Altered fire patterns, pests, poor harvesting practices and demographic shifts all challenge the sustainability of Missouri’s forests.
Missouri’s forest resources are entering some of the most interesting and dynamic times we have ever known. Seldom have our forests faced so much threat, yet simultaneously posed so much opportunity to alleviate social and environmental challenges.

Conversion, Fragmentation and Parcelization
Eighty-two percent of Missouri’s forestland is privately owned. This means that the future sustainability of Missouri’s forests rests largely in the hands of private landowners. It also means that social, demographic and economic forces translate into major changes in the way those lands are managed and used.

In the coming decades, there will be a significant changing of the guard for Missouri’s private forests. According to a 2006 survey conducted by the U.S. Forest Service, 17 percent of Missouri’s family forestland is owned by people 75 years of age or older, and nearly 70 percent is owned by people 55 years or older. As these forests are passed on to heirs or sold to new owners, they often become more vulnerable to the threats of conversion, fragmentation and parcelization.

Currently, Missouri’s net forest acreage is increasing. However, conversion to pasture, cropland or urban development is still a major concern in Missouri. We are losing many acres of high-benefit forest while gaining forests that produce fewer benefits, such as abandoned pastures reverting into honey locust thickets. These provide little wildlife habitat or forest product potential.

One of the side effects of forest conversion is fragmentation. Forest fragmentation refers to the breaking up of larger forest blocks into smaller, disconnected patches with a greater abundance of open land scattered throughout. Fragmentation negatively impacts many wildlife species that require large blocks of continuous forest. This can make forests more vulnerable to insect and disease outbreaks, invasive exotic plants and domestic animals that can harass native wildlife or alter their habitat.

Landowners are also subdividing their properties into smaller tracts. Given today’s economic hardships, these temptations become especially great. A common practice among older landowners is to divide their property into multiple tracts of equal acreage to pass along to each of their children. This can only happen so many times before tract sizes get so small that management options become significantly limited.

A landowner who needs to sell 80 acres of woods, for example, is likely to make much more money by breaking the land up into eight 10-acre lots and selling them as home sites, instead of selling the 80 acres intact. Through this parcelization, significant forest acreage can be converted to other uses. Acres remaining forested often become fragmented and the smaller tract sizes make it much more difficult to manage for wildlife or forest products or to realize the full benefits of clean water and air associated with forests.

Woodland Fire
For thousands of years, fire has influenced Missouri’s forest and woodland landscapes. Historically, Native Americans used fire for improving wildlife habitat and hunting opportunities, enhancing travel conditions and as defense against rival tribes. These fires resulted in a rich mosaic of prairie, glade, savanna, woodland and forest communities across the state.

As European settlers displaced Native Americans in the early 1800s, they continued the tradition of using fire to improve grazing...
opportunities for free-ranging livestock.

It has only been in the past 70 years that Missourians have begun suppressing wildfires. These efforts have been so successful that Missouri currently only has about 50,000 acres of wildfires per year. This is a remarkable achievement considering that earlier in the 20th century, up to one-third of the Ozarks burned each year.

Fire suppression has significantly improved the quality of Missouri’s forest products and has greatly increased the safety of people and their property.

However, the removal of fire has also had negative impacts. For example, we are now seeing a strong shift from the fire-tolerant, shade-intolerant species that traditionally dominated our forests (mostly oaks and pines) to species such as maples and elms, which are not tolerant of fire, but are highly tolerant of shade.

This change has not come without consequences. A significant impact of the removal of fire is that our forests are becoming overcrowded. Wildfires historically thinned out forests as weak competitors and fire-intolerant species succumbed, while the survivors grew larger.

Trees now have to compete for light, water, nutrients and space in crowded forests, and they grow very slowly, produce less fruit and nuts and are more vulnerable to insects and diseases. What’s more, the replacement of oaks with maples and elms means fewer acorns that many wildlife species require.

A crowded forest also shades the forest floor to the point that many wildflowers, grasses and other understory vegetation cannot survive. This trend affects many sensitive wildlife species that need this vegetation for food and cover.

Finally, the newcomer tree species are often much less desirable for forest products than the oaks they are replacing. This will eventually impact the type, amount and quality of wood products we are able to produce.

There are ways to maintain the health and diversity of our forests in the absence of wildfire. Examples include carefully planned and executed prescribed fire, timber harvesting and non-commercial thinning. These practices require active and well-thought-out management that can cost time and money. On the
other hand, not managing your forest can have significant costs as well.

Growth, Harvest and Consumption
Missouri’s forest products industry offers significant economic, ecologic and social benefits. Sustaining these benefits requires maintaining a careful balance of forest growth, natural mortality, harvesting and consumption. It’s also important to ensure that forests are harvested in a conservation-friendly manner.

Fortunately, Missouri’s forests are growing significantly more volume than is being harvested. From 2004 to 2008, Missouri’s forests grew three times more than was harvested.

Missourians currently consume about twice the volume of forest products (approximately 411 million cubic feet of wood per year) as we harvest each year. With increasing interest in using woody biofuels for the generation of heat and electricity, Missouri’s consumption numbers could soon skyrocket. In the face of this growth, it will be important to keep harvest rates at sustainable levels.

The manner in which forest products are harvested is also an important consideration. Timber harvests can be conducted in ways that actually improve the health of the forest and promote future growth.

Harvesting on public lands involves rigorous safeguards to ensure that the resulting forest will meet these standards, but there are few safeguards to ensure similar results on private lands.

Missouri relies strictly on the goodwill of landowners and loggers to make conservation-friendly decisions. Sometimes this approach works well and sometimes it does not. The Conservation Department offers help to private landowners who want to make conservation-friendly decisions with their forest through technical assistance to landowners, information on the best ways to manage forests and through logger training.

Invasive Plants, Insects, Diseases and Weather
Numerous exotic invasive plants are becoming a nuisance. They crowd out native plants, impede tree regeneration, reduce forest management options, degrade forest health and wildlife habitat and minimize recreational opportunities. Of Missouri’s 800-plus non-native plant species, 37 have become serious problems.

Some of the worst culprits include bush honeysuckle, garlic mustard, Japanese honeysuckle, autumn olive, wintercreeper and multiflora rose.

Missouri trees and forests also face a large number of insect and disease pests. Some of our most prominent threats are exotic species that have not yet developed enough natural predators to keep their numbers in check. Examples include the emerald ash borer, the gypsy moth and the Asian longhorn beetle.

Damage from these pests can range from cosmetic inconvenience to widespread destruction of entire forest communities. The damage is exacerbated when insects or diseases attack a forest already stressed from drought or site disturbance.

Unfavorable weather also becomes a challenge to forest health. In the past five years, Missouri has experienced incredible extremes in weather patterns and events. Three years of extreme drought were followed by two of the wettest years on record.

Additionally, many of our forests recently suf-
fered widespread damage from severe freezing rain, and on May 8, 2009, wind leveled 113,000 acres of Ozark forest.

Although there is not much we can do to stop the weather, we spend a lot of time dealing with its aftermath. Strategies need to be developed to ensure that Missouri’s forest resources are as resilient to various weather conditions and events as possible, and that Missouri’s agencies and people are well prepared and available to respond quickly to disasters when they occur.

**Community Forestry Issues**

Urban street tree inventories were conducted by the Conservation Department in 44 Missouri towns in 1989 and 1999. A comparison of results shows significant changes in Missouri’s community forests.

Communities now have more street trees. In 1989, there were 46.2 trees per mile, and in 1999 there were 62.9 trees per mile. However, average tree condition declined during this period. In 1989, 66 percent of community trees were good or excellent, compared to only 24 percent in 1999. This underscores the need to maintain trees throughout their life and then remove them as their condition deteriorates.

The inventory also shows that Missouri’s community forests are becoming more diverse. The top six tree species constituted 53 percent of those surveyed in 1989, as compared to 37 percent found in 1999. Having a diversity of tree species helps reduce the vulnerability of a community forest to devastation from such threats as emerald ash borer and Dutch elm disease.

In 1999, 12 percent of all community trees were topped, making them vulnerable to pests and diseases and shortening their life spans. Topping also weakens trees, turning them into community hazards. Despite extensive efforts of the Missouri Community Forestry Council to put an end to this practice, tree topping continues to be a major community tree problem today.

Because of the vast economic, social and environmental benefits provided by community trees and forests, it is helpful to think of them as a critical component of a city’s green infrastructure.

Like all other types of infrastructure, however, trees and forests need investment in order to maintain and sustain their benefits into the future. ▲