

2010 and 2011 Wild Brook Trout Enhancement Evaluations in Northeastern Pennsylvania

During the 2010 and 2011 field seasons the Fisheries Management Area 5 staff conducted inventories to quantify wild brook trout populations in Kistler Run, Wolf Swamp Run, and Jeans Run. The examinations were conducted as part of monitoring brook trout abundance in streams placed in the [Wild Brook Trout Enhancement Program](#) in 2005. Under the Wild Brook Trout Enhancement Regulations angling is permitted on a year-round basis with no tackle restrictions, and no brook trout may be harvested from these waters at any time. [Commonwealth Inland Water Regulations](#) apply to other trout species with a seven-inch minimum length limit and five trout per day creel limit from the opening day of trout season through Labor Day and no harvest for the remainder of the season.



Figure 1. Jeans Run (top left) a Wild Brook Trout Enhancement Stream, Devils Hole Creek (top right) a Commonwealth Inland Waters Regulation stream, crew backpack electrofishing (bottom left), and a colorful adult brook trout (bottom right)

Backpack electrofishing was conducted at historic sampling locations on each stream. The length of each sample site was 300 meters (or 330 yards).

Based on information compiled on wild brook trout waters for the 2002 Trout Summit, the statewide average for legal size wild brook trout (greater than or equal to seven inches in length) for freestone streams was 34 trout/mile. Surveys in 2004 found Kistler Run, Wolf

Swamp Run, and Jeans Run exceeded the statewide average of 34 legal size brook trout per mile (Table 1). In 2010 and 2011 only Kistler Run (156 and 43 legal trout/mile) remained above the statewide average. The abundance of legal size brook trout in Wolf Swamp Run and Jeans Run fell below the statewide average in 2008, 2010, and 2011, although Jeans Run exhibited a rise in the number of legal trout from five/mile in 2008 to 32/mile in 2011. Larger brook trout (greater than or equal to nine inches in length) were captured in Kistler Run and Wolf Swamp Run in 2010, but not in 2011; when the overall catch of brook trout was comparatively lower across all study streams. On Jeans Run nine-inch and longer brook trout were only recorded in 1992 when the stream was stocked with adult trout, raising doubt on the origin (wild or hatchery) of larger brook trout.

Prior to each stream's inclusion in the Wild Brook Trout Enhancement Program the abundance of brook trout in Kistler Run, Wolf Swamp Run, and Jeans Run averaged 126, 37, and 32 legal size trout per mile, respectively. After the change in angling regulations the average number declined to 70, 31, and 17 legal size brook trout per mile for each respective stream. This decrease represented a 44, 16, and 47 percent decline in legal size brook trout abundance for the three "enhancement" streams. Possible reasons for this decline include natural variation in fish abundance due to year class strength, recruitment, and mortality, which are often related to the influence of weather on stream conditions. Other variables to consider include angling mortality associated with advertisement of the streams through there listings as special regulation waters in the Wild Brook Trout Enhancement Program.

Furthermore, it should be noted that during the 2005 through 2011 study period there was very little snow cover during the spring-runoff period, except for 2011. This is an important consideration for these streams and their wild trout populations because young-of-the-year production and fish mortality are greatly influenced by the acidic (snow/rain and organic decay) purge during the initial spring run-off discharge. Thus, the surveys were conducted during a sequence of years when any adverse impacts typically associated with high spring-runoff (except for 2011) on production and recruitment were thought to be negligible.

Additional surveys were conducted on two neighboring "control" brook trout streams to compare trout abundance in streams managed under the Commonwealth Inland Waters regulations. Devils Hole Creek was matched with Kistler Run and Wolf Swamp Run, while the Unnamed Tributary to the Lehigh River (RM 58.48) was matched with Jeans Run for comparison based on stream similarities and proximity to nearby enhancement waters. These surveys were performed to aid in evaluating the response of wild brook trout populations to Wild Brook Trout Enhancement regulations and to providing additional insights on brook trout populations being managed under conventional regulations. Devils Hole Creek and the Unnamed Tributary consistently exceeded the statewide average of 34 legal size trout per mile (Table 2). In addition, larger wild brook trout (greater than or equal to nine inches in length) were captured more frequently in Devils Hole Creek than in the other study waters as a result of the stream having considerably better habitat to support larger brook trout.

The density of legal and larger size brook trout in the three Wild Brook Trout Enhancement Waters and the two Commonwealth Inland Regulation Waters was variable over the

monitoring period. Among Brook Trout Enhancement streams the number of legal size brook trout in Jeans Run increased from 2008, decreased on Wolf Swamp Run, and increased on Kistler Run from a low of 26/mile in 2008 to a high of 156/mile in 2010 before declining to 43/mile in 2011. Overall, since the implementation of Wild Brook Trout Enhancement regulations in 2005, the abundance of legal size brook declined in the three study streams. Results were also mixed for the two streams managed under the Commonwealth Inland Waters Regulations with Devils Hole Creek exhibiting an overall decrease in the abundance of legal size brook trout after 2008 and the Unnamed Tributary exhibiting an increase from 2008 to 2010 before falling in 2011.

Our results suggest that the trends in wild brook trout abundance were stream specific and somewhat cyclic. Factors influencing these trends include variation in year class strength, water quality and stream discharge (especially during the spring-runoff period), habitat, and possible changes in sampling efficiencies related to flow. Although angler use was not quantified it can have an impact. A statewide evaluation of the Wild Brook Trout Enhancement Waters program is currently in progress to determine the future status of this program.

Table 1. Time series of brook trout catch for three Northeast Pennsylvania streams managed under Wild Brook Trout Enhancement Regulations beginning in 2005. Prior to 2005 Commonwealth Inland Waters regulations applied. * indicates drought year

Brook Trout Enhancement Study Waters – NE PA Kistler Run – Monroe County (Bold = Enhancement Regulation Management) Limits: 3.1 miles of stream within State Game Lands (SGL) 127 Nearest Town and Receiving Water: Tobyhanna and Tobyhanna Creek Water Quality: A tannic colored low alkalinity freestone stream				
Survey Year	Total Caught	Size Range (inches)	Estimated Number 7 inches or longer/mile	Estimated Number 9 inches or longer/mile
2011	87	2-8	43	0
2010	157	2-9	156	11
2008	90	2-8	26	0
2006	74	2-8	53	0
2004	97	2-8	109	0
2003	75	1-8	143	0
Wolf Swamp Run – Monroe County Limits: 2.1 miles of stream within SGL 38 Nearest Town and Receiving Water: Scotrun and Pocono Creek Water Quality: A clear low alkalinity freestone stream				
Survey Year	Total Caught	Size Range (inches)	Estimated Number 7 inches or longer/mile	Estimated Number 9 inches or longer/mile
2011	48	2-8	16	0
2010	130	1-9	26	5
2008	212	1-7	32	0
2006	149	1-7	48	0
2004	146	1-8	48	0
2001*	204	1-8	26	0
Jeans Run – Carbon County Limits: 2.5 miles of stream within SGL 141 Nearest Town and Receiving Water: Nesquehoning Borough and Nesquehoning Creek Water Quality: A clear very low alkalinity freestone stream				
Survey Year	Total Caught	Size Range (inches)	Estimated Number 7 inches or longer/mile	Estimated Number 9 inches or longer/mile
2011	87	1-7	32	0
2010	220	1-7	21	0
2008	191	1-7	5	0
2006	144	2-7	11	0
2004	192	2-7	43	0
1993	127	2-7	5	0
1992	136	2-10	47	42

Table 2. Time series of brook trout catch for two Northeast Pennsylvania streams managed under the Commonwealth Inland Waters regulations from 1977 through 2011.
*indicates a drought year.

Commonwealth Inland Waters “control” Waters – NE PA Devils Hole Creek – Monroe County Limits: 1.5 miles of stream within State Game Lands (SGL) 221 Nearest Town and Receiving Water: Mount Pocono and Paradise Creek Water Quality: A clear low alkalinity freestone stream				
Survey Year	Total Caught	Size Range (inches)	Estimated Number 7 inches or longer/mile	Estimated Number 9 inches or longer/mile
2011	427	2-8	154	0
2010	525	1-9	164	11
2008	387	1-9	333	11
2002	629	1-9	227	10
2000	431	1-8	227	0
1999*	638	1-13	304	14
1998	522	1-9	237	5
1994	373	2-8	106	0
1977	376	1-9	246	5
Unt to Lehigh River (RM 58.48) – Carbon County Limits: 1.25 miles of stream accessible via Lehigh George State Park Nearest Town and Receiving Water: Jim Thorpe and Lehigh River Water Quality: A clear and very low alkalinity freestone stream				
Survey Year	Total Caught	Size Range (inches)	Estimated Number 7 inches or longer/mile	Estimated Number 9 inches or longer/mile
2011	100	2-8	101	0
2010	220	1-8	182	0
2008	210	1-8	113	0
2006	197	2-9	69	5