

Every Acre Counts: the Newfound Watershed Master Plan



Science-based Water Resource Planning

By Robert Craycraft, UNH Center for Freshwater Biology

Have you heard a friend or neighbor characterize Newfound Lake as the clearest lake in the country? Many residents within the Newfound Lake watershed, the land area that drains towards Newfound Lake, clearly feel they live near one of New Hampshire's natural resource assets. Water quality data, collected as part of the *Every Acre Counts: The Newfound Watershed Master Plan* project, should help expand upon a growing body of knowledge about the Newfound Lake Watershed that will assist local decision makers in protecting our vital water resources. Previous articles in the *Every Acre Counts* series have highlighted a review of local master plans and the results of a community-wide survey distributed to nearly 2,000 watershed residents. Based on the community survey results and town master plans, residents of the nine watershed communities recognize the importance of the region's clean water.

The Newfound Lake watershed is framed by the majestic headwaters of Mount Cardigan to the west and is ringed by ridgelines and hills that traverse the high country of Alexandria, Bristol, Bridgewater, Danbury, Dorchester, Groton, Hebron, Plymouth and Orange. Water quality monitoring conducted during this study focused on the nutrient phosphorus in Newfound Lake as well as streams that originate more than six miles from the Lake. Much as lawns or gardens flourish when they are fertilized, a lake becomes greener as more nutrients, particularly phosphorus, enter the water body. "Background" phosphorus concentrations occur naturally in our New Hampshire Lakes and increase over a geological time frame of thousands of years. However, the amount of phosphorus, as well as other pollutants, can enter the lake or stream at an accelerated rate when local activities and policies do not consider the long-term environmental impacts.

There is a saying, "a lake is a reflection of its watershed", and the predominantly forested Newfound Watershed essentially functions as a natural purification system that removes sediments, phosphorus, and other pollutants before they are transported into the streams and ultimately into Newfound Lake. An eighteen-month study of the Newfound Lake tributaries was conducted between October 2006 and September 2007, during which extensive stream inlet sampling was undertaken. The study results indicated that nearly 50% of the stream flow to Newfound Lake comes from the Fowler River while the Cockermouth River contributed approximately 35% of the stream flow. Not only do the Cockermouth and Fowler Rivers account for the majority of flow into the Lake, they also contribute the majority of the phosphorus load to the lake, totaling approximately 48% and 19%, respectively. The phosphorus loading values documented for eighteen stream inlets were generally low and characteristic of a forested watershed such as that of Newfound Lake.

Data collected by UNH personnel and Newfound Lake Region Association volunteers between 2006 and 2008 support the claim that Newfound Lake is one of the clearer lakes in New Hampshire, but short-term water quality reductions – typical during heavy rain events - are a reminder that serious threats exist. For instance, sampling of the Cockermouth and Fowler Rivers during an intense August 11, 2008 storm event, detected turbidity (sediment) and total phosphorus concentrations nearly two orders of magnitude (100x) above baseline levels. It is during these periods of heavy rainfall that sediment has been readily visible in all of the stream inlets and during which elevated total phosphorus concentrations have been documented. Visual observations of most stream channels indicate extensive bank undercutting. Steep slopes that form the headwaters of much of the Newfound watershed, coupled with shallow bedrock and granite out-crops, provide little infiltration capacity for water that rapidly runs downslope. While some erosion occurs naturally, bank erosion and phosphorus loading threats may be exacerbated by development, increased amounts of impermeable surfaces (especially on steep slopes) and improper logging practices.

An understanding of how land use impacts water quality, coupled with sound land use planning and our appreciation for the Newfound area's exemplary water quality, can be used to pro-actively address potential threats to water quality that will arise over time. We hope that you continue to watch for these articles to learn

more about the Watershed Master Plan, and also hope to hear from you at public meetings or around town to express your desires for the future. You can also share your ideas with the NLRA at info@Newfoundlake.org.

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