



Climate Change and Kentucky Wildlife

by Matthew T. Springer

In this issue of Kentucky Woodlands Magazine, several potential impacts of climate change on our forests have been covered. Those issues will have direct or indirect impacts on Kentucky wildlife populations and distributions. As is the trend with climate change, impacts will be species-dependent and could vary greatly.

As wildlife biologists, we monitor several categories to help us understand the status of populations and the potential impacts of habitat, harvest, disease, etc. Outside of hunting or trapping seasons, activities managing wildlife usually fall within one of the three overarching habitat components: food, cover, and water. Reproductive and thermal requirements fall within that broader cover category. Other activities play roles in management to lesser extents: for instance wildlife health monitoring for disease and parasite issues, useful indicators for the overall health of populations. This particular activity may become especially important if a new disease or parasites enters a system and its impacts to populations are unknown. More on why this may be more important in the future of wildlife management under the context of climate change a bit later in the article.

Usually wildlife populations thrive if all or most of those categories are present to meet the needs of the species. For example, when there are enough snags of sufficient size and decay category present within a forest stand to support woodpecker foraging and nesting needs, or those snags also meet the daytime resting sites for Indiana bats then we would expect there to be healthy population levels in that stand. However, how climate change becomes an issue for wildlife is when the species we are managing for has

evolved to deal with temperatures, water cycles, or plant communities that may no longer be the norm for those areas or lost completely. Let's go into how the predicted climate variations may impact our Kentucky wildlife species in both negative and positive manners.

Diseases and Parasites

Diseases and parasites are an often overlooked group that will likely become more of an issue moving forward. Ticks and tick-borne disease are predicted to increase in prevalence and abundance as winter temperatures become warmer, increasing their overwinter survival. Ticks usually do not cause individuals to perish on their own, but add another stress to that individual potentially resulting in reduced reproductive success. However the new invasive species to Kentucky, the Asian Longhorn tick, can be the exception to that rule. Along with aiding tick survival, the changing environmental conditions will potentially allow diseases to be present temporally within the year or occurring more frequently or new novel diseases may be introduced. A prime example may be EHD/Blue tongue in deer, which occurs every five to 10 years when we have droughts helping to increase populations of the midge that transmits the disease, may be something that occurs annually with new weather patterns.

Higher Temperatures, Drought, and Extreme Weather Events

Overall temperatures are predicted to increase across the state, with western parts being a bit more impacted than eastern parts. Temperature can have varying impacts on wildlife species as physiologically each species has a thermal zone they can thrive and survive in. Species that have a harder time regulating their own body temperature or those that are cold blooded and



Species like the black and white warbler and wild turkey may be at higher risk of impacts from climate change than others like the bobcat due to their annual cycles being tied to insect emergence and abundance. Alternatively, ticks and related issues will increase in abundance and duration they are active as the climate remains warmer longer.



are regulated by the environment will be the most impacted, but many of our species in the state are not at the extremes of their temperature ranges and the increase predicted will not push them over the edge.

Indirect impacts from higher temperatures may have a larger impact on wildlife in Kentucky. Many of the predictions for our region involve varying precipitation patterns which will include slightly more rain but falling in ways that will create micro droughts and extreme weather events like floods or tornadoes. Water is a major factor in the survival of wildlife especially those that either reproduce directly in it, salamanders, frogs, toads, as well as just being able to acquire drinking water from freestanding sources, which can have major impacts on species of bats and others that do not necessarily acquire water through metabolic sources.

Wildlife have evolved with flooding, ice storms, tornadoes, wildfires, and other extreme weather that occasionally occurs within our state. Models predict these events to be more common occurrences in the future. Larger or more mobile species can relocate themselves easily to areas sheltered from these events while some will either find ways to survive them or unfortunately their local populations will take a hit. The bigger concern may be the rates at which these events occur. If they become more frequent it would give local populations less time to recover from them and eventually push localized extirpation. On the positive side, these disturbance events may create early successional habitat which is lacking within Kentucky.

Phenology and Food

Many of our wildlife have evolved to time life history events alongside key resource abundances. For instance, songbirds will migrate to Kentucky at the time when leaves are budding and insects are becoming more abundant on the landscape. The opposite side of the spectrum, waterfowl migrate to Kentucky from the north when wetland seed resources are available and water bodies are still unfrozen. The timing of these resource pulses can be vital to adults feeding young enough for them to develop at rates needed to survive the upcoming fall and winter. With insects and many plants being more responsive to earlier growing windows and warmer temperatures, those food pulse timings may be earlier and disrupt wildlife depending on them. Those species would spend more energy to forage and feed their young, resulting in less young being produced or surviving, lowering population's overtime. Conversely, some herbivores like deer or elk could benefit from earlier growing seasons and be in better physical condition when it is time for them to have their young.

Summary

As with habitat alterations that regularly occur in our landscapes, there will be winners and losers as our climate shifts. Those species that are more generalized in their habitat, food, reproductive, or other physiological requirements will most likely respond in favorable ways. Those animals that have specialize behaviors or habitats may be more vulnerable and could see population declines or distributions altered. That could especially be true for those that are linked to vegetation that may be reduced or lost completely with the new climates. We may also even see new species call our state home as their climate allows for them to survive, think the now more commonly seen armadillo in western and southern Kentucky.

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