

Big Spring Creek

Cumberland County

August 2015 Wild Trout Survey

Big Spring Creek originates from a large spring approximately three miles south from the Borough of Newville in Cumberland County, and flows north for five miles through agricultural and residential lands to its confluence with Conodoguinet Creek. Big Spring Creek can be characterized as a low-gradient, fertile, limestone spring stream and is defined by the fertile springs that supply cold and alkaline waters to the stream along its length. Big Spring Creek, from the spring source downstream to the Nealy Road Bridge crossing the stream (1.5 miles), is currently managed by the Pennsylvania Fish and Boat Commission (PFBC) with [Catch-and-Release Fly-Fishing Only \(CRFFO\) angling regulations](#), and is the focus of this Biologist Report.

Historically, instream physical habitat problems were identified to be primary factors limiting the fish community residing in Big Spring Creek. These deficiencies were originally addressed through various habitat enhancement projects throughout Big Spring Creek. Most recently and most extensively, habitat enhancement projects were completed during 2010 (Phase 1) and 2013 (Phase 2) at two reaches within the CRFFO portion of the stream. These projects were made possible through funds provided by the Pennsylvania Turnpike Commission, various grant monies and substantial non-cash contributions from local government and private industry. Additionally, the PFBC partnered with the Big Spring Watershed Association and the Cumberland Valley Chapter of Trout Unlimited to facilitate the completion of these large-scale habitat enhancement projects.

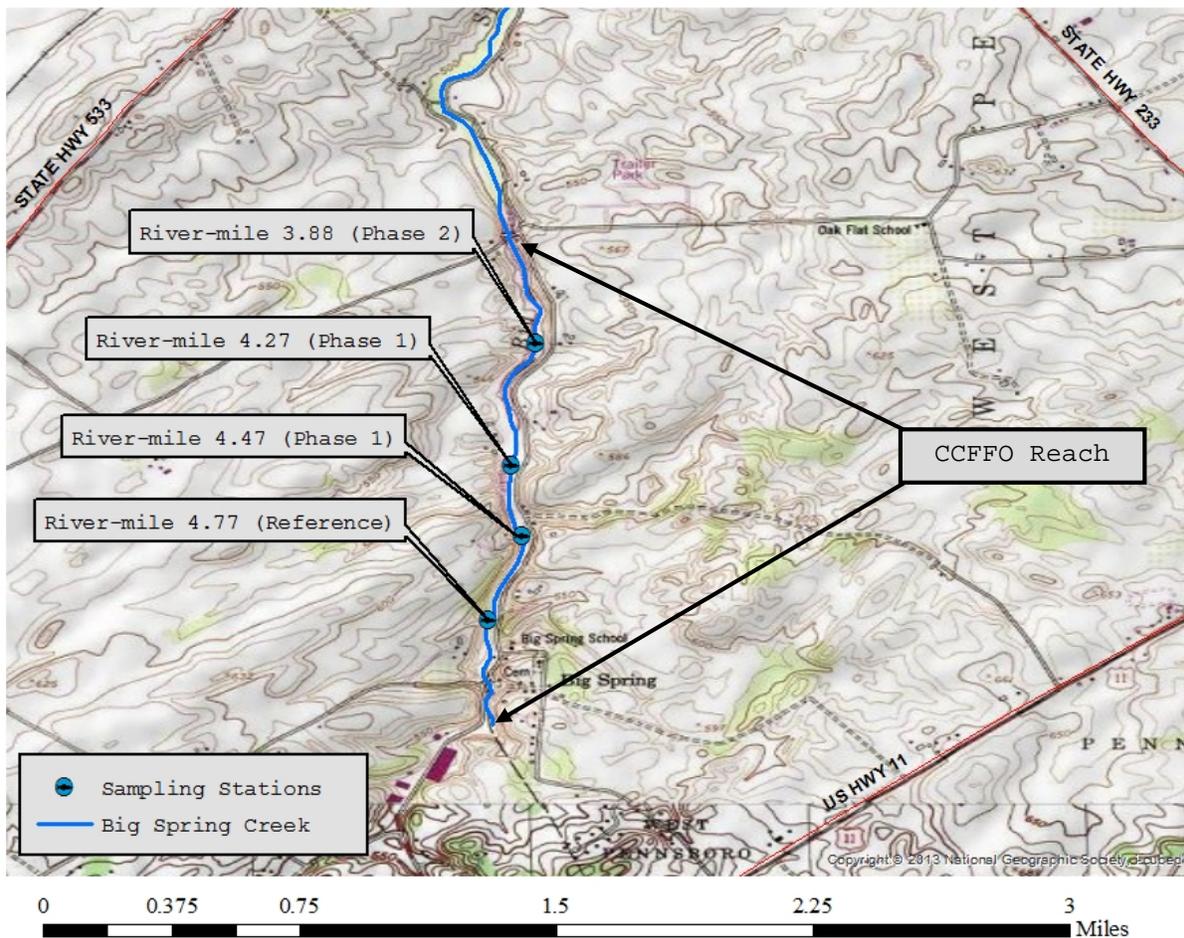


*Newly placed cross vane and boulders in the Phase 2 habitat enhancement reach during construction in 2013.
Photograph provided by Gleim Environmental Group, Inc.*

The goal of these projects was to continue to manage the CRFFO portion of Big Spring Creek as a multi-species trout community, but to manage the fisheries preferentially for Brook Trout. Under this strategy, preferential management was provided to the Big Spring Brook Trout fishery through physical habitat manipulation designed to favor that species, rather than removal of Rainbow Trout and Brown Trout in an effort to reduce competition

from non-native trout species. The response of the trout community to the habitat enhancement is the primary measure of success and for a more detailed account of the goals and objectives of these habitat enhancement efforts consult the [Fisheries Management Plan for Big Spring Creek](#).

During late-August 2015, the CRFFO portion of Big Spring Creek was re-examined to evaluate the current status of the naturally reproducing trout community and to assess its preliminary response to the physical habitat enhancement projects completed in 2010 and 2013. Four sampling sites were surveyed in the CRFFO portion of Big Spring Creek: one site upstream from the projects, two sites in the Phase 1 project reach, and one site in the Phase 2 project reach. Biologists from PFBC's Fisheries Management Division surveyed the trout community using towed boat electrofishing gear. This examination was an interim evaluation five years post-completion of the first project, and the effectiveness to meet objectives of the habitat enhancement projects will not be fully scrutinized until after the 2020 evaluation.



Location map of the portion of Big Spring Creek managed with Catch-and-Release Fly-Fishing Only (CRFFO) angling regulations depicting sites surveyed during August 2015.

A total of 611 wild Brook Trout ranging from two inches to 16 inches in total length were captured during the August survey of the Phase 1 project reach with 300 (49 percent) being greater than or equal to seven inches.

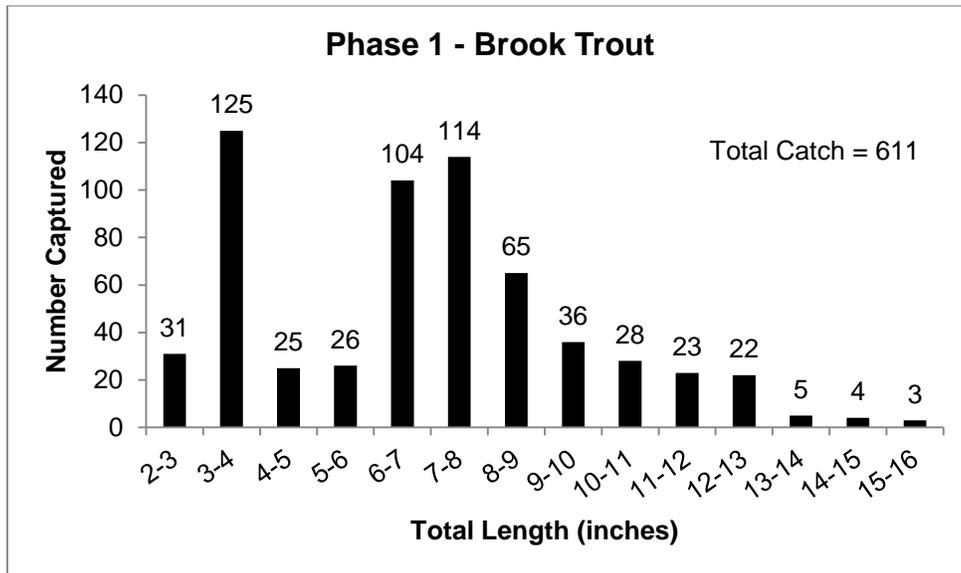


Figure 1. Length-frequency distribution of wild Brook Trout captured at Big Spring Creek in the Phase 1 habitat enhancement reach during the August 2015 survey.

Total abundance of Brook Trout was estimated at 1,906 trout per mile, while adult and young-of-the-year (YOY) abundance were estimated to be 1,048 trout per mile and 858 trout per mile, respectively. The number of adult Brook Trout estimated to occupy the Phase 1 project reach at the time of the 2015 survey was the highest during the period from 2008 to 2015 and has steadily increased since project completion in 2010.



A nice-sized Brook Trout captured during surveys conducted at the CRFFO portion of Big Spring Creek.

A total of 937 wild Rainbow Trout ranging from three inches to 24 inches in total length were captured during the August survey of the Phase 1 project reach with 258 (28 percent) being greater than or equal to seven inches.

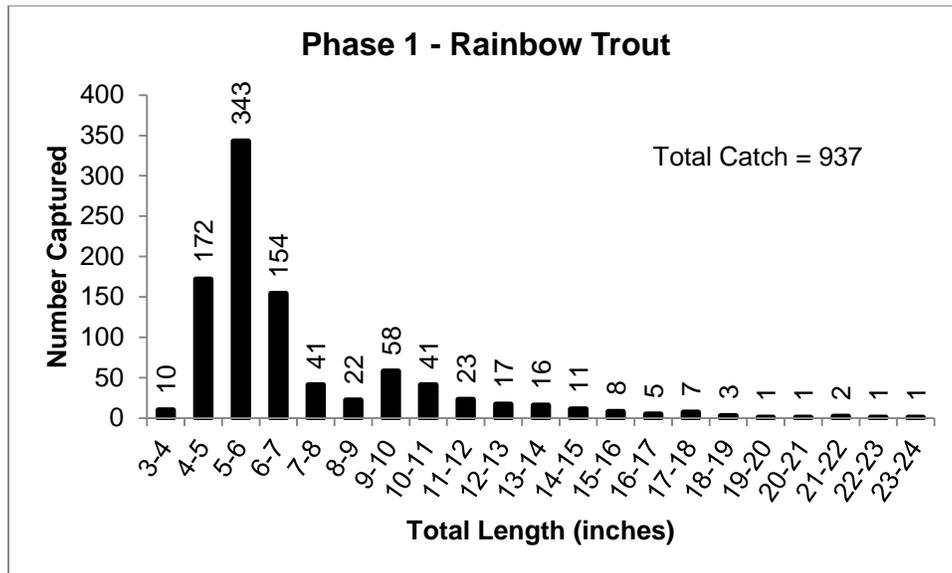


Figure 2. Length-frequency distribution of wild Rainbow Trout captured at Big Spring Creek in the Phase 1 habitat enhancement reach during the August 2015 survey.

Total abundance of Rainbow Trout was estimated at 2,631 trout per mile, while adult and YOY abundance were estimated to be 557 trout per mile and 2,074 trout per mile, respectively. The number of adult Rainbow Trout estimated to occupy the Phase 1 project reach at the time of the 2015 survey was the lowest since project completion and has trended downward since a proliferation of that species in 2012 attributable to a very strong 2011 year class.

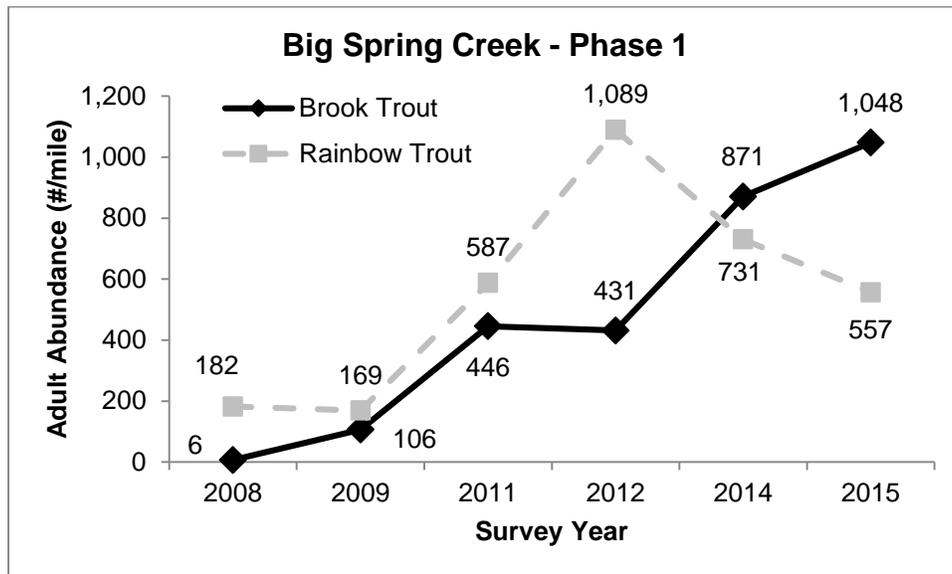


Figure 3. Estimated total abundance of adult wild Brook Trout and Rainbow Trout captured at Big Spring Creek in the Phase 1 habitat enhancement reach during surveys conducted between 2008 and 2015.

A total of 176 wild Brook Trout ranging from three inches to 18 inches in total length were captured during the August survey of the Phase 2 project reach with 95 (54 percent) being greater than or equal to seven inches.

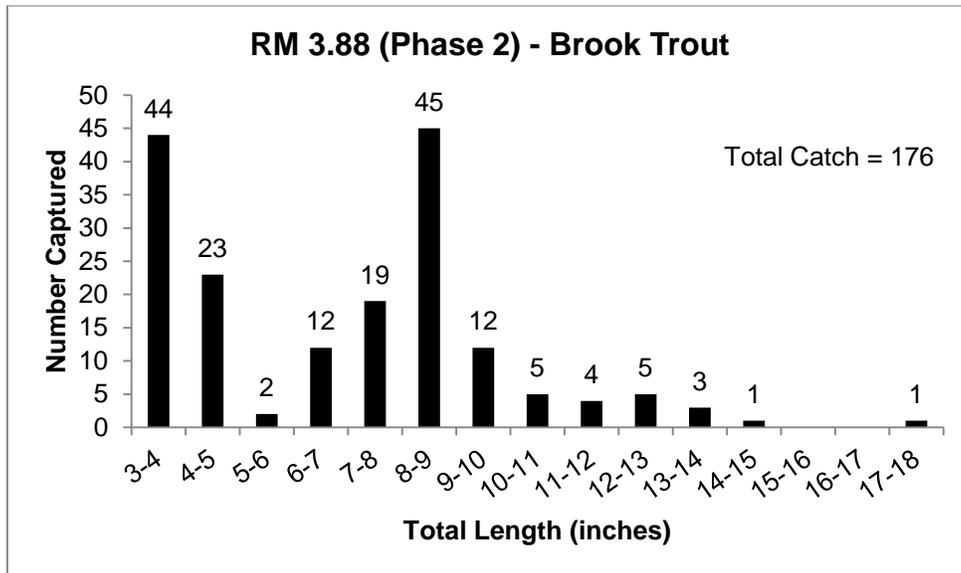


Figure 4. Length-frequency distribution of wild Brook Trout captured at Big Spring Creek in the Phase 2 habitat enhancement reach during the August 2015 survey.

Total abundance of Brook Trout was estimated at 1,241 trout per mile, while adult and YOY abundance were estimated to be 597 trout per mile and 644 trout per mile, respectively. The number of adult Brook Trout estimated to occupy the Phase 2 project reach at the time of the 2015 survey was the highest during the period from 2011 to 2015 and has substantially increased when compared to conditions prior to project completion in 2013.



A plump Rainbow Trout captured during surveys conducted at the CRFFO portion of Big Spring Creek.

A total of 214 wild Rainbow Trout ranging from four inches to 19 inches in total length were captured during the August survey of the Phase 2 project reach with 76 (36 percent) being greater than or equal to seven inches.

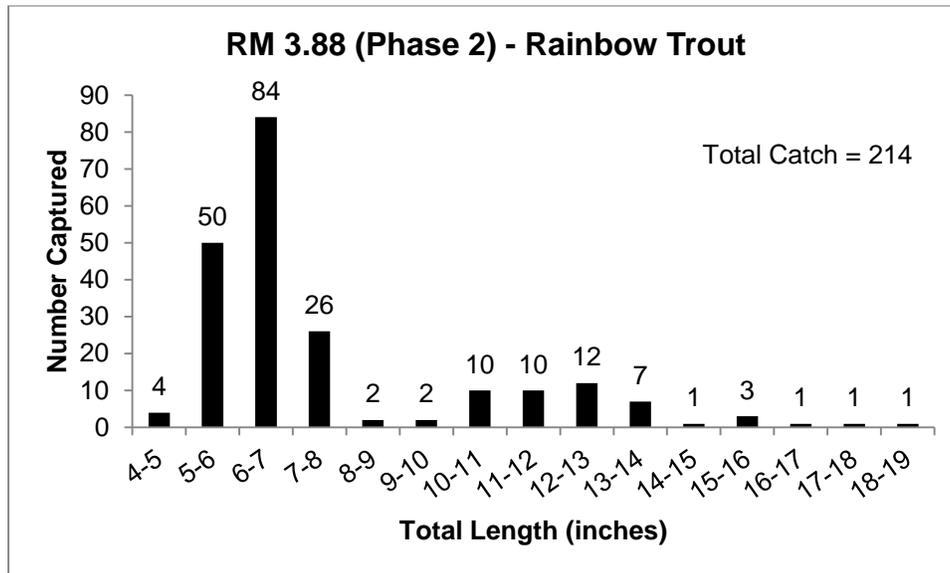


Figure 5. Length-frequency distribution of wild Rainbow Trout captured at Big Spring Creek in the Phase 2 habitat enhancement reach during the August 2015 survey.

Total abundance of Rainbow Trout was estimated at 1,490 trout per mile, while adult and YOY abundance were estimated to be 272 trout per mile and 1,218 trout per mile, respectively. The number of Rainbow Trout estimated to occupy the Phase 2 project reach has been declining since project completion in 2013 following a substantial increase in 2012.

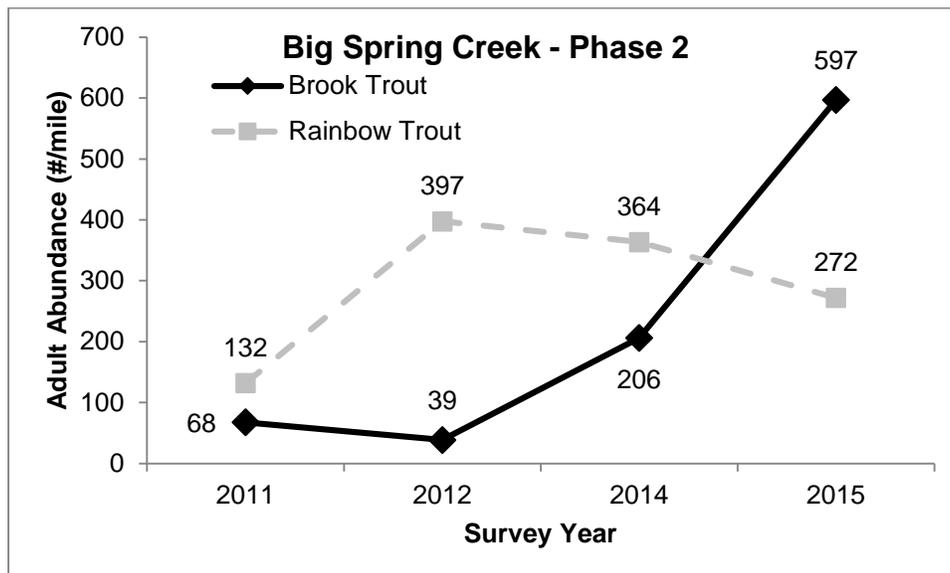


Figure 6. Estimated total abundance of adult wild Brook Trout and Rainbow Trout captured at Big Spring Creek in the Phase 2 habitat enhancement reach during surveys conducted between 2011 and 2015.

It should be noted that although the Phase 1 and Phase 2 project reaches are unique portions of the CFFO area of Big Spring Creek, they are located immediately adjacent to one another and comprise approximately 55 percent of this reach of stream. Fish range throughout the upstream portion of the stream and occupy suitable habitat needed for different purposes at different times. Therefore, monitoring the trout fisheries throughout this relatively short reach of stream, rather than focusing solely on site-specific observations provides a holistic view of population trends. Since completion of the projects in 2010 and 2013, trout populations have trended in the desired direction; however, as previously noted it is important not to focus in on results from one specific year or one specific survey location. Monitoring will continue through 2020 before final results and conclusion will be

made regarding the response of the fisheries to the projects and success of these projects at meeting goals and objectives.

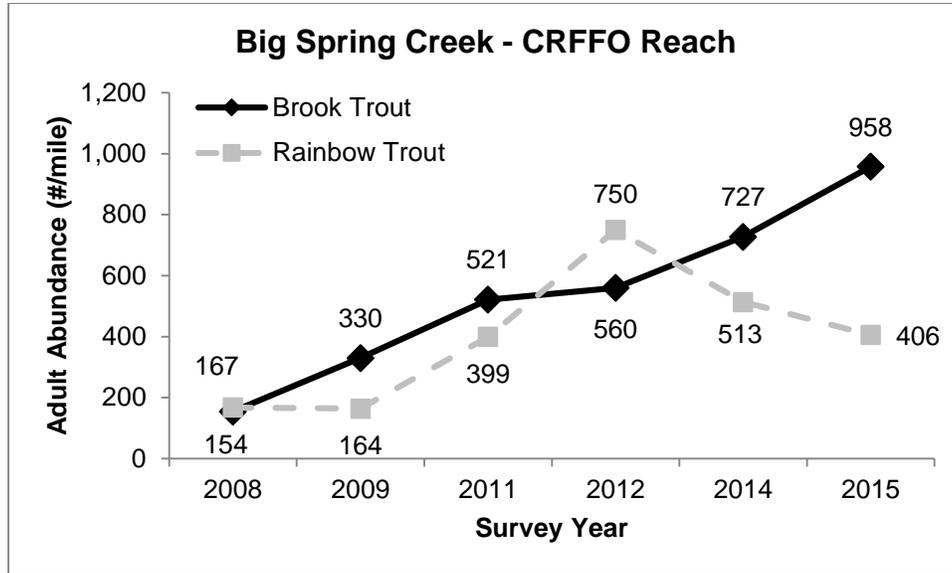


Figure 7. Estimated total abundance of adult wild Brook Trout and Rainbow Trout captured at Big Spring Creek in the portion of the stream managed with Catch-and-Release Fly-Fishing Only (CRFFO) angling regulations during surveys conducted between 2008 and 2015.

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