

# TO MANAGE OR NOT TO MANAGE: THAT IS THE QUESTION

By Sara Kelso

You may be a long-time forest owner (or a long-time lover of a piece of land) and noticed that even in the absence of active management the forest doesn't look the same as it did in the past. You might be seeing fewer white trunks of paper birch, and notice that they are being replaced by maples or fir. This is not a cause for alarm. These ecosystem changes are predictable and are referred to as forest succession.

Paper birch trees are sun-loving and relatively short-lived. Once they have reached the end of their lifespan (around 80 years), the more shade-tolerant trees around them have grown up. The young birch can no longer survive under these shady conditions.

Oliver and Larson (1990) observed this natural phenomenon and identified four stages of forest stand development: stand initiation, stem exclusion, understory re-initiation and mature growth. This is a generalized model of global forests and it varies based on different ecosystems from region to region.

- **Stand initiation:** After a disturbance in the forest (think a windstorm, fire or a logging job) there is suddenly a lot of "growing space" for sun-loving plants to grow into a new forest. Growing space is comprised of the available water, sunlight, nutrients and physical space for plants to use.
- **Stem exclusion:** As trees continue to grow, they compete with each other for light and other resources. This is when the trees start to "self-thin" or when the stronger trees have a competitive advantage and crowd out their neighbors.
- **Understory re-initiation:** As this natural thinning process occurs, the forest structure begins to change. The forest looks different from that initial stage. There is more diversity in tree sizes, and more space on the forest floor for different, shade-loving species to occupy.

- **Mature growth:** When a forest reaches its older, mature growth stage, many of the trees from the initial cohort have died except for the longer-lived species. (In Wisconsin those are often sugar maples, oaks, white pines, yellow birch and hemlocks). There are more standing dead trees and downed logs lying on the ground, adding to species and habitat diversity and nutrient cycling.

There are living and non-living factors, besides time, that influence forest succession. Soils introduce constraints and availabilities of future forests. Nutrient availability, moisture content, soil temperature and density of the forest floor may limit or enhance the ability for seedling germination for specific species. A swampy forest will succeed differently than an upland forest.

Climate change can affect forest succession. Drought stress can weaken trees, making them more susceptible to pests, which in turn are strengthened by the warmer temperatures. Invasive plants may be more aggressive due to longer growing seasons or variations in bloom periods and pollinator availability, although most trees are wind pollinated.

Wildlife populations also change along the succession continuum (e.g. ruffed grouse will happily raise their broods in a thicket of young aspen, but as the forest matures and loses that dense understory they will move on to find more suitable habitat). Wildlife can influence how and when these changes happen. Heavy deer browse pressure in an area impacts the plant species that survive in the forest understory, then eventually the overstory. The new forest is more likely to be comprised of species that are not preferred food for deer. This might mean fewer mature forests of yummy, slow-growing species such as hemlock, cedar or oak. This outcome can be partially offset by human activities, such as protecting seedlings from deer browse or better manag-

ing their populations.

All of these situations can affect how regeneration and recruitment happens in forests, as well as the pattern of tree mortality. Of course, what actions taken, or not taken, comes down to planning and a future vision for a forest.

While there might be a natural progression of the forest, it may not fit your dreams. If you used to have plentiful aspen stems but are now seeing more long-lived, shade-loving species, you may want to think about actively managing your forest to maintain those aspen (if that's what is wanted). Much of forest management mimics natural disturbance, which is how we have such diversity in forest ages across our landscape. How you specifically manage your land comes down to defining goals and objectives and working with a forestry professional.

Different types of forest management can influence how and when (and sometimes if) these different stages of forest development occur. Clearcutting may mimic a stand "replacing" event, completely removing the overstory and creating an excess of growing space. Cutting patches of trees may imitate small wind events, and a selection thinning can mimic individual tree death. Mature forests cannot be planted, but management can accelerate succession and their characteristics can be incorporated into younger forests through the addition of standing dead trees, downed logs and species and structural diversity. These are some examples of ways that a forest owner can manipulate stages of forest succession. This can be helpful in achieving certain outcomes, such as timber production or a particular set of wildlife habitats.

In the absence of disturbance, your forest may eventually reach that "mature growth" stage, which will have different visual characteristics. Recognizing how and why a forest looks the way it does can go a long way toward understanding the health of a forest and what the

future might hold. We can then use active management to reach the stage that best fits the goals and objectives of the forest owner. Each of these stages plays an important role in wildlife habitat, carbon sequestration, the forest products industry and recreation.

There is no single “right” way to manage forests. Forest succession takes time and patience. Watching a forest grow is a rewarding labor of love. Working with a professional forester can help ensure that you understand the underlying processes and that the end result fits your vision for the future. The woods tell a story, and the final chapters are yet to be written.

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