

Wild Trout Populations of Big Spring, Past and Present – Drs. T.M. Hurd and J. Black.

Big Spring was historically known as a stream that supported tremendous brook trout production (Chestney 2005). He notes how these native trout made Newville a destination for early fly-fishers after 1850:

“Big Spring Creek has enjoyed a glorious background in the annals of American trout fishing. A native brook trout population of unbelievable size and numbers made this stream a haven for many early anglers and Newville, PA. located on its banks became known as trout town. With access out of Harrisburg by the Cumberland Valley Railroad and having several hotels, this small friendly town, had all the trappings early American anglers required to make it a favorite. As early as 1829, Big spring Creek and Newville were featured in articles written for the sportsmen’s magazines of that era. An extremely popular early American fly was dubbed the “Newville.”

Some of the earliest conservation measures adopted in America may have been originated on this stream with the establishment of a creel limit in 1850 of 50 trout per day. Mill owners and other cooperative land owners had the foresight to realize the brook trout were not dispensable. They petitioned the state legislature to enact special regulations for this stream. They also established an open fishing season during the months of June, July, and August only, again by having the legislature enact special legislation. Copies of these laws are in the archives of the state legislature, and these regulations, unique to the stream alone, remained in effect until the Pennsylvania Fish Commission came into being and established state wide regulations.”

Cooper and Scherer (1967) documented wild brook trout (*Salvelinus fontinalis*) production occurring in Big Spring at rates 5 times that of a typical Pennsylvania freestone stream prior to opening of a large state hatchery by Pennsylvania Fish and Boat Commission (PAFBC) in 1972. Their results indicate native trout biomass of 231 kg/ha between the headwaters and the site of the Thomas hatchery. Subsequently, wild trout were largely absent from most of the stream until the hatchery ceased production in 2001 (Larson et al. 1987), but have recently resurged since the hatchery closed in November 2001. The PAFBC has electro-fished the stream annually in recent years, and the wild brook trout population in these reaches has increased exponentially with an annual increase of 66% (Figure 1).

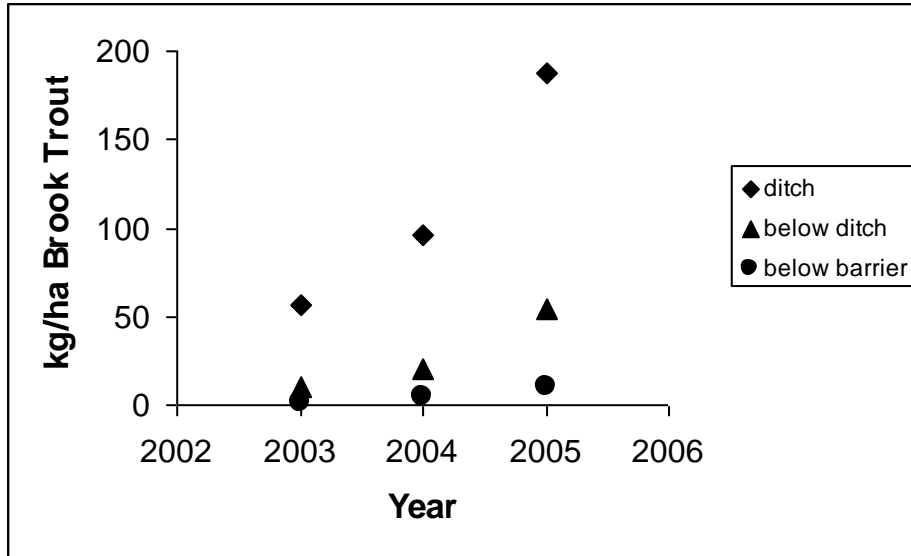
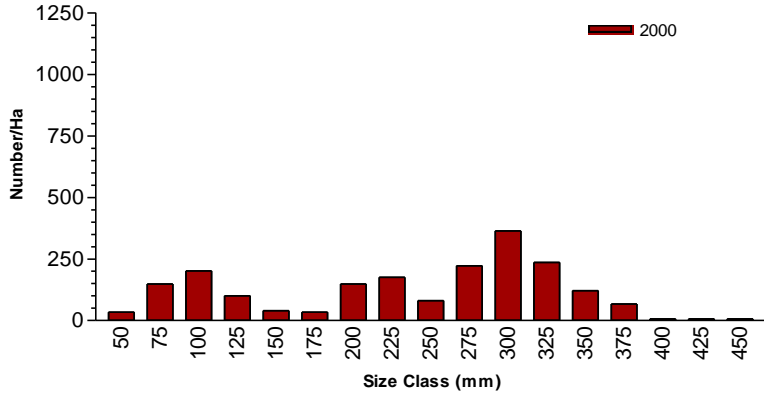


Figure 1 – Exponential increase of wild brook trout in upper Big Spring following hatchery closure, with most increase occurring in the “ditch” or headwaters, and 300 m reach below (the approximate area surveyed by Cooper and Scherer 1967). Data based on PAFBC electrofishing population estimates and length-mass relationships.

Upon hatchery closure, population age-structures in the ditch were inverted, i.e. with many more large fish than small, young-of-year fish (Figure 2). This pattern, in comparison with the historic age structures of Cooper and Scherer (1967), and the current age structures of the recovering brook and rainbow trout populations (Figures 3, 4), indicate that biomass of trout in the upper-most reach, although impressively large, was the result of fish originating from stocking rather than from natural reproduction. Brook trout appear to be out-competing non-native rainbow trout in the upper reaches, while below the barrier that was associated with the Thomas fish hatchery, rainbow trout are increasing exponentially through natural reproduction (Figure 4). Brown trout persist at low densities in the lower reaches (Figure 5) It is thought that brook, and possibly rainbow trout currently and historically out-compete introduced brown trout due to their ability to utilize groundwater upwelling zones in sand or fine substrate (Carline 1980).

Brook Trout Size Frequency Distribution Big Spring Creek - Ditch



Rainbow Trout Size Frequency Distribution Big Spring Creek - Ditch

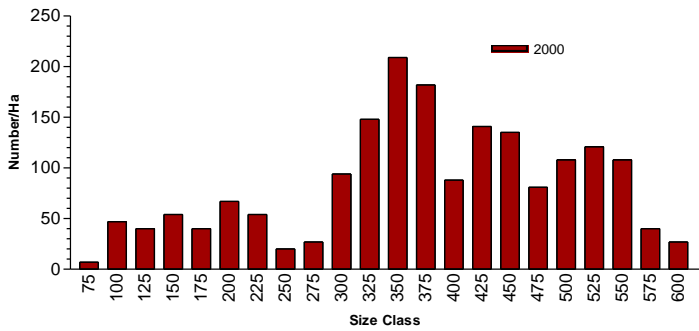


Figure 2 – Inverted age class distributions of brook and rainbow trout in the “ditch” or headwaters, demonstrating hatchery origin of trout in the headwaters during hatchery operation (2000). Data Source PAFBC, summarized by PADEP.

Brook Trout Size Frequency Distribution Big Spring Creek - Ditch

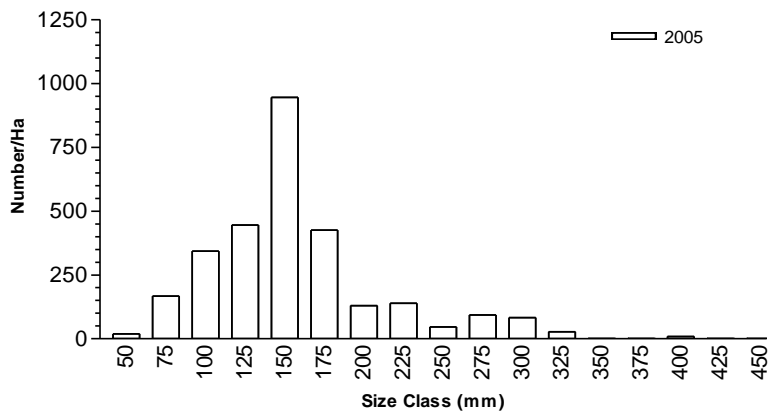


Figure 3 – Wild age class distributions of brook trout in the headwaters in 2005, indicating a healthy, self-sustaining wild population. Data Source PAFBC, summarized by PADEP.

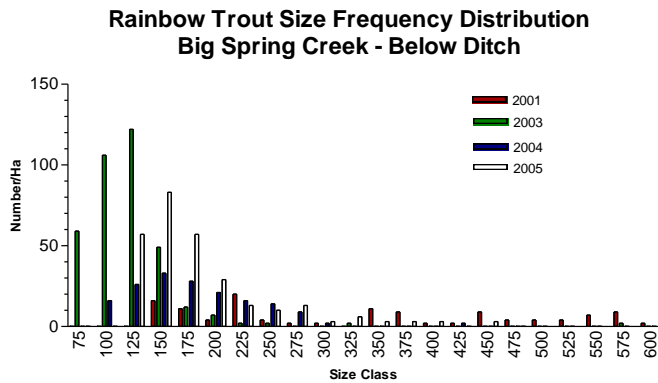
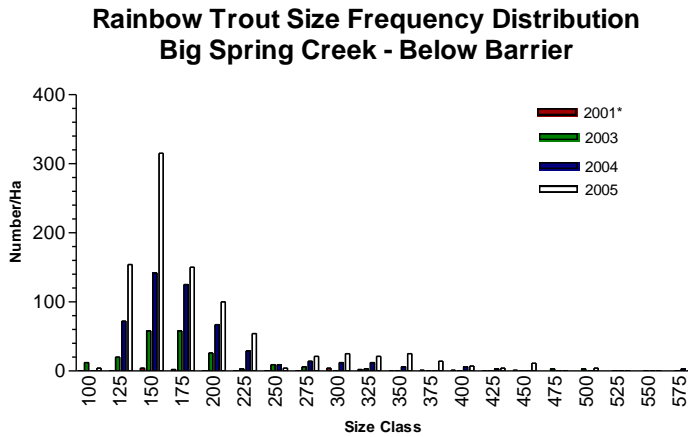
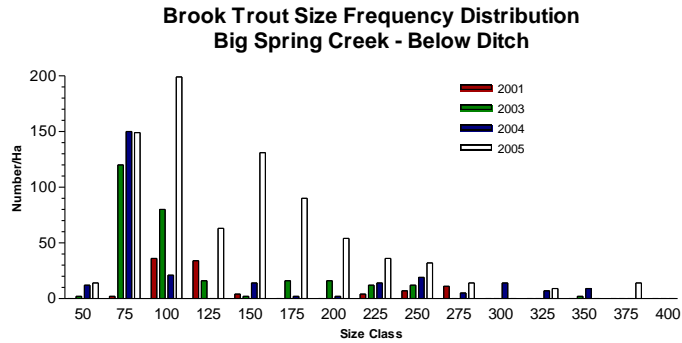


Figure 4 - Wild age class distributions of brook and rainbow trout repopulating the stream below the “ditch” or headwaters since hatchery closure in 2001. Data Source PAFBC, summarized by PADEP.

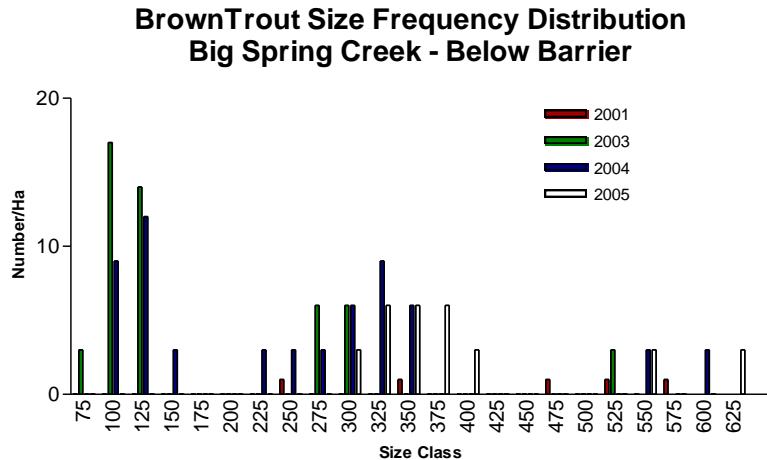


Figure 5 – Age class distribution of brown trout (*Salmo trutta*) in Big Spring, showing low densities and inconsistent annual reproduction (lack of young-of-year fish in the 75-150 mm range). Data source PAFBC, summarized by PA-DEP.

In summary, wild brook trout populations are returning strongly to Big Spring in numbers and biomass sufficient to reclassify the associated reaches to Class A Trout and extended Exceptional Value status. Big Spring will likely become a unique destination fishery, as it once was, characterized by remarkable growth and numbers of wild brook trout in the upper reaches (Cooper and Scherer 1967). In addition, non-native rainbow trout are re-colonizing mid-reaches of Big Spring, providing additional sporting opportunities for fishermen, but also likely competing with brook trout. Each reflects the outstanding potential of Big Spring and similar spring creeks to grow beautiful, wild fish given a continued supply of clean ground water, and suitable habitat.

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References

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