

Johnston Run Revitalization update

A LIMESTONE STREAM

– a Valuable Resource

By Elizabeth George MD and Michael Piper, KCI

Since last fall, utilizing a grant from the National Fish and Wildlife Foundation, Johnston Run Revitalization Council has been working in collaboration with MACWell and local municipalities to restore Johnston Run as a “living waterway”. The run is on the Department of Environmental Protection list of impaired streams. Even without this label, locals can tell you that our water resource has been devoid of significant fish wildlife and has been murky with sediment from erosion and flooding for years - not a place where we would want our children to fish and play.

A **watershed management plan** is being developed for Johnston Run by KCI Technologies, Inc., a consulting firm experienced in water resources and land management. Since this winter, KCI has been assessing the health and function of the stream, the adjoining flood plain, and watershed; they have been collecting samples and recording water pollution and degraded environmental conditions. Michael Piper, the research director from KCI, sent photos of recent progress, and I was particularly intrigued by this photo showing a lush growth of watercress. I asked Mike about this and he provided a very encouraging answer. It turns out, that while our stream is currently impaired and not supporting a vigorous fish population, it has significant potential to be a fine habitat for trout!

LIMESTONE STREAMS

by Michael Piper (KCI)

“The story of the watercress in Johnston Run is really a story of the limestone geology and the so called “limestone streams” or “limestoneers”, that are actually quite prevalent in Franklin County. According to *Pennsylvania Limestone Streams*



KCI stream assessment specialists Susanna Brellis and Elaine Ivy collect samples from Johnston Run in an area of lush watercress growth. In the photo they are measuring stream flow volume and velocity, both of which impact aquatic life significantly. They also have been measuring pH and collecting nutrient samples such as nitrogen and phosphorus as well as samples for bacterial counts. Fish population identification is ongoing.

by A. Joseph Armstrong, the number of limestone streams in Franklin County is second only to Lancaster County.

Limestone streams are unique and special because of the underlying limestone geology. As water percolates up from limestone springs, it feeds the stream with clear, cold, and mineral rich water, with high pH and buffered against wide swings in acidity.

Not only is the spring water cold (typically between 4 to 18 degrees Celsius) - but it is consistent. Limestone spring water will be colder than surface water in the summer and can be warmer than surface water in the winter. This consistency, both in temperature and pH, and with a steady supply of mineral nutrients, can generate an abundance of life including the primary producers at the bottom of the food chain, dense aquatic vegetation such as watercress, and fisheries such as trout.

Trout fishermen seek out high quality limestone streams

for their great fisheries, although all too often a limestone stream’s potential is not being met because of impacts due to development and agriculture. For example, water temperature can quickly be increased out of the optimal ranges by storm water runoff from hot summer pavement or the lack of a good streamside tree buffer to shade the water surface from direct sunlight.

Other impacts include unnatural stream modifications associated with development such as culverts and hardened banks and also livestock impacts such as trampled streams that causes stream bank erosion and impacts habitat for fish.

Johnston Run begins at several limestone springs to the west of Mercersburg, and therefore the upstream extent of the Run has the potential to be a great resource. Water temperature at the upstream end of Johnston Run, as measured in June of 2013, was well within the range for a good limestone stream, and the alkalinity (a measure of the pH buffering capacity) was well over the PA DEP lower recommended minimum for classification as limestone influenced. Results of benthic macro invertebrate (adult and immature stage

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Limestone stream...

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aquatic insects such as beetles and dragonflies, aquatic worms, snails, etc.) surveys conducted in June, and upcoming fish surveys will shed more light on the biological condition of the Run and how far the stream has been removed from its potential.

Biologists conducting the surveys are looking at the type and diversity of species and the overall abundance of organisms and fish, or biomass. Many types of fish such as trout, darters, and sculpins are considered sensitive to disturbance and if found are indicators of good water quality and a healthy stream system. A fish community dominated by only two or three fish types that are more tolerant of poor conditions – such as creek chub, blacknose dace, and the bluntnose minnow – would be an indicator of an unhealthy stream.

Stressors affecting the biological community could be impacts to stream habitat but can also be from poor water quality conditions. Typical issues in watersheds like Johnston Run include high levels of nutrients like nitrogen and phosphorus. Sources of these nutrients include fertilizers, manure, sewage, and, for nitrogen in particular, atmospheric deposition from combustion of fossil fuels (cars, utilities, industrial sources). High levels of bacteria such as fecal coliform bacteria indicate contamination from fecal material of humans or other animals such as livestock, pets, ducks and geese. Sources can include direct runoff of animal waste, sanitary sewer leaks, or failing septic systems.

As more data is collected and evaluated, a watershed management plan is being developed recommending specific *restoration actions* such as stream bank stabilization and re-vegetation, and *management activities* to sustain stream flows and water quality. From the management plan, an *action strategy* to implement the plan's recommendations will be developed

through collaborative public workshops involving residents, resource experts, and community leaders.

In conjunction with the watershed planning, KCI planners and landscape architects are identifying an environmentally-sensitive route for a trail along the run on borough property, and preparing a conceptual plan for its development. (*Great progress is being made and will be described in next week's article.*)

In addition to the grant support provided by the National Fish and Wildlife Grant, the work being done toward revitalizing Johnston Run is made possible by consultative support through the National Park Services Rails, Trails & Conservation Assistance Program (RTCA). Both groups bring extensive experience in working with communities and projects such as ours in Pennsylvania, neighboring states and across the country.

Tammy Piper, watershed specialist for the Franklin County Conservation District, plays an important part on the Johnson Run Revitalization Council, connecting us with local watershed and conservation consultants, informative materials and educational programs. Visit www.franklinccd.org Many thanks to all of these groups, to our community volunteers and to landowners for participating in this adventure to revitalize Johnston Run.
