

Long Distance Migration of Zebra Z6399

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Introduction

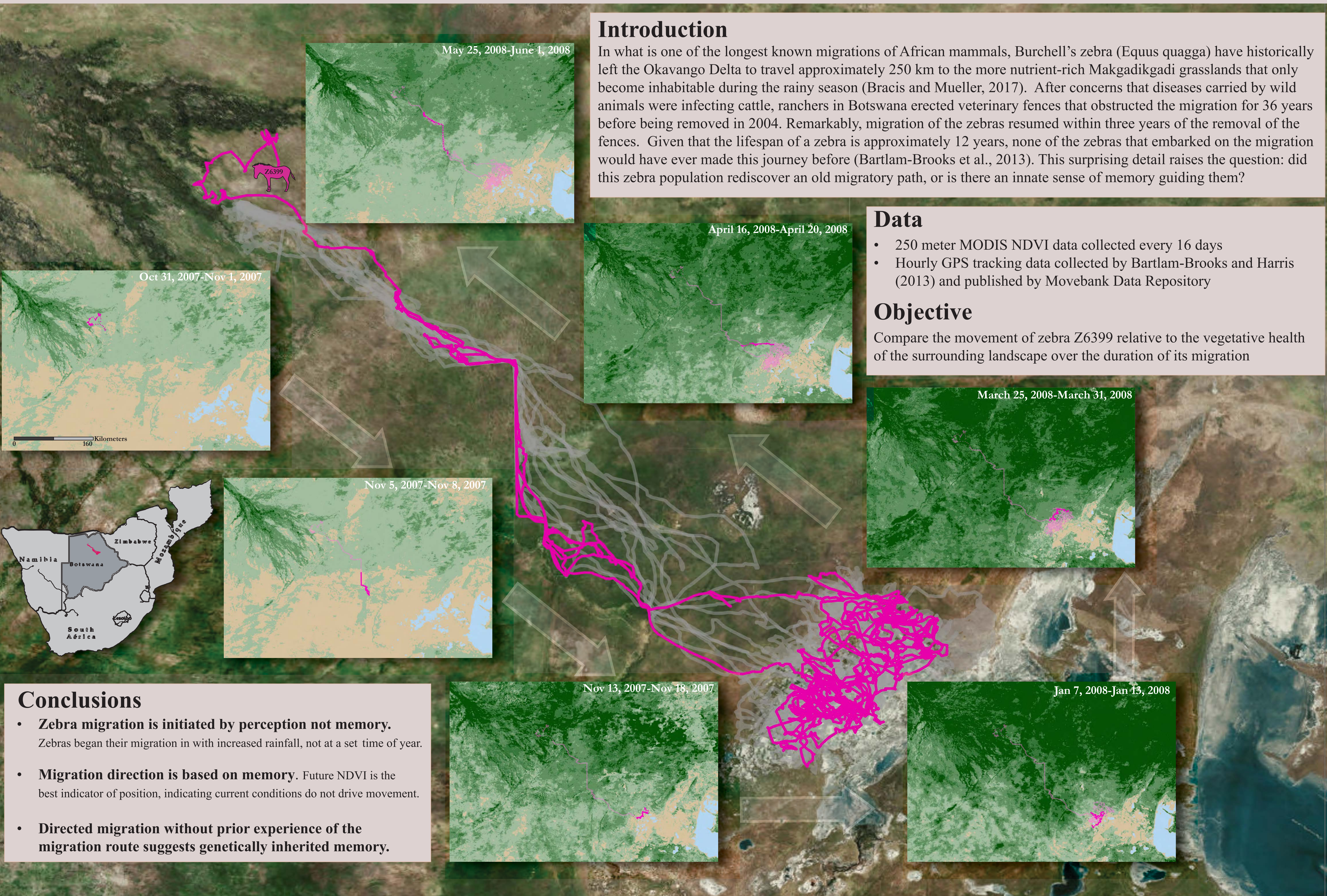
In what is one of the longest known migrations of African mammals, Burchell's zebra (*Equus quagga*) have historically left the Okavango Delta to travel approximately 250 km to the more nutrient-rich Makgadikgadi grasslands that only become inhabitable during the rainy season (Bracis and Mueller, 2017). After concerns that diseases carried by wild animals were infecting cattle, ranchers in Botswana erected veterinary fences that obstructed the migration for 36 years before being removed in 2004. Remarkably, migration of the zebras resumed within three years of the removal of the fences. Given that the lifespan of a zebra is approximately 12 years, none of the zebras that embarked on the migration would have ever made this journey before (Bartlam-Brooks et al., 2013). This surprising detail raises the question: did this zebra population rediscover an old migratory path, or is there an innate sense of memory guiding them?

Data

- 250 meter MODIS NDVI data collected every 16 days
- Hourly GPS tracking data collected by Bartlam-Brooks and Harris (2013) and published by Movebank Data Repository

Objective

Compare the movement of zebra Z6399 relative to the vegetative health of the surrounding landscape over the duration of its migration



Conclusions

- **Zebra migration is initiated by perception not memory.**
Zebras began their migration in with increased rainfall, not at a set time of year.
- **Migration direction is based on memory.** Future NDVI is the best indicator of position, indicating current conditions do not drive movement.
- **Directed migration without prior experience of the migration route suggests genetically inherited memory.**