CMS GIUM

Global Initiative on Ungulate Migration

FACT SHEET



Plains Zebra: Makgadikgadi National Park, Botswana

Migration Description

Zebras in central Botswana undertake a seasonal migration between the Boteti River and the Makgadikgadi grasslands, making a round trip of nearly 120 km. This population remains predominantly within the Makgadikgadi National Park. The Boteti River forms the western boundary of the national park and provides the only dependable dry-season water source for the park's wildlife. During the dry season, zebras travel progressively further from the river to feed on grasses growing in better quality and in greater abundance. Individuals have been recorded foraging 30–35 km from the river before returning to drink. Although they typically return every two to three days, researchers have recorded intervals of up to seven days. With the onset of the rains, zebras migrate eastwards to the nutrient-rich grasslands surrounding the Makgadikgadi salt pans, which become accessible as seasonal rainfall fills ephemeral pools. Some movements extend eastwards beyond the park boundary.

The Boteti–Makgadikgadi migration is distinct from the Okavango–Makgadikgadi zebra migration. During the wet season, zebras from these two migratory populations converge on the Makgadikgadi grasslands, forming large seasonal aggregations. As the pans dry, the Boteti migrants return west to the river and resume their dry-season foraging pattern.

Threats to Migration

The Boteti River is critical to sustaining the Boteti-Makgadikgadi zebra migration because it provides the only dependable natural water source on the landscape. Large numbers of zebras converge along the river, increasing potential competition with livestock for water and grazing, particularly during droughts. The wildlife fence, built along the western and southern boundaries of the national park, currently helps limit livestock and agricultural pressure along the park boundaries. However, deterioration or removal of the fence could increase these pressures and restrict access to important dry-season habitat. Artificial water provision presents a different challenge by altering the seasonal availability of water that drives migration. Artificial water sources within the zebras' wet-season range have been associated with changes in zebra migration timing, with some animals remaining there longer after rainfall ceases. Climate change represents an additional concern because movements are closely tied to seasonal rainfall and water availability. Because the migration is triggered by the timing and intensity of seasonal rainfall, shifts in rainfall patterns linked to climate variability could delay, shorten, or otherwise disrupt the timing of the zebras' movement onto the pans, with follow-on effects for forage access and foaling success, as well as potential impacts on carnivores and scavengers that prey on zebras. Together, changes in land use, water management and climate could alter the environmental conditions that maintain this migration.

Local Population Facts

Migration

Seasonal

Medium 42 km (avg.)

Threats

Climate change; Energy dev.; Urban sprawl; Linear barriers; Agriculture; Livestock; Illegal killing; Other

Species Facts

Common name: Plains zebra

Species name: *Equus quagga*

Range: Fragmented ranges in southern and eastern Africa

Diet: Grasses, some woody browse

Global population: 150,000-250,000

IUCN Conservation Status

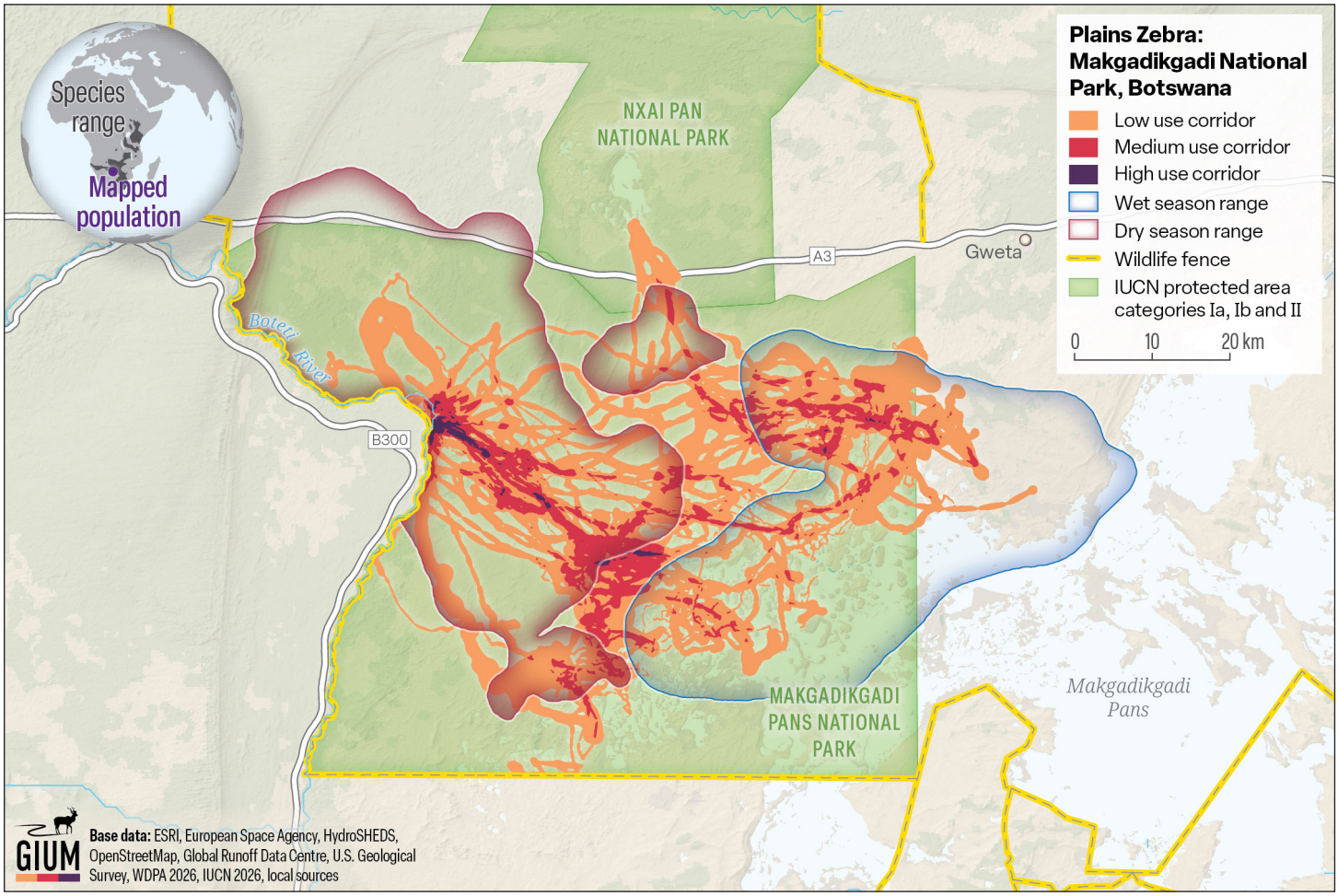
NT Near threatened

CMS Status

Not listed

Published: November 17, 2026

Plains Zebra Migration



Wet season range				Wet to dry season migration		Dry season range						Dry to wet season migration	
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec		

Study Information

Relocation frequency
15 minute GPS fixes

Project duration
2 years (2009–2011)

Data Analysis

Migratory individuals mapped
20

Delineation of migration periods
Seasonal shifts between dry and wet season ranges

Models derived from
Brownian Bridge Movement Model

Route Summary

Migration start and end date (median)
**Highly variable, depending on rainfall*

- Dry to wet season transition: November 28–December 11
- Wet to dry season transition: May 9–June 9

Average number of days migrating
**Highly variable, depending on rainfall*

- Dry to wet season transition: 11 ± 4
- Wet to dry season transition: 14 ± 9

Migration route length

- Min: 11 km
- Mean: 42 ± 14 km
- Max: 66 km

Data Providers

Data were collected under the direction of Dr. James Bradley then at the University of Bristol. This project was funded by charitable donations from Wilderness Safaris Wildlife Trust, The Rory and Elizabeth Brooks Trust, Dulverton Trust, Oregon Zoo, The Sophie Danforth Conservation Biology Fund, The Richard Stapley Educational Trust, Jim and Paula Crown, Ideawild and SAVE Wildlife.

In partnership with:

DEPARTMENT OF WILDLIFE & NATIONAL PARKS
BOTSWANA

CMS www.cms.int

The Convention on the Conservation of Migratory Species of Wild Animals (CMS), also known as the Bonn Convention, is an environmental treaty of the United Nations that provides a global platform for the conservation and sustainable use of terrestrial, aquatic and avian migratory animals and their habitats.

GIUM www.cms.int/gium

The Global Initiative on Ungulate Migration (GIUM) was created in 2020 to work collaboratively to: 1) create a Global Atlas of Ungulate Migration using tracking data and expert knowledge; and 2) stimulate research on drivers, mechanisms, threats and conservation solutions common to ungulate migration worldwide.

View and Download Map Data from the GIUM Migration Atlas

All fact sheets, maps, and geospatial products are made available under a CC-BY 4.0 license.

Bradley, J., & Boyers, M. (2026). Plains Zebra: Makgadikgadi National Park, Botswana (Version 1). Global Initiative on Ungulate Migration. Atlas of Ungulate Migration. Convention on the Conservation of Migratory Species of Wild Animals. https://doi.org/10.5281/zenodo.23319690