

**Research, briefly:**

# Drought affects benefits of migration



Jakopak

## Key takeaways

For migrating mule deer, drought reduced access to nutritious plants by reshuffling and changing the rate of growth in plants.

Many migratory herbivores time their spring migration with the burst of nutritious plant growth that spreads across the landscape. Scientists have called this behavior surfing the green wave, and this style of movement helps herbivores have more opportunities to eat nutritious food while migrating. Drought poses a new and growing threat to surfing by changing the timing of the plant's life-cycle and potentially reducing the foraging benefit of migration.

Migrating mule deer had less access to spring green-up in drought years than in non-drought years. Drought changed the order and pace of spring green-up, causing reshuffled green waves to move quicker across the terrain, making it more difficult for mule deer to eat high-quality food while they were migrating.

All routes were affected and essentially compromised by drought to some extent. Routes with long green-up durations in average years improved during wet years, but they worsened during drought years. However, routes with short green-up durations remained unchanged, albeit they were low quality routes with low foraging opportunities to begin with. Although drought affected routes, it did not sever any migratory routes.



## Careful habitat management might help offset negative effects of drought

Drought-induced changes to the landscape are expected to have an impact on migratory ungulate populations whose movements are fine-tuned to current plant patterns and can take generations to learn.

Although drought will likely continue to disrupt plant green-up patterns, conservation efforts that eliminate movement barriers and prevent habitat fragmentation can help ensure that migratory ungulates have necessary access to forage along their migratory routes.



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Based on “Drought reshuffles plant phenology and reduces the foraging benefit of green-wave surfing for a migratory ungulate” an article published in *Global Change Biology* in 2019 by E. O. Aikens, K. L. Monteith, J. A. Merkle, S. P. H. Dwinnell, G. L. Fralick, and M. J. Kauffman.

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The “greenscape,” or the landscape characterized by the rate, duration, and order of green-up along an animal’s migratory route, has a significant impact on how well individuals surf. By measuring greenscapes, researchers can compare the quality of routes and evaluate how the green wave is altered by climate.

Researchers used a 19 year (2001-2019) dataset on drought and the timing of the plant’s life-cycle, paired with migratory routes from 99 female mule deer migration routes in western Wyoming.