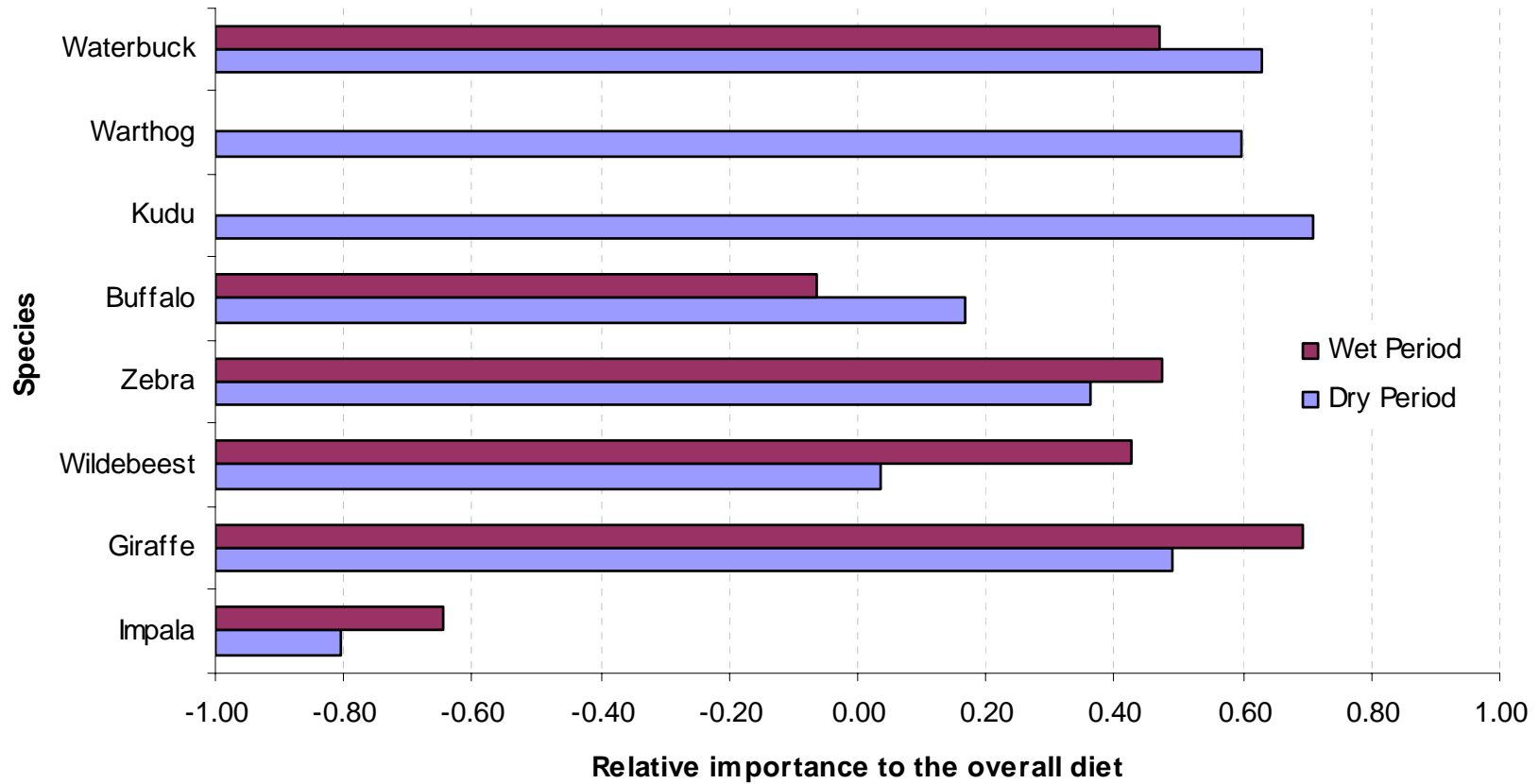
Points to consider

- Pride make up
 - High predation of buffalo and impala by males
- Satara data restricted to winter female predation patterns
- Scats not yet included in the Satara data (small kills)

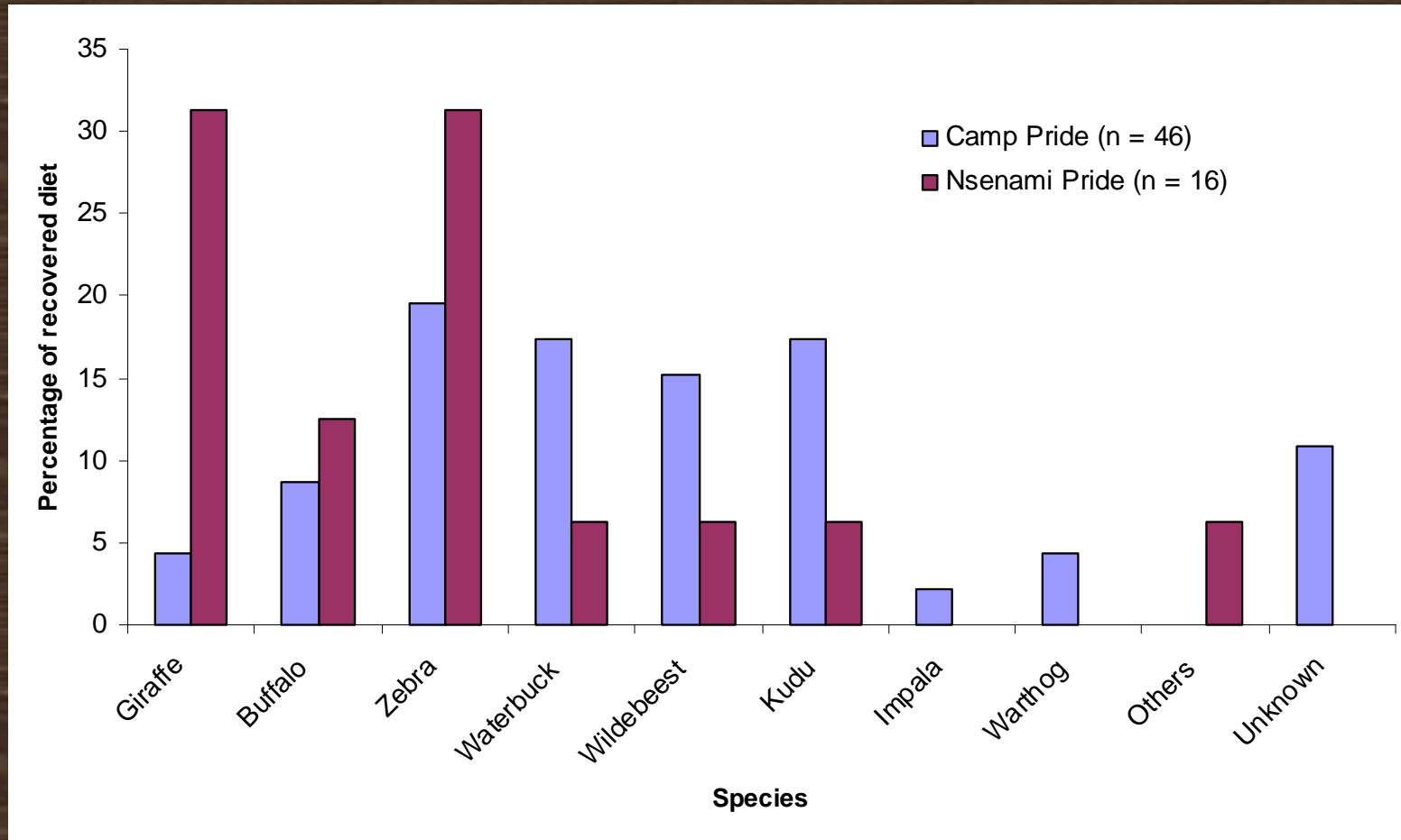
Females



Seasonal diet

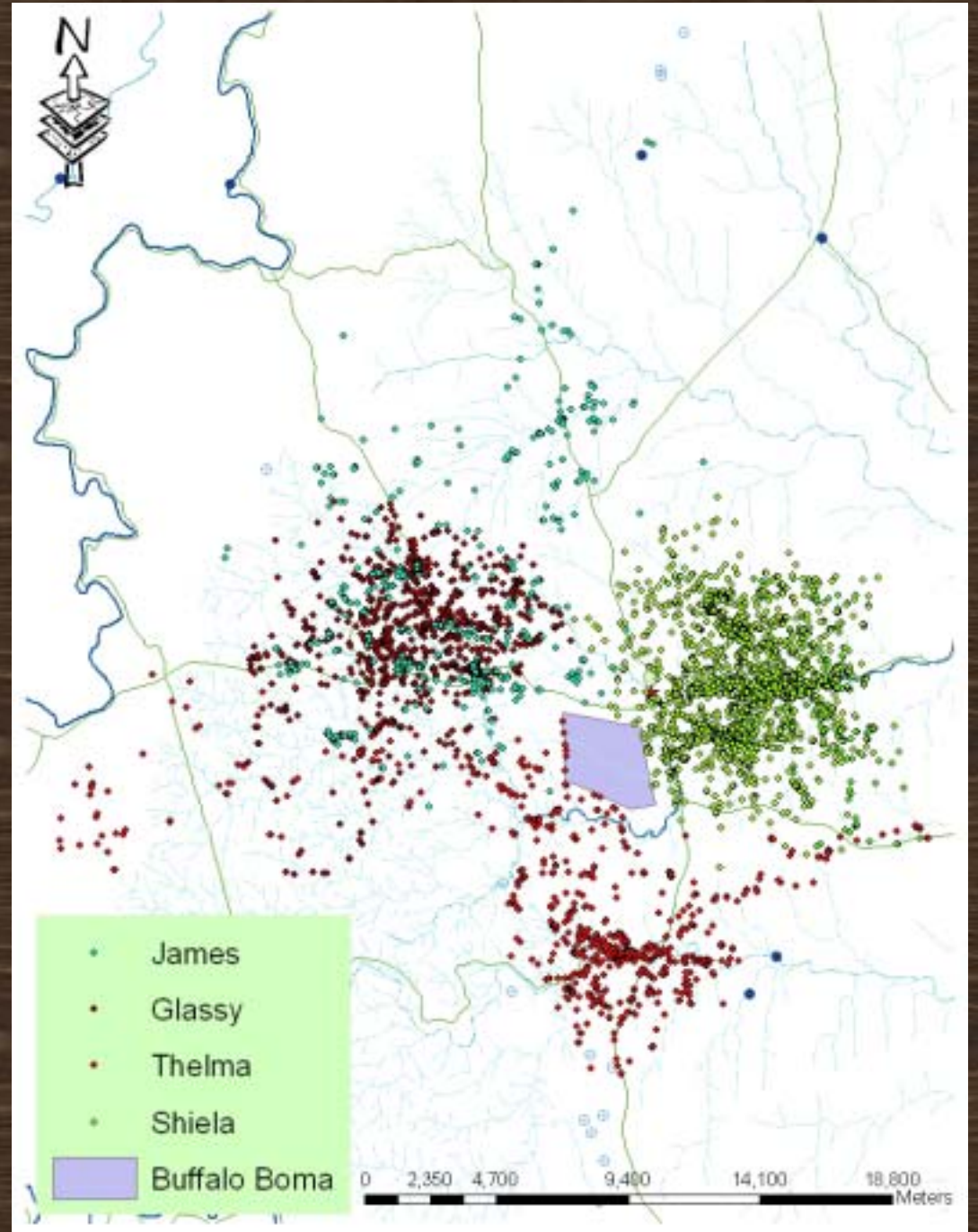


Pride differences



Large → Prey size continuum ← Small

Spatial data
collected

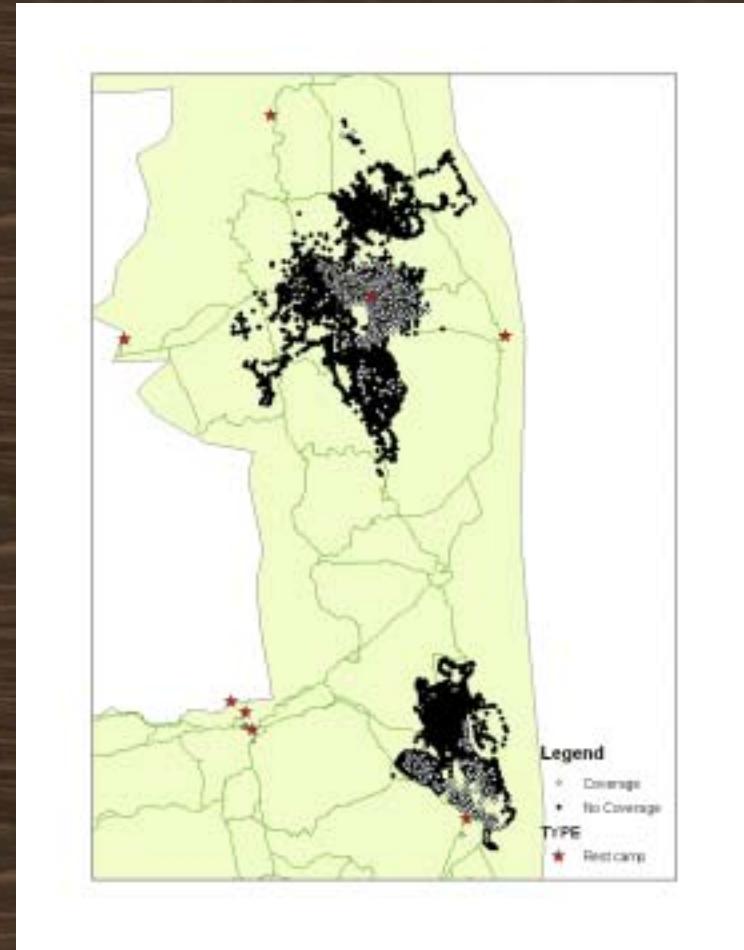


And so.....

- Standardization of techniques
 - Madikgadigadi, Hwange, Kruger, Okavango Delta, Pilanesberg
- Feasible alternative to continuous observations
- Teething problems in summer at the moment
- Technology can not be a stand alone!!!
 - Need people on the ground as well

Short comings

- Limited cell phone networks
 - Solution: Radio units
 - Used in Hwange
 - Testing new collars in Pilanesberg



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- Development of new technology can be tiresome
 - Solution: Perseverance
- Destructive lions
 - Solution: None



The bigger picture



- How much risk are lions exposing themselves to in the central region of the park?



- What risks do buffalo run and what does BTB do to their chances of survival with lion around?

Acknowledgements

- Martin Haupt
- Robert Dugtig
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