

Monitoring Brown Trout Invasion in a Native Brook Trout Stream Post Mine Drainage Remediation – A Cautionary Tale

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Abstract: Over the past several decades, there has been a push in Pennsylvania to reclaim abandoned mine lands and remediate acid discharges, thereby mitigating water quality impacts and restoring connectivity to previously fragmented watersheds. Although these restoration activities have obvious benefits to the overall ecosystem, removing the chemical barrier that prevents brown trout from colonizing areas where brook trout have been thriving in isolation could prove detrimental to the latter species. This situation poses a conundrum for natural resource managers as it represents a significant trade-off between ecosystem function and conservation of a declining native species. However, information regarding pre- and post-remediation distributions of brook and brown trout in AMD impacted watersheds is currently lacking.

The Kratzer Run watershed near Curwensville in Clearfield County, Pennsylvania, provides the ideal setting for monitoring distributions, abundance, and movement of brook and brown trout before and after AMD remediation. Previous surveys conducted by the Pennsylvania Fish and Boat Commission (PFBC) in 2015 documented a brook trout-only salmonid population in Bilger Run, a Kratzer Run tributary heavily impacted by acidic discharges. The mainstem of Kratzer Run hosted a mixed population dominated by brown trout. SRBC, starting in 2017, has begun to remediate the four main AMD pollution sources impacting Bilger/Kratzer. Implementation may improve water quality in Bilger Run to the point that the stream can be removed from the list of impaired streams. However, this improvement could also allow brown trout to invade Bilger Run, which could potentially overpower the resident brook trout population.

The Commission, is conducting a long-term study to document the effects of AMD remediation on the distribution and abundance of brook trout in Kratzer Run and the Bilger Run subwatershed and is focused on the following objectives:

1. Documenting pre/post-remediation water quality conditions (water temperature, dissolved oxygen, pH, specific conductance, and turbidity) using YSI sondes;
2. Documenting current distribution and abundance of brook and brown trout populations through electrofishing surveys;
3. Tracking pre/post-remediation movements of brook and brown trout throughout the watershed using Passive Integrated Transponder (PIT) tags.

We hypothesize that low pH caused by untreated discharges is acting as a chemical barrier to brown trout colonization of Bilger Run, and that movement of fish between Bilger Run and Kratzer Run is currently limited.