# The Effects of Liming on Litter Decomposition in Acidified Fresh Water Streams and Ponds

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Liming catchments of headwater streams has been shown to be effective at counteracting stream acidification from acid rain. We observed leaf litter decomposition rates and pH in tributaries of Barren Brook, Guysborough County, where powdered limestone was dropped to evaluate whether liming led to changes in ecosystem function. For this experiment, powdered limestone was dropped by helicopter over ~30% of the catchment area of the study stream to elevate the pH of the headwater streams and ponds. We used the litter bags method to compare the decomposition rates of air-dried Red Maple (*Acer rubrum)* in limed catchments and control sites nearby. We chose two ponds and two stream sites, a control and treatment for each. Leaf litter samples (2 g) were placed in flexible mesh bags and fixed to the substratum at each site. They were retrieved, dried, and weighed after 30 min and 2 wk, 4 wk, and 6 wk. The annual mean pH increased by 0.67 units in streams and 0.38 units in ponds the year after liming. Liming also caused the pH of the water to stabilize, which makes the water more resilient to acid rain. Liming had no significant effect on decomposition rates in streams. However, in our limed pond, the decomposition rate increased significantly after liming from 0.0075 $d^{-1}$ in 2020 to 0.0130 $d^{-1}$ in 2021 ($p < 0.05$). Hence liming does combat the acidification of streams and ponds while accelerating litter decomposition in ponds. However, the increase in decomposition in ponds was only temporary, because the trend did not persist to the second year after liming (2022). Future research could explore the long-term effects of liming on decomposition by applying a greater dosage of lime, or applying lime to a larger area of the catchment.