

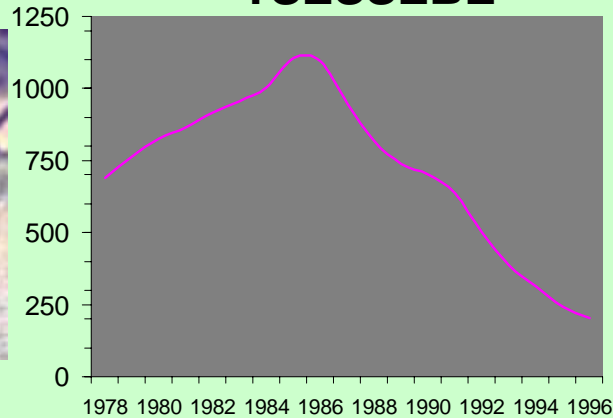
**SHIFTING PREY SELECTION BY LIONS
AND
RARE ANTELOPE DECLINES**

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University of the Witwatersrand

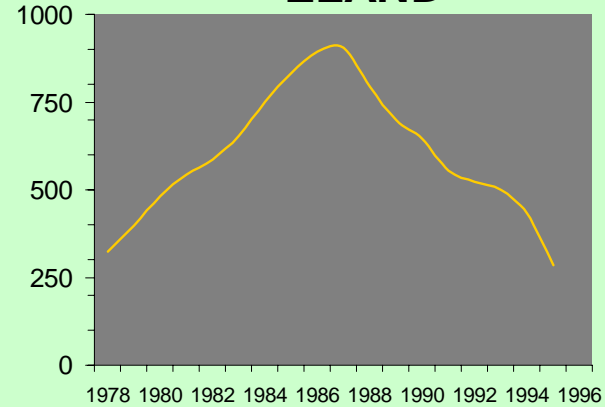
Four rare antelope species decreased to low numbers



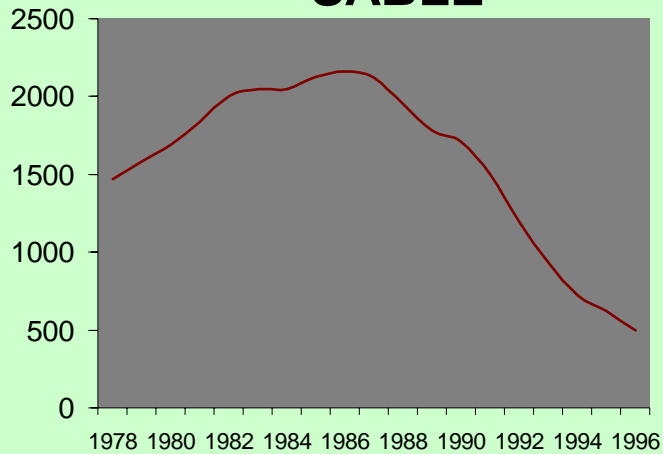
TSESSEBE



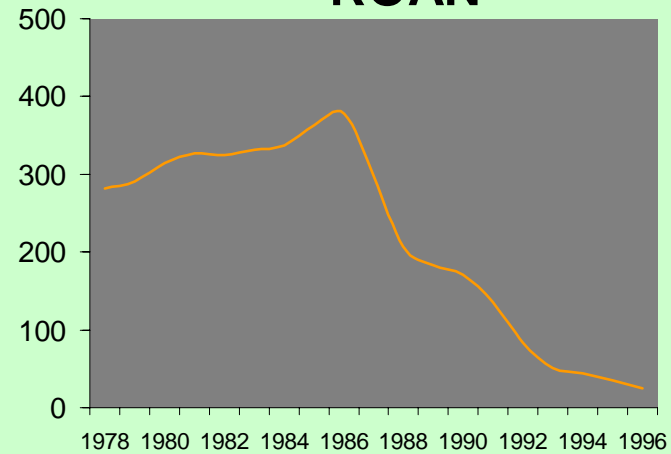
ELAND



SABLE

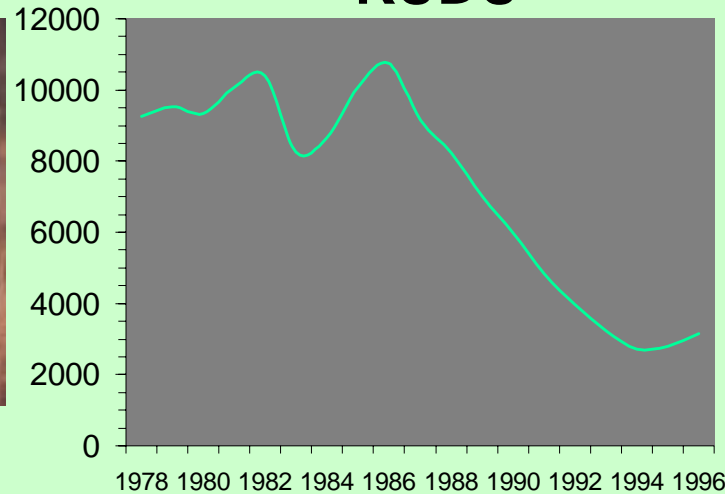


ROAN

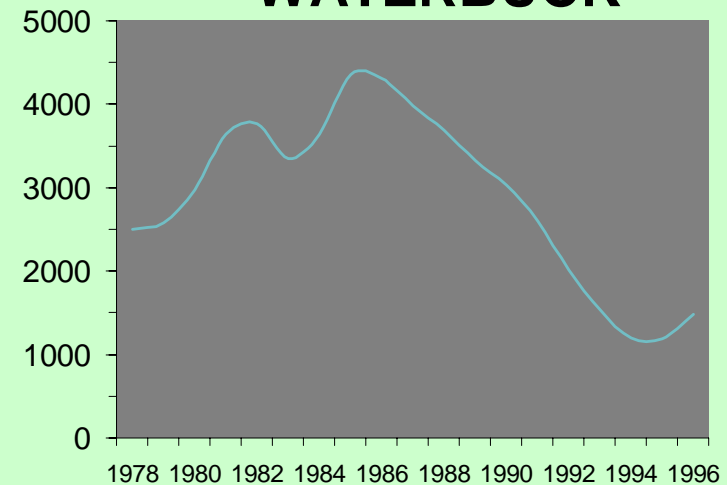


Three more common species also declined substantially

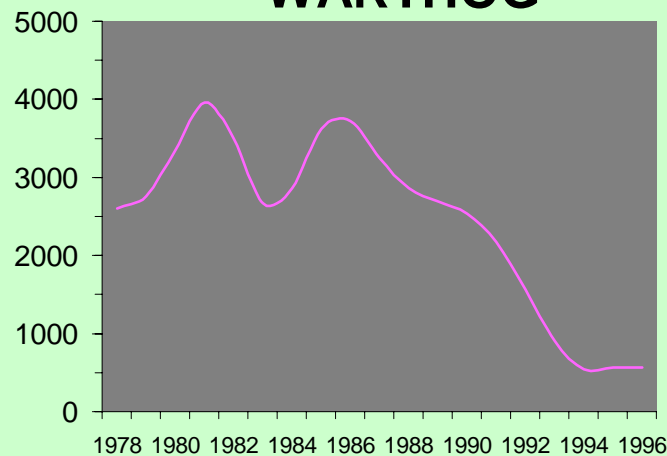
KUDU



WATERBUCK



WARTHOG



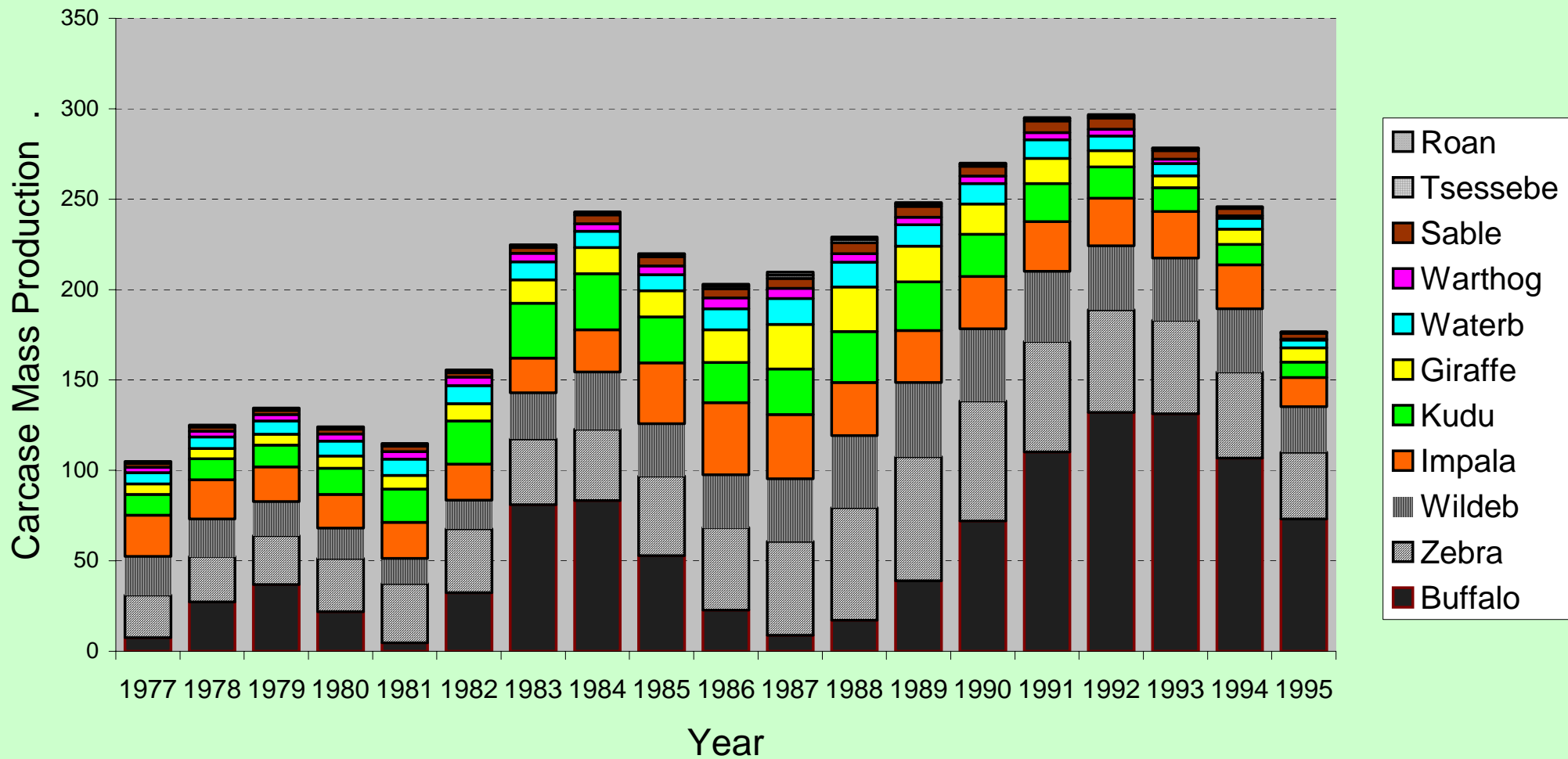
POTENTIAL CAUSES

1. Climatic extremes
2. Disease outbreak
3. Habitat degradation from overstocking
4. Competition from other species
5. Illegal cropping
- 6. Predation**
7. Management interventions
8. Changing environmental context

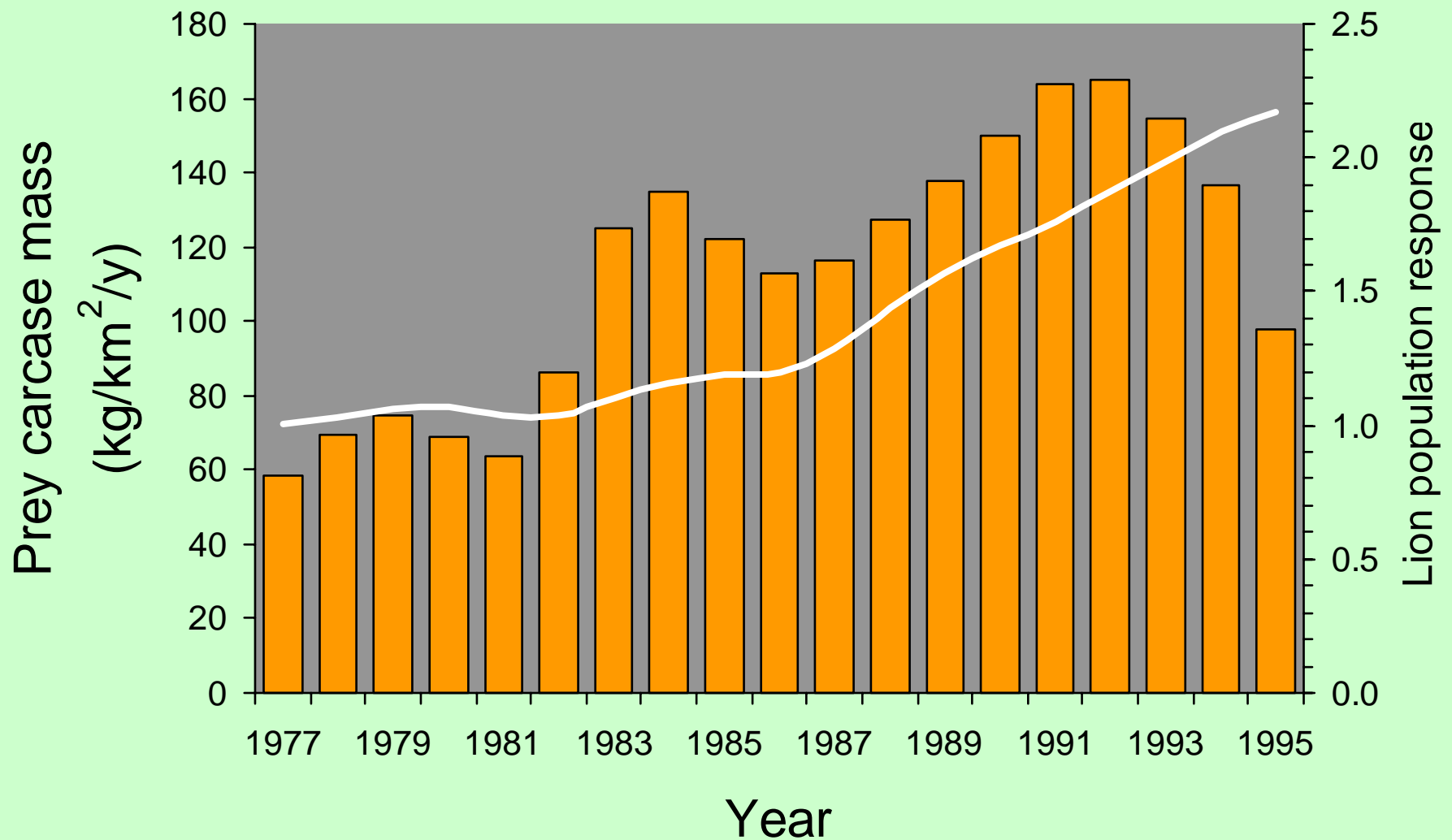


CHANGING PREY SPECIES CONTRIBUTIONS

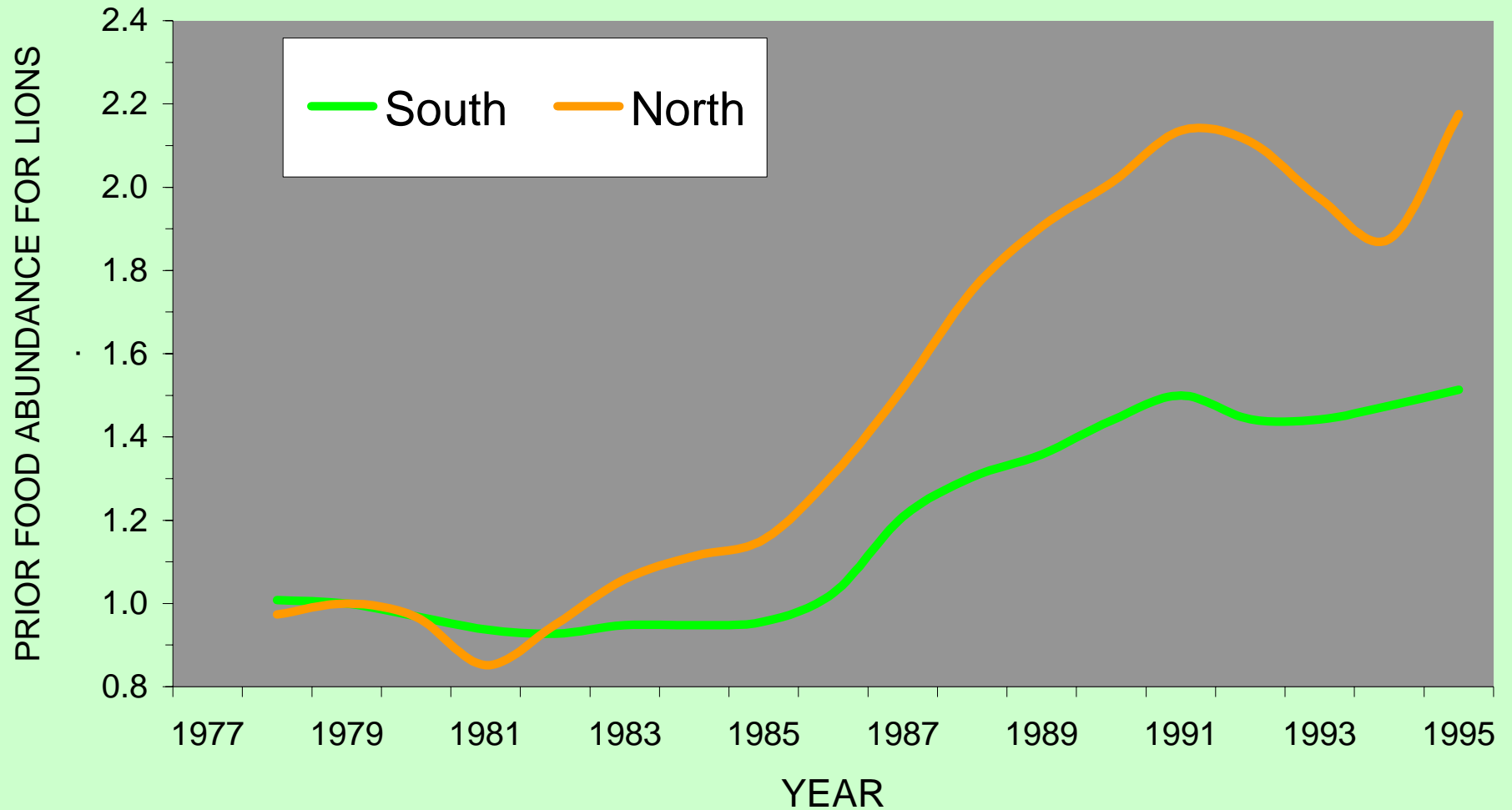
Abundance x annual mortality x mass



INCREASED FOOD SUPPLY SUPPORTED MORE LIONS



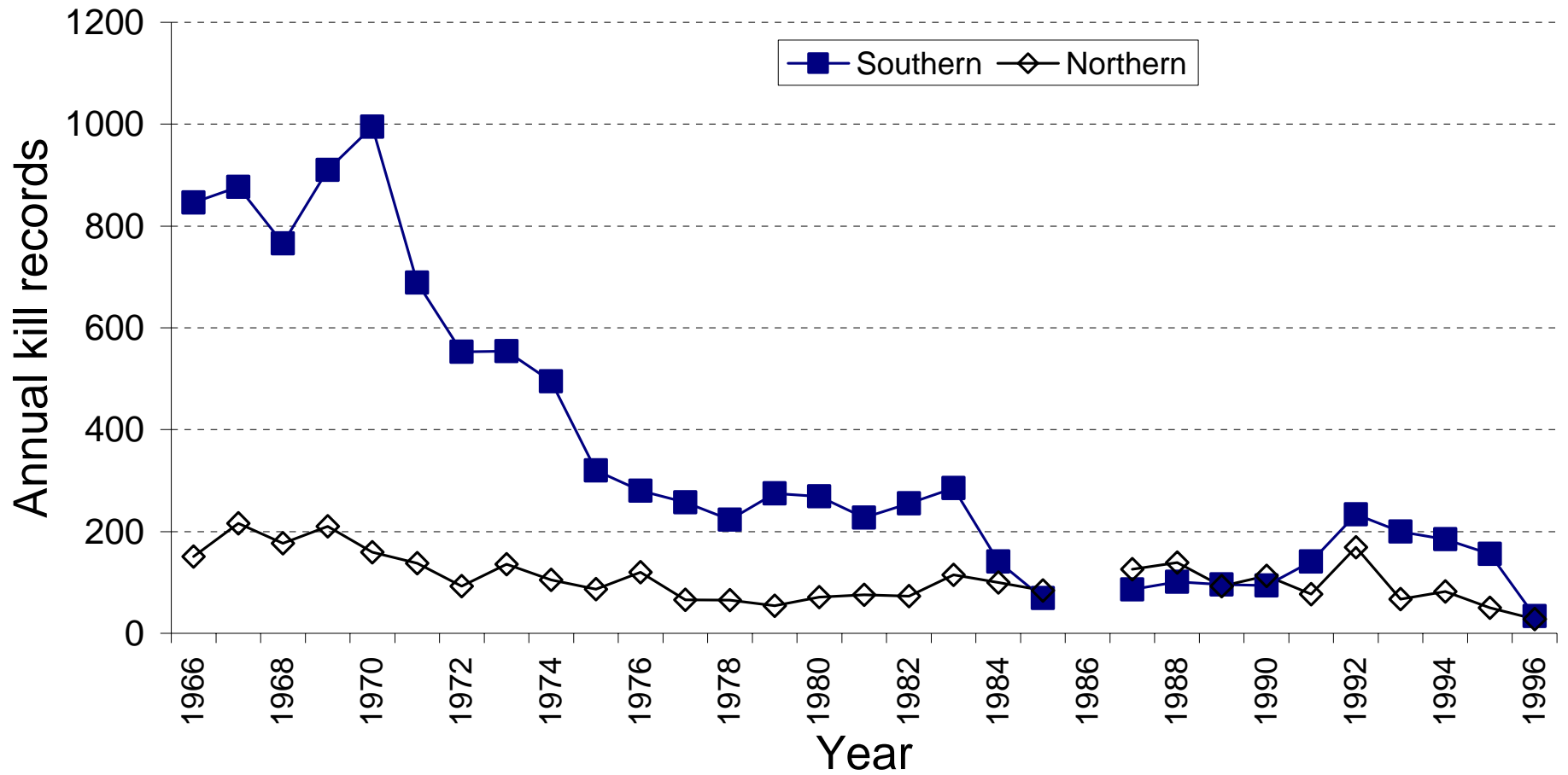
LION FOOD INCREASED MORE IN NORTH



ANIMAL CARCASS RECORDS

- Reported routinely by field staff
- All animals found dead
- Cause of death inferred from signs
 - Predator kill
 - Lion - Leopard - Cheetah - Wild Dog.....
 - Other causes
- Records 1936-46 and 1954 onwards → 41,000+ in total
- Pienaar(1969) summarised early data
- Mills et al (1995) analysed Central District only

LION KILL RECORDS



- **Kill records**

 - numerical proportion in the diet

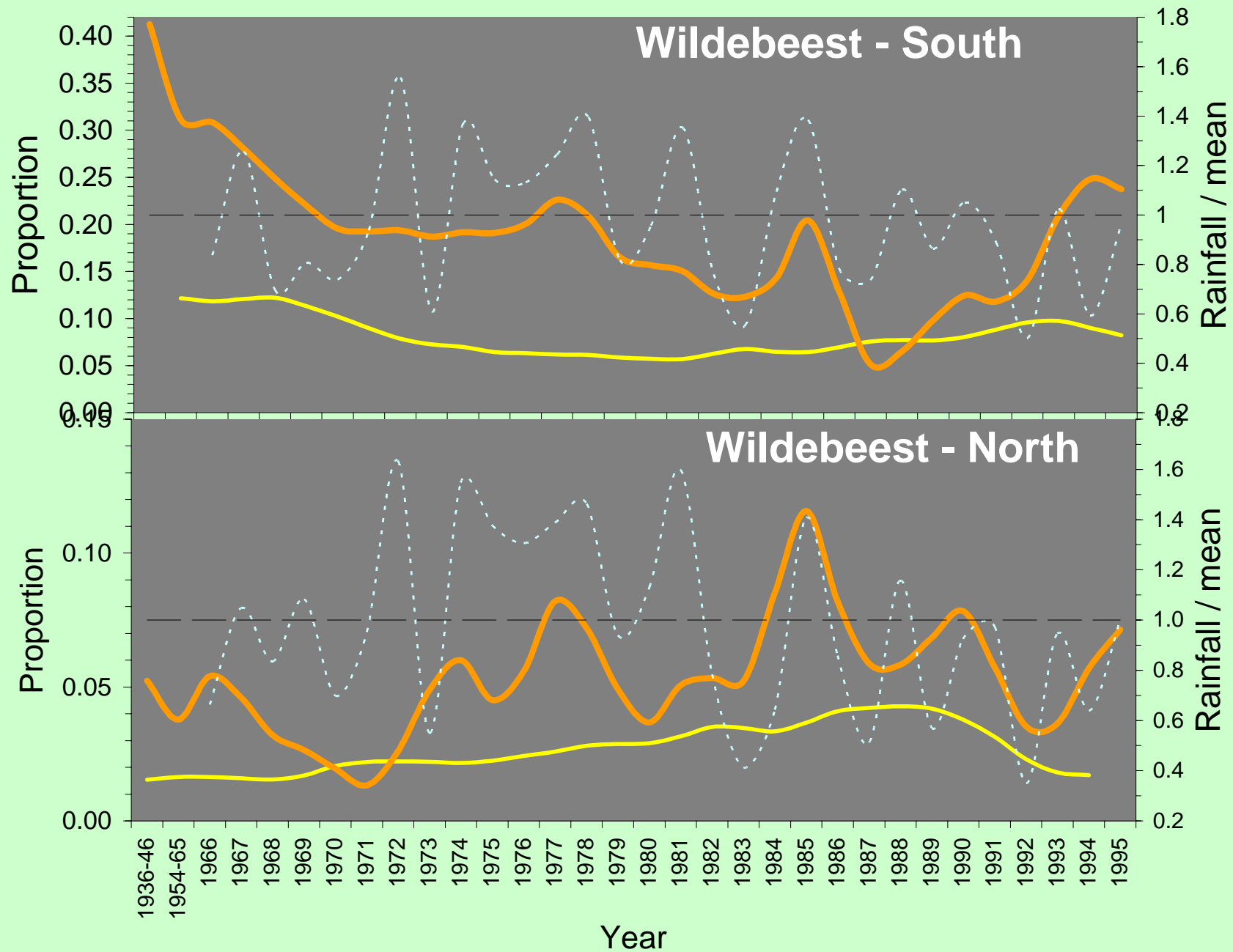
- **Census records**

 - numerical proportion among available prey

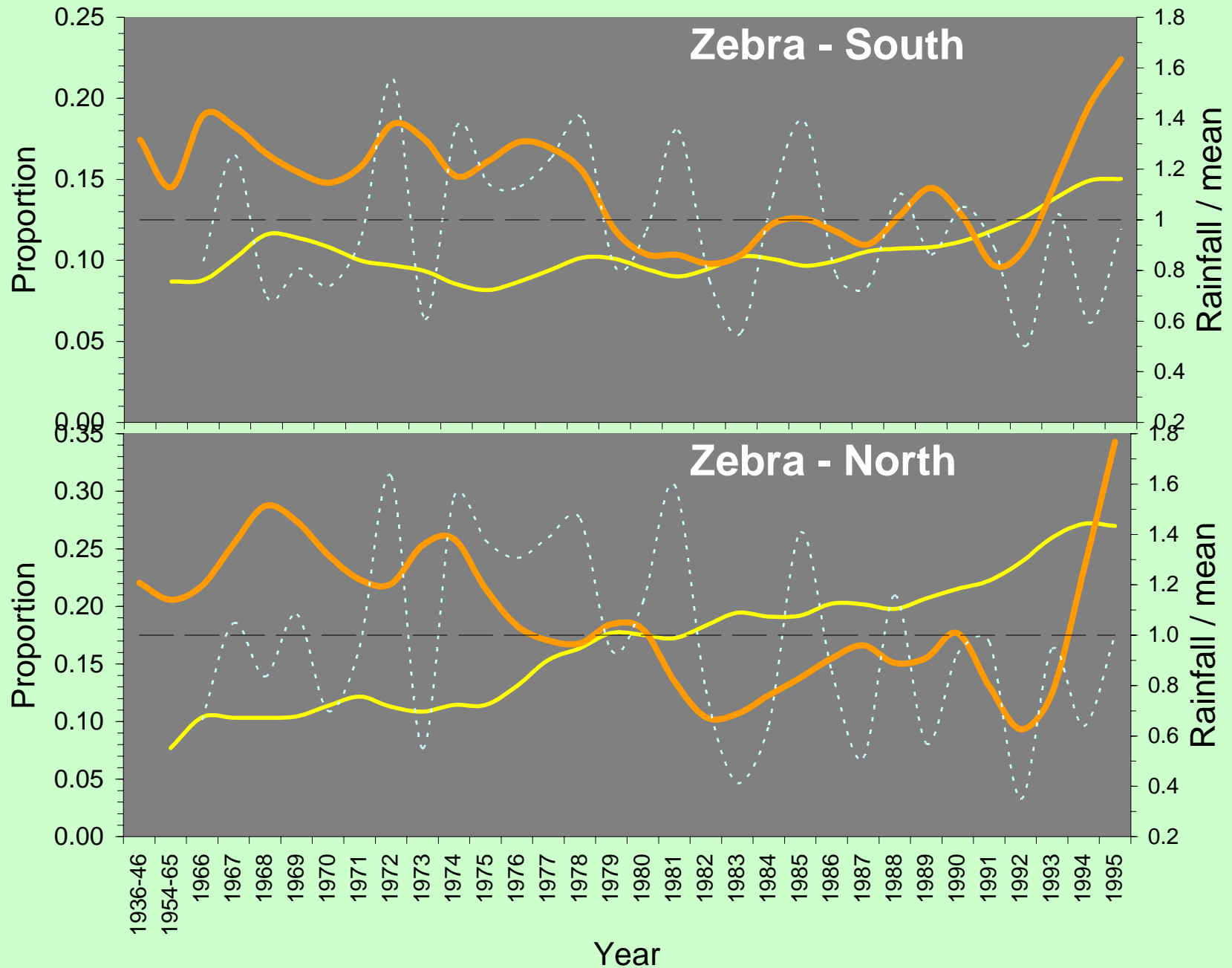
- **Selection ratio** = diet / available

But both carcass records and census records are biased against smaller animals

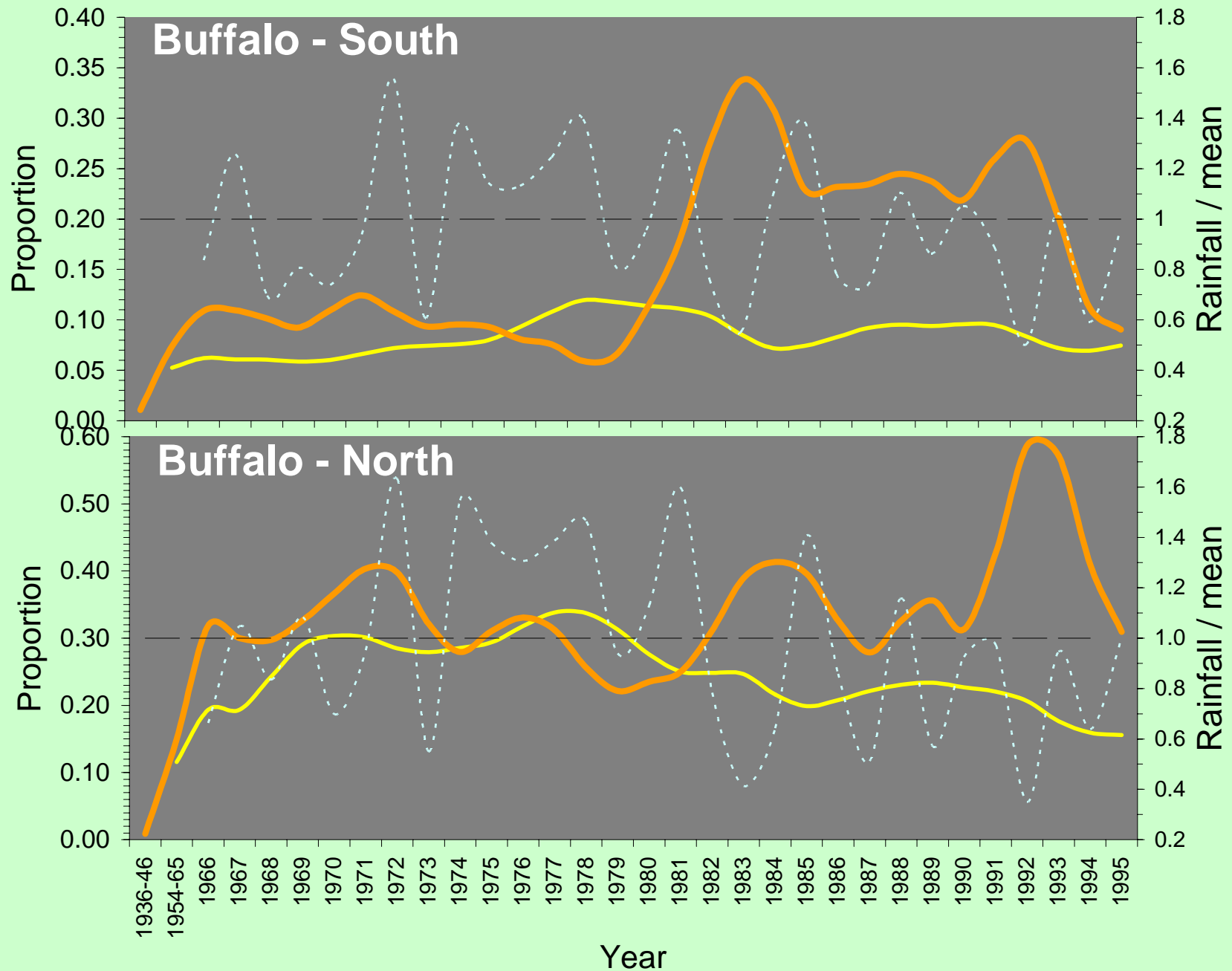
WILDEBEEST KILLS / AVAILABILITY



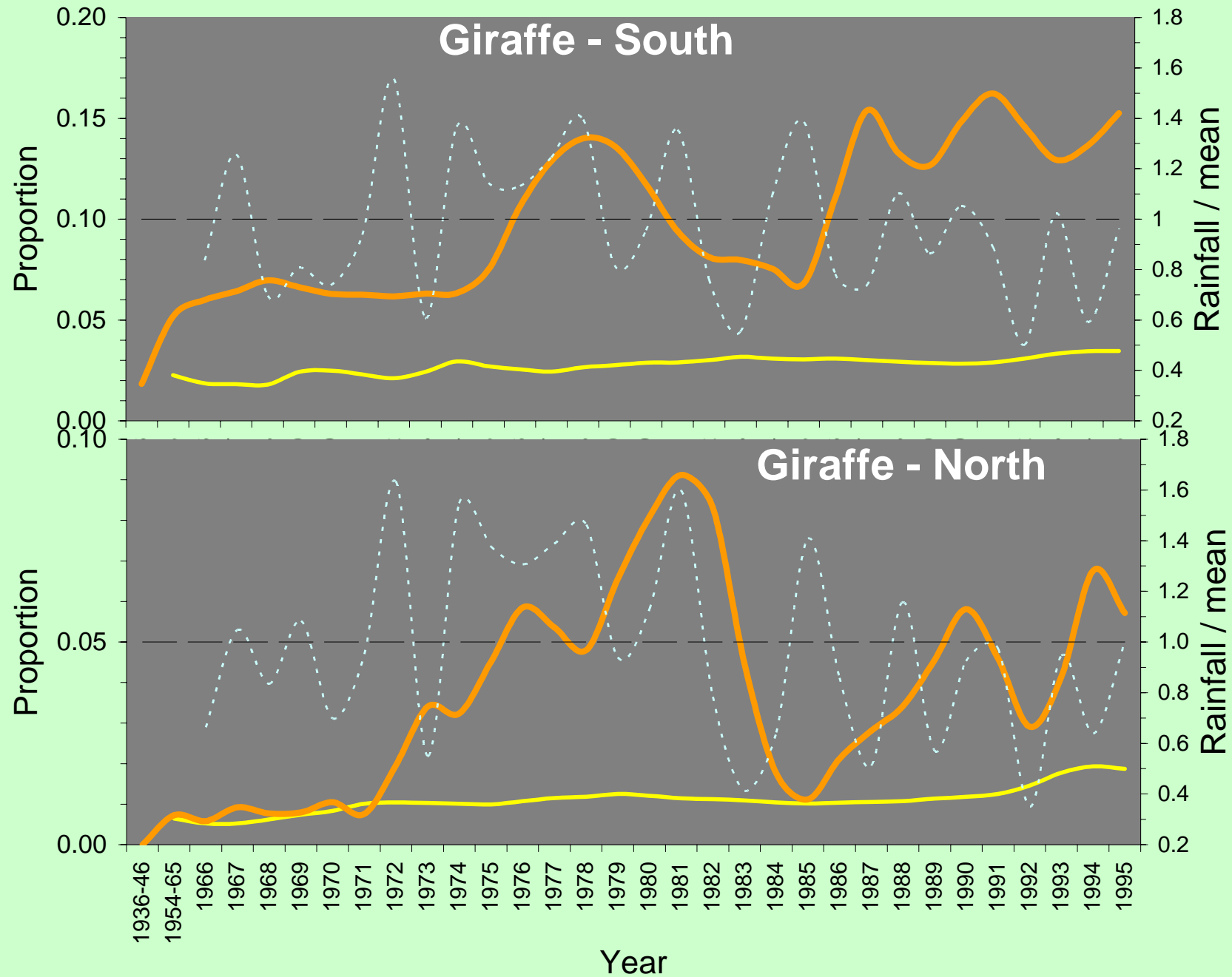
ZEBRA KILLS / AVAILABILITY



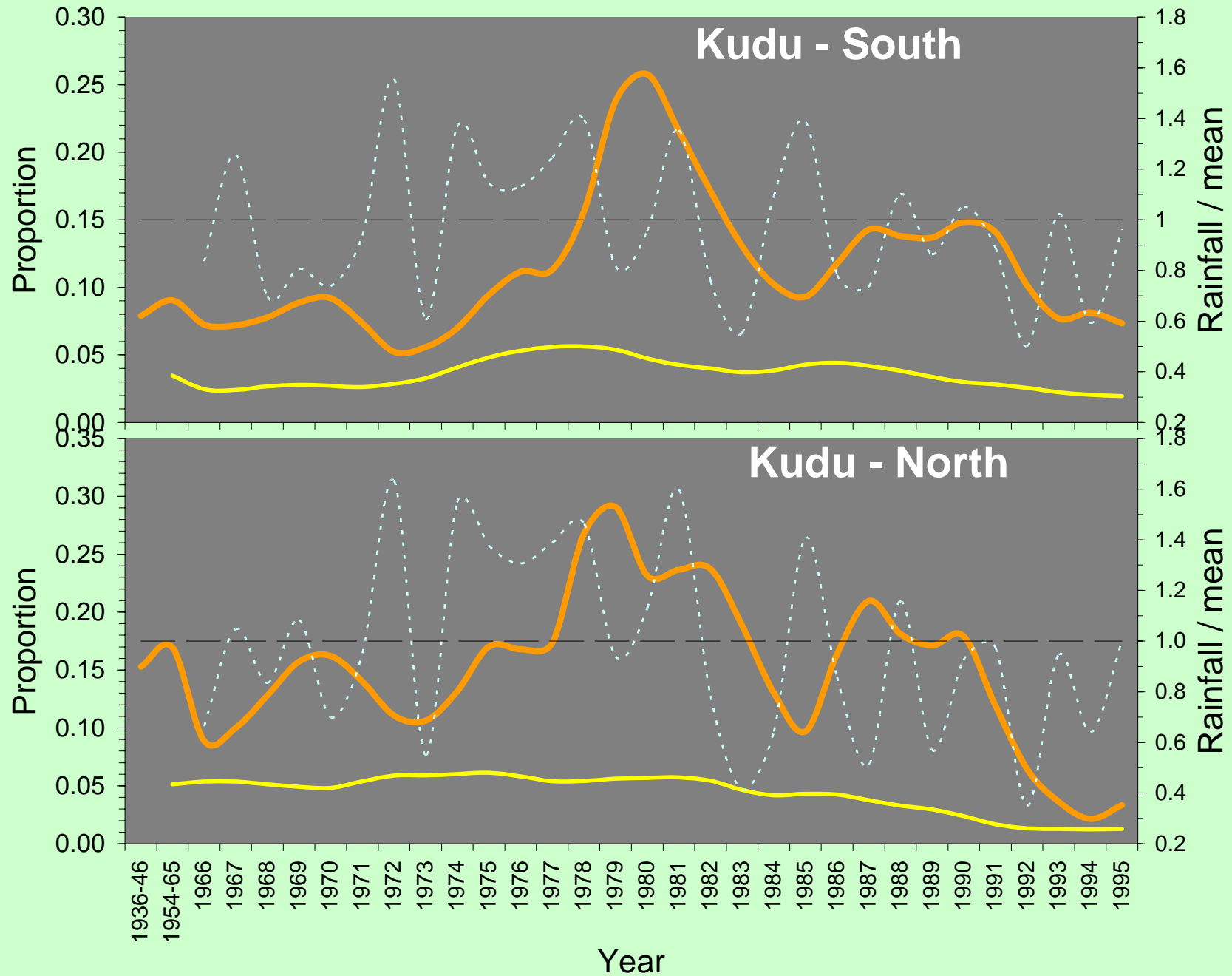
BUFFALO KILLS / AVAILABILITY



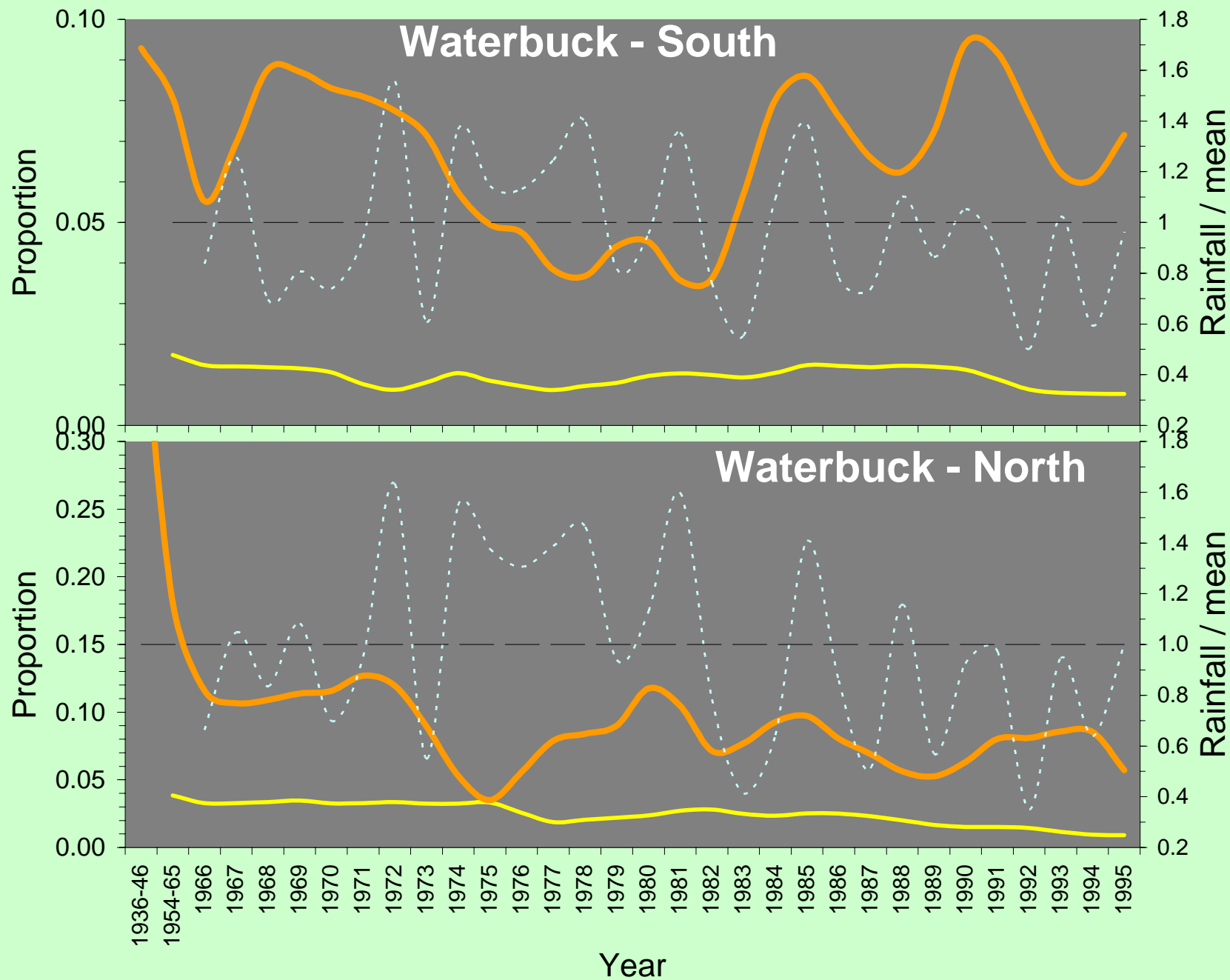
GIRAFFE KILLS / AVAILABILITY



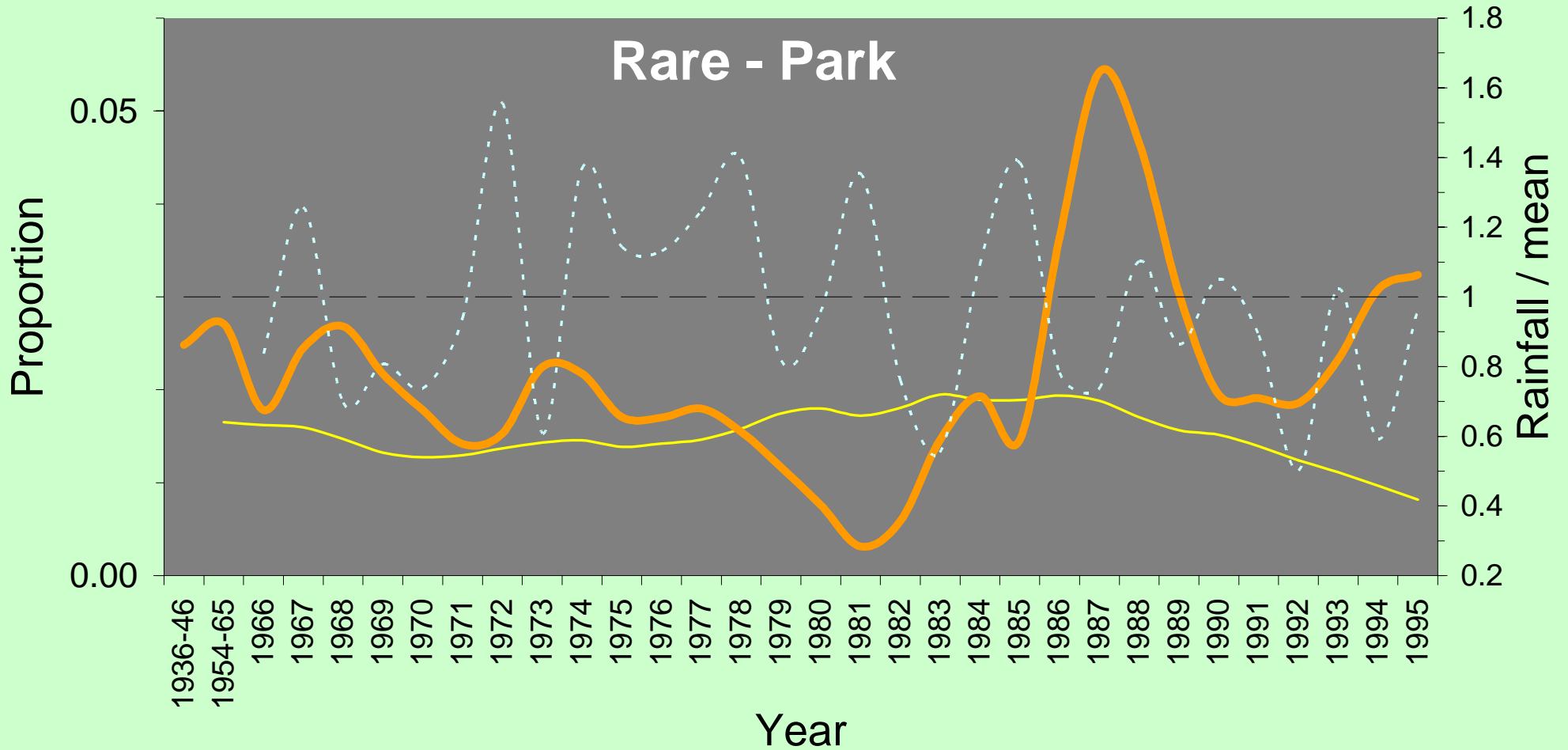
KUDU KILLS / AVAILABILITY



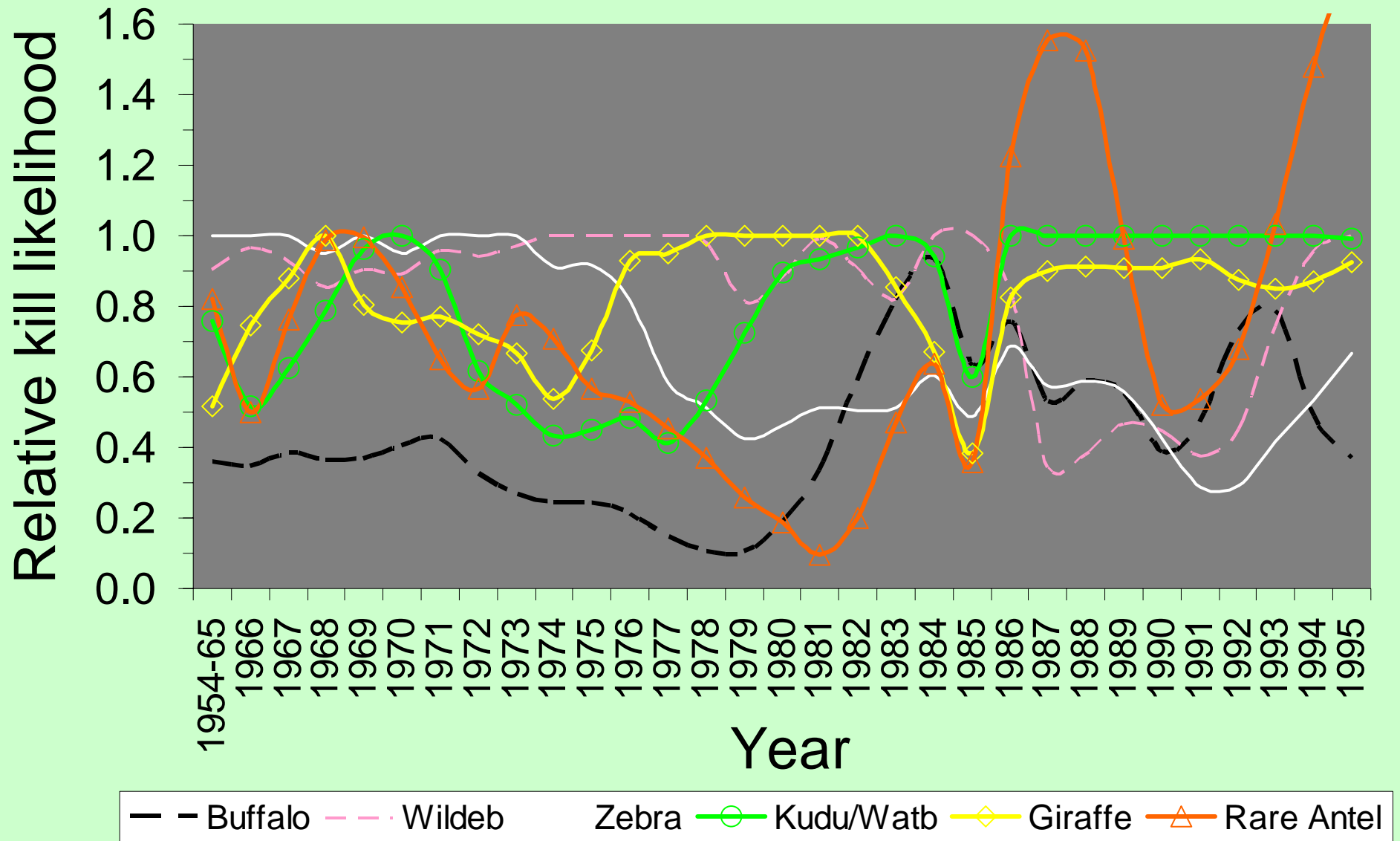
WATERBUCK KILLS / AVAILABILITY



RARE ANTELOPE KILLS / AVAILABILITY



RELATIVE PREY PREFERENCES



MECHANISM OF SWITCH TO RARE ANTELOPE?

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- Buffalo population had declined after drought
 - Wildebeest and zebra were less vulnerable due to low rainfall
- *Lions shifted hunting towards regions where rare antelope species occurred***

CONCLUSIONS

- Carcass records show increase in kill likelihood for rare antelope when population declines began



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- Lions shifted prey selection at time when buffalo and wildebeest became less available
- This could account for 2-3X increase in annual adult mortality of rare species after 1986
- Shifting prey selection by lions in response to changing prey vulnerability influences the dynamics of all ungulate populations