

RIPARIAN BIODIVERSITY PROJECT



Manomet Center for Conservation Sciences, Forest Conservation Program

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Riparian areas are located at the intersection of aquatic and terrestrial habitats and are considered to be biodiversity “hotspots” (Richardson and Danehy 2007). Large numbers of species can be found in riparian areas and in Maine, up to 85% of vertebrate species rely on riparian habitat at some stage of their life cycle (Bryan and Charry 2006).

Existing state forestry regulations require the establishment of riparian management zones (RMZs) which limit harvesting activities adjacent to water bodies. The required width of RMZs vary by stream size but in Maine, RMZs 11m (38ft) wide are effective in protecting water quality and temperature in small streams (Wilkerson et al. 2006).

RMZs have potential to be a useful conservation tool for aquatic and terrestrial habitats because the limited timber management in these areas may make retain similar structures and functions of unharvested forest. However, little scientific research exists to verify how much RMZs contribute to the overall biodiversity goals of sustainable forestry. To answer this question, Manomet conducted a field study to assess the biodiversity of riparian management zones (RMZs).

During the summer of 2007 we visited 130 streams in the state of Maine (Figure 1) and measured a number of parameters within the stream channel (bankfull width, channel gradient coarse woody debris >8 cm dbh, canopy closure) and in the RMZ (woody debris >8 cm dmh, large [$>40\text{cm dbh}$] trees and snags, presence of selected lichens, basal area, vertical structure of vegetation, and leaf litter depth). Complete data analysis is ongoing but this document provides a summary of the preliminary analysis.

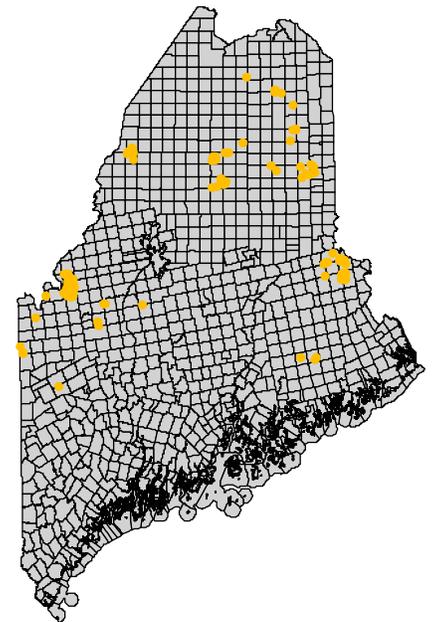
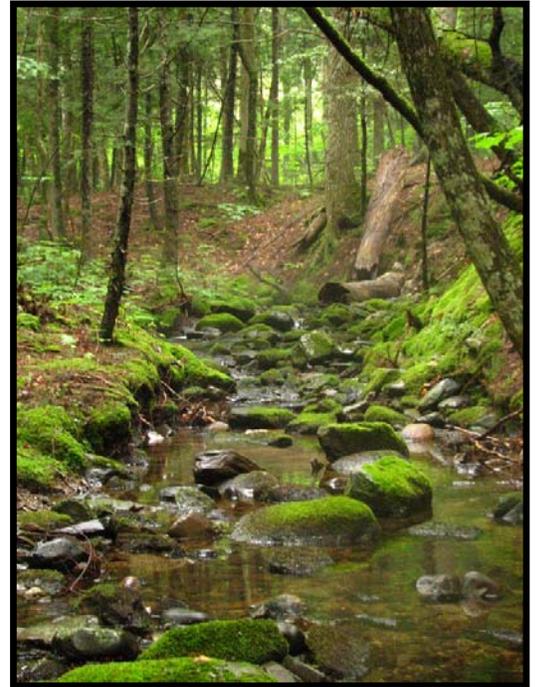


Figure 1 Locations of RMZs sampled

PRELIMINARY RESULTS

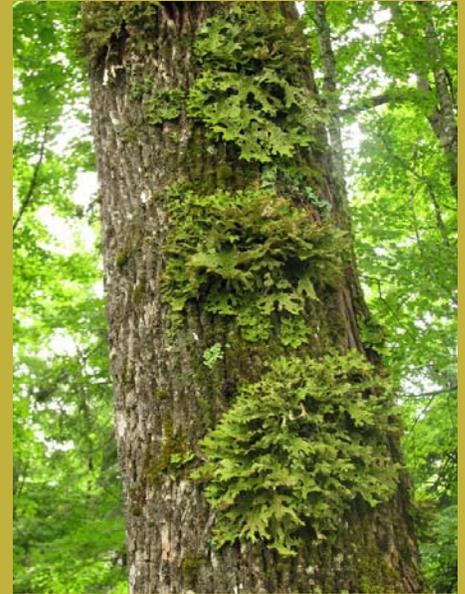
The average bankfull width of the streams we sampled was 2.8m (9.2ft) and average gradient was 6%. The average canopy closure over the stream channel was 83%. This indicates the majority of stream channels were well shaded from solar radiation which can increase water temperature.

At the sites we visited, 47% of the RMZs were greater than 25m (83ft) wide. This is wider than legally required under state law for streams this size and has been found to fully protect against changes in water quality and stream temperature (Wilkerson et al. 2006).

Late-successional forests are a rare habitat type in Maine (Hagan and Whitman 2004). Late-successional forests contain high densities of trees larger than 40cm (16") in diameter and often contain several lichen species closely associated with old forest (>80yrs). The RMZs we surveyed contained an average of 13 large (>40cm or 16" in diameter) trees per acre. Of the RMZs sampled, 15% of sites had no large trees but 25% of the sites had more than 20 large trees per acre. The majority (93%) of these large trees (>40cm dbh) hosted a lichen species that is an indicator of late-successional forest.

Woody debris originating from the surrounding forest is important in creating aquatic habitat (Maser et al. 1988). Streams harvested within the past 20 years had an average volume of woody debris between 2.1-3.8m³ (74-134ft³) of within 100m (330ft) of stream channel. Streams surrounded by old growth or late-successional forest had an average of 4.8-4.9m³ (170-173ft³) of woody debris per 100m (330ft) of stream channel.

Late-Successional Lichens



Pool Formed by Woody Debris



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