

Flood Effects on Stream Life in Lake County

By John Pogacnik, Biologist

Living in a river or stream is a difficult life. Organisms living in this environment must learn to deal with conditions ranging from droughts to floods. Most of these organisms have learned

constant state of change, roaming unrestricted across floodplains, creating and destroying side channels, backwaters, and a variety of other habitats. Floodplains serve as a particularly important part of the river. They act as a check valve to absorb high flows or flood pulses, they help to cleanse runoff waters, they act as a mechanism of energy exchange, and they provide temporary and seasonal habitats for its biological components. In fact, periodic flooding is a key factor in maintaining a healthy river ecosystem.

Aquatic species appeared to have survived the flooding of the Grand River better than along the smaller tributaries.

Crayfish, aquatic insects and fish were apparent along the Grand River in the days following the storm. The only organisms that appeared to be greatly affected were mussels. After the flood waters receded, mussels that were washed onto the floodplain become stranded. Of the twenty-six mussel species found along the Grand River, nine are on the Ohio list of rare species. Many shells of the rare species were observed along the banks of the river after the storm.

In the streams, all aquatic species were greatly reduced. In most areas only fish were in evidence and their numbers appeared to be about half of what they were previous to the flooding. Many of the aquatic insects that did survive were displaced into a variety of habitats. They have slowly migrated back to their preferred habitats. A week after the storm, along Mill Creek, crayfish and aquatic insects



Big Creek

to adapt to such varying extremes. There may be occasional drops in population levels but they can rebound quickly. The flooding event on July 28, 2006 was different. This event exceeded the 500-year flood level. A 500-year flood—the maximum for which the United States Geological Survey computes statistics—is the peak stream flow that has only a 1 in 500 chance of being equaled or exceeded in any given year. The 500-year flood is not the flood that will occur every 500 years, it is the flood that has a 0.2% chance of occurring each year. This was the type of flood that few animals could prepare for.

A United States Geologic Survey (USGS) crew measured the streamflow in the Grand River at the State Route 84 bridge in Painesville at 19,300 cubic feet per second on July 28 after the river had begun receding. Prior to the measurement the river had peaked nearly four feet higher. Estimates of the stream flow at the peak have been placed at 30,000 cubic feet per second. The highest previous streamflow was 18,700 cubic feet per second in 1975.

Flooding along the smaller tributaries was even worse. The smaller streams lack the wide floodplains found in many parts of the Grand River and the water has no where to go but up. River systems in their natural form are in a



Mill Creek

were almost impossible to find except within 100 feet of where the stream meets the Grand River. However, it was apparent that species were already beginning to recolonize the stream.

Damage to the beds of the streams was severe. In many areas the water scoured away any accumulated sand and gravel and left only solid sections of bare shale. In some areas the water even uplifted sections of the solid shale bedrock and deposited the large pieces into massive piles. Some of these large areas of accumulated shale and rock were deep enough to temporarily restrict the streamflow on sections of Mill Creek and Paine Creek. Erosion along Mill and Paine Creeks created new waterfalls and deepened others.

Another consequence of the flooding is the loss of many streamside trees and shrubs. There are many areas of Big, Paine, and Mill Creeks that were once shaded and are now sunny due to widened floodplains. Since the streams now receive increased sunlight, water temperatures will rise creating difficulties for cold-water dependent species.

How long will it take organisms to repopulate the streams? Will there be a change in species composition due to the increased water temperature due to the loss of streamside trees? These are just some of the questions left to be answered. Many of the species that occupy these habitats have large enough populations that repopulation should not be a problem. But what about species that were rare to start with?

As you venture through these affected stream corridors over the next few years, pay particular attention to the changes occurring. It is not very likely we will be able to observe impacts like these again.

RAPID RELIEF

Disaster assistance response was rapid and effective during and after the flooding. Local safety forces (including the Sheriff and all police and fire departments in Lake County), the Emergency Management Agency, County Engineers and Health Department, Soil and Water Conservation District, the local Red Cross, Salvation Army and United Way all sprung into action to assist and provide aid as quickly as possible. Several local schools were also made available for temporary housing.

Safety forces from across northeastern Ohio provided support in many ways. State and federal agencies were also quick to respond including FEMA, the National Flood Insurance Program, the U.S. Coast Guard and the Ohio Department of Natural Resources.

Lake Metroparks Ranger Department and Recreation Department staff assisted with evacuation and clean-up efforts in affected communities during the week following the flood. Park operations staff also worked hard to restore and reopen damaged parks in a timely manner.

Paine Creek

