

Research, briefly:

Mule deer can, but do not always, learn migratory behavior from mother.



Key takeaways:

Young mule deer can learn migratory behaviors from their mothers.

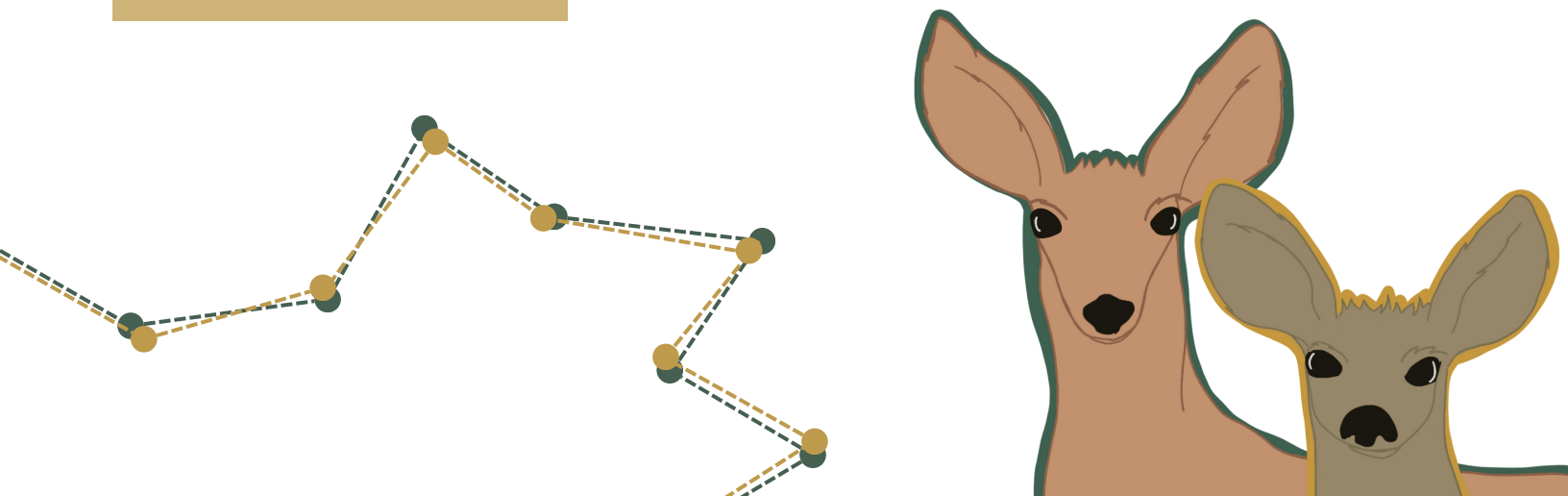
But, they don't always! Some mule deer established migratory behaviors that differed from their mothers.

Early life experiences can have life-long implications: route taken during their second migration informed the movements of mule deer for the remainder of their lives.

Every autumn, many mule deer in Wyoming migrate from their high-elevation summer ranges down to sagebrush-covered winter ranges. They travel up and over mountain ranges, cross rivers, and navigate through roads, towns, and other forms of human development. Remarkably, they tend to take the same migratory routes and return to the same summer and winter ranges, year after year.

We have long assumed that mule deer learn migratory behaviors, including which migratory route to take, from their mothers. Mule deer that are just 6 months old complete their first migrations alongside their mothers. That first migration might be the pathway for how young, inexperienced mule deer learn how and where to migrate.

Q: Can mule deer learn migratory behavior from their mothers?



Mule deer can learn from their mothers!

Most daughters used migratory routes that overlapped with their mothers. Daughters could retrace these paths through complex landscapes, even if their mothers were not present. This overlap suggests that they learned migratory behavior from their mothers.

But surprisingly, a few daughters did not follow in the footsteps of their mothers! Instead, they found their own paths.

Whether daughters learned from their mothers or not, the paths they took during their yearling migration influenced their routes for the remainder of their lives. Mule deer use memory to guide their movements, and early life shaped their life-long memories.

Implications for conservation.

First, learning from mother is an important component of maintaining migratory behavior in mule deer. Conservation efforts that maintain habitat connectivity will make it possible for the behavior to be passed from mother to offspring.

Second, adult mule deer rarely change their migratory routes, but in a changing world, staying faithful to migratory routes can be detrimental. The daughters that established different migratory routes from their mothers provide a previously unappreciated opportunity for resilience of migratory behavior in changing landscapes.

Researching learning.

Using GPS collars, we studied 16 pairs of mothers and daughters. We followed daughters from birth to their first migration, through their second migration as yearlings, and until the end of their third migration as adults.



We examined whether adult daughters used routes that overlapped with their first routes, which they used while migrating alongside their mother. Overlap suggested that daughters learned migratory behavior from her mother. Little or no overlap suggested that daughters established migratory behavior using other methods.

This research brief summarizes the main findings from a peer-reviewed research paper. Learn more by reading the paper, "Migratory routes are inherited primarily from mother in a terrestrial herbivore"! This research brief was published in 2025 and was led by Rhiannon Jakopak.

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