Marine bird exploitation: A key factor in better understanding foraging and mobility patterns of Later Stone Age people on the Mossel Bay coast.

Leesha Richardson

Honours Thesis for the University of South Africa (UNISA)

Supervisors

Dr MM Van Der Ryst

University of South Africa

Dr CW Marean

Arizona State University

Introduction

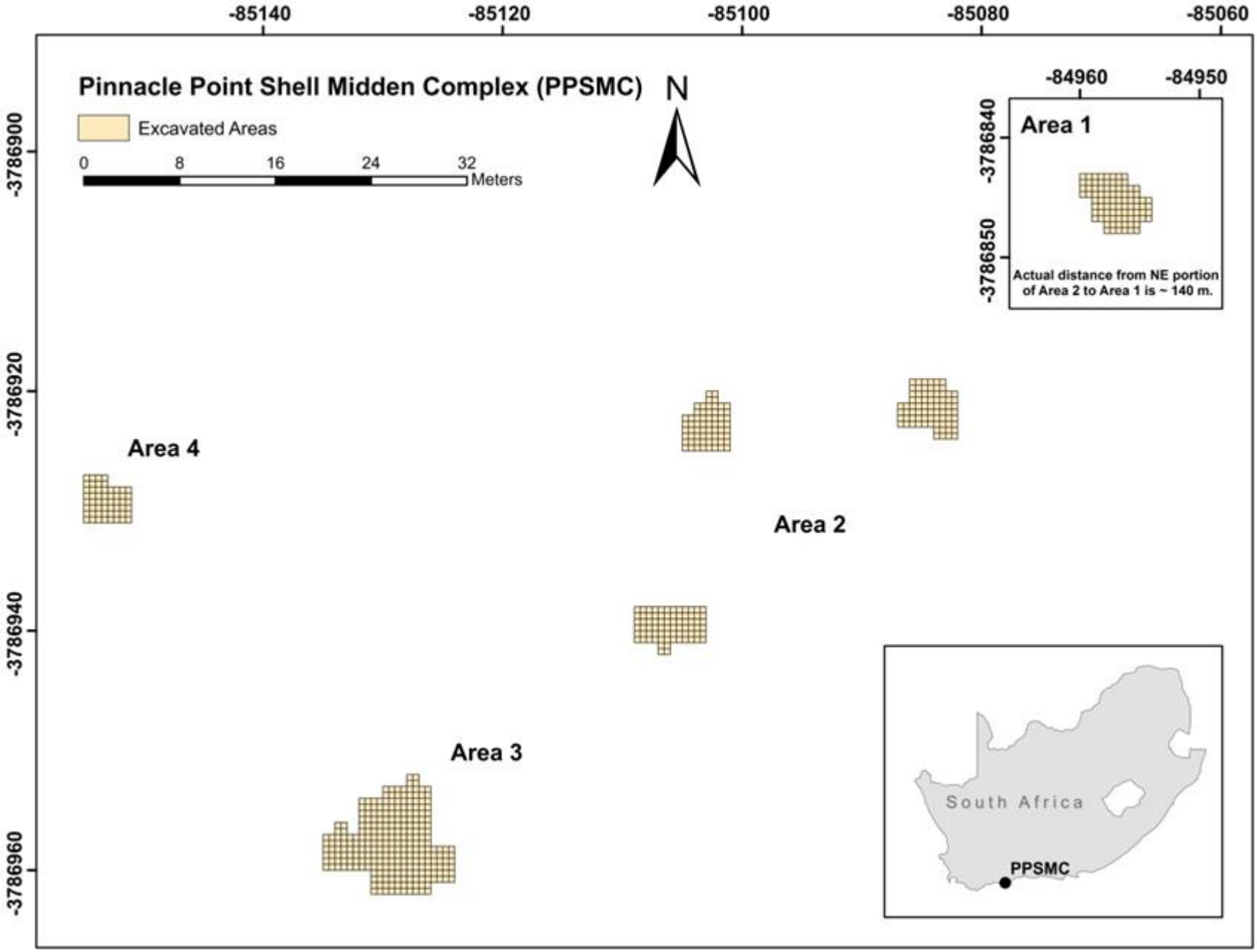
- The transition from Middle Stone Age (MSA) to Late Stone Age (LSA) started around 40, 000 years ago in Southern Africa.
- During the LSA we start to see a change in the material culture such as specialised hunting (bow and arrow) and fishing (hook, sinker) equipment
- Marine bird remains also start to appear in the archaeological record during the LSA. At PPSMC bird remains were present in all 4 excavation areas.
- **Aims**:
- To investigate importance of these marine birds in the subsistence economy of LSA people at Pinnacle Point.
- To reconstruct the season and length of occupation of these midden sites based on marine bird data analyses.

Avery (1985) argues that birds are highly seasonal in their availability.

- Avery conducted monthly beach surveys along the South African coast to record the number of bird carcasses washed up on the shore.
- This research was conducted over a period of 29 years
- His data indicated that marine birds are highly seasonal in their availability.
- His data also showed that these birds would have been a viable and predictable food resource for coastal foragers as an average of 2.6 beached carcasses would be available each day for every 1km walked.

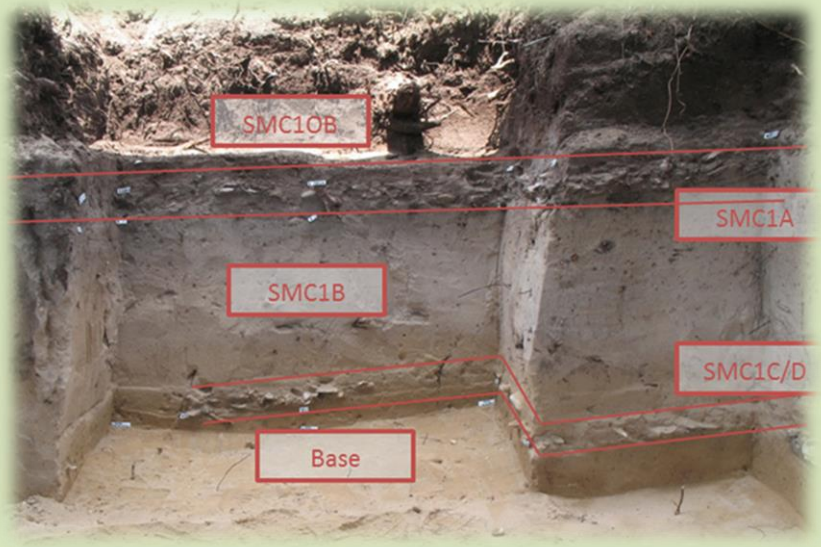
In theory the knowledge on the ecology of the birds represented in the archaeological record should provide a basis for interpreting aspects of human ecology:

- Season and length of occupation
- Change of the environment through time and space
- Exploitation patterns
- Various possible uses of bird remains


-85140
-85120
-85100
-85080
-85060
Pinnacle Point Shell Midden Complex (PPSMC)
N
Excavated Areas
0
8
16
24
32
Meters
-84960
-84950
-3786840
-3786850
Area 1
Actual distance from NE portion of Area 2 to Area 1 is ~ 140 m.
-3786900
-3786920
-3786940
-3786960
Area 4
Area 2
Area 3
South Africa
PPSMC

A stitched photograph of the hearth feature from PPSMC3 (MAPCRM cc. 2014).

View of excavations conducted in Area 3. The top of the stone-lined hearth feature is visible in the far left (Nilssen & Manhire 2009).

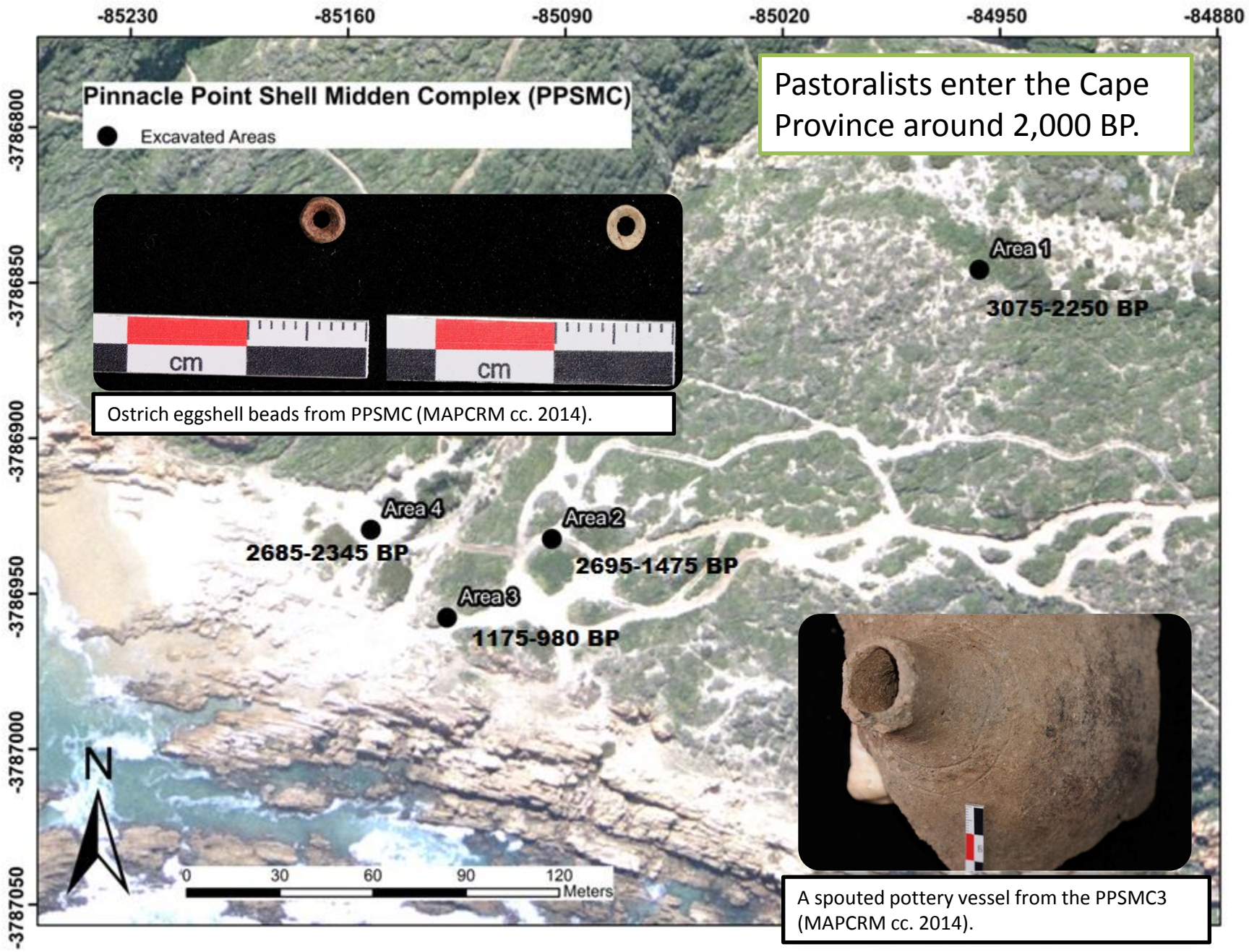


A section photo of Area 1. The photo depicts the two distinct shell lenses separated by a 60cm sterile sandy sediment layer (MAPCRM cc. 2014).

A section photo of Area 4. Three dark anthropogenic layers are evident (MAPCRM cc. 2014).

PPSMC Dates by Beta Analytics and ANSTO

Site Name	Conventional Age	2 SIGMA CALIBRATION (SHCAL13)
PPSMC1	2180 ±30 BP	Cal BC 350 to 300 (Cal BP 2300 to 2250)
PPSMC1	2920 ± 30 BP	Cal BC 1125 to 975 (Cal BP 3075 to 2925)
PPSMC2	1680 ± 30 BP	Cal AD 360 to 475 (Cal BP 1590 to 1475)
PPSMC2	2470 ± 30 BP	Cal BC 745 to 685 (Cal BP 2695 to 2635)
PPSMC3	1160 ± 30 BP	Cal AD 775 to 970 (Cal BP 1175 to 980)
PPSMC3	971 ± 43 BP	893-1020 cal AD
PPSMC3	962 ± 43 BP	893-1023 cal AD
PPSMC3	890 ± 30 BP	1150-1268 cal AD
PPSMC4	2430 ± 30 BP	Cal BC 540 to 395 (Cal BP 2490 to 2345)
PPSMC4	2410 ± 30 BP	Cal BC 735 to 690 (Cal BP 2685 to 2640


-85230
-85160
-85090
-85020
-84950
-84880
-3786800
-3786850
-3786900
-3786950
-3787000
-3787050
Pinnacle Point Shell Midden Complex (PPSMC)
Excavated Areas
Pastoralists enter the Cape Province around 2,000 BP.
Area 1
3075-2250 BP
cm
cm
Ostrich eggshell beads from PPSMC (MAPCRM cc. 2014).
Area 4
2685-2345 BP
Area 2
2695-1475 BP
Area 3
1175-980 BP
N
0
30
60
90
120
Meters
A spouted pottery vessel from the PPSMC3 (MAPCRM cc. 2014).

Who were the occupants of PPSMC?

- **Area 1** (3075-2250 BP) and **Area 4** (2685-2345 BP) were occupied before the introduction of pastoralists to the Cape.
- **Area 2** (2695-1475 BP) occupied before and during the introduction of pastoralism.
- The absence of domestic fauna and pottery most likely suggests that Area 1,2 and 4 were occupied by hunter-gatherers.
- **Area 3** (1175-980 BP) occupied after the introduction of pastoralism to the Cape.
- Area 3 yielded features associated with herder culture such as ceramics and domestic fauna which suggests that is was occupied by herder-foragers.

Seasonality debate

- The past decades there have been a debate between Parkington and Sealy on the seasonal mobility patterns of LSA coastal occupants along the South African coast.

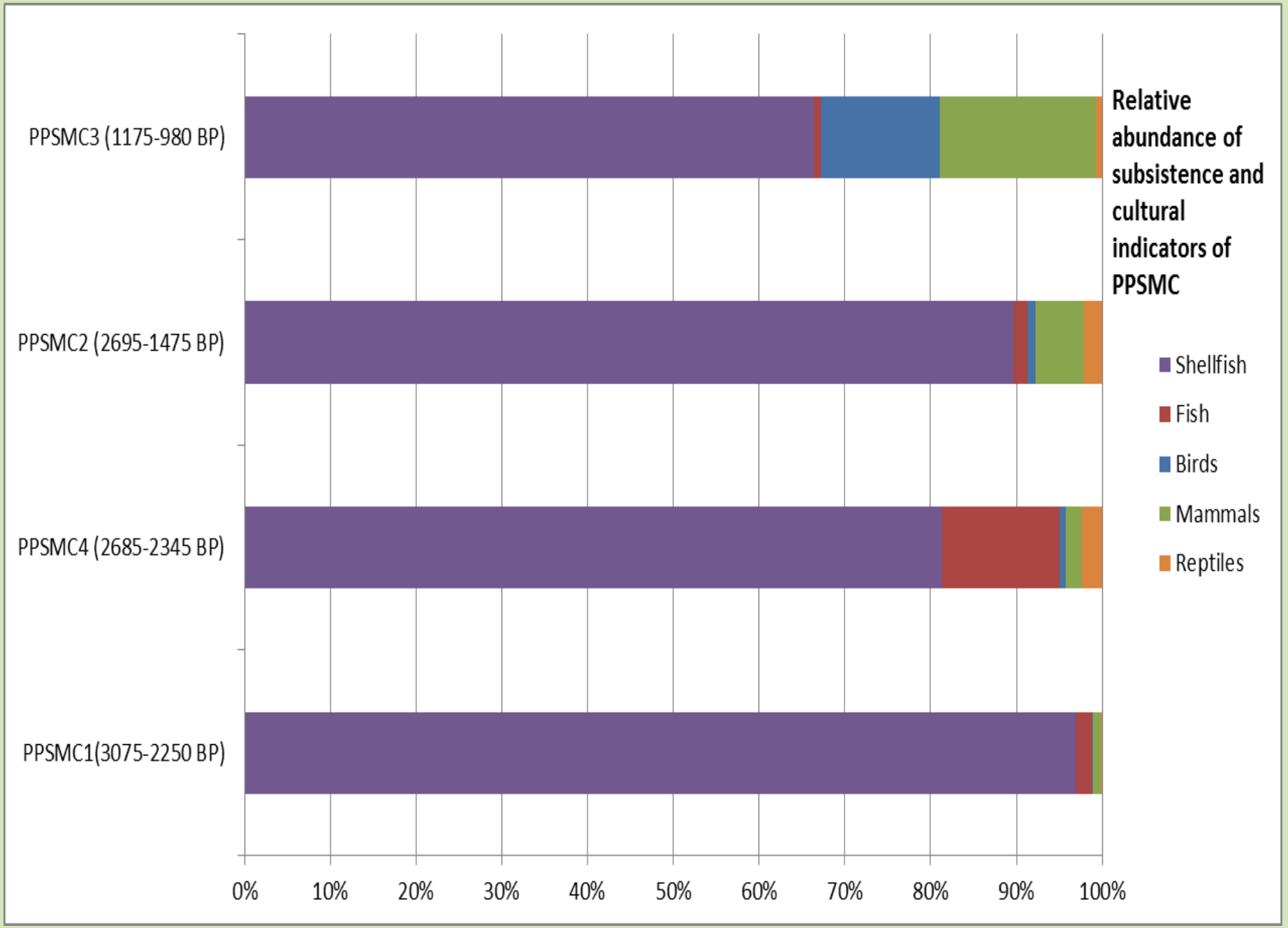
Parkington (2001) argues:

- Coastal sites along the West Coast were occupied on a seasonal basis.
- Based on archaeological indicators of seasonality as well as Southern African hunter-gatherer ethnography.

Sealy (2006) argues:

- Coastal sites along the Southern Cape were occupied throughout the year.
- Based on isotopic analyses of LSA human remains found in the Southern Cape.

- Later we will see how this debate fits into the PPSMC bird analyses data.


Relative abundance of subsistence and cultural indicators of PPSMC
PPSMC3 (1175-980 BP)
PPSMC2 (2695-1475 BP)
PPSMC4 (2685-2345 BP)
PPSMC1(3075-2250 BP)
Shellfish
Fish
Birds
Mammals
Reptiles
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Possible uses of bird remains

Skins

Drawing by Col. R. J. Gordon of the Nama people from the Orange River (Avery 1985).

The ventral side of the PPSMC3 bone awl (Photograph: J. McGrath).

Tools

Meat and fat

feathers

Morus capensis (Cape gannet): (http://www.capenature.co.za/wp-content/uploads/2013/08/Cape-Gannets5_1.jpg)

Religion and decoration

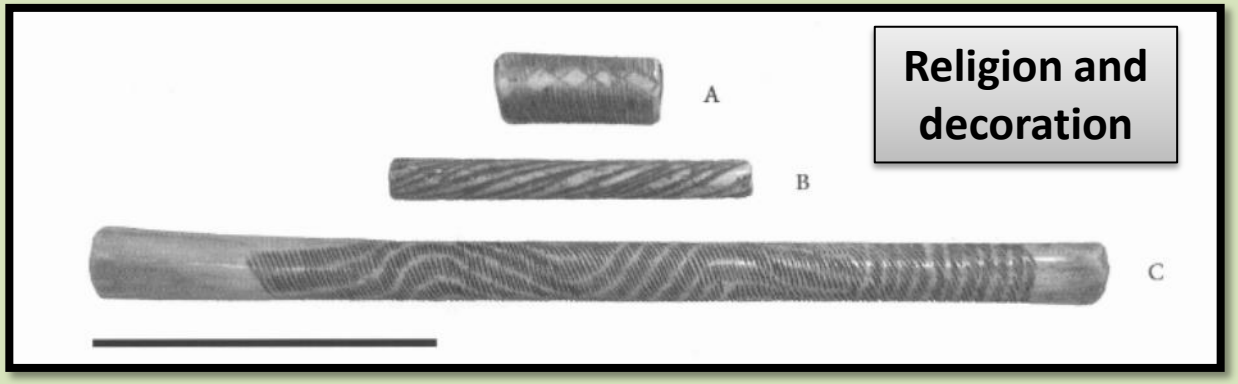
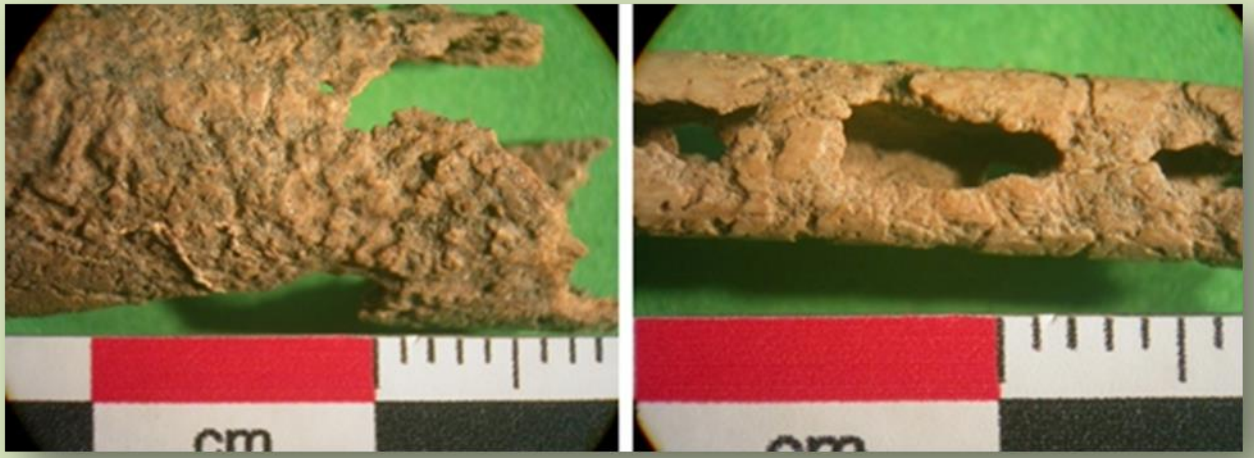
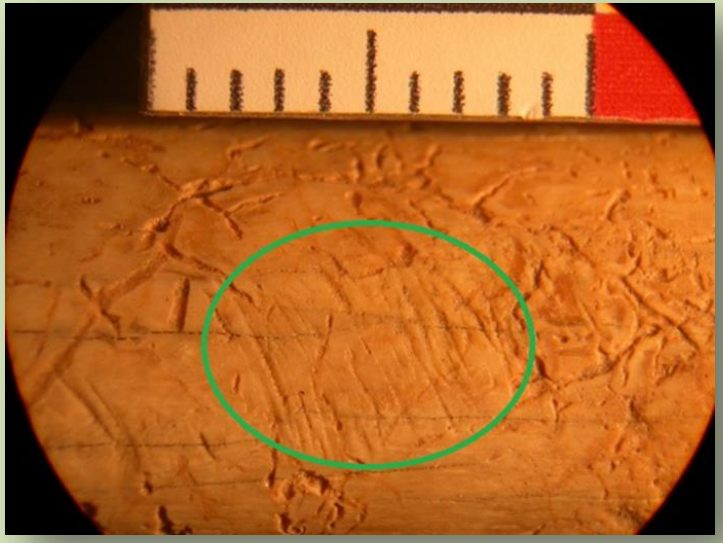


Figure taken from Avery (2011) depicting incised bone tubes. A: a *Morus capensis* ulna segment from Byneskranskop 1. B: *Phalacrocorax* sp. Ulna segment from Nelson Bay Cave. C: *M. capensis* ulna from the Marais Robberg collection.



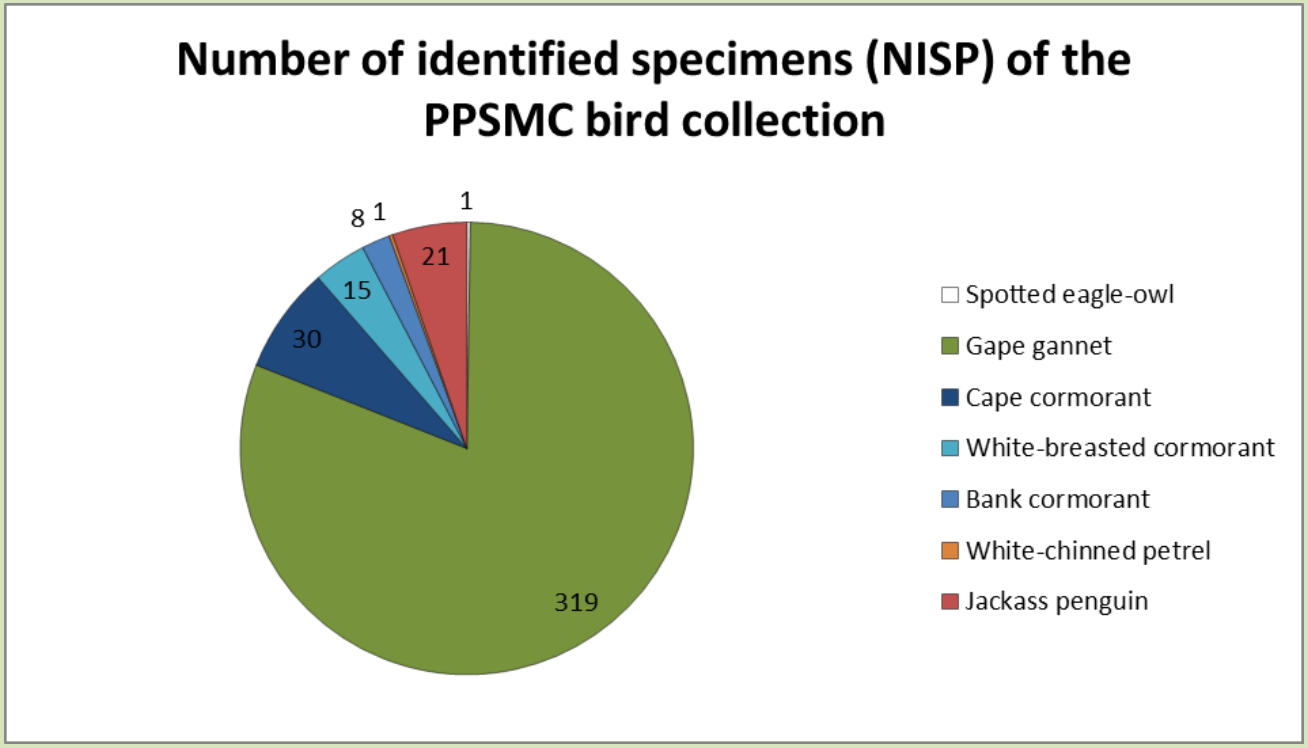
Microscope images demonstrating the extent of root etching to the bird bones (Photograph: L. Richardson).

Sub-parallel striations on the humerus of a Cape gannet bird. The striations are visible within the green circle, other marks present on the humerus are root etchings (Photograph: L. Richardson).

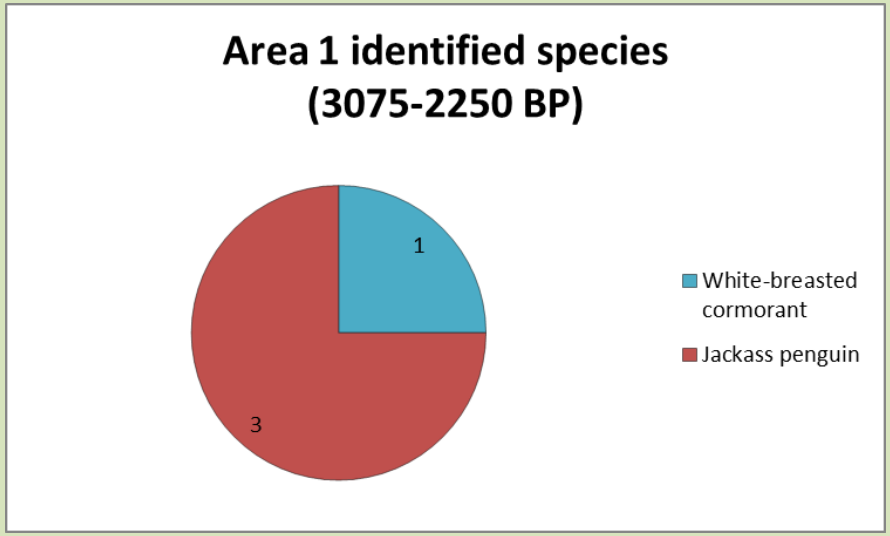


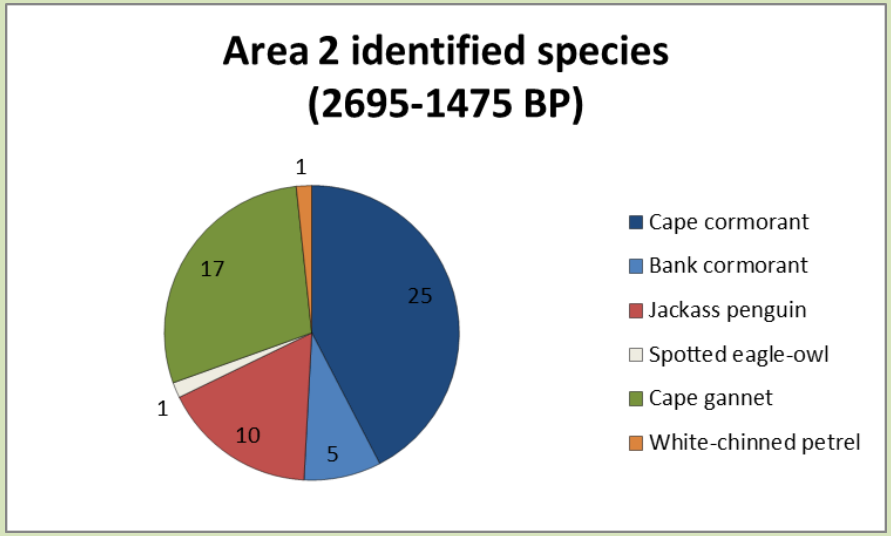
A bone tool (awl) made from a midshaft fragment of a Cape gannet long bone (photograph: J. McGrath).

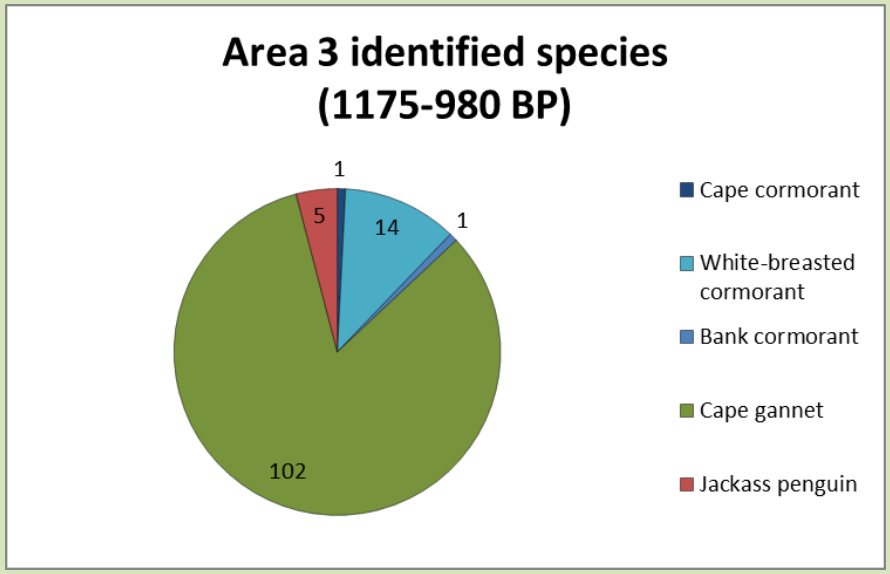
Avian species present at PPSMC						
Scientific name	Common name	Area 1 NISP	Area 2 NISP	Area 3 NISP	Area 4 NISP	Total
Bubo africanus	Spotted eagle-owl	0	1	0	0	**1**
Morus Capensis	Cape gannet	0	17	302	0	**319**
Phalacrocorax capensis	Cape cormorant	0	25	1	4	**30**
Phalacrocorax lucidus	White-breasted cormorant	1	0	14	0	**15**
Phalacrocorax neglectus	Bank cormorant	0	5	1	2	**8**
Procellaria aequinoctialis	White-chinned petrel	0	1	0	0	**1**
Spheniscus demersus	Jackass penguin	3	10	5	3	**21**
Unidentifiable	Unidentifiable	7	53	428	14	**502**
Total		**11**	**112**	**751**	**23**	

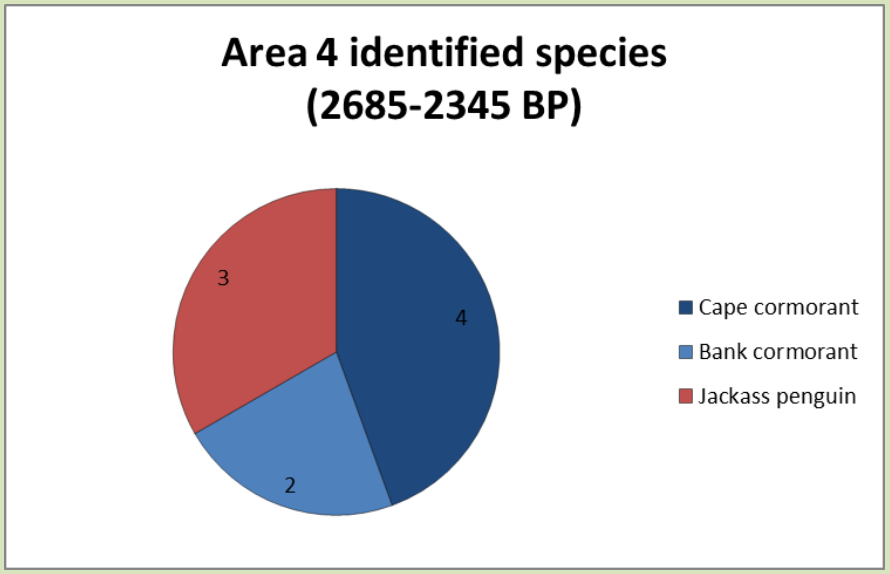


The number of identified specimens (NISP) for Areas 1 to 4

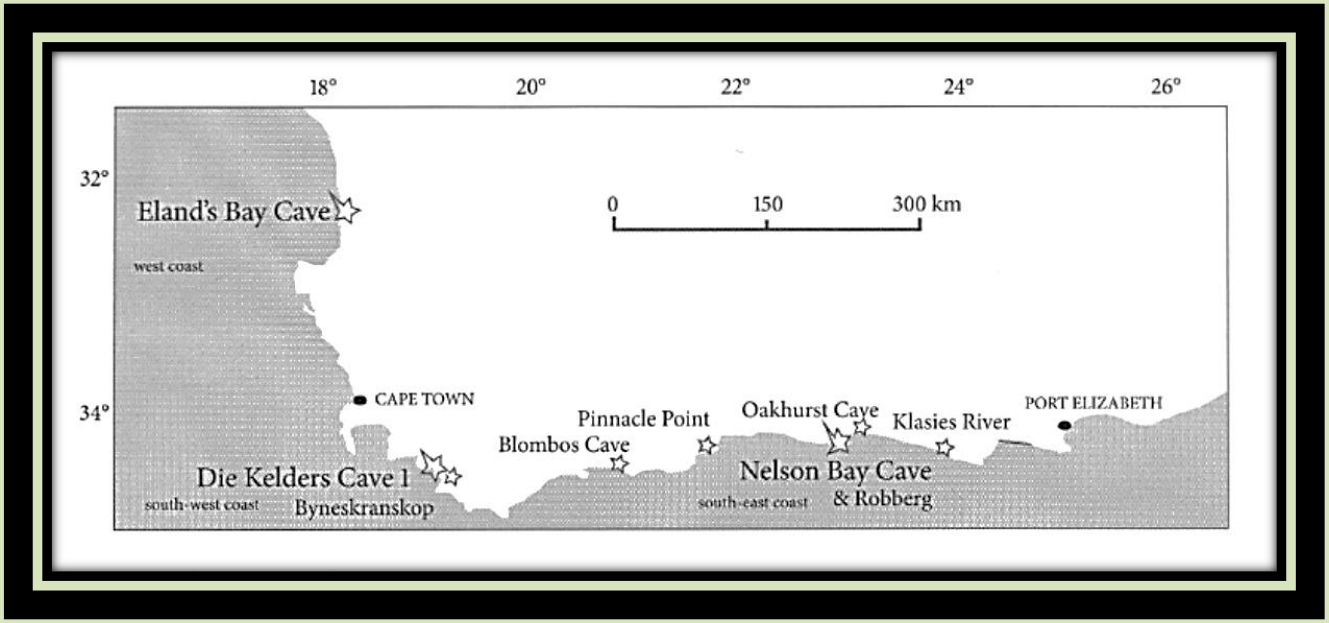




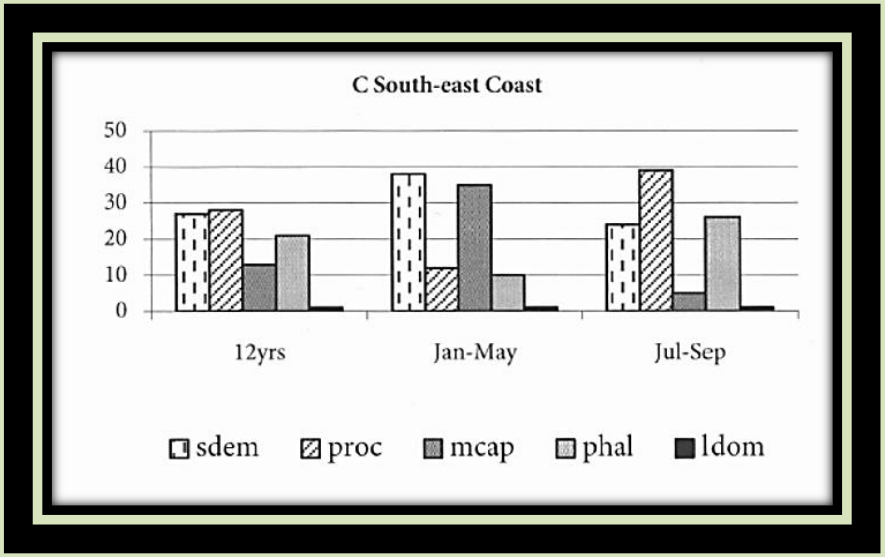




Seasonal occupation



Pinnacle Point in relation to nearby archaeological sites. (Avery 2011)



Seasonal variation in beached birds along the south-eastern coast of South Africa. sdem = *Spheniscus demersus*, proc = *Procellariidae*, mcap = *Morus capensis*, phal = *Phalacrocoracidae*, ldom = *Larus dominicanus*. (Avery 2011)

Cape gannet carcass washed up on the Cape Agulhas strandline (Photograph: L Richardson).

Season of occupation at PPSMC

- **Area 1 and Area 4** (pre-pastoralist) were occupied in the winter season.

The cormorant species prominent with a seasonal available between Jul to Sep.

- **Area 3** (post-pastoralist) was occupied in the summer season.

The Cape gannet species prominent with a seasonal availability between Jan to May.

- **Area 2** (introduction of pastoralists) was occupied throughout the year.

Presence of both cormorant (winter) and gannet species (summer).

Seasonal mobility debate continued

- **Areas 1 and 4** (pre-pastoralist)

Winter occupation sites. Both seem to have a seasonal mobility pattern similar to the West Coast.

- **Area 2** (pastoralists entering the Cape)

Sedentary site, occupied throughout the year. The arrival of pastoralists to the Cape during this period may have restricted mobility.

- **Area 3** (post-pastoralist)

Herder-forager site occupied in the summer. Mobility most likely less restricted due to hunter-gatherers being assimilated into herder groups.

- It should be noted that the absence of bird remains in the archaeological record cannot be seen as evidence for the absence of foragers along the coast. Bird remains can only indicate what season of the year foragers were present along the coast and actively acquiring birds, they may have preferred higher quality food resources when they were available.

Acknowledgements

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