

Quarterly report October 2009

The ecology of African buffalo (*Syncerus caffer*) in the Okavango Delta, Botswana

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Since the last report, my data collection has been continuing in the same way, following the protocols that I have set out.

The high flood waters that came into the study area last June caused access problems for me, in that certain areas were out of bounds for several months. This meant that I was unfortunately unable to reach my data collection targets for the Early Flood season, though I was only missing three sample sites. These I should be able to make up for next year.

The Late Flood season began in August and will run through until November. The collars that I deployed in June have mostly been working well, providing me with plenty of additional information, as well as increasing the number of sites that I can access for sampling purposes. The herds in the Stanley's area have been difficult to get to because of water levels, but I have managed to collect lots of data from the herds on the Gomoti side. I intend to focus more on the Stanley's herds now that the water has dropped.

One of the collars that was put out in April, T5HS – 1876, stopped sending me GPS fixes on the 3rd September. When this happened previously, with T5HS - 1874, it was because of a fault with the collar's modem and the collar was still on the animal. This time, I obtained a fix for the collar from the air, but was unable to see a herd. I drove in and was able to recover the collar from the ground, where it had fallen. The collar appeared to have been ripped off the animal, causing damage to the cables. This is a shame because the animal was lost, but shows that the collar will break under extreme duress, which is a better option than injuring the animal. The cow in question had been wearing a collar for close to a year, so the collar was due to be removed fairly soon anyway.

Another cow that was collared at this time last year has been wearing her collar successfully since, so I intend to remove that one and redeploy in onto a new individual. So far, I have collected almost a full year's worth of GPS data from 6 animals, with 5 others currently collared. I have a refurbished collar to go out as soon as possible as well. In total, I hope to have a full year's worth of data from 13 animals, giving a significant insight into habitat use and movement patterns of buffalo in the Delta.

Two collared cows were originally collared in separate herds, but have spent the majority of their time since collaring in the same herd. They have moved up and down the north-eastern side of Chief's Island three times since collaring. They have not been further than Chief's Camp to the North, and have spent most of their time in the south on Santantadibe Island, in NG17, although some time was spent further south (Fig. 1).

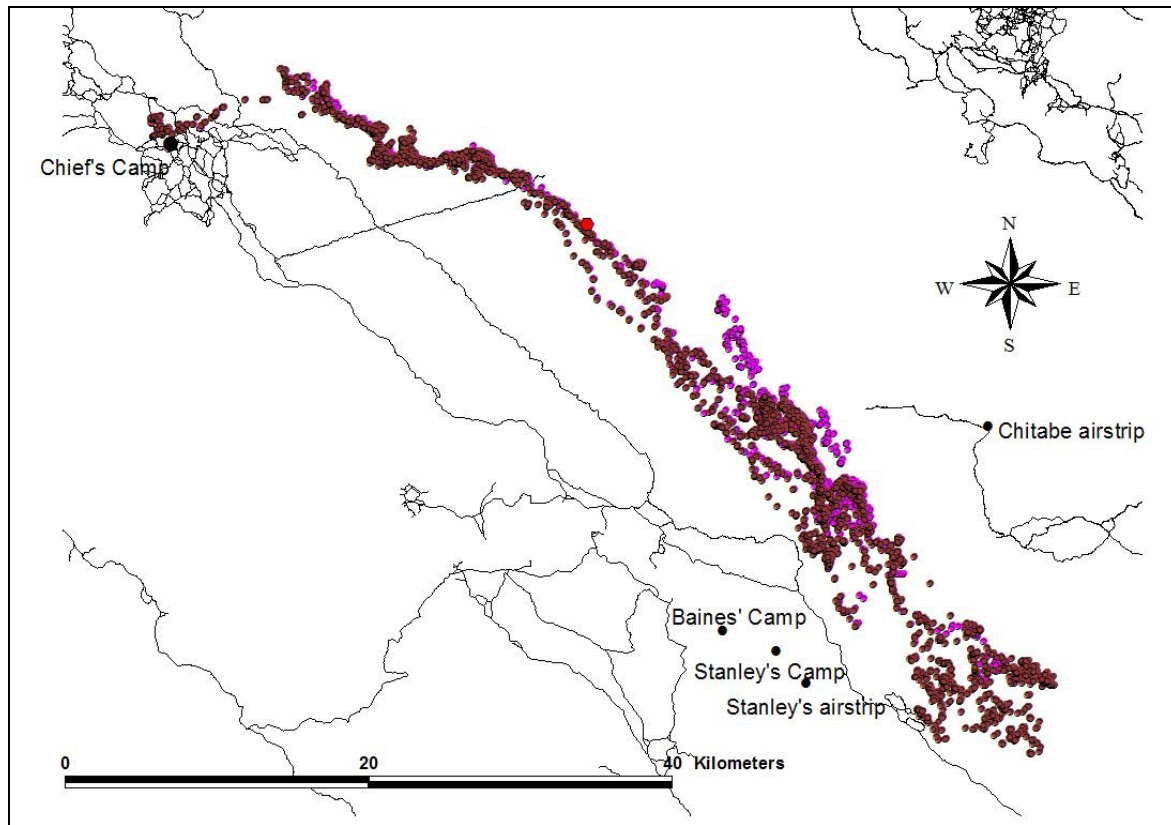


Figure 1: Movements of B73 and B77 from 24th June, 2009 to 7th October, 2009. Red dot indicates current position (both collars in one herd).

This is an unusual movement pattern, as they do not appear to be spending large periods of time in any one place, rather appear to be feeding whilst being constantly on the move, to a greater extent than any of the other collared animals. I intend to sample along their path shortly, as well as at both ends of their route. They have spent some time in different herds, but only at either end of the trips – they walk up and down together. They have not strayed far from the edge of Chief’s Island during the trek. Whether this is due to unusually high water levels, or simply because it is easiest for them to walk in a continuous manner along the edge of the island is unclear.

Two other cows that were collared in the Stanley’s area have been spending some time in the same herd (as at present), but their home range has been far more diffuse (see Fig 2), with a much looser association between the two animals. This year, a large proportion of the Stanley’s area has been flooded. This could explain the home ranges being less linear than in other areas. Buffalo herds appear to spend the majority of the early and late flood seasons on floodplains. I have not accessed the area used by these two collared animals for a couple of months now, but when I was last there not only were the floodplains flooded, but also large portions of grassland. There is an area in the south-eastern part of the map that appears to have been avoided to a greater extent than others. This area is dominated by mopane woodland, which is a habitat type that only has viable forage during the wet season.

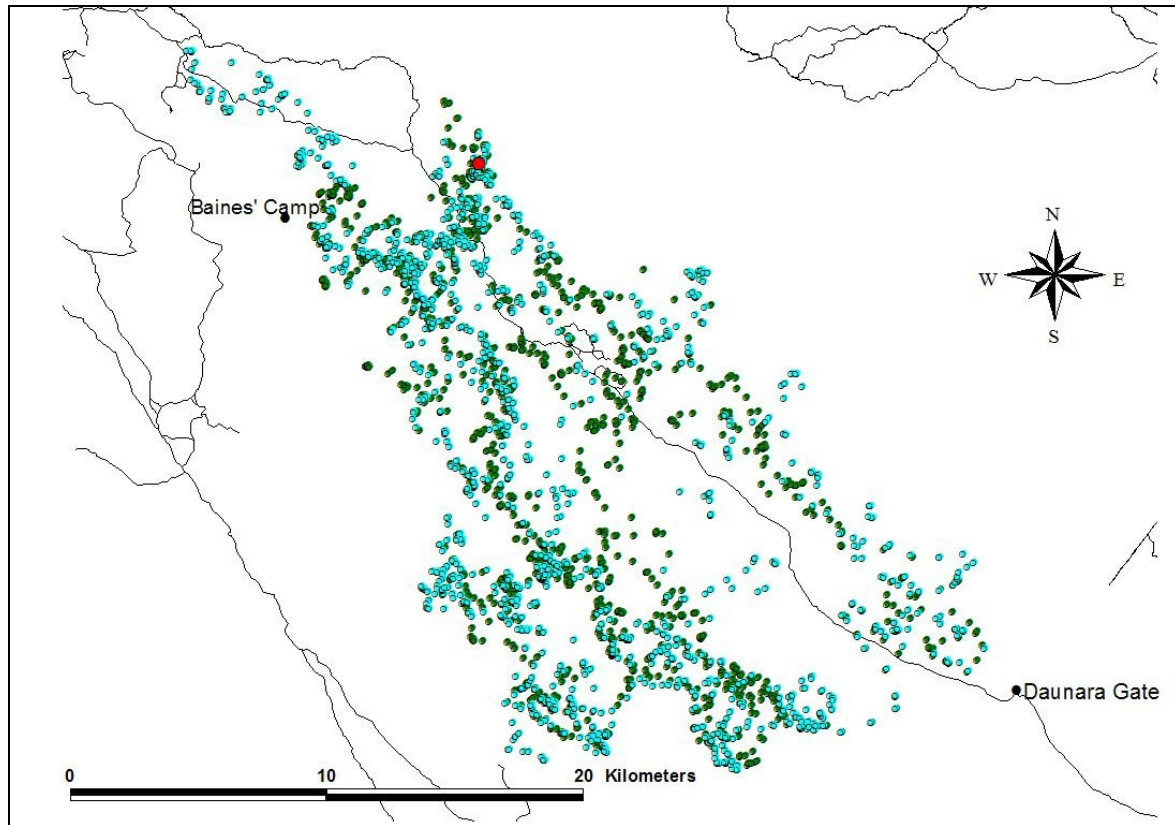


Figure 2: Movements of B75 and B78 from 24th July, 2009 to 7th October, 2009. Red dot indicates current position (both collars in one herd).

The other collared animals have been spending their time around the Gomoti and Chitabe areas, with varying degrees of overlap. B36 has been the most wide-ranging (see Fig 3), whilst B37 has stayed within a relatively short distance of my base camp (see Fig 4). B76, whose collar I have just recovered, overlapped with both of these herds (see Fig 5).

All of these collared animals clearly avoided the inside of the Chitabe land mass, focussing on the floodplains. B37 spent several weeks inland, in close proximity to my base camp, which I was a little surprised by. The herd was found mostly in grassland areas, with some mopane dominated areas also being used. Pans were still fairly full, so they did have reasonable access to water. It was only a few weeks ago that the herd moved to spend the majority of their time in habitats next to channels and floodplains.

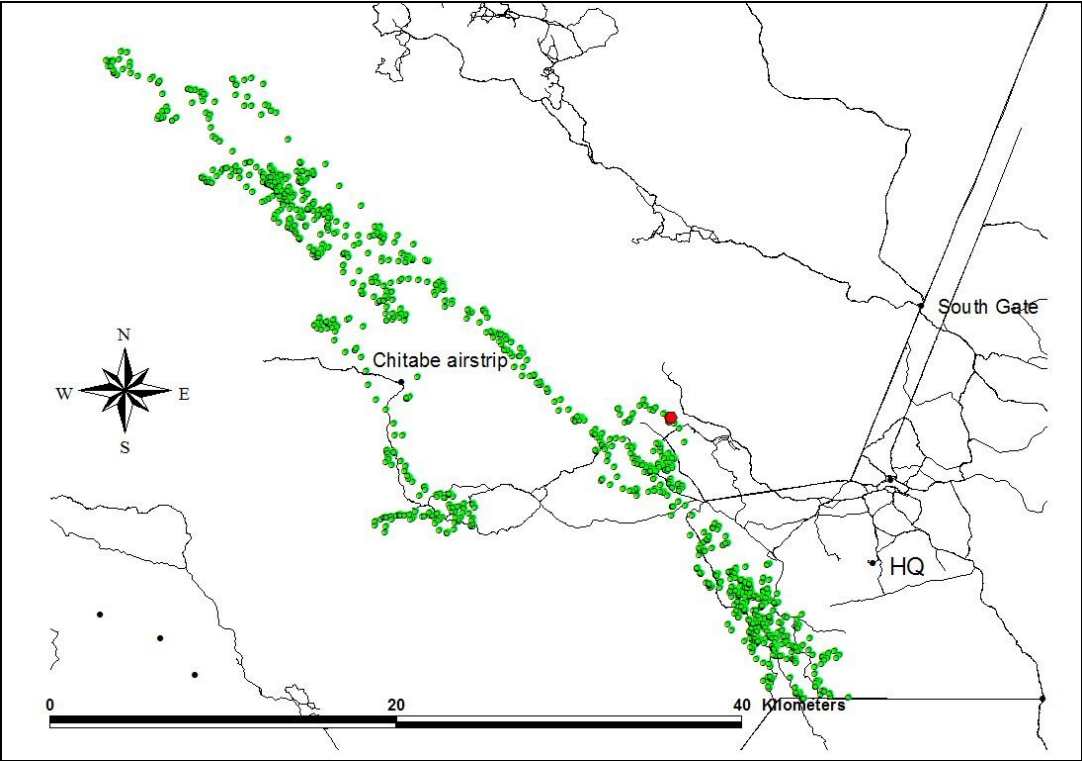


Figure 3: Movements of B36 from 24th July, 2009 to 7th October, 2009. Red dot indicates current position.

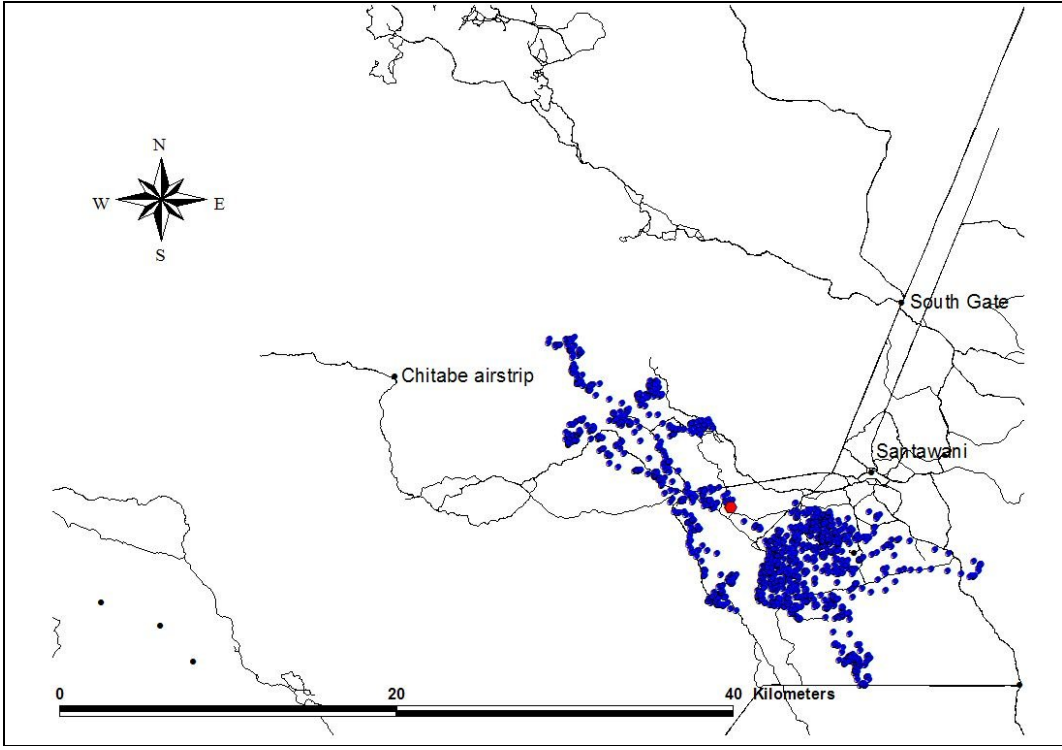


Figure 4: Movements of B37 from 24th July, 2009 to 7th October, 2009. Red dot indicates current position.

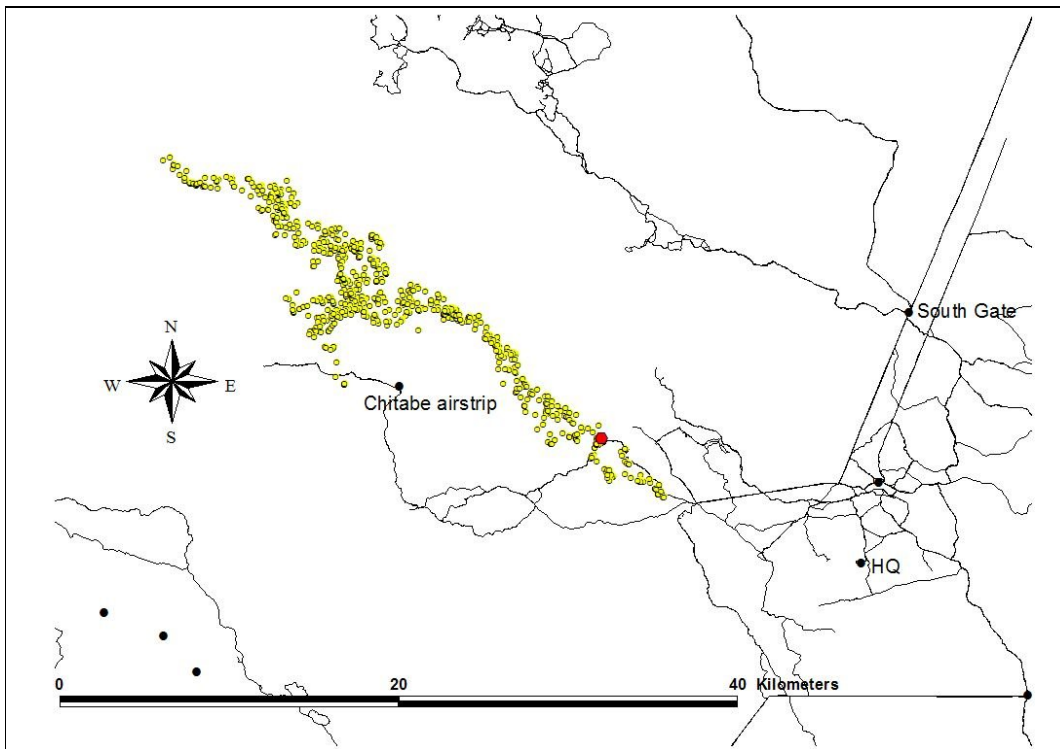


Figure 5: Movements of B76 from 24th July, 2009 to 3rd September, 2009. Red dot indicates last position.

I have been compiling the GPS and habitat data for the animals that were collared for a year. When comparing the varying proportion of habitat use across the seasons, several points stood out. Herds on the Stanley's and Gomoti side appear to use habitat types to different extents during the wet season. One main factor is the absence of the Low Mixed Woodland (LMW) habitat from the Stanley's area. This habitat type is used extensively by the Gomoti herds, whereas the Stanley's herds must turn elsewhere for their forage, likely using grassland habitats more (see Fig 6). Proportional use of Open Mopane (OMP) and Dense Mopane (DMP) seem to be relatively similar in both areas.

It is however difficult to ascertain how prevalent the preference for certain habitat types is without determining their availability. This is the next step for me with this aspect of my research. I am consulting with staff at the University of Bristol to identify the best protocol for this. I will either have to map vegetation types, or plot thousands of randomly generated points into Google Earth, recording the habitat type of each.

Figs 7 and 8 show the overall use of habitat types for herds in both areas, since they all use similar habitat types during the flooding seasons. In each of these graphs, certain habitat types that are used minimally (less than 7.5%) have been left out of the representation.

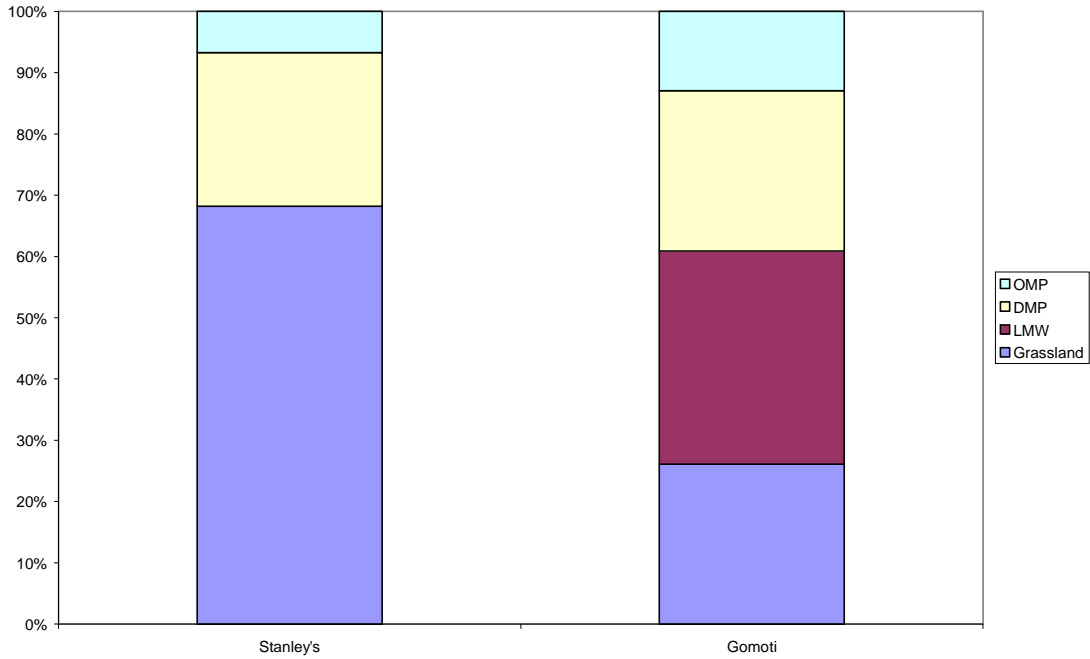


Figure 6: Proportional habitat use by herds in different areas during the wet season 2007-08.

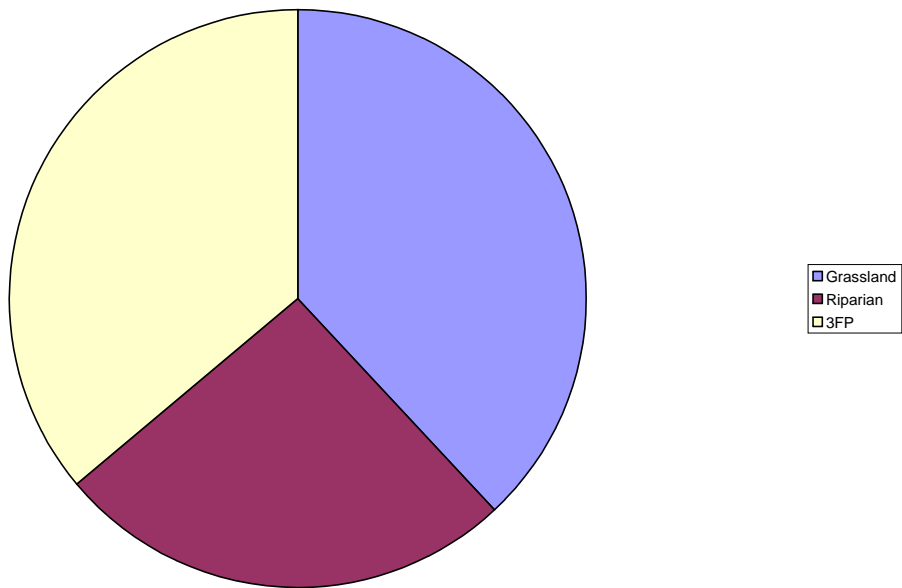


Figure 7: Habitat use by all collared buffalo herds during the Early Flood season, 2008

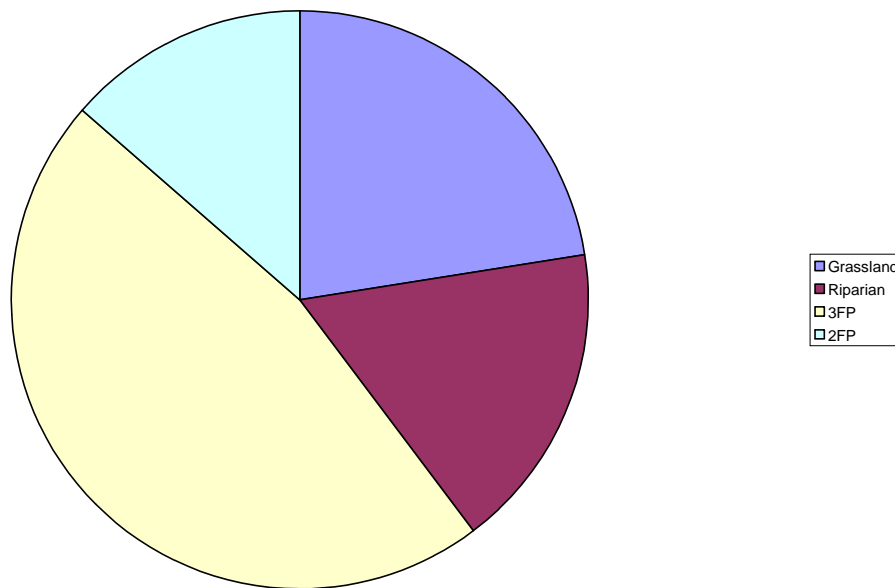


Figure 8: Habitat use by all collared buffalo herds during the Late Flood season, 2008

Secondary floodplain was not used to a significant extent during the early flood season. This could be because the waters rise over secondary floodplain early on in the season, rendering them inaccessible. The fact that they are used in the late flood season, despite being flooded for the majority of the season, indicates that they could provide a valuable source of forage when the floodwaters start to recede. This will be looked into more closely.

I have recently been receiving reports of large herds of buffalo from pilots in areas all across the Delta, as well as seeing large aggregations myself. I will shortly be asking pilots from charter companies to record all herds that they see within a week, as a way to estimate the most frequent herd size. I did this last year, so I would be interested to see whether there are any changes this year, given that the water levels on the Gomoti are still very high compared to last year.

I have been approached by a colleague, Rasmus Heller from the University of Copenhagen, Denmark, who is currently carrying out research into population genetics and evolutionary biology of buffalo. He has expressed an interest in collaborating with me in some way, potentially obtaining DNA samples from herds in the Okavango Delta, an area that has not been studied as intensively as some other parts of southern Africa. This could provide an interesting additional insight into the study that I have been carrying out.