

Potential factors influencing movements & habitat preferences of elephants



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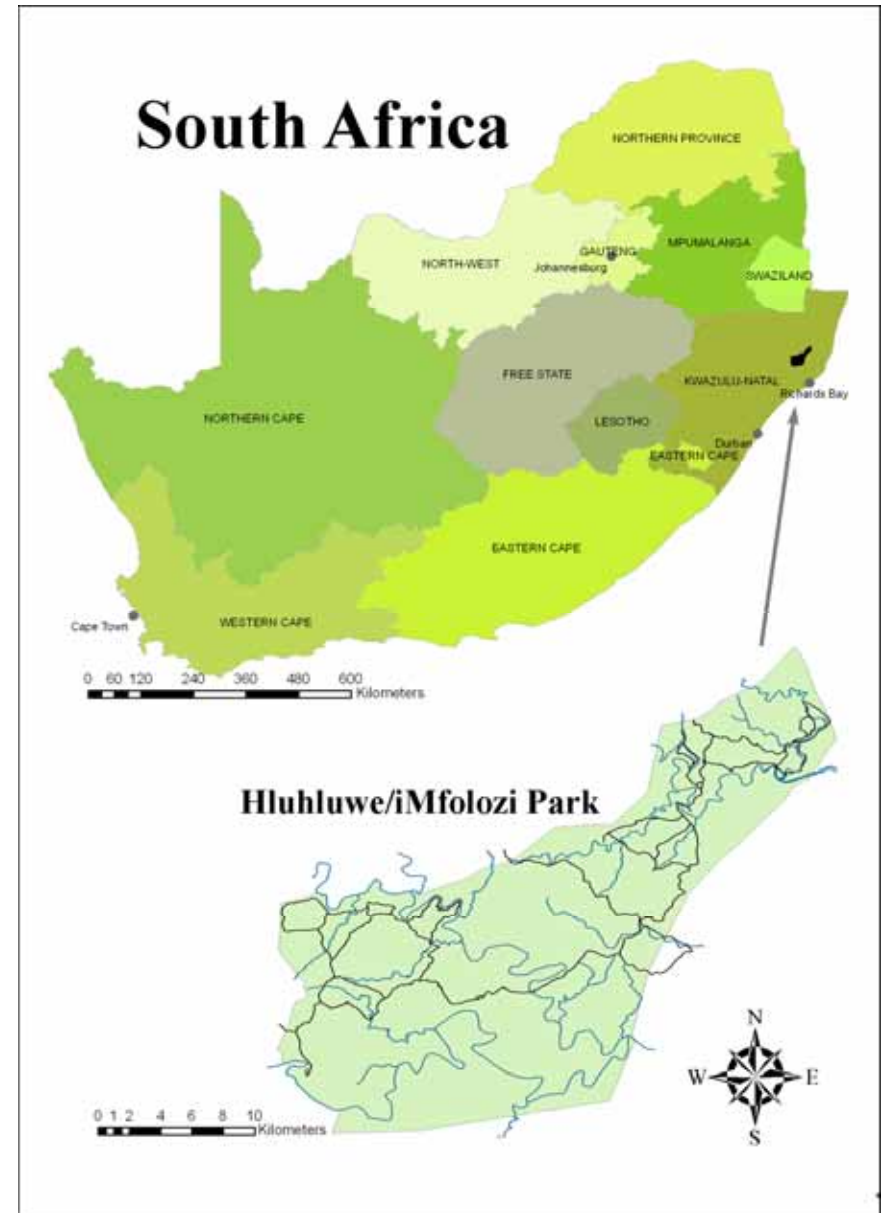
Aims & Objectives

- Identify & investigate factors influencing spatial distribution & habitat selection of breeding herds
- Calculate seasonal home ranges & relate to rainfall & group size
- Determine seasonal habitat preferences (Selection vs. avoidance)



Study Area

- Northern Zululand - KZN
- $\pm 900 \text{ km}^2$
- North – Hilly topography/
thicket & forest habitat
- South – Flatter terrain/
typical savanna habitat

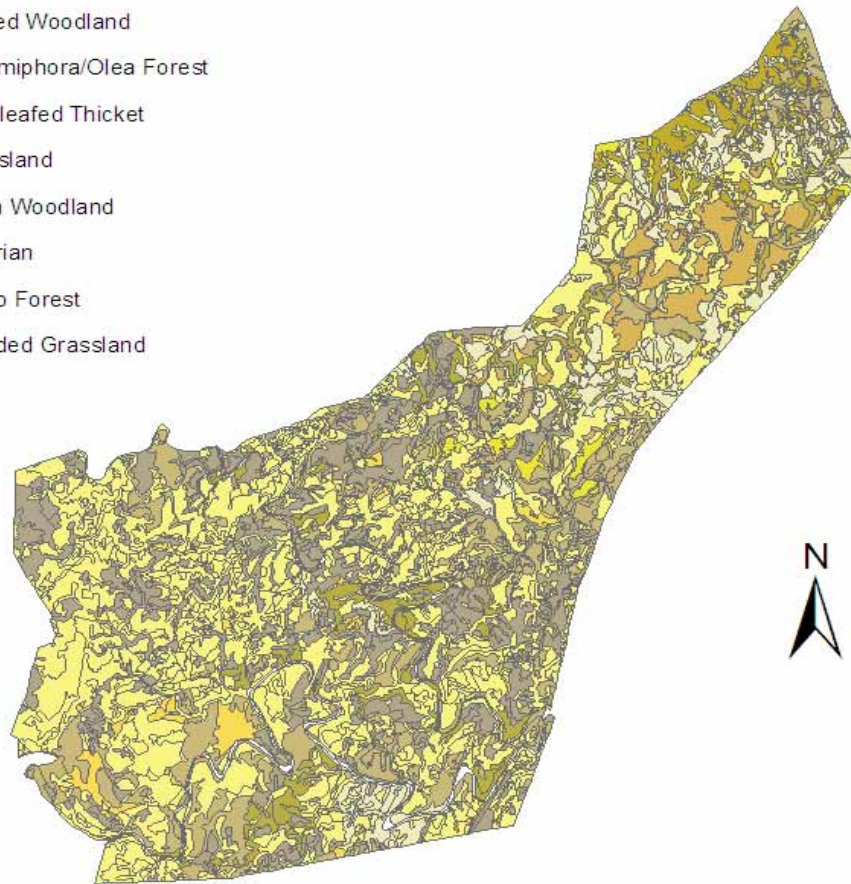


HiP Vegetation Map (adapted from Whateley-Porter (1980))

Legend

HABITAT

-  Broad-leafed Thicket
-  Closed Woodland
-  Commiphora/Olea Forest
-  Fine-leafed Thicket
-  Grassland
-  Open Woodland
-  Riparian
-  Scarp Forest
-  Wooded Grassland



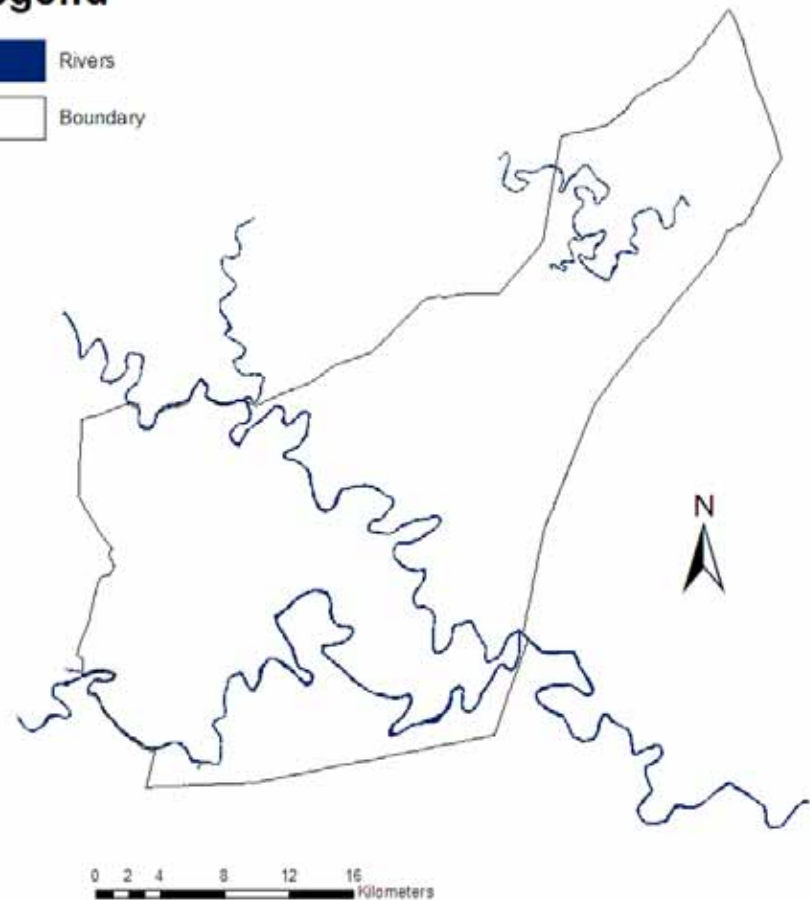
0 3 6 12 18 24 Kilometers

Study Area cont.

- 3 major rivers
- Distinct rainfall gradient (25-yr):
 - (950-1000mm in north)
 - (600-650mm in south)

Hluhluwe-iMfolozi Park Boundary & Major Rivers

Legend



Methodology

- 2009 = \pm 500 elephant (5 breeding herds)
- GPS collar fitted on a matriarch
in 4 herds (Oct-2006)
- 5th in April 2007
- Half-hr location downloads
- ArcGIS: Home Range + Habitat
Preference analyses

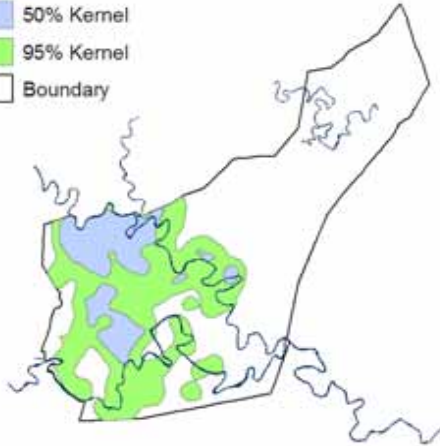


South & North Home Ranges

166 Wet Season

Legend

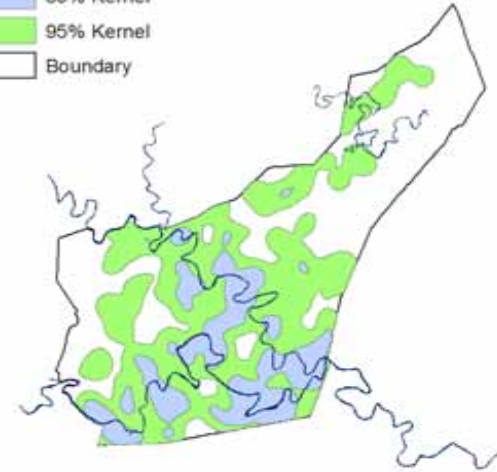
- Rivers
- 50% Kernel
- 95% Kernel
- Boundary



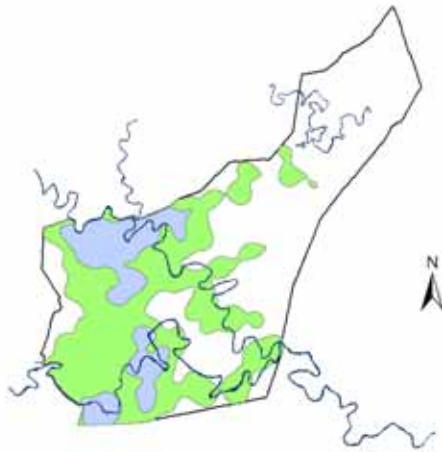
159 Wet Season

Legend

- Rivers
- 50% Kernel
- 95% Kernel
- Boundary

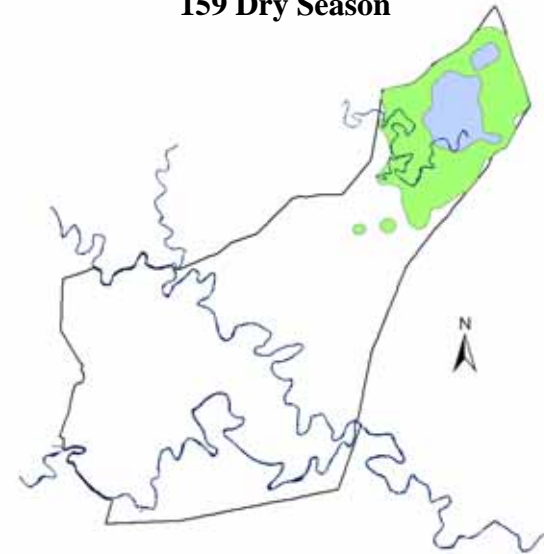


166 Dry Season



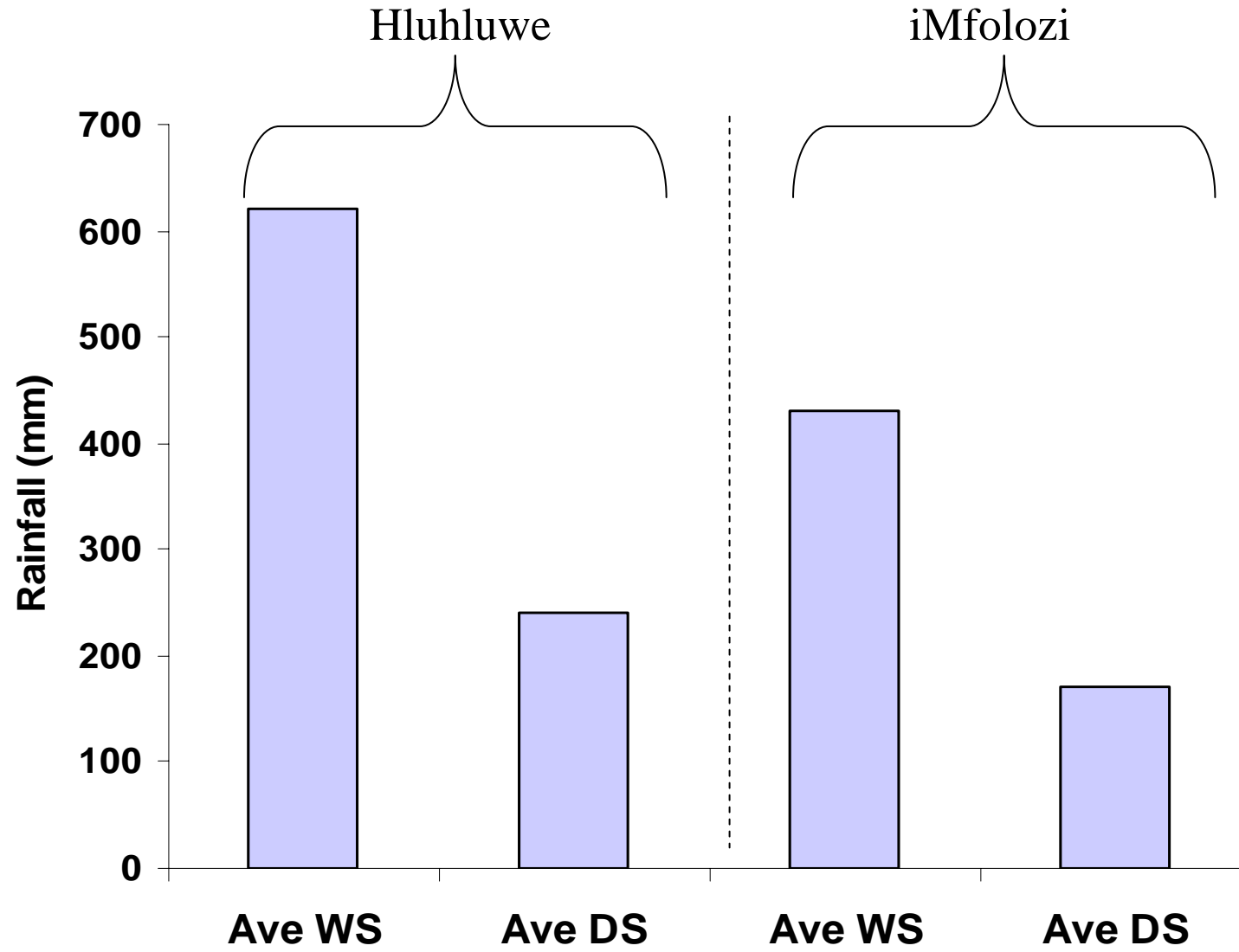
0 2 4 8 12 16 Kilometers

159 Dry Season

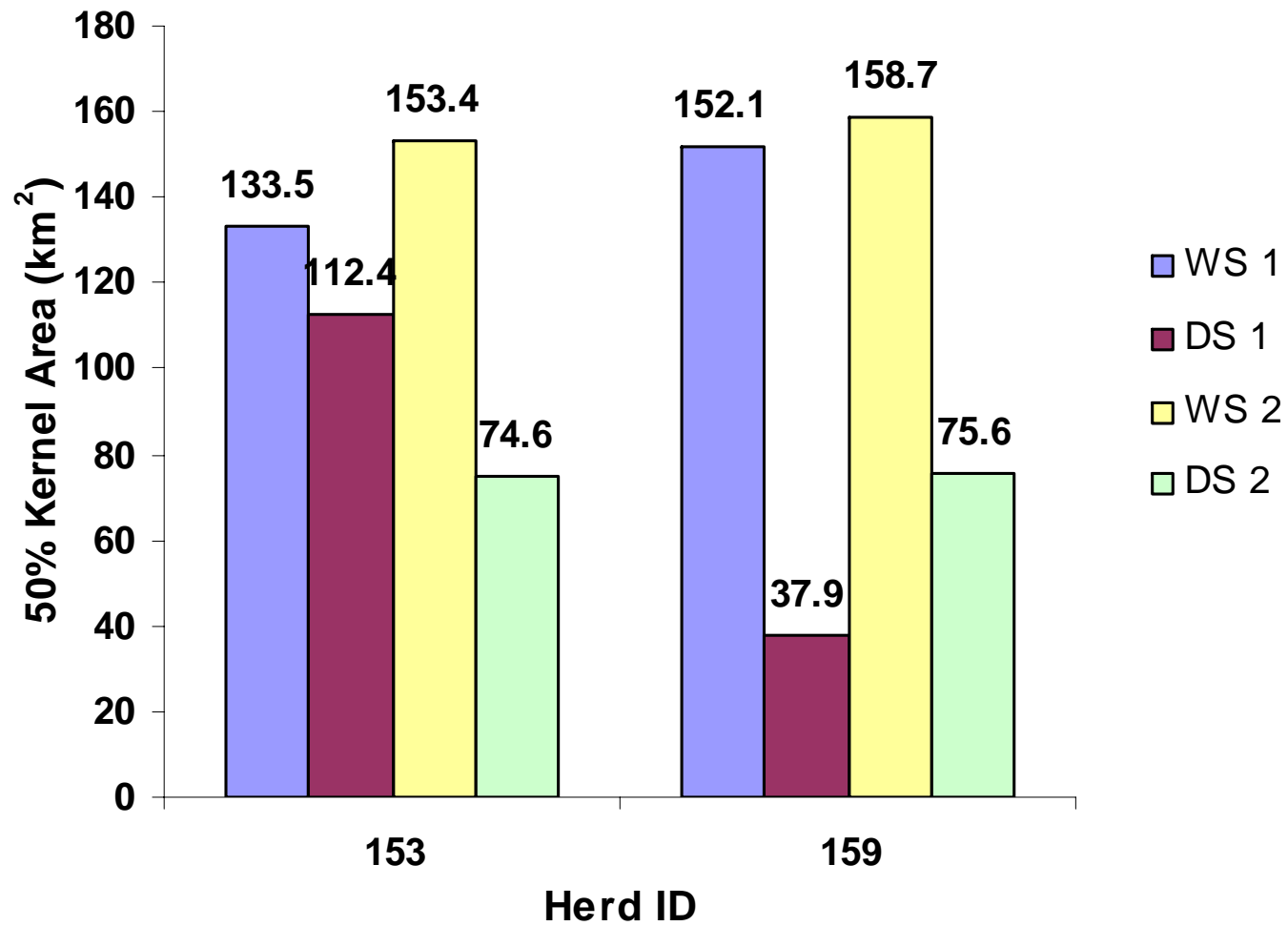


0 2 4 8 12 16 Kilometers

Rainfall

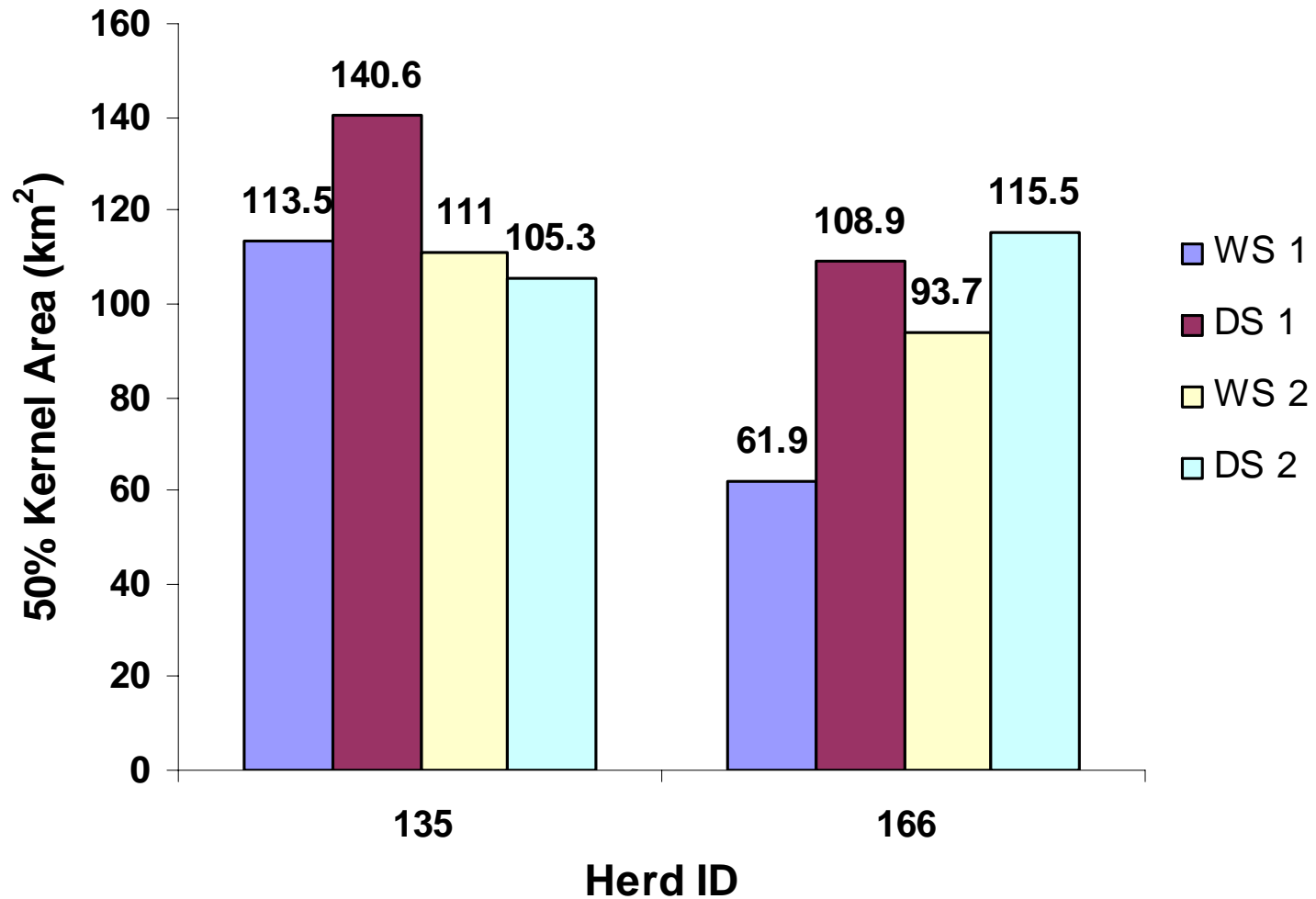


Seasonal home range variation



- Hluhluwe - Typical dry season contraction

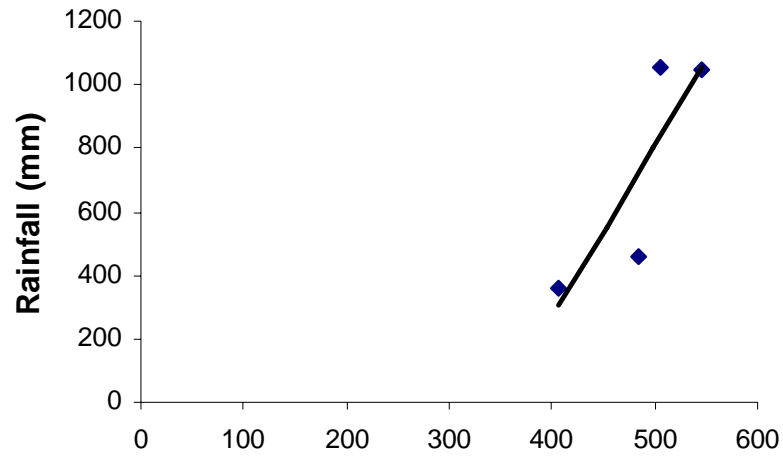
Seasonal home range variation 2



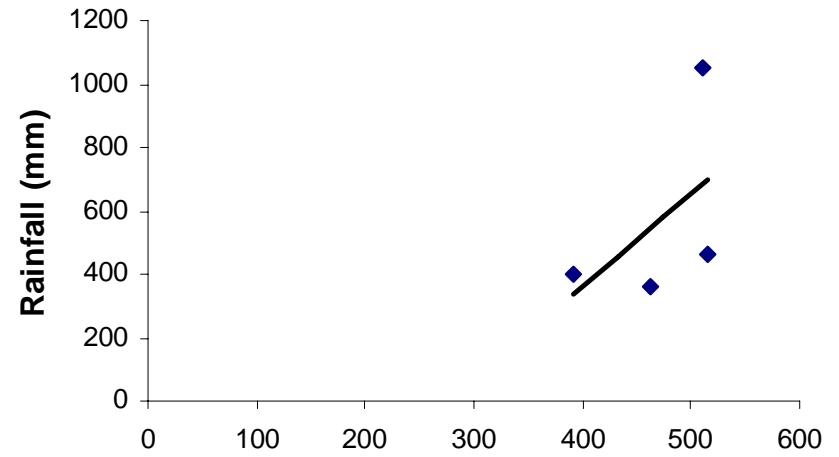
- iMfolozi - Nearly opposite trend

Home range vs. Cumulative rainfall

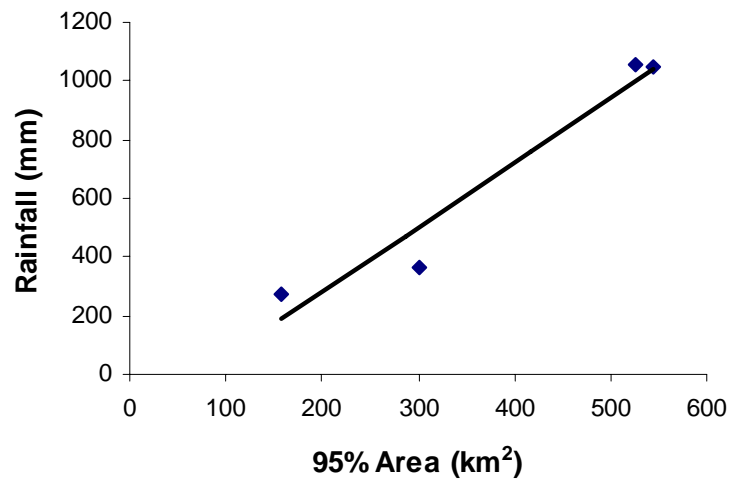
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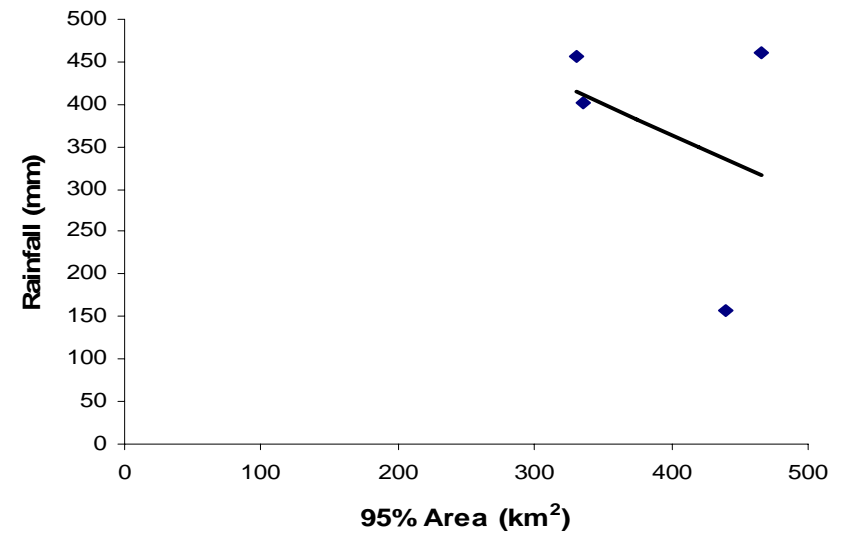
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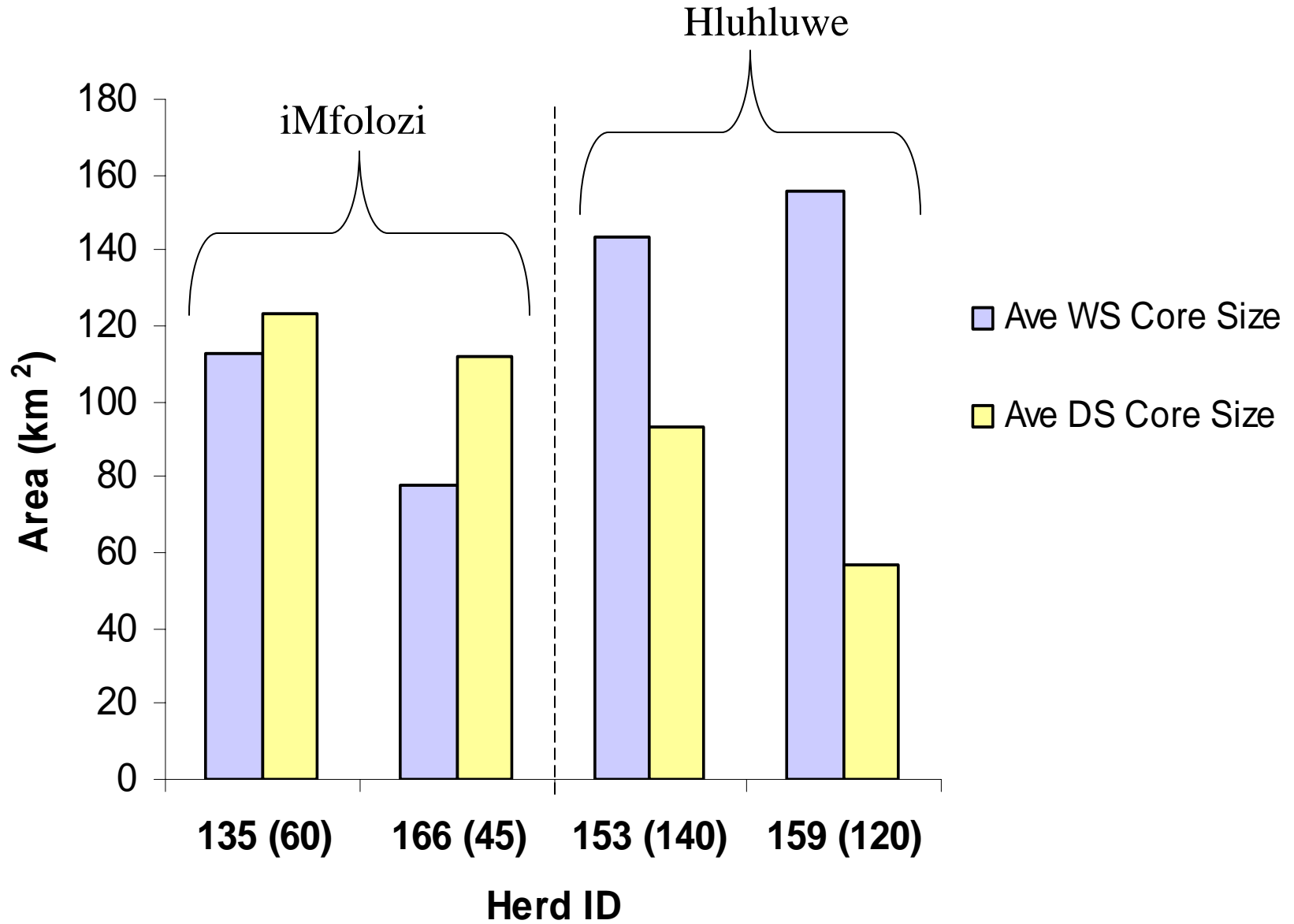
159



166



Group Size

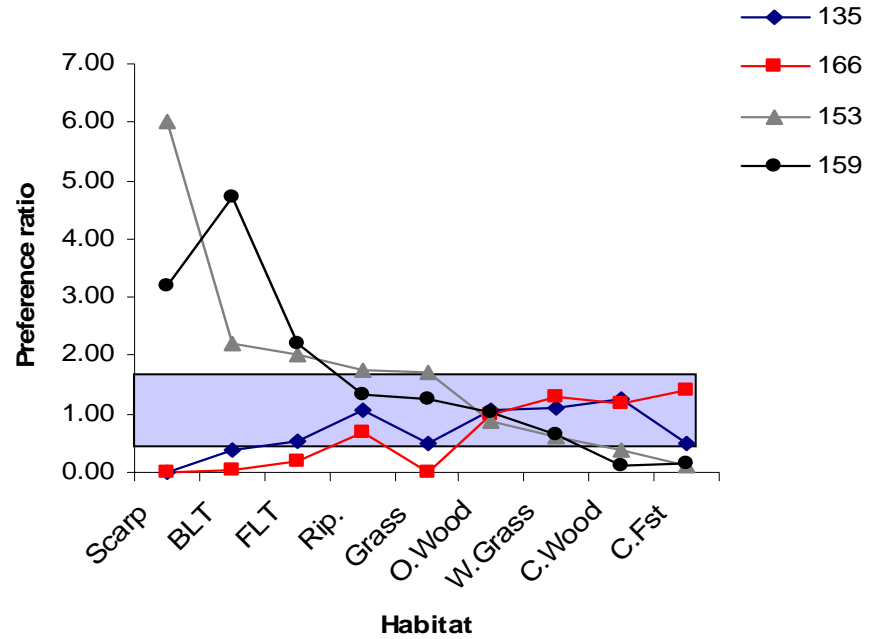
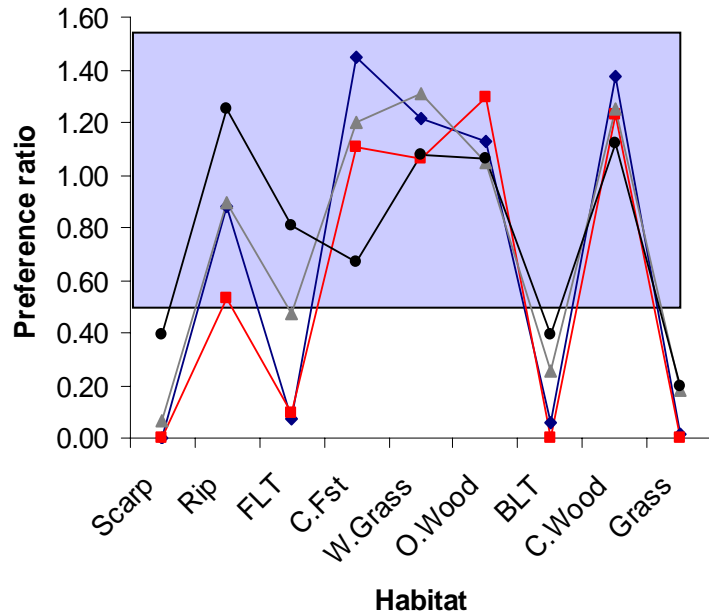
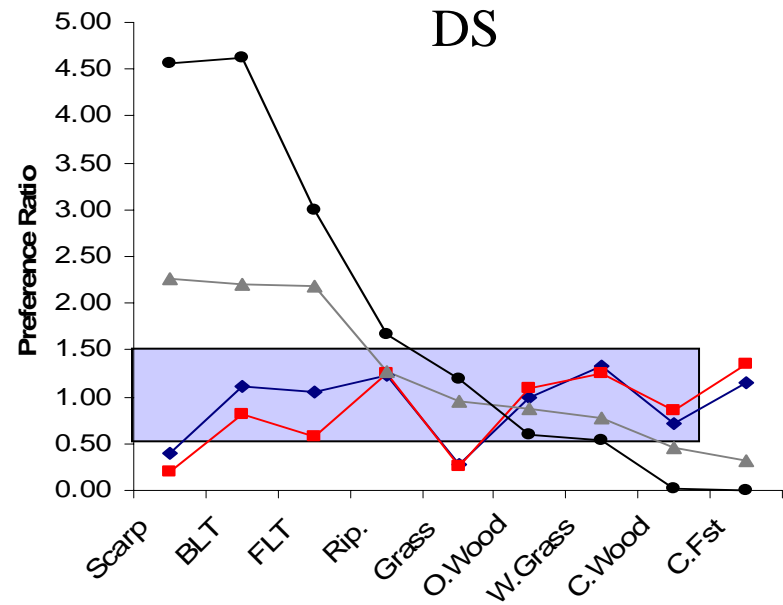
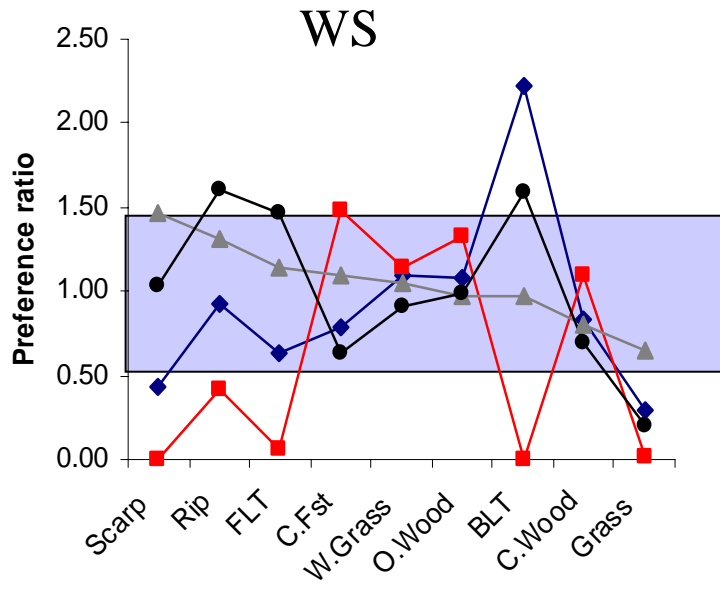


Habitat selection

- Initial use of preference ratios (proportion available vs. proportion selected)
 - Other indices
 - K-select method
- Seasonal variation
- 2 spatial scales:
 - Habitat selected at park level
 - Habitats selected at home range level



Habitat Selection Indices



- ◆ 135
- 166
- ▲ 153
- 159

Conclusions

- High variability in home range size & habitat selection
- iMfolozi-herds display more sedentary behaviour in WS
- Reverse trend for Hluhluwe-herds
- Larger herds show marked preference for specific habitats in DS
- Combination of rainfall & group size as factors



Further Analyses

- Avoidance vs. preference at finer scale – low smoothing factor
- Effects of competitive exclusion – spatial segregation
- Optimal areas for dominant groups?
- Less competition in smaller herds?
- Net seasonal displacements/speed
- Variation in different habitats



Acknowledgements

- Sue van Rensburg
- EKZNW Staff & Research students

