Keeping Invasive Plants out of Forest Fragments

Fragmented forest habitats are vulnerable in part because they have more edges, which are susceptible to invasion by non-native species. While the obvious solution of minimizing the amount of edge is not always feasible, there may be another effective approach: intact edges can help keep seeds out of the forest interior, according to new research in the February issue of "Conservation Biology."

"Our work addresses the impact of forest fragmentation at the 'neighborhood' scale - what happens when developers put up a new strip mall or housing complex. The development of our landscapes continually fragments forests and [that] should be considered when thinking about the distribution and degree of aggregation of homes," said Mary Cadenasso of the Institute for Ecosystem Studies in Milbrook, New York, who did this work with Steward Pickett of the same institution. Cadenasso and Pickett measured how many seeds blew from an old field into an adjacent deciduous forest patch, a common type of edge in New England. The researchers studied seeds that are dispersed by the wind because many invasive plants have wind borne seeds.

To see how the forest edge's structure affected seed invasion, the researchers compared two types of edges: intact and thinned. They created 130 feet of thinned edge by removing all trees, shrubs and branches that were less than half the height of the forest canopy. This thinning extended 65 feet into the forest patch. The resulting thinned edge resembled that created by logging or a large blowdown. The researchers found that four times as many wind borne seeds crossed the thinned edge than the intact edge. They also found that seeds crossing the thinned edge penetrated 2.5 times deeper into the forest - 145 feet into the "thinned edge" forest versus 55 feet across the "intact edge" forest. To help protect forest fragments from invasive weeds, Cadenasso and Pickett recommend "sealing" the edge by planting it with dense native shrubs, vines and understory trees, as well as removing non-native plants from the edge.

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