

Brian Murphy:



The Northeast Region is thought to have plenty of water yet widespread drought was experienced in the 1960's and as recently as 2016. I was doing a little bit of research trying to find out about the drought in the 1960s which was the northeast drought of record. At that time, President Johnson had ordered a study seeking to assist the northeast region and the Mid-Atlantic States with dealing with the drought. Apparently, things were actually getting pretty desperate, such that the mayor of York, Pennsylvania actually took 350 dollars out of his own pocket to pay for a rain maker! I'm not sure how that exactly worked out, since the drought was over two years later. In essence, droughts are predicted to become more prevalent in northeast region with climate change influencing patterns of rainfall and temperature. What I'm going to do today is briefly talk about four drought management plans within our northeast region and some of the instream flow of protections for aquatic resources or lack thereof.



For the State of Connecticut, we have a drought plan that was revised in 2016. It's managed by an interagency drought work group. There's six different agencies within that drought work group, including my agency, the Department of Energy and Environmental Protection where the Fisheries Division is housed. However, the lead agency is the Office of Policy and Management. We now have a new five tiered approach for drought stages from heightened awareness to extreme drought. That terminology was changed to avoid confusion with drought stage terms used by water suppliers in their State mandated water supply plans. Each stage is determined by monitoring two separate groups of criteria, primary and secondary. For us in the instream flow business,



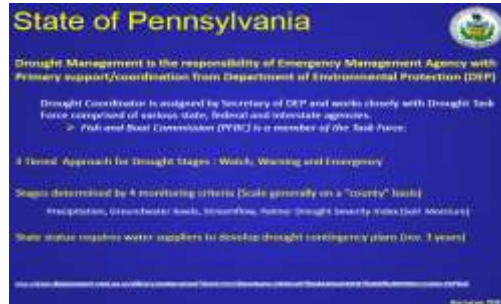
switch to another water supply system in an adjacent basin. In the long term, restrictions that we place on water withdrawals during the regulatory review permit process is the best way to be protecting our resources, during low flow periods as well as drought. Sometimes if we're waiting until drought, it's probably too late to provide protection.



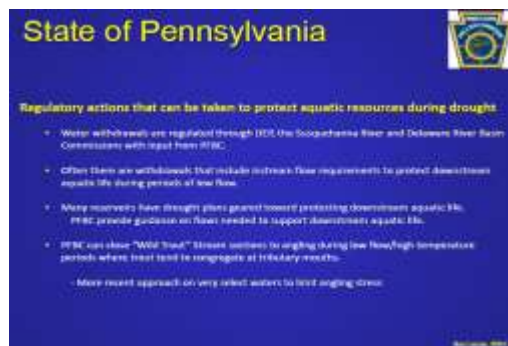
As mentioned, we had a drought in Connecticut during 2016. One of the fisheries' agency tools that we utilized was to issue an emergency closure of fishing to eight key tributaries to the west branch of the Farmington River to protect trout. Sometimes, we're not going to be able to augment additional water during drought, but we certainly can protect these resources especially when trout congregate within thermal refuges. We had some pretty good buy-in from the anglers. We put out a press release, increasing public awareness. I was pretty impressed with the anglers. They have a way of being able to police themselves in these heavily utilized angling areas.



In Pennsylvania, drought management is the responsibility of the emergency management agency with primary support and coordination from DEP. A drought coordinator is assigned by a secretary of the DEP who works closely with the Drought Task Force that's comprised of various state and federal agencies. The Fish and Boat Commission is a member of that task force. They have a three tiered approach for drought stages: watch, warning and emergency. The stages are determined by four monitoring criteria. Basically the scale of drought is determined on a county level. State statute requires water supplies to develop drought contingency plans that are revised every three years. There are different actions water suppliers have to implement depending upon the stage of drought.



There are regulatory actions that can be taken to protect aquatic resources in Pennsylvania but it's not necessarily the result of specific actions taken by the drought taskforce. As we heard today, there are withdrawals that are regulated through the DEP in the Susquehanna River and Delaware River Basin Commissions. We heard about the flexible flow management plan within the Delaware River Basin. There also are withdrawals in the State that include instream flow requirements to protect downstream aquatic life during periods of low flow and there are many reservoirs in Pennsylvania that have drought plans that are geared toward protecting aquatic life. PA Fish and Boat Commission staff provide guidance on recommended downstream flows. Similar to Connecticut, the PA Fish and Boat Commission can close wild trout stream sections to angling during low flow and high temperature periods to limit angling stress. This is done recently on a few select waters.



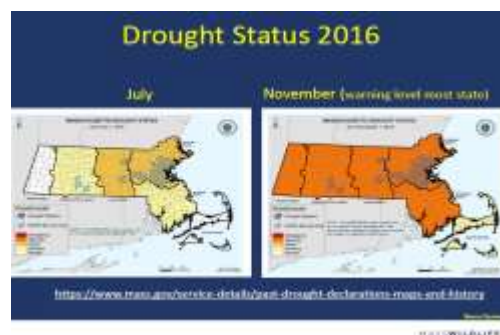
State of Massachusetts drought management plan developed in 2013 is in the process of being revised. The lead agencies are the Office of Energy and Environmental Affairs and Emergency Management Agency, these are more cabinet level agencies closer to the governor's office. There is a drought management taskforce that's comprised of multiple agencies, organizations and conservations groups. It seems like Massachusetts was the only state that actually had NGOs as members of their taskforce. I think that's pretty good to have NGOs being part of the drought decision making process.



There's six different drought regions within Massachusetts. The plan incorporates seven drought management parameters with five different action levels from normal to emergency.



Like all the states within our region, Mass has a webpage where you can look at the current drought status. So here's just an example from Massachusetts during the 2016 Drought. From July through November, the drought status went from a watch to a warning stage for most of the State.



While not always explicitly stated, the drought plan does provide protection for fisheries resources in Massachusetts. The plan identifies MassWildlife's role to assess impacts to fish and implement measures to mitigate these impacts. The taskforce does receive input from fishery staff when deciding on specific

drought level actions. Though public health and drinking water concerns are always going to be the main priorities, timely water conservation actions really help protect fish and wildlife resources. Its inherent protection in that if you're reducing water demand it's going to really lessen the impact at water supply sources.



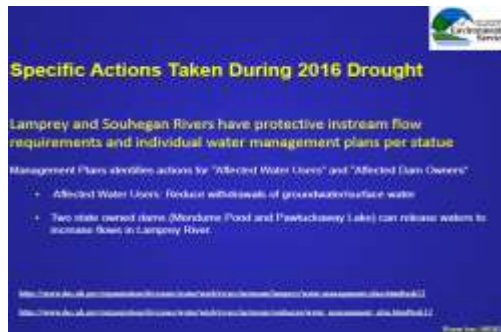
State of New Hampshire drought management plan recently revised in 2016 is managed by a Drought Management Team. It's comprised of 31 support agency officials and the Department of Environmental Services is the lead agency. I always get that “warm and fuzzy feeling” when we have an environmental agency that is taking the lead. I have more confidence in drought management decision making. There's five drought management areas within the state. Five action levels from watch to disaster with four different monitoring or assessment parameters.



I talked to Wayne IVES from DES about some specific actions that were taken during 2016 during the drought. The Lamprey and Souhegan Rivers have protective instream flow requirements and individual water management plans per state statute. The management plan identify actions for affected water users and affected dam owners. Affected water users can reduce withdrawals of groundwater/surface water and there are two state owned dams that can release waters to increase flows within the Lamprey River, however only the



Lamprey River only has the infrastructure changes needed to accomplish flow augmentation releases.



In September of 2016, there was a two day release of 10.5 cfs from Pawtuckaway Lake. This downstream flow release resulted in lowering the lake level six inches. So here we are trying to balance the need for protecting downstream flows and then also making sure that we're maintaining recreational water levels within the lake.



In summary, drought management plans in our region help guide activities in response to droughts, define the specific actions of different state agencies and include assessment and monitoring of various drought parameters. Public outreach components are very important and all drought management teams include fisheries and environmental staff as members. The plans don't always specifically spell out instream flow, aquatic resource protections but there are inherent protections as water conservation helps reduce impact at the water supply source.

It is my opinion, in the long term, state agency permit requirements for water withdrawals and recommended instream flows are most important to ensure the protection of aquatic resources during low flow seasons as well as during droughts. Lastly, fisheries agencies do have the authority to close areas to

fishing to reduce angling stress on coldwater fish species. With that, there's the summary for Region Four.

