

# WHAT HAPPENS AFTER A TRAIN WRECK?

## Death and Renewal in the Sinnemahoning Creek Watershed

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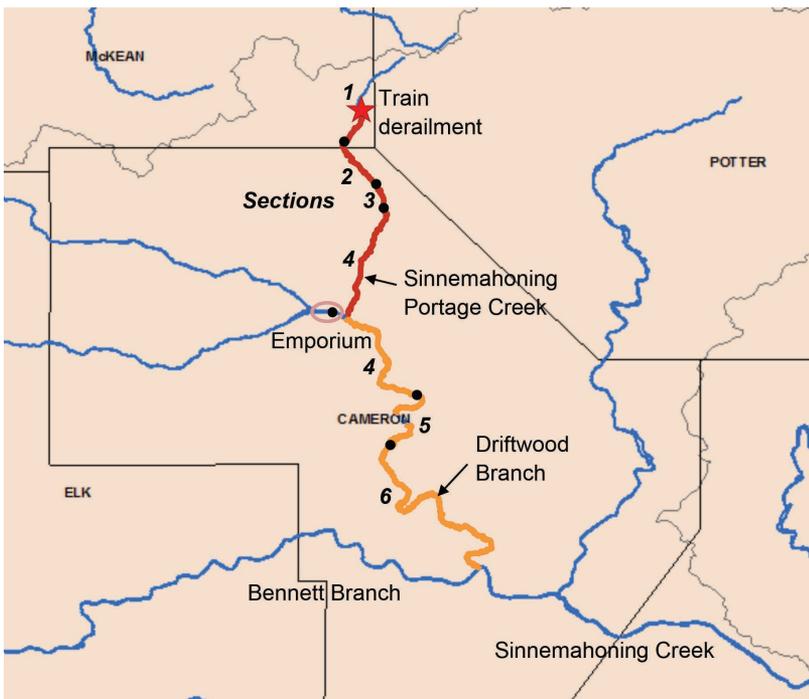
photo-PFBC archives

On June 30, 2006, one of the most catastrophic fish kills in Pennsylvania occurred. A train derailment along Sinnemahoning Portage Creek, McKean County, caused three tank cars to rupture, sending 42,000 gallons of sodium hydroxide into the stream. Sodium hydroxide is the active ingredient in commercial drain cleaner. The fish kill was immediate and total as the brown, foamy slug of pollutant scoured 11 miles of Sinnemahoning Portage Creek to its mouth at Emporium, Cameron County. Waterways Conservation Officers Robert "Pete" Mader and William Crisp reported that fish leaped from the water trying to avoid the toxic liquid. As the day progressed, more and more fish died as the sodium hydroxide traveled an additional 19 miles down the Driftwood Branch of Sinnemahoning Creek, where water from the Bennett Branch of Sinnemahoning Creek contributed its diluting flow at the village of Driftwood. As night fell, stunned residents and visitors saw banks strewn with dead fish and knew they had experienced an environmental disaster.

The Pennsylvania Fish & Boat Commission (PFBC) Bureau of Law Enforcement was unable to conduct a dead fish count at the time of the kill due to vast numbers of fish, limited visibility and chemical exposure hazard. Biologists for PFBC and the Pennsylvania Department of Environmental Protection (PA DEP) sampled affected streams a week later after water quality returned to normal. Historical data and fish abundance at unaffected sites were compared to results from spill-affected sites to determine the number of missing fish. The kill total was staggering. Sinnemahoning Portage Creek lost its entire fish community estimated to be 372,000 fish in 2006. Aquatic insect losses ranged from 98 percent near the spill site to 63 percent near the mouth. A straight-line recovery to pre-spill conditions was predicted to take 3 years for nongame fish (one generation) and 6 years for trout and bass. In Sinnemahoning Portage Creek, 374,000 additional

fish were projected to be lost from the population until recovery by 2012. The Driftwood Branch of Sinnemahoning Creek suffered loss of an estimated 97 percent of fish in shallow riffles and 87 percent of fish in deeper runs and pools. The estimated kill totaled 149,000 fish in 2006 and 165,000 for 2007 through 2012. Dead hellbenders discovered in the Driftwood Branch added to the damage total. Aquatic insects appeared to be unaffected here. The PFBC could not detect spill damage downstream of the Bennett Branch, which was already impaired by mine drainage. Total angler trips lost due to the fish kill were projected to be 4,400 in 2006 and 39,000 in 2007-2012.

Former McKean County District Attorney (now President Judge) John Pavlock and PFBC Chief Counsel Laurie Shepler negotiated a settlement of \$3.675 million with Norfolk Southern to compensate for these losses. Funds were placed in an account to support the Sinnemahoning Creek Watershed Restoration Grant Program that benefits recreational fishing and boating and aquatic resources in Cameron, McKean, Elk and Potter counties. You will learn about the activities



This area map shows the extent of the 2006 fish kill and affected stream sections.

of this program in the next issue of *Pennsylvania Angler & Boater*. PA DEP settled their part of the pollution case for an additional \$3.675 million.

The gloomy picture from 10 years ago points to an obvious question, “Did fish in Sinnemahoning Portage Creek and the Driftwood Branch recover as predicted?” Commission biologists conducted follow-up sampling in 2009 and 2012 to provide an answer.

percent of baseline occurred in 6 years. Smallmouth Bass and Rock Bass are known to be more mobile than smaller species. Bass recovery in deeper habitat was well underway in 3 years and exceeded pre-spill abundance by 2012.

What factors made recovery in the Driftwood Branch better than Sinnemahoning Portage Creek? The 2006 fish kill was not total in the Driftwood Branch and some reproducing adult fish were present. Influx of warmwater species could occur from downstream as well as upstream in the larger system. An intact aquatic insect population was present. In Sinnemahoning Portage Creek, recovery had to start from scratch with this chemically “scrubbed” stream. The 11-mile kill zone was not closely linked to tributaries and downstream areas with a high potential to repopulate to waters with cold water species. High summer temperatures may also be limiting cold water fish species, especially trout, in downstream sections of Sinnemahoning Portage Creek.

The fishing outlook in the Sinnemahoning Creek Watershed is very good. The lower section of Sinnemahoning Portage Creek was stocked again with adult trout beginning in 2007. Wild trout thrive upstream and immediately downstream of the spill area. However, wild trout in the vicinity of Cowley Run and downstream are at lower densities than were found in a 1989 PFBC survey for reasons that may be unrelated to the 2006 spill. The Driftwood Branch has been stocked with trout since 1932, and it remains a popular springtime fishery. Smallmouth Bass up to 15 inches with the occasional larger specimen are again common in the Driftwood Branch and continue to be found in Sinnemahoning Creek. Rock Bass provide an additional dimension to this good warmwater fishery. The miles of water, quality fishery and lovely forested setting make the Sinnemahoning watershed a destination worth the trip. After 10 years, fish in the area affected by the 2006 spill have largely recovered. Gamefish abundance in

the upper Sinnemahoning Portage Creek and the Driftwood Branch equals or exceeds pre-spill levels. Areas with partial recovery could experience additional gains, but these areas are likely influenced more by location specific habitat, productivity and water quality factors that outweigh past spill effects. ☐

Sinnemahoning Portage Creek				
		2006	2009	2012
		% of Baseline	% of Baseline	% of Baseline
Reference	trout	100%	58%	119%
	non-trout	100%	97%	57%
Section 1	trout	0%	39%	119%
	non-trout	0%	10%	19%
Section 2	trout	0%	no data	2%
	non-trout	0%	no data	82%
Section 3	trout	0%	24%	17%
	non-trout	0%	67%	52%
Section 4	trout	0%	24%	17%
	non-trout	0%	67%	52%

Driftwood Branch Sinnemahoning Creek				
		2006	2009	2012
		% of Baseline	% of Baseline	% of Baseline
<i>Riffle (shallow) habitat</i>				
Section 5	all fish	5%	77%	233%
Section 6	all fish	2%	no data	61%
<i>Run/Pool (deep) habitat</i>				
Section 5	SMB&RB*	9%	51%	136%
Section 6	SMB&RB*	16%	no data	no data

Key - State of recovery    no recovery    partial recovery    recovered

\*SMB&RB = Smallmouth Bass & Rock Bass

*This table shows the recovery of fish over 6 years following the 2006 fish kill.*

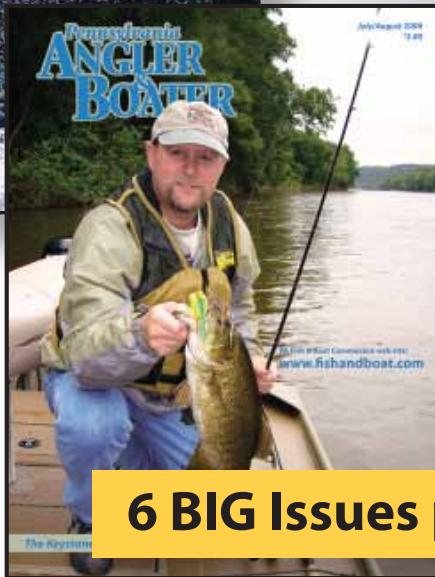
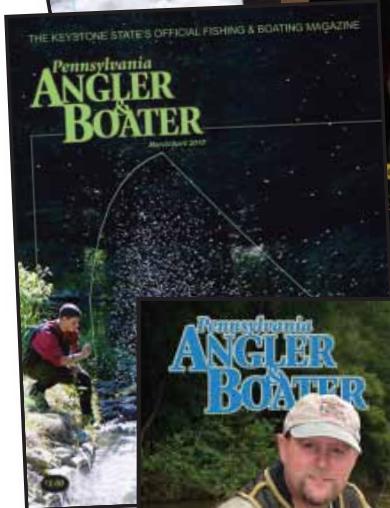
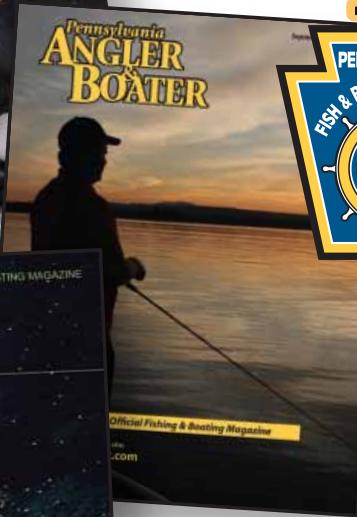
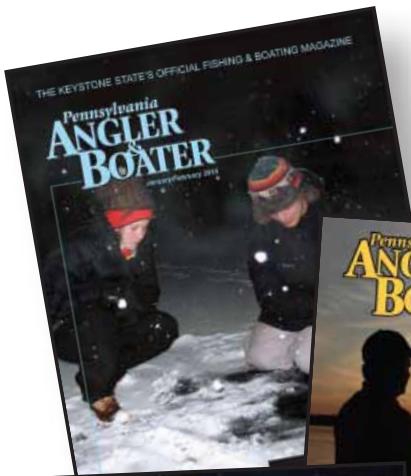
Full recovery in Sinnemahoning Portage Creek was limited to specific areas. The table summarizes findings for the stream sections shown on the map. Section 1 of Sinnemahoning Portage Creek upstream of the spill location showed some variation in fish abundance, which reflected natural variability. Wild trout in Section 1 downstream of the spill recovered as predicted by 2012. Non-trout species such as dace and Creek Chubs experienced limited recovery. Wild trout in Sections 2, 3 and 4 had poor recovery compared to 1989 PFBC survey information. The 2012 survey showed water temperatures in these areas were higher than those preferred by trout. Additional thermal investigation is warranted. Non-trout species, that included darters and a more diverse fish community, recovered by 2012 in Section 2 but did not approach baseline conditions in Sections 3 and 4.

Downstream, the Driftwood Branch of Sinnemahoning Creek experienced greater recovery. Smaller fish in shallow riffle habitat recovered to 77 percent of baseline in 3 years, when full recovery was predicted. By 2012, abundance increased to more than double the baseline condition. Section 6 had less favorable habitat. Partial recovery of riffle dwelling fish to 61



*Smallmouth Bass, Rock Bass and stocked trout are the backbone of the Driftwood Branch fishery.*

Photo-Carl Hansen



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