



Biologist Report: What makes a good brook trout stream?

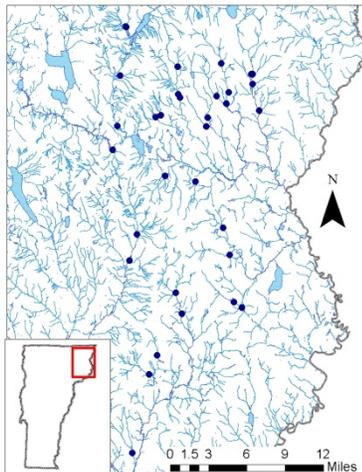
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With the exception of those living in the lower Champlain valley, nearly every Vermonter lives within a short walk or drive to a clear, cold stream, populated by wild brook trout. In fact, many of us have several nearby options for stream brook trout fishing. So many brook trout streams, so little time. How do you choose which stream to fish? What factors make for a good brook trout stream?



Fisheries biologists with the Vermont Fish and Wildlife Department (VTFW) have initiated a study that may help to answer those questions. We used electrofishing to sample trout at 33 streams in northeastern Vermont (see map). We also assessed temperature, chemistry, and trout habitat at each of



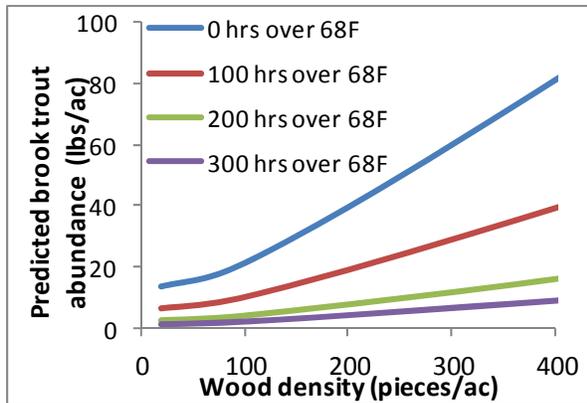
these streams. Temperature was monitored with thermographs that were left in the streams from May to late September. Chemistry values included pH, conductivity (the amount of salts in the water), and alkalinity (the ability to buffer acids). Habitat values included depth, percent pool area, slope, elevation, and the amount of wood present. We used statistical modeling to determine which factors were most strongly related to brook trout abundance.

In the 33 streams, brook trout abundance ranged from 0 to 1,725 trout per mile with an average of 440 trout per mile. We failed to collect brook trout at only the warmest stream, where water temperatures reached as high as 80°F. Water temperature never exceeded 68°F at nine stations. Wood densities ranged widely from a minimum of 10 to a maximum of 688 pieces per acre.

Temperature and the amount of wood per acre were the best predictors of brook trout abundance. In fact, the duration of water temperatures over 68°F and total wood density together explained 64% of the variation in brook trout abundance.



Wood provides important habitat for brook trout.



Brook trout abundance increased with decreasing water temperature and increasing wood. The different lines represent streams where water temperatures exceeded 68°F for 0, 100, 200, or 300 hours from May through September.

Brook trout abundance generally increased with decreasing water temperature and increasing wood density (see graph). For streams where water temperatures exceeded 68°F for 200 hours or more, water temperature was the most important factor affecting brook trout abundance. In these warm streams, brook trout abundance was relatively low, regardless of the amount of wood present.

However, for streams where water temperatures were suitably cool, brook trout abundance increased with increasing wood density.

This study demonstrates the importance of both water temperature and woody habitat to stream-dwelling brook trout and underscores the importance of proper habitat management. The Department of Fish and Wildlife is currently working with state, federal, and private partners to improve habitat for trout and other species by deliberately adding natural wood to selected streams where these important habitats are lacking. We will monitor these streams to determine if this practice can effectively improve trout populations. However, it is much more effective to protect stream habitats by maintaining mature trees along stream banks which will provide shade to the stream and keep temperatures low. Over time, some of these trees will fall into the stream, where they will create important habitat for trout and other species. Wood should remain in the stream where it can contribute to larger trout populations and better fishing for all Vermonters. Wood is good for trout!

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