

# Demography and morphometry of an important mesopredator (black-backed jackal – *Canis mesomelas*) in southern Africa

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# **Presented against the backdrop of Coordinated Predation Management**

**- discussed in the context of**

**Livestock Production**

**Wildlife Ranching**

**Biodiversity and Conservation**





Large and medium-sized  
African predator species  
are increasingly  
conflicting with human  
activities ...



...especially these  
two medium-sized  
predators...





**... there should be no illusion about a daily reality ...**



**... and a cry for help by livestock farmers & wildlife ranchers  
and producer organisations – NWGA / RPO / SAMGA / WRSA**



**The black-backed jackal is implicated as a major cause of predation losses, impacting negatively on the livestock and wildlife ranching industries**




**Black-backed jackal - *Canis mesomelas***





**Although it is unfortunate,  
but not surprising, many  
livestock farmers view  
dead black-backed jackals  
as the only good jackals ...**



A photograph showing three dead animals, likely coyotes or foxes, hanging from a wire fence in a field of tall, dry grass. The animals are positioned vertically, with their heads at the top and tails at the bottom. The scene is set in a rural area with a fence line running across the frame. The lighting suggests it might be late afternoon or early morning, with a warm, golden glow.

**... but this abhorrent  
practice [show piecing the  
bounty, strung up in public  
view] must be rooted out**



**“In our endeavours to contribute to our knowledge of our mammalian fauna there is an ethical responsibility on those of us who collect mammals to ensure that the best possible use is made of these by ensuring that as much data as possible is obtained from each and every specimen handled.”**

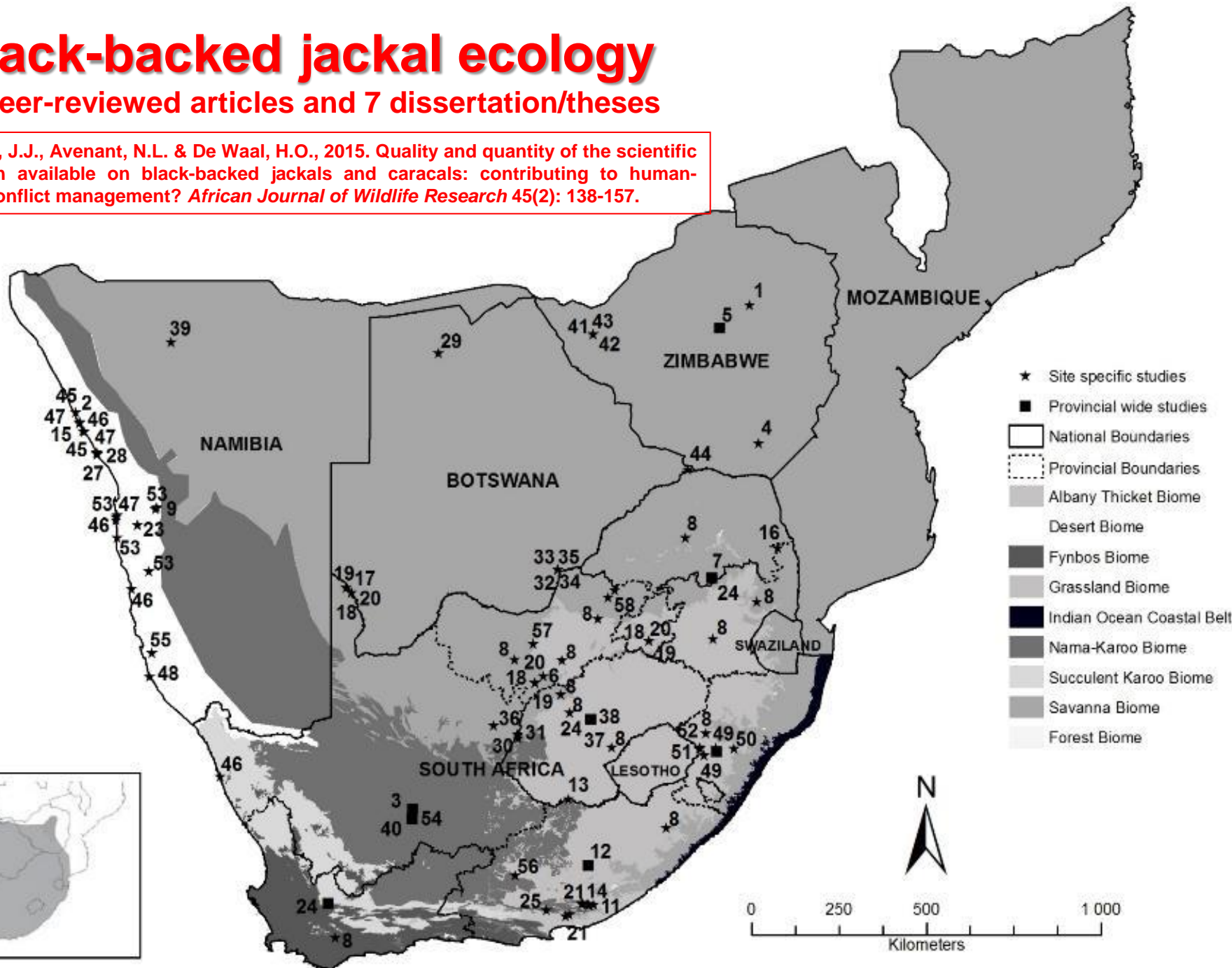
Smithers, R.H.M., 1973. *Recording data on mammal specimens*. Trustees of the National Museums and Monuments of Rhodesia. Variprint (Pty.) Ltd., Salisbury.



# Black-backed jackal ecology

51 peer-reviewed articles and 7 dissertation/theses

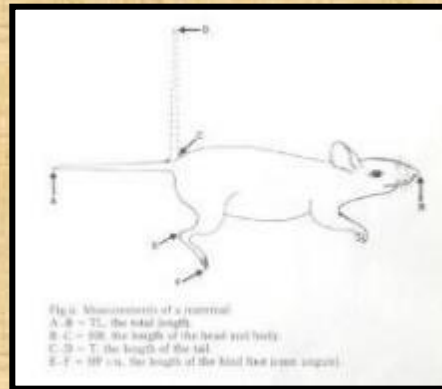
Du Plessis, J.J., Avenant, N.L. & De Waal, H.O., 2015. Quality and quantity of the scientific information available on black-backed jackals and caracals: contributing to human-predator conflict management? *African Journal of Wildlife Research* 45(2): 138-157.



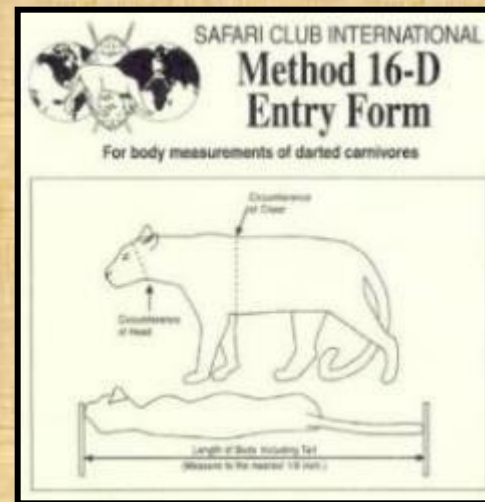
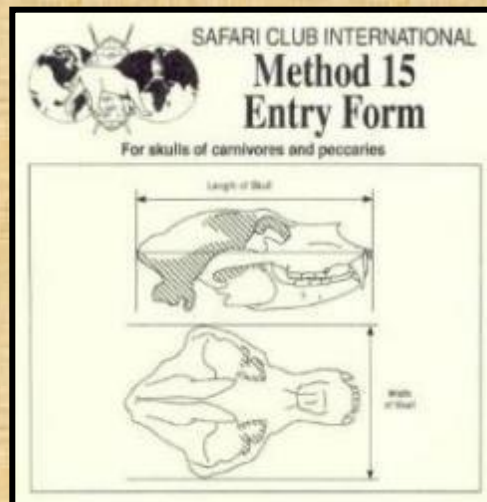


# What techniques were available to collect morphometric data from large mammals, specifically predators?

## Measurements for mammal specimen



## Measurements for trophies and darted carnivores





# The measurements of a mammal

... but several “personal”  
procedures are also being used  
by individuals.

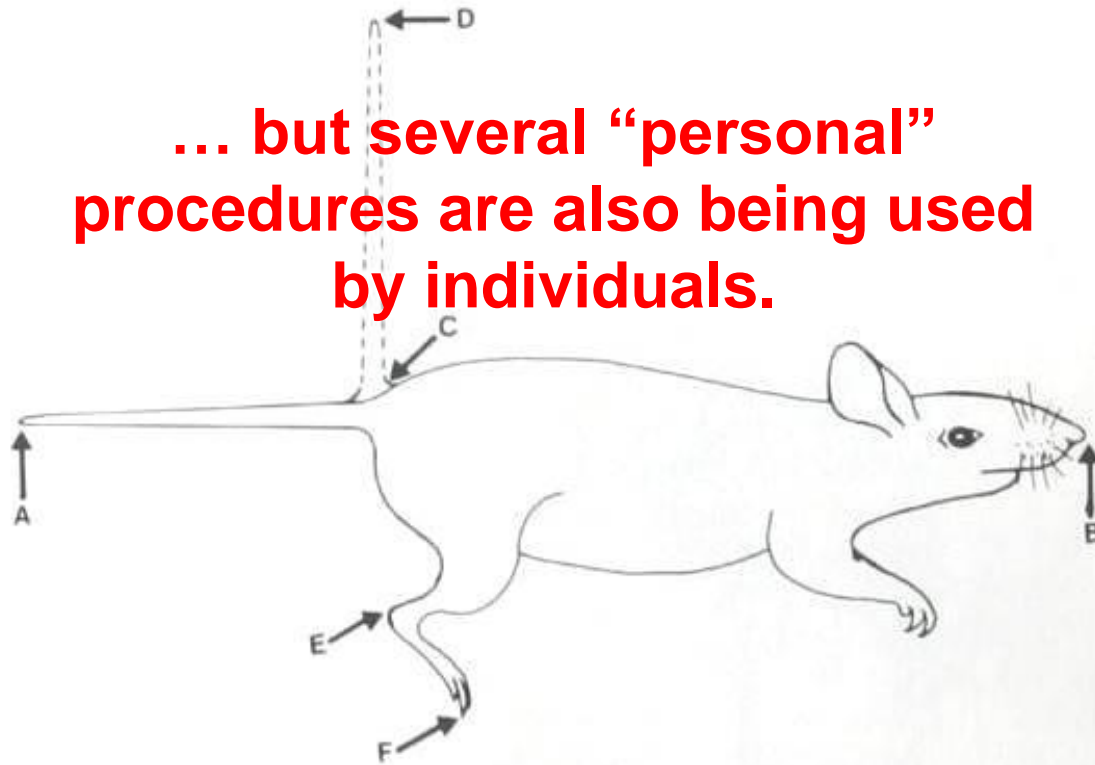


Fig.ii. Measurements of a mammal:  
A-B = TL, the total length.  
B-C = HB, the length of the head and body.  
C-D = T, the length of the tail.  
E-F = HF c/u, the length of the hind foot (cum unguis).



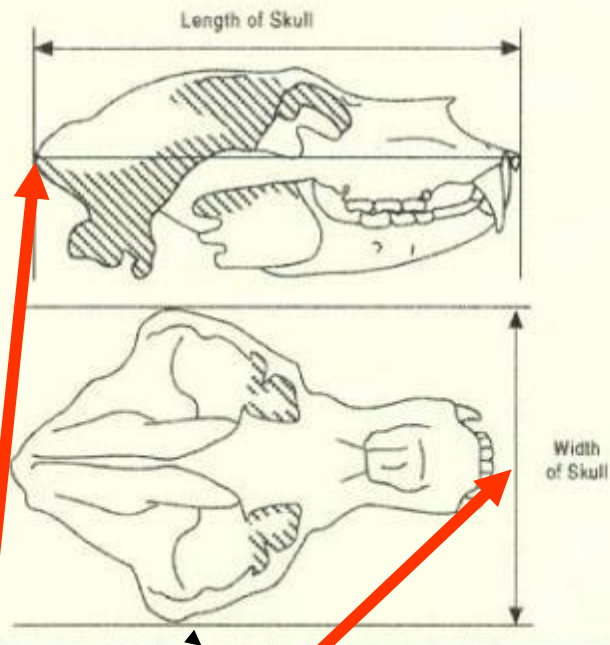
# Procedures for measuring large carnivore trophies and darted carnivores

Circumference of head & chest



## SAFARI CLUB INTERNATIONAL Method 15 Entry Form

For skulls of carnivores and peccaries



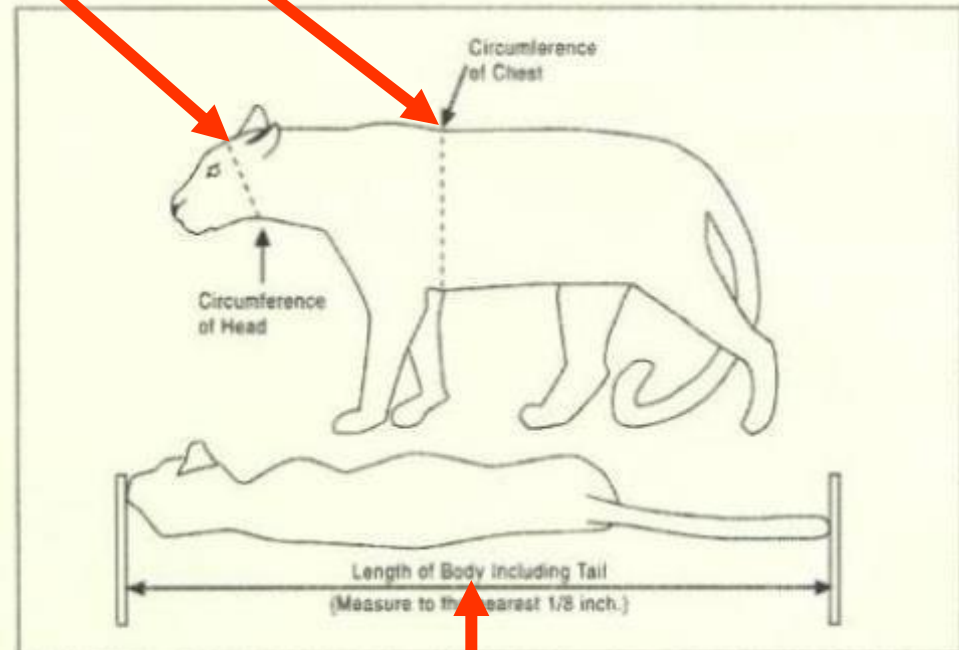
Length & width of skull



SAFARI CLUB INTERNATIONAL

## Method 16-D Entry Form

For body measurements of darted carnivores



Length of body & tail

Weight of animal is supplemental



# The procedures did not meet ALPRU's specific objectives ...

*J. Zool., Lond.* (2004) **262**, 393–398 © 2004 The Zoological Society of London Printed in the United Kingdom DOI:10.1017/S095283690300476X

## A comprehensive procedure to measure the body dimensions of large African predators with comments on the repeatability of measurements taken from an immobilized African lion (*Panthera leo*)

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African Large Predator Research Unit (ALPRU), Department of Animal, Wildlife and Grassland Sciences (70), Faculty of Natural and Agricultural Sciences, University of the Free State, PO Box 339, Bloemfontein, South Africa

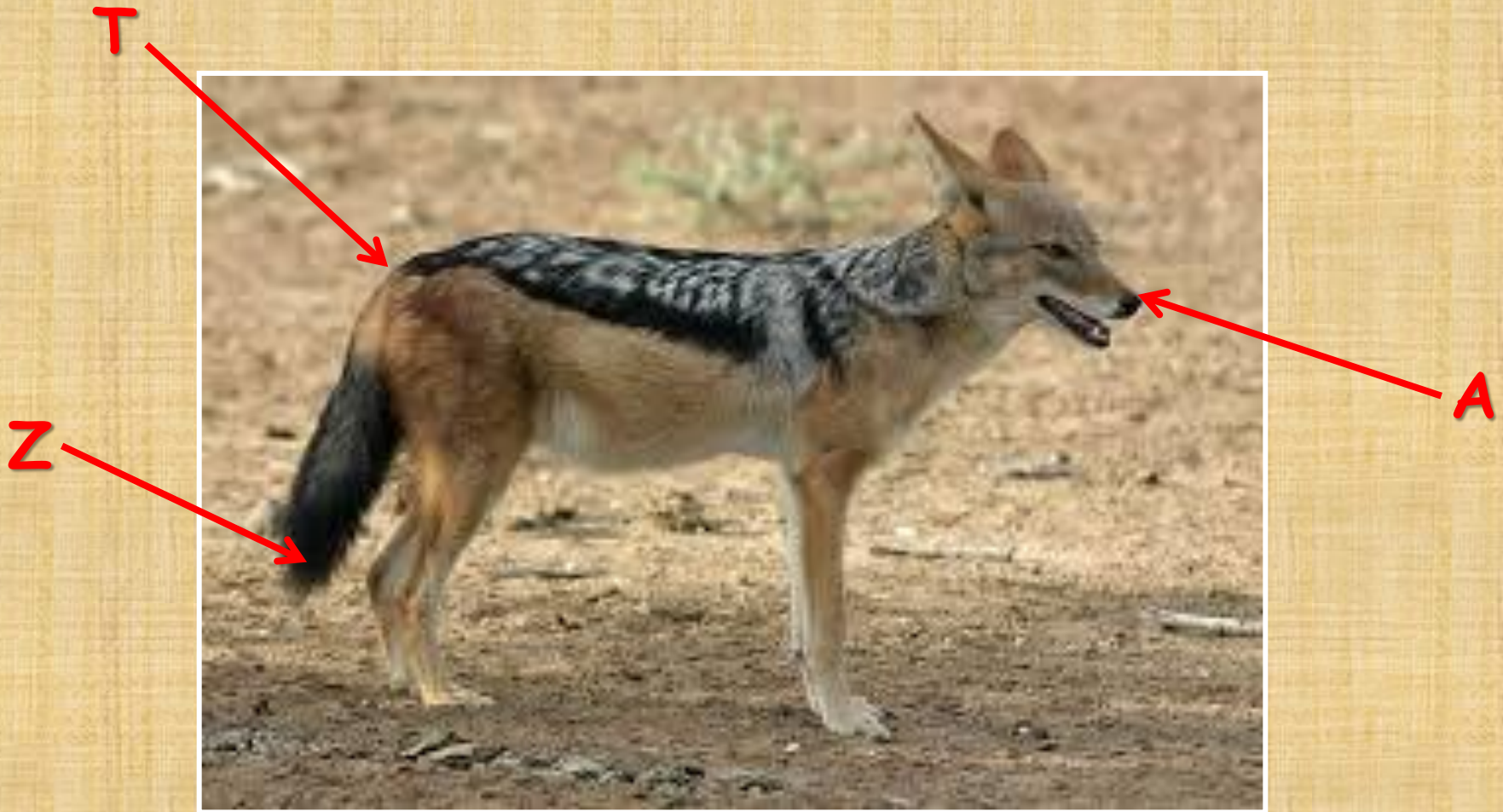
(Accepted 30 September 2003)

# The ALPRU comprehensive procedure was developed





The ALPRU comprehensive procedure was modified  
→ the shortened version facilitates measurement of large  
numbers of black-backed jackals



Rooijakkals / Black-backed jackal - *Canis mesomelas*






**Measure and  
sample  
carcasses of  
black-backed  
jackals and  
caracal**



**The number and gender of 918 black-backed jackals (*Canis mesomelas*) hunted by 51 specialist hunters during a 21 month period (12 May 2009 - 1 February 2011) in South Africa and Namibia**

Period	Dates	Black-backed jackals (n)			
		Totals	Males	Females	Not stated
-	12 May 2009 – 17 Feb 2010	224	97	94	33
Period I	19 – 28 Feb 2010	82	34	42	6
-	1 Mar – 5 May 2010	94	52	42	-
Period II	6 – 31 May 2010	125	70	55	-
-	1 Jun – 24 Jul 2010	49	28	21	-
Period III	28 Jul – 31 Aug 2010	131	62	69	-
Period IV	1 Nov – 12 Dec 2010	170	91	70	9
-	13 Dec 2010 – 1 Feb 2011	43	21	18	4
Totals		918	455	411	52



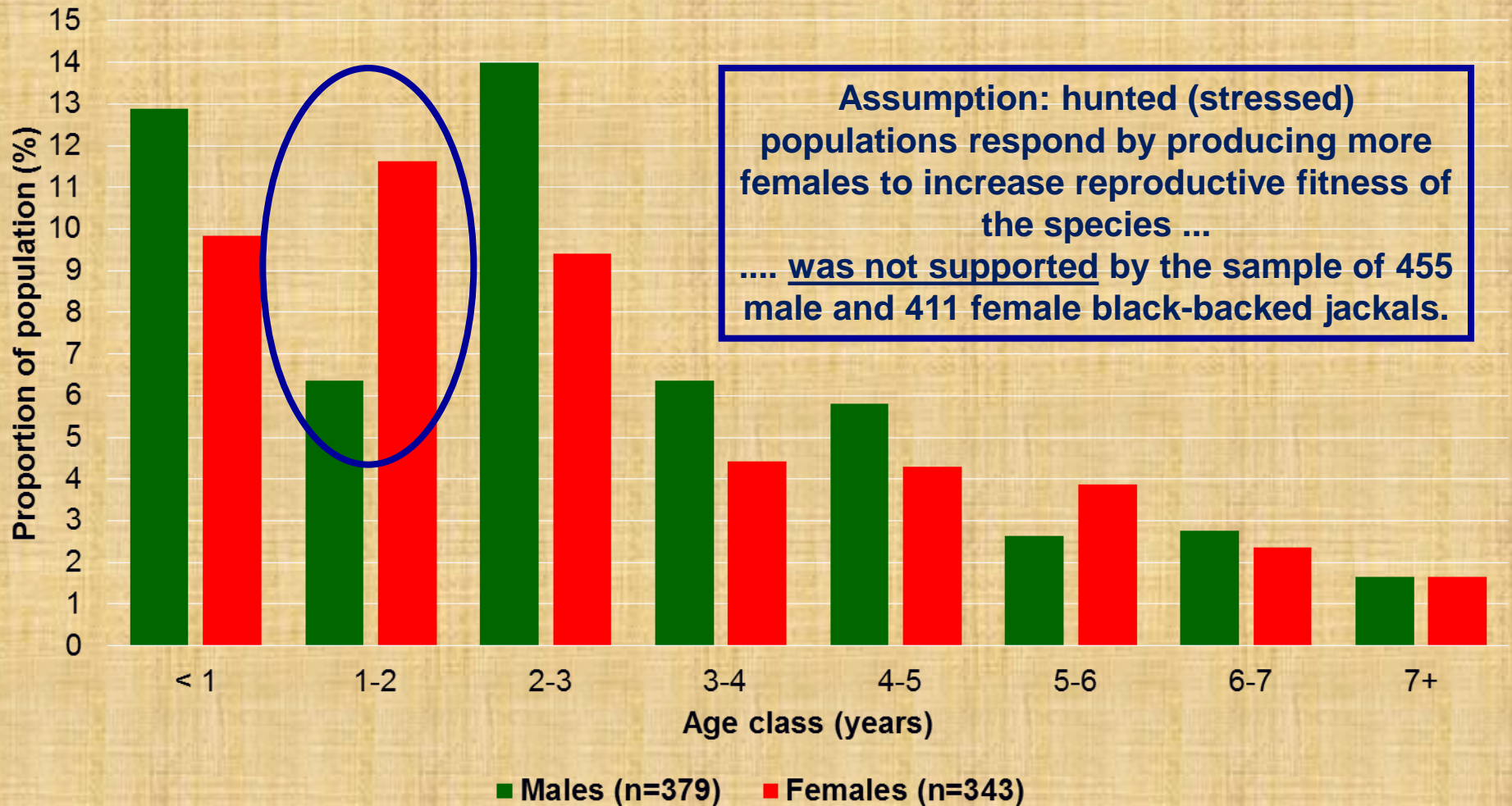
A photograph of a wolf standing in a dry, dusty environment. The wolf is facing right, with its mouth open, showing its teeth. The background is a blurred, arid landscape. The text is overlaid on the top half of the image.

Time of year hunted (age relative to whelping), eruption of the permanent teeth and the wear of incisors were used to categorise 4 age groups:

- <0.5 years (pups)
- 0.5–1 years (juveniles)
- between 1–2 years (yearlings)
- $\geq 2$  years (adults)

# The age structure of black-backed jackals hunted (12 May 2009 to 1 February 2011) in South Africa and Namibia

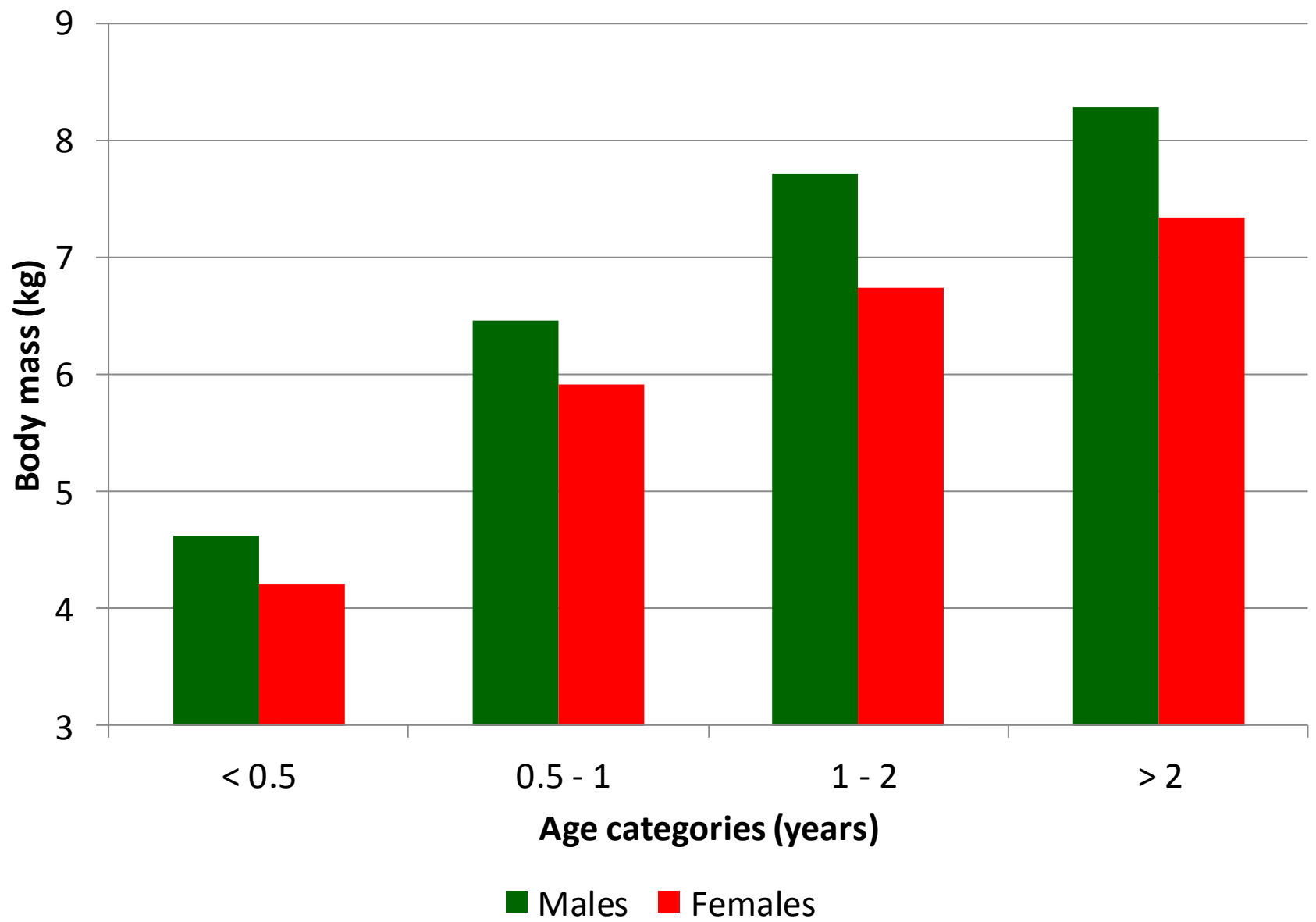
Age structure of 722 black-backed jackals





# Body mass of black-backed jackal hunted (12 May 2009 to 1 February 2011) in South Africa and Namibia

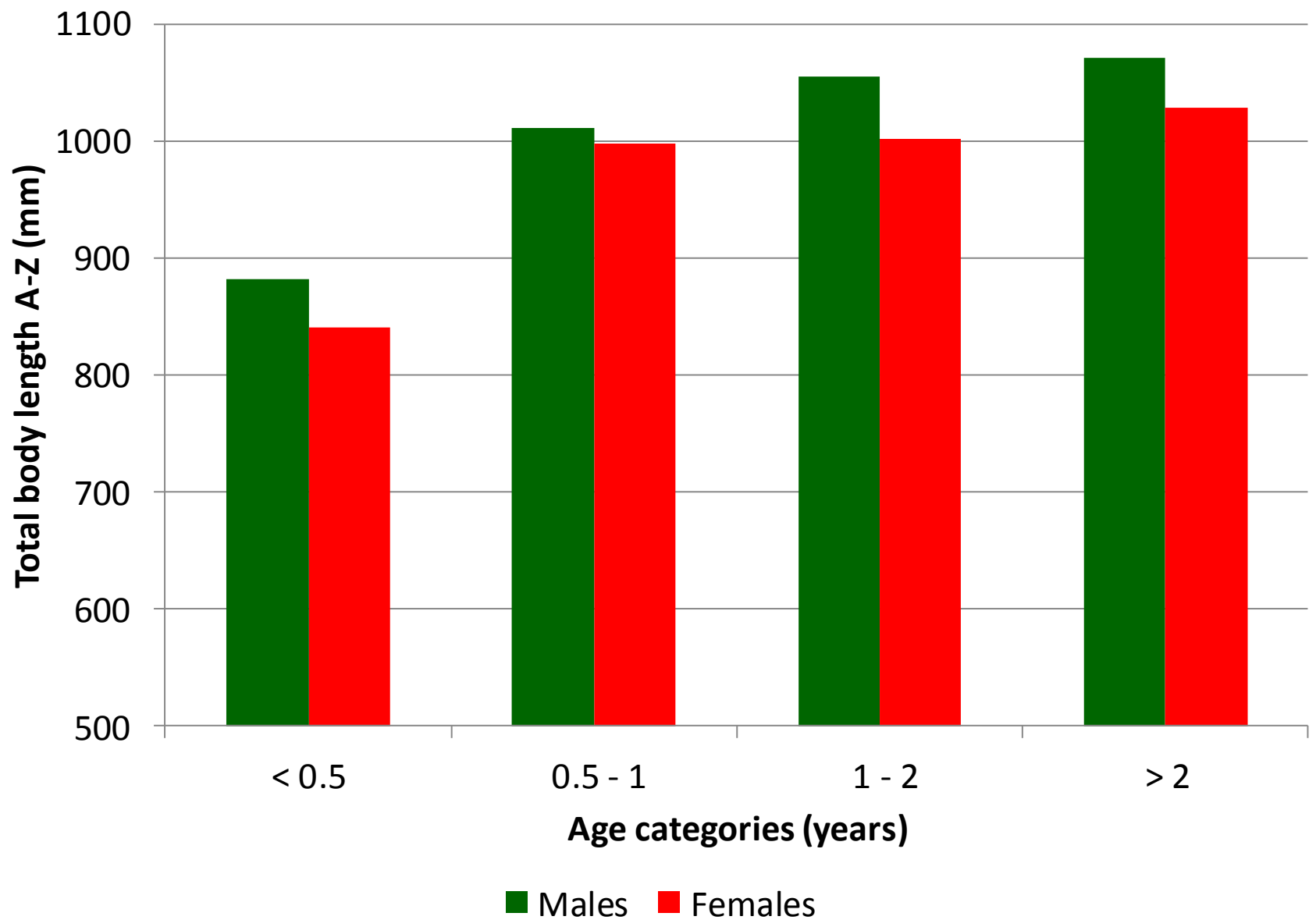
Body mass kg	Age groups							
	<0.5 years		0.5-1 years		Between 1-2 years		≥2 years	
	(pups)		(juveniles)		(yearlings)		(adults)	
Sex	M	F	M	F	M	F	M	F
n	40	23	37	39	41	78	216	167
avg kg	4.62	4.21	6.46	5.91	7.71	6.74	8.29	7.34
SD	1.03	0.83	0.79	0.97	1.16	0.87	1.23	1.12
Min	1.8	3.0	4.5	3.5	5.5	4.5	6.0	4.8
Max	6.0	5.6	7.5	7.5	11.0	8.5	12.5	11.5





# Total body length (A-Z) of black-backed jackal hunted (12 May 2009 to 1 February 2011) in South Africa and Namibia

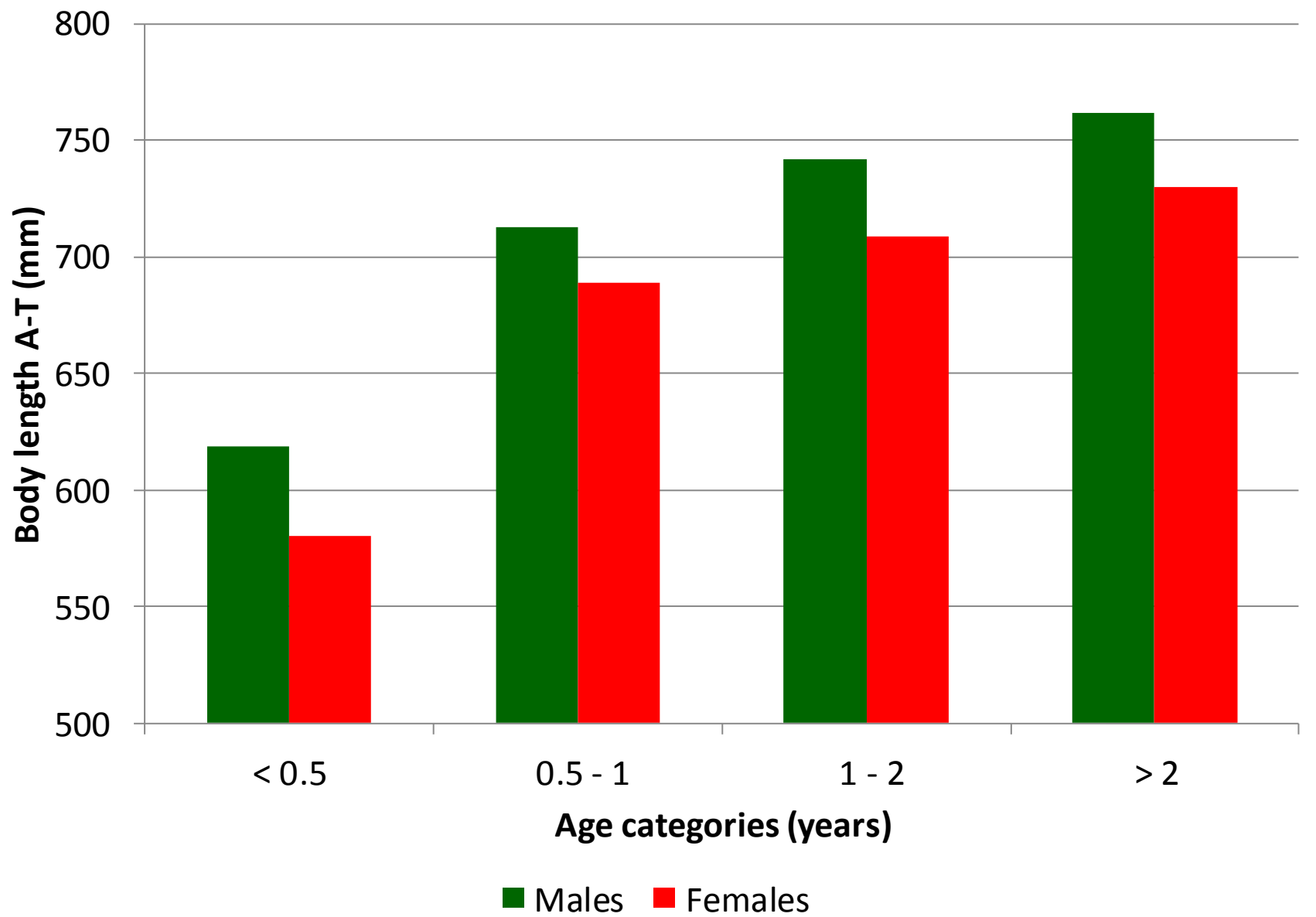
Total body length A-Z mm	Age groups							
	<0.5 years		0.5-1 years		Between 1-2 years		≥2 years	
	(pups)		(juveniles)		(yearlings)		(adults)	
Sex	M	F	M	F	M	F	M	F
n	38	20	28	28	37	64	155	112
avg A-Z	882	841	1011	998	1055	1002	1071	1028
s.e.	10.8	18.1	12.3	9.6	9.7	10.4	4.5	6.1
SD	66.5	81.0	65.2	51.0	58.9	53.0	56.2	64.7
Min	700	660	870	865	930	650	830	770
Max	1022	945	1140	1080	1160	1120	1300	1200






# Body length (A-T) of black-backed jackal hunted (12 May 2009 to 1 February 2011) in South Africa and Namibia

Body length A-T mm	Age groups							
	<0.5 years		0.5-1 years		Between 1-2 years		≥2 years	
	(pups)		(juveniles)		(yearlings)		(adults)	
Sex	M	F	M	F	M	F	M	F
n	34	18	25	22	33	53	123	90
avg A-T	619	580	713	689	742	709	762	730
s.e.	8.4	12.2	12.2	12.7	8.1	7.2	4.0	5.4
SD	49.0	51.7	60.9	59.7	46.7	52.2	44.8	51.3
Min	530	480	620	520	640	550	650	600
Max	735	700	880	800	830	790	950	860





A close-up photograph showing a thin, dark wire or string embedded in the light-colored fur of a jackal's abdomen. The wire enters from the left and extends towards the right, where it appears to be coiled or tangled.

**A wire lodged  
through the  
abdomen and  
still predating ...**

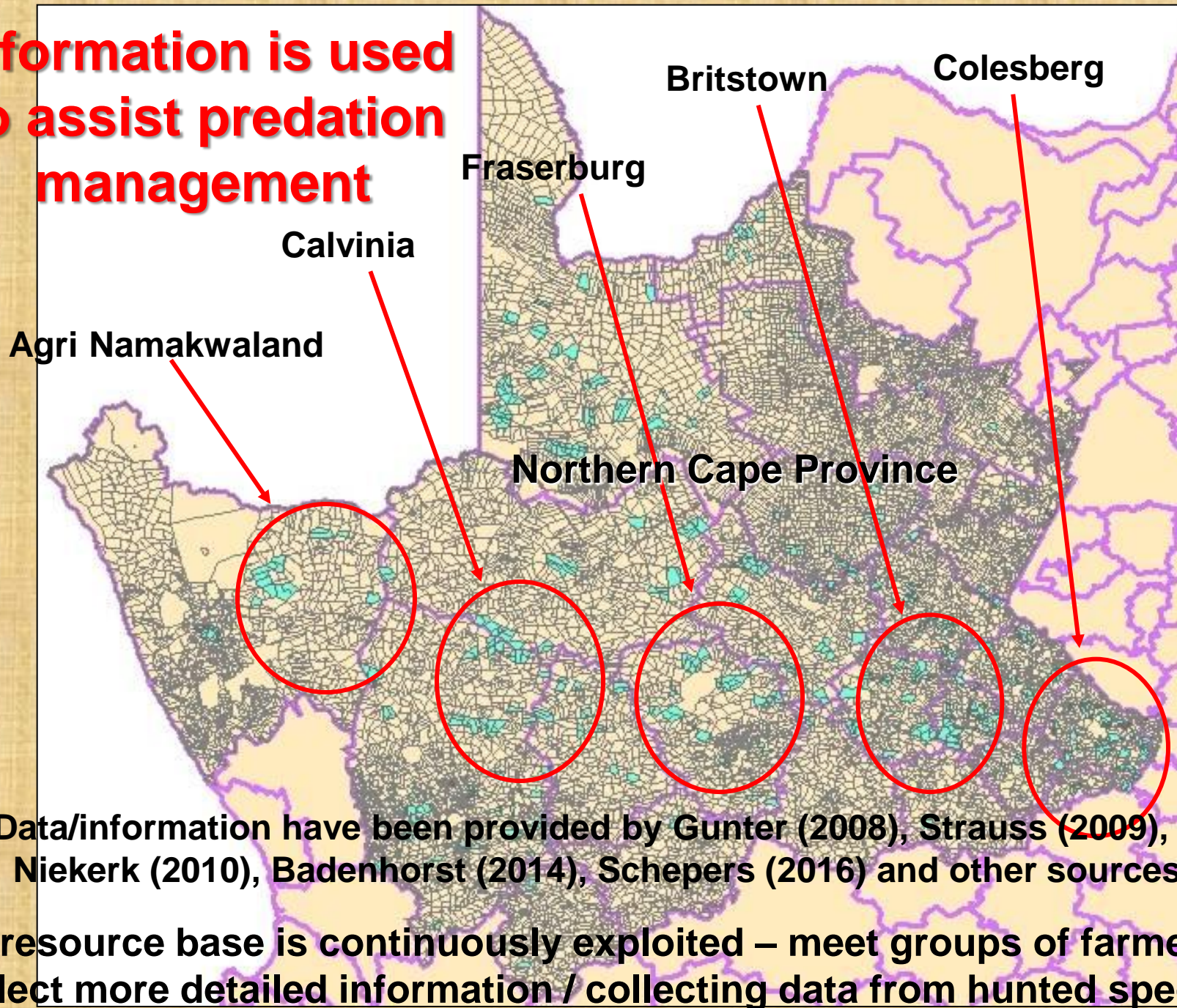
A photograph of a dead black-backed jackal lying on its side on a dark, textured surface. The animal's head is on the left, and its body extends to the right. A large, open, and bloody wound is visible on its side, near the midsection. The fur around the wound is matted and stained with blood. The jackal's eyes are closed, and its front leg is visible in the foreground.

**Black-backed  
jackals are  
opportunistic,  
persistent and  
very tough ...**

**Hit by a vehicle  
and still  
predating ...**



**Information is used  
to assist predation  
management**



Data/information have been provided by Gunter (2008), Strauss (2009), Van Niekerk (2010), Badenhorst (2014), Schepers (2016) and other sources ...

... resource base is continuously exploited – meet groups of farmers to collect more detailed information / collecting data from hunted specimen





24 Aug 2009 Tc

22 Oct 2009 Tj



1 Aug 2009 Kj



**Monoestrus species  
- breed only once a  
year**



25 Aug 2016 Db

**... concentrate on the  
reproduction of black-backed  
jackal females**

Acknowledging 4 friends

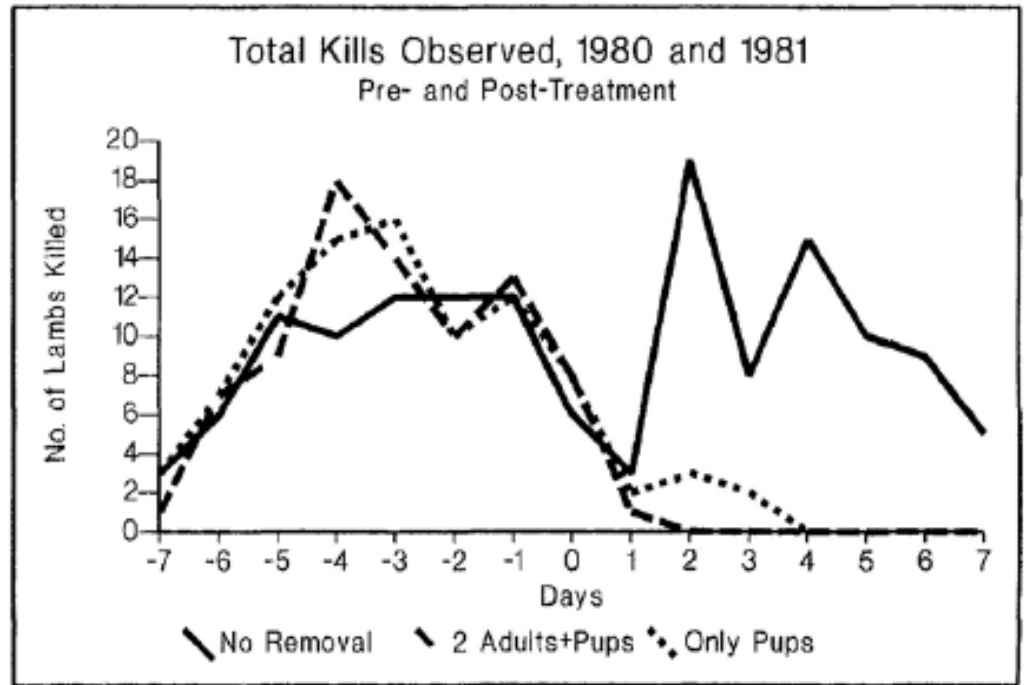


Figure 1. Domestic lamb losses before and after coyote removal strategies. (From Till and Knowlton 1983).

## Practical application of research results

Bands of domestic sheep lambing on the open range in south central Wyoming were monitored for predator losses before and following coyote (*Canis latrans*) removals. Experimental treatments, including (1) no removal (control), (2) removal of 2 adults and their pups, and (3) removal of pups only (replicated 15 times each). Predation incidents (events) declined 98.2% and the number of sheep killed was reduced by 98.8% when adults and pups were removed. Removing only litters of pups resulted in a decrease of 87.7% in predation incidents and total kills decreased 91.6%. Overall, 23 of 30 predation sequences terminated immediately, whereas in all instances predation ceased within 3 days after removing adult coyotes, their pups, or both. In terms of "offending individuals," **denning can be a selective means of coyote depredation control**. Removing only litters of offending adults can be nearly as effective in stopping losses as removing the adults. Litter size did not appear to influence kill frequencies.



Gier, H.T., 1968. Coyotes in Kansas

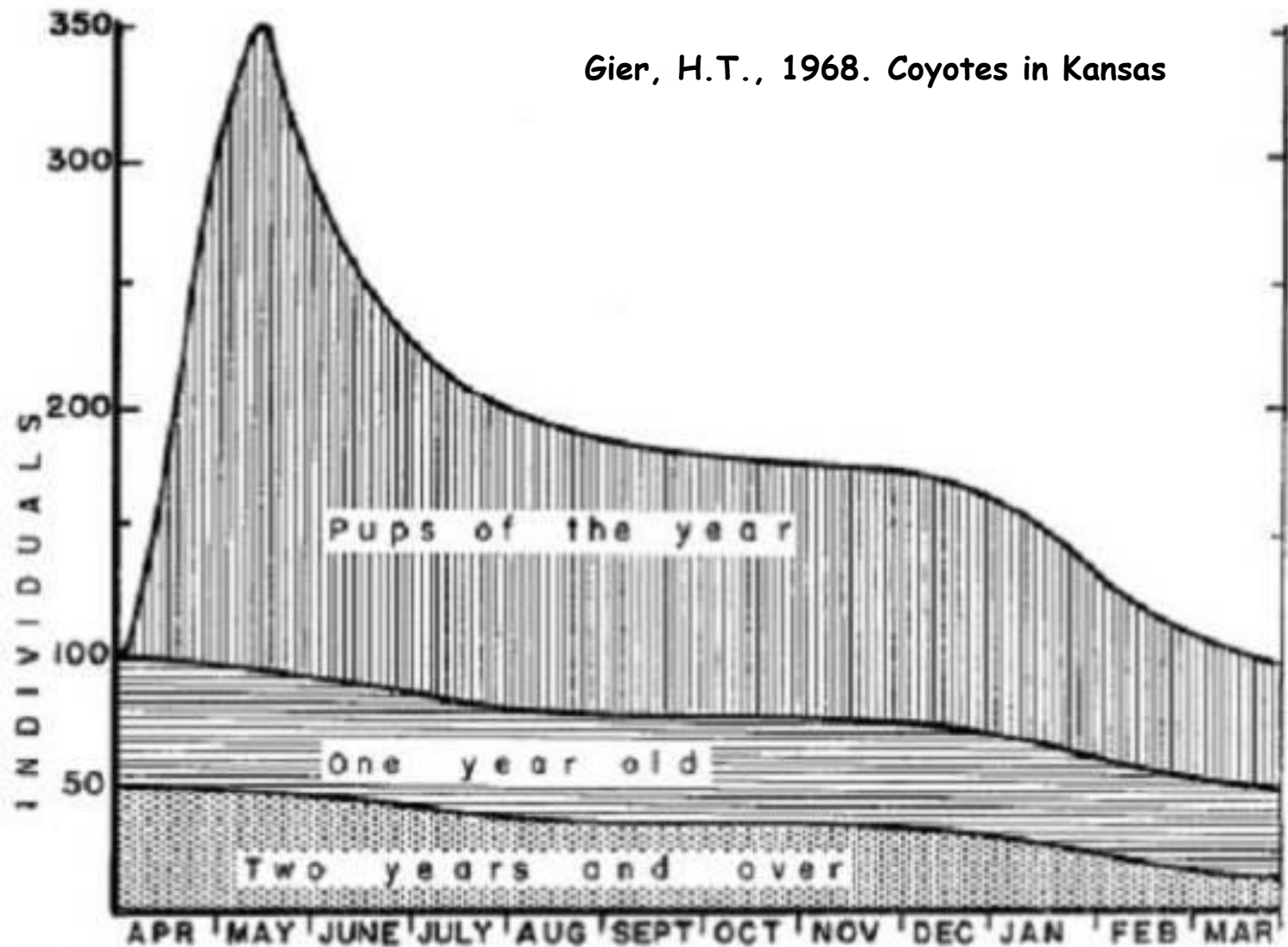


Fig. 15.—Population fluctuation throughout a typical year. April 1, approximately 50 % of the population is composed of yearlings. Each 100 individuals (50 pairs) will produce an average of 250 young by mid-May. Decrease is rapid through May, June and July, then stabilizes until the winter hunting season. By the next March, again approximately half of the coyotes are yearlings.



This information assisted in establishing a *Predation Management Centre* at the UFS, Bloemfontein



Thank you

Coordinated predation management can reduce the impact of predation

Action is now needed ...

