

# Drought and wildlife: Explore the connection

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The 2012 drought may have important impacts on wildlife populations, both negative and positive. Population dynamics incorporate a suite of factors, large and small, but drought can set the system atilt.

Severe drought affects many wildlife species in ways that we can relate to with our human experience. Droughts lead to less food and water, as well as deterioration of various forms of cover. Some effects are current. Other effects will continue long after the rains resume. For many species, drought is hazardous. For others, it may be a time of opportunity. Impacts on populations may last several years.

Immediate effects include heat stress, fewer water sources and reduced amounts of fruit and forage. These environmental conditions can lead to physiological stress and contribute to higher levels of mortality and lower breeding success. These are the sorts of factors that most of us might think about right away.

But there is more, and much of it has to do with habitat quality.

In the forest, dry conditions lead to lower overall production of fruits and nuts, something called “mast.” Although, in some cases, the current year response may be the opposite. Trees and other plants produce less palatable browse, in both quantity and quality. Some herbaceous species go into dormancy earlier. Reductions of these energy rich food sources result in less fat build-up among herbivores. Those wildlife species that remain resident throughout the winter may not have enough reserves to survive. Those that migrate will have a more difficult passage and will need good food supplies at their destinations, if they arrive.

Poorer habitat quality has ramifications beyond the summer. Trees and shrubs will produce fewer flower buds. That means that next year, there will, again, be a lower amount of fruits and nuts. Aspen will have fewer flower buds to feed wintering ruffed grouse. Increased mortality of perennial vegetation leaves cover gaps needed for overwintering, breeding and shelter from predators and foul weather. Vegetation on sandy and shallow soils is particularly vulnerable.

Reduced lake levels are more than just a recreational inconvenience. Exposed structure reduces habitat for certain fish species. Wider shorelines increase the risk of predation by animals that utilize these riparian zones. Of course, this is good if you're a hawk, owl or coyote. It also may be good to re-establish and invigorate some wetland plant species - if the lake reductions aren't long term.

Changes in when and how lakes stratify and mix affect nutrient and oxygen levels. These levels are important to fish and other aquatic wildlife. Warm weather can prevent mixing, which means insufficient amounts of oxygen may reach the deeper parts of a lake.

Lower stream levels won't do any favors for most aquatic mammals, especially during the upcoming winter. Warmer summer flows discriminate against cool water fish species, such as trout. Low spring water levels can hamper fish runs and leave fish more vulnerable to predation.

Aquatic insect populations have taken hits this year. We've enjoyed a lack of biting bugs, but that's a vacancy at the bottom of the food chain that reverberates throughout the web. Insectivores have had to travel further and expend more energy. Winter may intensify this issue.

Drying micro-habitats reduce the number of overwintering areas for reptiles and amphibians. Species concentrate in and around the remaining areas, which make populations more vulnerable to diseases and predation. Those forest vernal ponds may not have carried water longer enough to bring maturity to some species of frogs, toads, and salamanders.

Bark beetles and wood boring insects may flourish. Drought-stressed trees are less able to repel the invading larvae. Certain fungi that control populations, such as those of gypsy moth, fail during dry springs, which might lead to larger defoliating insect outbreaks in 2013.

Risk of certain diseases will increase. Avian botulism can occur in shallow ponds and wetlands, which are favorite haunts of waterbirds. The warm water with decaying protein matter allows the bacterium *Clostridium botulinum* to blossom. Large bacterial populations produce toxins that can be fatal to birds.

Blastomycosis is fungal disease associated with lower water levels, warm weather, and decaying wood, especially around beaver ponds. Dogs are particularly vulnerable but humans can also contract the disease.

Some drought effects on wildlife are fairly easy to identify and track. Others are more difficult to identify, as drought creates underlying predispositions that make healthy wildlife populations more vulnerable. Some impacts are long-term. Drought is an important factor in wildlife ecology.

Changes in habitat quality and environmental effects within an ecosystem can be complex and sometimes counter-intuitive. Ecosystems will recover from short-term weather trends. However, if long-term change is underfoot, we may be looking at another set of ecosystem dynamics in an uncertain future. Time will tell.

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