

**Trout Unlimited's Conservation Success Index:  
Monitoring Strategies for Central Appalachian Trout Habitats - April 2014**

Trout Unlimited's Conservation Success Index (CSI) is a compilation and assessment of information related to a species' distribution, populations, habitat features, and future threats. The CSI assembles spatial data available from national, state, and non-profit resource management agencies into a database and summarizes the data by watershed. These watershed-scale summaries are interpreted within an analytical framework and assigned a categorical score of 5 (high) to 1 (low), allowing for the investigation and comparison of conditions and threats within and across watersheds.

This analysis builds upon the CSI for eastern brook trout, completed in 2007, and the Pennsylvania-specific trout habitat CSI developed in 2010. The Central Appalachian CSI uses newly available data - brook trout habitat patch data developed by the Eastern Brook Trout Joint Venture and new projections of shale gas development in the Marcellus and other shale gas formations developed by The Nature Conservancy - to characterize the condition of trout populations, their habitats, and threats they may face in the future across PA, WV, VA, and MD.

CSI information has been summarized to provide a landscape-scale perspective of water quality monitoring opportunities related to shale gas development in watersheds with trout.

- **Baseline monitoring strategies** occur in watersheds without active shale gas development, but with a geological setting similar to some existing shale development. These watersheds lack locations highly likely to be developed in the future and may serve as long-term reference sites.
- **Immediate monitoring strategies** are appropriate in watersheds with existing shale gas development. These watersheds warrant monitoring to track water quality variables of importance, including changes in conductivity resulting from spills of produced water and sedimentation in streams from construction activities. Baseline data may provide a valuable reference for observations from these watersheds.
- **Long-term monitoring strategies** occur in watersheds which lack existing shale gas development, but contain areas identified as high probability locations of future development. Monitoring in these watersheds now provides baseline data for key water quality variables likely to be affected by future development, including temperature and sedimentation.

These strategies should be considered in light of the limitations of the shale gas development models, which are robust in predicting the location of future development based solely on the pattern of current development. As shale gas extraction technologies evolve and as new formations are developed, that pattern will inevitably change. The development models do not anticipate those changes, and the CSI monitoring strategies (Figure 1) will warrant revision and refinement as shale gas development occurs throughout the region. CSI results are available as an interactive [webmap](#). Additional information, including details on data sources and analyses, is available in the full Central Appalachian CSI report.

**Figure 1:** Water Quality Monitoring Strategies for monitoring the impacts of shale gas development in trout habitat in the Central Appalachians.

