

The Fragmented Forest

By: Adam Downing, Virginia Cooperative Extension

Those words carry negative undertones. Perhaps I should've chosen a different title like "Forest Bits & Pieces" or "Checkerboard Forestry" which sound more like an environmentally friendly candy or a board game. Aside from the undertones of the phrase, the fact is that forest fragmentation has both positive and negative consequences. Forest fragmentation is the conversion of forests to non-forest use, leading to a diversity of land uses on former forestland. Parcelization, the division of large, continuous forest tracts into smaller properties and ownerships, creates the conditions necessary for forest fragmentation.

Are Parcelization and Fragmentation New?

The one-word answer to this question is "No." Before Europeans arrived in this country, the Southeastern United States was actively and extensively managed. According to latest estimates, pre-European population, of what is now the geographical United States, was as high as 50 million. To put that in context, that's about what the population of this country was not long after the Civil War. The point is that this was not the wild, untamed land many of us learned about in history class. Collectively, native populations maintained hundreds of thousands of cultivated fields. In addition, intentional management activities and severe weather events kept the forest in somewhat of a patchy mosaic.

This patchy mosaic was accentuated by European settlement patterns. The desire to own land and to pass it on to one's heirs was and still is a dream many Americans share. This often leads to parcelization where a block of land is subdivided into multiple ownerships. Over time, multiple ownerships naturally lead to different land use decisions resulting in fragmentation. To illustrate, here's a fictional short story based on many true stories.

The Hundred-Acre Wood

I grew up in a 100-acre wood. My brother and I are excited to inherit this piece of property that we hunted, built forts on, and played in. We figure the easiest thing to do, since we both want the property, is to split it in two.

(20 years pass...)

Hunting on 50 acres isn't like hunting on 100 but it's better than nothing, since my brother changed his mind a few years back about letting me hunt on his piece. Since I don't live on the property, I only make it back once a year anyway.

Downing. Virginia Forest Landowner Update. V. 30, No. 4. Fall 2016.

Town is moving out, and the neighbor's farm has metamorphosed into a subdivision. My uncle's place, next to ours, is now in three different pieces for his three daughters and I can't hunt there either. I think how great it must have been for my great-grandfather when he owned all 500 acres before he sold some to a golf course and the children inherited the rest.

Today I opened my mail to find a letter offering more money than I've ever seen for my property. I had always figured I'd leave it to my children but they don't seem very interested in it anyway. Besides that, I'm still in debt from the loan I had to take out to pay the inheritance taxes and I could really use the money to pay for their college educations...SOLD!

I guess a large retail store wants to capitalize on the recent growth in the area. The land will be cleared, paved, and built on. I'm sad as I think about the place I knew but I hear the residents are eager to have a store so close.

The End.

Parcels and Fragments: The Rest of the Story

Virginia's forests play a critical role in the economic and ecological health of the state. They provide over \$17 billion in economic value to the commonwealth and another \$16 billion in ecosystem services such as wildlife habitat, clean air and water, recreation, and carbon storage. How do parcelization and subsequent fragmentation affect these values?

Parcelization and fragmentation can be beneficial. An economic/social benefit is that fragmentation allows more of us to live in or near wooded areas while remaining in close proximity to amenities such as shopping, work and school. A biological benefit is that fragmentation may create a diversity of habitats suitable for many different types of wildlife.

However, in the context of healthy and productive forests, properly functioning ecosystems, and the forest industry, parcelization and fragmentation can also be detrimental.

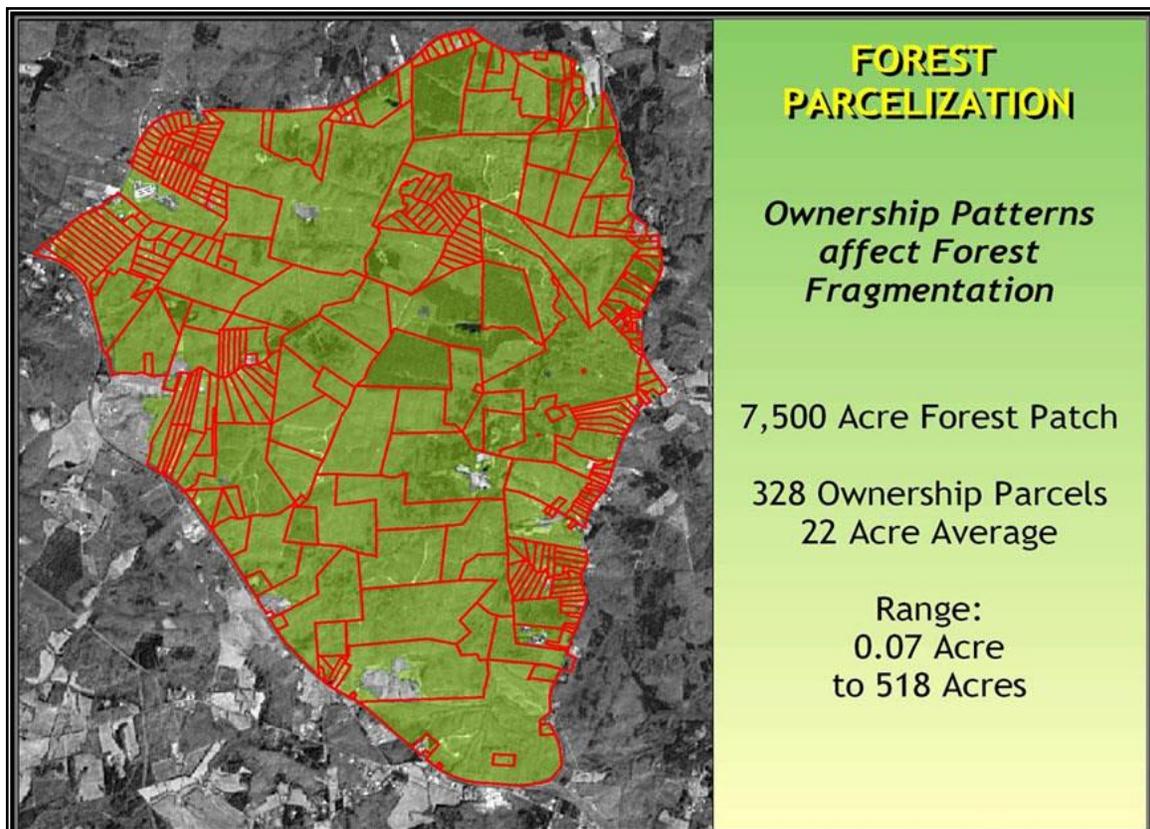
Fragmentation tends to separate and isolate forested parcels. This leads to changes in wildlife habitat and the ability of a forest to produce products and amenities. Fragmented forests abound with wildlife habitats beneficial to generalist and edge species. Deer, squirrels and rabbits, for example, do well with a mixture of open,



Demand for affordable housing and preference for wooded lots are two common factors contributing to forest fragmentation across Virginia. Photo by: Adam Downing, VCE.

brushy and wooded areas. However, many other wildlife species, such as certain migratory songbirds, need large interior forest areas. Fragmentation reduces this.

Fragmentation also impairs landowners' ability to actively manage their forests, which in turn decreases the production of timber and non-timber products. Studies show that owners of less than 25 acres are not as likely to actively manage their forestland for various income, aesthetic, or wildlife goals. And even when small woodlot owners want to manage their land, fewer options may be available. For example, timber harvesting is often a viable tool to improve wildlife habitat; however, timber harvesting efficiency decreases as tract size shrinks.



This 750-acre forest is to be broken into multiple parcels. While much of it will remain wooded for a time, the shift of land use towards residential use changes the values and potential outputs. Residential woodlots are typically valued more for intangible benefits versus income or hunting. Image by: Virginia Department of Forestry and Mike Santucci, VDOF.

Despite the fact that Virginia has always had fragmented forests, fragmentation today is more widespread and more permanent than in the past. This is a result of development; once a previously forested parcel becomes a shopping center, the

chance of it ever returning to natural forest is slim. And this development is occurring more rapidly than ever before.

As citizens, natural resource professionals, and landowners, we need to be aware of this. While it's true that we all need places to live and work and shop, we also need forests that are capable of providing us with clean air and water, homes for wildlife, timber to build homes and a myriad of other benefits.

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