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Acton WildAware Beacon Article

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Drought 2016

The National Weather Service provides an informative definition of drought. "Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones, from very wet to very dry. Drought is a temporary aberration from normal climatic conditions, thus it can vary significantly from one region to another. Drought is different than aridity, which is a
permanent feature of climate in regions where low precipitation is the norm, as in a desert."

There are national, regional and local sources of information about the drought. Current information is available on the OARS.org Home page. The abbreviated post indicates that, "dry conditions have persisted in New England for 6 months straight, and that rainfall through November is predicted to be inadequate to end the drought." Now that the growing season has ended, tips for indoor water conservation are being recommended.

Acton residents responded cooperatively to the summer water ban. In the Acton Water Supply District minutes for September 12, 2016, it was reported that "due to the recent ban on outdoor water use, peak demand has been cut in half, from around 3 to 1.5 million gallons per day. The ban was implemented on August 15th when the drought status was escalated to a drought warning."

Locally, the Acton Land Stewards cited dried up bogs, streams and vernal pools and low water in ponds on conservation lands. A longtime Central Street resident reported that Fort Pond Brook behind his back yard dried up completely, for the first time since he moved to Acton in the 1950s. Beaver seemed to disappear, although at Heath Hen Meadow where the water level was very low, the beavers reacted by continuing to fortify the dam with mud even though there was no sound of gurgling running water that usually triggers their instincts to repair and seal gaps.

Brian Butler, President of Oxbow Associates, Inc., a wetlands and wildlife consulting company, contributed anecdotal information from field work to this article. Mr. Butler has studied the ecology of reptiles and amphibians for over 30 years. He related the plight of several Box turtle nests in Norfolk, Massachusetts. Grass growing adjacent to the nests sent down roots into the eggs in search for moisture in the parched, open canopy soils. "The Box Turtle eggs were excavated on August 4, 2016, a couple of weeks before they would normally hatch. Due to the drought, they didn't have a chance. The adjacent grasses wanted the water in the eggs." Brian went on to say, "Spotted turtles construct egg nests in sandy soils where the top-most egg is about 1 cm from the soil surface.

Because of this, in years like this one, those clutches are often lost to dessiccation. Fortunately, some Spotted turtles nest on Sphagnum hummocks within their wetland habitat; that behavior probably pays a dividend in years of extended drought and high heat."

Brian related that Fish and Wildlife biologists working at Oxbow National Wildlife Refuge in Harvard to protect nests and recruit hatchlings for head-starting of Blanding's turtles, began early to support optimum survival of this years' hatchlings. Even so, due to the drought there was a low 60% success rate among protected nests. In normal years of adequate rainfall there is an 85 to 90% chance of success for nests protected from predators. Additionally, insects often respond to lack of water by invading turtle nests. Brian described that "during times of drought, Sarcophagus fly larvae and ants invade turtle nests around the time of pipping (when turtles hatch out of eggs but have not yet emerged from the nest). They (maggots or ants) go into the nests, enter the pipped eggs and feed on the embryos and their yolk sacs. They sometimes refill the eggs with sand that they have brought in during tunneling through the nest."

Regarding the impact of the drought on birds, according to Brian, "one example is that there were not as many earthworms available due to dry soil conditions that kept them from emerging near the surface-too far underground for Robins to reach. And there were fewer flowers, therefore less pollen to feed bees, butterflies and other pollinators."

As for the drought challenges to amphibians, Brian shared that "amphibians require moist conditions to move about and feed, either diurnally or nocturnally. Local amphibians in particular had many fewer opportunities to feed through the parched summer months when they should be accumulating fat to support next season's breeding. Similarly, the predators that feed on amphibians as they move about also went without to a greater extent than a "normal" season. Amphibians like Wood Frogs and Spotted Salamanders must be able to keep their skin moist because that is, at least in part, how they respire. Their moist skin allows oxygen in and particularly allows carbon dioxide to escape. When their skin dries out, carbon dioxide accumulates in their blood." On a positive note for amphibians, Brian reported that one year of drought is not a total disaster. For example, if due to lack of rain at breeding time, Spotted Salamanders reabsorb their eggs because conditions are not good for egg and offspring survival, their 25 to 30 year lifespan means that skipping a year of egg laying due to stress is okay. Similarly, Brian indicated that if the summer of 2016 reduced the food obtained by members of this species, some females may not have accumulated enough fat reserves to produced a clutch of eggs this fall to be deposited next spring. In sum, "One bad year is not a significant impact on these long-lived animals, but repeated climate hardships could be."

Resources:

Brian Butler, President of Oxbow Associates
http://oxbowassociates.com/index.html

Acton Water District-Rebates on high water use appliances

http://www.actonwater.com/conservation/high-efficiency-toilets-and-clothes-washers-help-save-you-money

National Weather Service: http://www.nws.noaa.gov/os/brochures/climate/DroughtPublic2.pdfhttp://www.nws.noaa.gov/os/brochures/climate/DroughtPublic2.pdf

OARS: http://www.oars3rivers.org/severe-drought and on Facebook: https://www.facebook.com/OARS3Rivers/?fref=ts

United States Drought Monitor: http://droughtmonitor.unl.edu/

MASSACHUSETTS WATER RESOURCES COMMISSION-Hydrologic Conditions in Massachusetts-October 2016 Summary: http://www.mass.gov/eea/docs/dcr/watersupply/rainfall/reports/2016/october-2016-hydrologic-conditions.pdf

Cold Water Fisheries Setback by Drought: http://www.telegram.com/news/20161029/coldwater-fisheries-setback-by-drought

Monitoring of Water Resources to Continue, Water Conservation by Public Necessary: http://www.mass.gov/eea/pr-2016/historic-drought-conditions-continue-for-commonwealth.html