

# **Big Spring Creek Restoration Plan**

**Prepared for  
The Pennsylvania Fish and Boat Commission**



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# Restoration Concepts

The current restoration plan is based on the fact that Big Spring Creek has been adversely impacted by man's activities and we have now an opportunity to restore the stream to a better condition than it is currently in. There has been much speculation as to what caused the decline of the fishery in Big Spring Creek, and there is no doubt that the stream has undergone substantial changes as the result of man's activities in the last 200 years. What we do know is that the brook trout continued to populate the creek in relatively high numbers through much of the early physical assaults that were caused by dams and active agriculture. Despite numerous studies investigating and documenting adverse impacts to the creek by the hatcheries, the primary cause of the collapse of the fishery remains to be identified. Yet the correlation of the decline of the fishery with hatchery production seems to be clear.

Habitat conditions in Big Spring Creek will continue to be a major concern even though the hatchery operations have ceased. The closing of the last hatchery will answer many of the questions regarding the magnitude of the impact that it was having on the fishery.

We have received a large number of reports and suggestions as to the best way to restore the functions of the stream, and they range from do nothing to a very aggressive reconstruction of the stream. If this was a typical Central Pennsylvania stream with a high sediment load, conventional narrowing of the stream to improve sediment transport and move the fine sediments out of spawning areas would improve conditions for the brook trout, and frankly, that was the direction that we first proposed. Upon closer examination, we learned that the sediments in Big Spring Creek, heavily laden with fine sand that typically do not support good trout reproduction, do not appear to be a result of degradation, but rather are what we should expect to find in spring creeks in this region. Bulk sediment analyses of samples from Big Spring Creek and the reference creeks show that the sediments in Big Spring Creek are very similar to those in reference areas on the Letort and Falling Spring Creeks. Examination of core samples of the sediment do not show evidence of buried layers of coarse sediment that we expected to find if hatchery discharges, mill pond breaching or agricultural activities had deposited large quantities of fine sediment.

From a construction standpoint, Big Spring Creek is among the least challenging streams in Pennsylvania with very stable flows, low bank heights, and extremely low sediment input. Big Spring Creek poses none of the hazards that face most stream restoration projects. The challenge in Big Spring Creek is to restore a stream habitat that supports a world class brook trout fishery and fishes well.

The first task in restoring Big Spring Creek is determining the condition that we wish to restore it to. With a long history of manipulation and degradation it is not a simple matter to select a "desired condition". Based on our assessment of all the information that we have reviewed, we believe that wild brook trout have thrived in Big Spring Creek through a number of adverse conditions, including the construction of six mill dams; a severe influx of sediment from a clay mine; and harrowing with subsequent downstream flushing of these sediment deposits. Wild brook trout thrived even after the introduction of brown and rainbow trout, but the world class brook trout fishery "fell apart" after the trout hatcheries were constructed on the headwaters.