

**Reconstructing Past Beaver Activity
Using Tree-Ring Analysis**

Dendrochronology Fieldweek Group Leader Report

by

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As one of the group leaders of the Dendrochronology Fieldweek held at Pinkam's Notch Camp on August 13-17, 1990, I proposed that tree-ring analysis and dating could be used to document histories of beaver activity in the region. This proposal was accepted and applied to an extensive sequence of old and new beaver ponds located directly across the road from the camp. The fieldweek participants who selected this proposal for their project were Dave Houston, Hilary Woodcock, and ??? (the AMC intern).

Several kinds of tree ring samples were collected to determine the ages of the various beaver ponds. Alders growing on the tops of the older beaver dams were cut for ring counts to determine the minimum ages of the dams. Partially cut trees were sampled to determine the year of injury. Trees on the margins of the beaver ponds were sampled to determine if the rise in water level adversely affected growth. Most of these "witnesses" to beaver activity were living trees and shrubs. Although there were many dead stems, both in the dams and standing along the margins of the ponds, the number of rings were usually too few to date the time of death by cross-dating. Finally, the full extent of past and present beaver dam activity was surveyed and carefully mapped.

Back at the research center, the tree-ring specimens were carefully analyzed for age, cross-dating, and anomalous behavior, all in an effort to date the various stages of beaver dam construction and ponding. The minimum-age estimates based on alder ring counts proved to be quite useful and were accurate to within a few years of the most

probable construction dates determined by other means. Dating the beaver feeding scars on living trees was less useful in general because they frequently recorded only the most recent activity. However, scars on one red maple specimen recorded three different periods of beaver activity. Ring-width reductions due to inundation proved to be very useful in dating the time of dam construction. At the newest dam location, spruce and fir trees were inundated to the depth of 2-3 feet and were in the process of dying. These trees showed an abrupt reduction of radial growth and a bluish stain in the sapwood that presumably was due to anoxic conditions.

Based on these analyses, a time history of beaver activity extending back to the 1950's was reconstructed. A series of aerial photographs of the area beginning in the mid-1950s and extending up to the late-1980s in approximately 10-year intervals was used to validate the tree-ring reconstruction of beaver activity. The success of this brief, but intensive, effort clearly demonstrated the utility of tree-ring analysis for reconstructing beaver activity in New England.

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