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Woodland Visions—Appreciating and Managing Forests for Scenic Beauty

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Preface

The concept of scenic beauty is seldom included in woodland management publications, though the reality is that aesthetics are extremely important to most forest landowners. Good forest management can enhance scenic benefits not only for woodland owners, but also for the surrounding community.

Woodland Visions discusses multiple uses of forestland, but does not give equal treatment to all of them; most are covered at length in many other publications. Rather, it is designed to help woodland property owners enjoy and enhance the scenic beauty of their land more fully.

Throughout this publication, the focus remains on appreciating and managing woodlands for the beauty they provide.

Lowell Klessig
Spring, 2002

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Introduction

> "We should do our utmost to encourage the Beautiful, for the Useful encourages itself."
>
> —*Goethe*

Webster defines *aesthetics* as "a branch of philosophy dealing with the nature of the beautiful and with judgments concerning beauty." As an adjective, aesthetic is defined as "appreciative of, responsive to, or zealous about the beautiful." In this publication, the term "scenic beauty," a more common expression and one that applies only to outdoor settings, is used interchangeably with aesthetics.

Except for the small number of landscape architects in natural resource management, professionals have historically paid little attention to aesthetics in their management decisions or recommendations.

And while scenic beauty is frequently the paramount goal of forest landowners, it has seldom been included in woodland management programs. Because management prescriptions have usually not addressed aesthetics, woodland owners have often rejected all professional advice.

This publication is intended to fill that void for woodland owners. It may also interest professionals who work with private or public forestland. The premise here is that conscious management decisions can enhance the visual attractiveness of individual properties and the rural landscape of the community. As professionals incorporate that premise into their verbal and written communications with landowners, landowners will be more comfortable about getting involved in woodland management and perhaps in formal programs such as Wisconsin's Managed Forest Law. As landowners understand their options for enhancing the scenic qualities of their woods, they will be motivated to manage their land for aesthetics as well as their other goals. And they will be more likely to involve a professional—if that professional understands their emotions.

Chapter I

Biophilia: the need for contact with nature

Aesthetics has often been treated like a frill—nice but not essential. That view is changing. E.O. Wilson at Harvard University and Stephen Kellert at Yale University have conducted research and reviewed other research regarding people's need for contact with nature.[1] They coined the word *biophilia* to characterize this need of the human mind to associate with other forms of life and life processes. That need is most often filled through visual contact with nature.

Owners of woodland have a great deal of visual contact with nature. And they can enhance the visual quality of their woodlands through sensitive management. But woodland owners are not alone in their need for biophilia. Urban dwellers, as well, exhibit the need for contact with nature. Bob Holmes writing for *U.S. World and News Report* observed biophilia even in the center of New York City:[2]

> *Within New York's Metropolitan Museum of Art is a Chinese garden rich with plant life and the soothing murmur of falling water. Visitors love to linger under the trees for a few meditative moments and watch the peaceful gliding of goldfish in their pond. Even in the midst of one of the world's great art collections, nature has a magnetic hold on the human psyche.*

According to Holmes, when North Americans and residents of Bali were asked to rate landscapes from photographs, they preferred savannas with scattered trees and some water—perhaps because the first humans lived in such a setting where they could find food but also see the advance of predators.

Additional experiments found that patients with gallbladder surgery recovered faster and needed fewer strong painkillers if they had a view of trees through their hospital windows than if they looked out at a brick wall. When prisoners could see trees from their cells, they suffered fewer stress related illnesses.

"... nature has a magnetic hold on the human psyche."

In his conclusion, Holmes notes:

> *So strong is the human affinity for nature that rural and city dwellers alike prefer almost any natural scene—even an ordinary non-spectacular one—to almost any scene of an urban environment lacking vegetation or water.*

How people fill the need for biophilia

The most common way people have contact with nature is visually. Preferences for blue and green may well be related to the dominance of these colors in nature. Green is associated with plant growth and plentiful food while yellow and brown are associated with drought, starvation or winter.

People express their need for biophilia in many ways. Plants and pets help fill the gap, as does gardening. Some people garden for practical reasons, while others simply like to feel the soil in their hands, or watch the plants grow under the summer sun. Gardening teaches children about the magic of seeds and the dynamics of growth. Many people cite the peacefulness and tranquility they experience in the garden as the most satisfying aspect of gardening. For woodland owners, managing the woods is much like managing their gardens—only on a more majestic scale and over a longer period of time.

Most people like to hear the wind in the trees, see it ripple across a field of grain or watch it play a lake into shimmering waves. And virtually everyone enjoys seeing and hearing waterfalls, the ocean surf and fountains. Water is universally attractive to people.

Finally, wildlife helps meet the need for contact with nature, whether it is by listening to songbirds on a spring morning or watching a rookery of terns on a northern island, deer grazing in the meadow, or an eagle soaring above the white pine. With few exceptions, watching wildlife is appreciated as an aesthetic experience. In earlier times wildlife had significant economic and spiritual value, which did not diminish its aesthetic value.

The natural beauty of parks and wildlife and big trees is important to people who never use or see them directly. They appreciate natural beauty vicariously in movies or videos and find satisfaction in simply knowing that it exists.

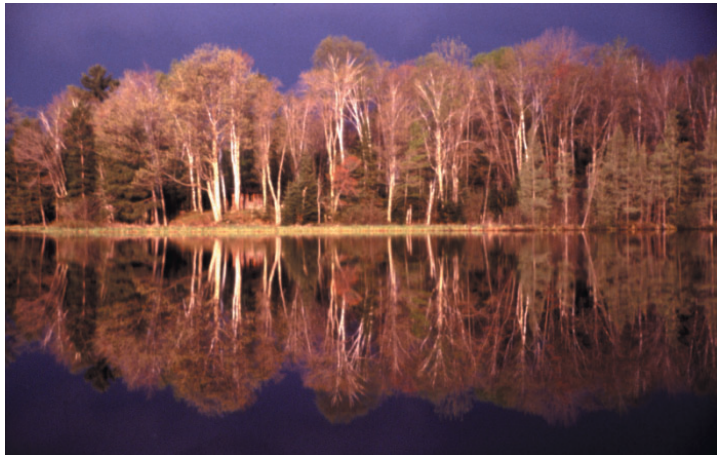
Meeting our primary social needs

Aesthetics are part of a broader set of primary social needs. Eleven primary needs are shown and described on page 3. Klessig and Hagengruber[3] at the University of Wisconsin–Stevens Point developed the list after 30 years of research and visits to 28 countries.

One way of assessing the value of woodlands to landowners and communities is to ask individuals, communities and societies what they need and then ask how woodlands contribute to those needs.

On a daily basis and for most citizens, trees make a major contribution toward meeting the need for aesthetic surroundings. However, the contribution of woodlands clearly goes beyond aesthetics. The lore of Paul Bunyan, the mythic lifestyle of lumberjacks, and the risks of running the logs down the river are part of the Lake States culture.

Forest products are an important part of the economy of Wisconsin and many other states. They provide a large portion of the jobs in many northern counties. In addition to paper and saw timber, forest related recreation supports many service industries. The forests provide economic opportunity for individual landowners, communities and society in general.



Forests offer lessons for landowners and anyone else who passes through them with an observant eye. Environmental education for children is often conducted in forests and the forest is the best place to teach forest ecology.

Woodlands, especially those that have been in a family for decades or generations, are part of the emotional bond between the family members or friends who use them. People and communities also bond to their physical place of residence and recreation. Aldo Leopold, the great philosopher who developed the "land ethic," once said that the only two things that really interested him were: 1) the relationship of people to the land; and 2) the relationship of people to each other.

Forests are central to global environmental security. They protect the soil and water. They filter the air. If managed appropriately, they provide biodiversity—habitat for a wide array of plants and animals. They take carbon dioxide out of the air that otherwise contributes to global warming.

Since woodlands can be used for many activities and since there are so many management options, woodlands contribute significantly to individual freedom. This is particularly true for woodland owners but also true for citizens using public forests.

Recreational opportunity is one of the major contributions of woodlands. From a quiet cross-country ski in the twilight of a white winter day to the blazing orange of deer season opening day, forests teem with recreational activity.

For people in past millennia and modern times, forests have provided a spiritual experience—a sense of awe and reverence. Large trees, especially those in old growth forests, facilitate this experience. While forests are a direct source of creativity and inspiration for some, others use them as an environment conducive to retreats for organizational planning or personal development.

In sum, forests contribute to most of the primary social needs of individuals, communities and societies.

Primary social needs

Aesthetic opportunity
- Natural beauty/landscapes
- Attractive buildings/cities
- Soothing interior spaces

Collective security
- International peace
- National defense
- Protection from internal disorder

Cultural opportunity
- Music
- Art
- Heritage

Economic opportunity
- Good wages/job security
- Return on investment
- Efficient production

Educational opportunity
- Formal schools
- Continuing education
- Wisdom of elders

Emotional security
- Family bonds
- Friendships
- Sense of community

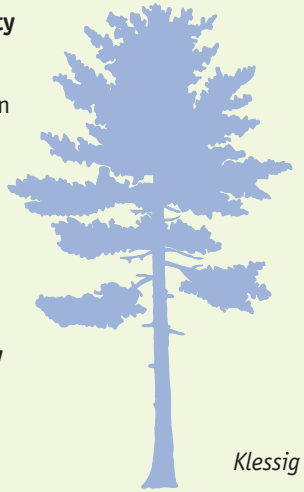
Environmental security
- Clean water
- Clean air
- Biodiversity

Individual freedom and variety
- Private property rights
- Consumer choices
- Unrestricted speech/media

Individual secrity
- Health care
- Police protection/prisons
- Fire protection

Recreational opportunity
- Outdoor sports
- Indoor leisure acrivities
- Relaxation time

Spiritual dimension
- Humility before Supreme Being
- Awe of nature
- Set of moral principles



Klessig and Hagengruber, 1999.

Chapter 2

What motivates people to buy and own woodlands?

People buy land for many different reasons. The reasons landowners decide to keep wooded real estate may differ from the reasons why they purchased it. Those reasons may change over time as a landowner ages. Woodland owners typically range in age from 40–70 years and are at a time of their lives when they are most secure financially.

In a speech to the Appalachian Society of American Foresters, reprinted in the *Journal of Forestry,*[4] Lislott Harberts tried to help professionals in the Southeast understand small landowners, whom she characterized as owning 50–500 acres.

> *…there are other drawbacks (of intensive management) that many forestry professionals do not take into account. These problems are not financial but psychological and esthetic. You foresters have been trained as technicians, as masters of a rational science. You may not like to deal with such imponderables as human emotions—but the landowner has lots of them. His median age in North Carolina is 54. He may not enjoy looking at an area that, even with the best intensive management, will remain an esthetic wasteland. Assuming a 35-year rotation, can we really expect him to hang in there until he's 89 to see his trees mature?* (In northern climates rotation time would range from 45 for clear cut aspen to over 100 years for red pine—*author's addition*).

These demographic characteristics explain many landowner motivations regarding woodland ownership. For example, a 20-year-old who appreciated young, thick aspen stands for the grouse that could be hunted there, at age 65 may see a young aspen stand as impenetrable and uninteresting. Later in life, a mature pine and hardwood stand that is easy to walk through may be viewed as providing solitude and beauty. For elderly landowners there may even be a gerontological bond between their age and the age of the trees they admire.

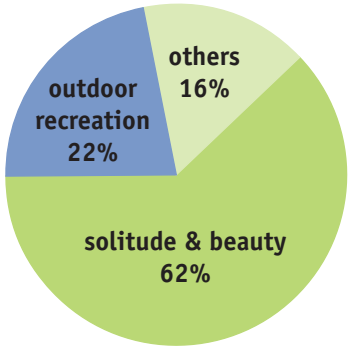
In University of Wisconsin–Madison research on management motivations, John Bliss noted the significance of the landowner's social psychological

characteristics such as ethnic background, family cohesiveness, intergenerational continuity, personal identity and values in making the determination to own woodland.[5]

Studies of landowner motivations have shown a striking consistency among states. In other words, when groups of landowners at different times and in different states are asked why they own woodland, the rankings are very similar.

The motivations of lakeshore property owners are consistent with the motivations of woodland owners. The results of the first major study of a large sample of lakeshore owners in 1972 are shown in the chart below.

Reason for purchasing lakeshore property



Fishing was expected to be the highest priority for buying lakefront property, but all "Outdoor Recreation" pursuits together only accounted for 22%. The expectation that "investment" would be a significant motivator, because of the high rate of appreciation of lakefront property, was also wrong. People buy lakefront for scenery and solitude.

Subsequent studies and informal surveys over 25 years have consistently yielded the same results: lakefront property is purchased and owned primarily for natural beauty and an aesthetically induced sense of solitude. Often the percentage of lakeshore property owners who rank aesthetics as their top value reaches the 80–90% range.

Wildlife habitat and natural beauty

The top two motivations for owning woodlands are for wildlife habitat and natural beauty.[6] These reasons, given by more than 80% of landowners, are usually closely ranked and highly correlated.

While wildlife habitat is frequently related to hunting game species, the motivation is usually broader, also relating to simply seeing wildlife and knowing that a variety of wildlife is present on the property. Many landowners manage their property to protect that habitat and improve it for specific species or for general ecological integrity.

Landowners, who like to see wildlife (especially birds and large mammals), cite an aesthetic experience as part of their wildlife habitat goal. However, good habitat for some game species may not be the preferred scenery of non-hunters. While wildlife management, especially for game species, is included in professional management plans, natural beauty is usually considered too nebulous of a concept to address. If the goals are not consciously integrated, efforts to enhance wildlife may damage natural beauty; for example, deer feeding may result in concentrated damage to tree seedlings and wildflowers. More generally, high deer populations have reduced local plant diversity.

Preventing development

While the terminology varies somewhat, an important mid-range motivation for about one-half of woodland owners relates to preventing sprawl from reaching the landscape.

Some take special measures to protect the property after they are gone. They may sell or gift the property with deed restrictions (covenants). They may sell or give development rights (conservation easements) to a governmental unit or non-profit organization. Increasingly, such landowners are getting involved in land trusts.

Although many landowners want to protect forests from development, fragmentation is still occurring at a rapid rate. The opportunity for large capital gains and the negative pressure of property taxes are causing many industrial and non-industrial forest landowners to subdivide land holdings into smaller and smaller parcels. Smaller landowners typically have less interest in management than larger landowners, and at some point, the property is simply too small to manage for forestry objectives. Managing for visual quality, however, is possible even on very small acreages.

Outdoor recreation

More than one-third of landowners own their property to pursue outdoor recreation. When pursuing outdoor recreation is combined with providing wildlife habitat as a goal, this figure is much higher.

When landowners were asked to separate motorized recreation from non-motorized recreation, less than 10% said they owned their property to use four wheelers or snowmobiles. The "quiet" sports (hunting, hiking, cross-country skiing, bird watching, berry picking, photography) were much more popular.

Wood products

A 1997 USDA Forest Service inventory found that less than 1% of Wisconsin woodland owners hold forestland for timber production. About 30% of all landowners report wood production as one of the reasons they own woodland, and almost half have had a harvest sometime during their ownership. That number may increase when timber prices increase or decline as land is divided into parcels. Timber production is more important to owners of larger tracts than it is to owners of smaller tracts. In any case, wood production is unlikely to ever be a primary motivation for ownership by private non-industrial woodland owners.

Wood production will only become more popular if it is fully integrated into a management plan that emphasizes aesthetics, wildlife and recreation. Many more landowners would consider timber harvesting if they were convinced that it was compatible with their higher values. It might be perceived as compatible if the recommendations landowners receive don't start with harvesting. And if the emphasis of a projected harvest in a management plan is on "what will be left" rather than on "what can be cut," aesthetics and harvesting cannot only be compatible but even mutually beneficial.

Land investment

During most of the past century, forestland has not compared favorably with other investments. The stock market, the bond market and even least-risky certificates of deposit have often yielded better returns.

In recent years timber production has provided a reasonable profit. Accessible forest land has also become a good real estate investment. Unfortunately achieving those benefits often involves conflict with other values and parcelization of the property, especially when ownership passes to the next generation. Not surprisingly, owners of large acreage are more concerned with the investment aspects of ownership than owners of smaller parcels.

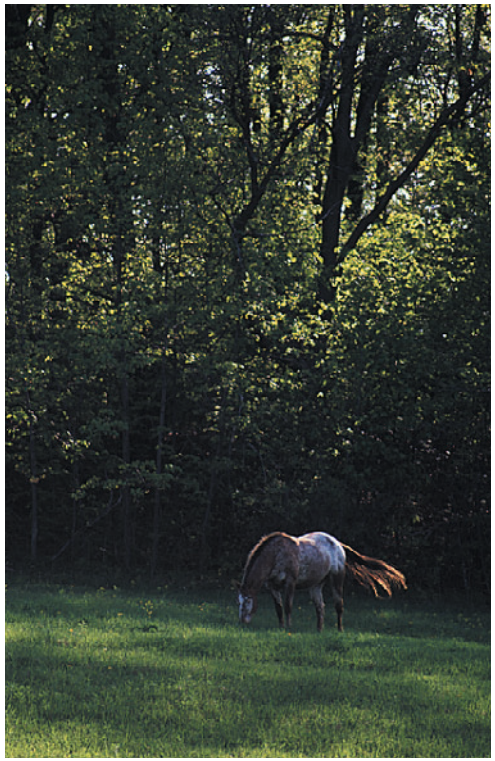
Part of farm

Timberland owned by Wisconsin farmers dropped dramatically from 6.4 million acres in 1956 to 1.5 million acres in 1997.[7] While total acreage declined as farm woodlots are split off for home sites, second home sites and hunting land, woodland continues to be part of many farms. Thirteen percent of non-industrial private forest landowners are farmers. Farmers may be more interested in the production and investment aspects of ownership than non-farm landowners. But farmers are less likely to have a management plan for their woods than for their crops and livestock. Increasingly small farms are populated with horses or beef cattle; aesthetics then are often the primary value of both field and forest.

Summary

Woodland owners have multiple motivations for buying and holding their land. Scenic beauty, wildlife habitat and related recreational opportunities clearly top the list. Additional values can complement those core motivations.

Regardless of their reasons for owning land, most forest landowners do not have a management plan. Thus they do not fully recognize their stewardship opportunities with integrated management. Without an integrated management plan, actions they take based on one value may have negative, unintended consequences on others. They might even damage the primary value—most often an inseparable mix of scenic beauty, wildlife habitat and recreation.



Chapter 3

Is beauty in the eye of the beholder?

In America, the idea that beauty lies in the eye of the beholder is applied to landscapes, private real estate, cityscapes and buildings. But that application may sometimes be flawed. Citizens, and particularly landowners of other countries expect and accept aesthetic standards as a normal part of their daily lives.

Examples of aesthetic standards are evident in the ancient cultures of China, Egypt, Greece, Rome and Native America

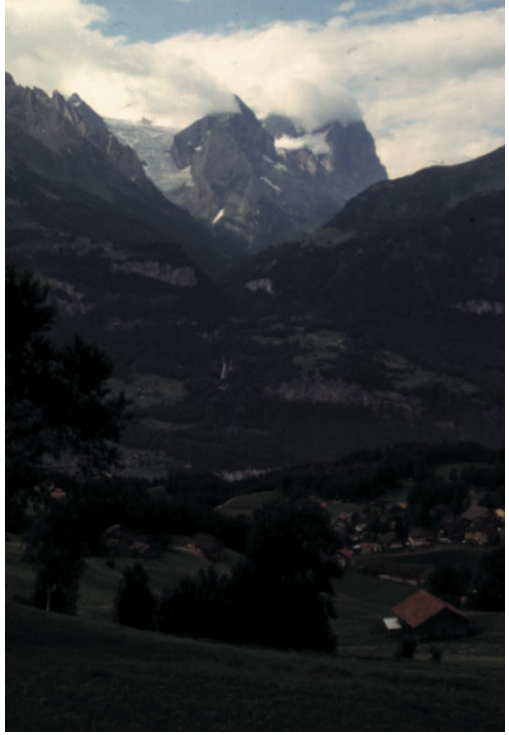
Examples of aesthetic standards are evident in the ancient cultures of China, Egypt, Greece, Rome and Native America. In modern centuries, European countries have developed a clear consensus on what is beautiful and what is not. Rural and city buildings meet community standards through customs or through legal requirements. Landscapes are also required to meet stiff standards, which individual landowners accept and promote as a significant part of quality of life for them personally and for their communities.

Europeans and their forests

Forests are an integral part of the European vision of the countryside—small villages surrounded by fields and forests. European farmers and forest landowners cannot conceive of the idea of subdividing their land. In many countries farmers live in the villages and even their own homes cannot be built on their agricultural or wooded acreage (hectares).

Germans have a love affair with their forests as explained in the following extended quote from *Forest World Magazine:*[8]

> *Germans instinctively claim ownership in the forests as part of their common heritage.*
>
> *The Federal Forest Law Bundeswaldgesetz establishes the framework for state legislation, such as the State Forest Law Landeswaldgesetz of Baden-Wuerttemberg, which encompasses the Schwartzwald (Black Forest). According to that law, all owners, both public and private, must manage their forests in a sustained, professional, careful and orderly manner in conformance with environmental concerns.*



> *The State Forest Law further mandates that every forester (1) pay special attention to the establishment and care of the forest's edges so as to conform to natural features; (2) retain sufficient habitat for endemic plants and animals; and (3) consider the diversity and natural individuality of the landscape.*
>
> *The edges of forests, especially along rivers, lakes, ponds and meadows, are visually sensitive and are popular with the public, accounting for the statutory mandate of maintaining a natural-looking forest fringe. The State Forest Authority might enforce this goal by imposing conditions on a permit to afforest land (reforestation).*

When agricultural land is converted to forest, the conversion follows the land's contour. Trees are planted over a number of years beginning on the original forest edge. Shrubs are used as the final planting. Since the older planted trees will be closest to the original forest and later plantings move farther from the forestry, feathering produces a soft transition from agricultural land to shrubs to small trees to larger trees. It appears that the trees of each planting dropped seeds, which grew into the next generation of trees farther into the former field. This feathering mimics natural regeneration.

Since law as well as custom enforces these practices, German courts must use criteria to determine if the laws relating to aesthetics have been broken. Germans, as well as other Europeans, have consensus as to what is a beautiful landscape. A legal system to enforce visual standards is explained in the following continuing quotation from *Forest World Magazine*:[9]

> *Courts are sometimes called upon to decide what is a disfigurement of the landscape. As a standard, they employ the aesthetic preferences of the hypothetical "average educated person" (gebildeter Durchschuittsmensch)….*
>
> *Minimal burdens would be conforming roads and cuts to the landscape, feathering the boundaries of clearcuts, and leaving a few attractive bushes or trees after harvesting, especially along a popular walking trail. These walking trails, by the way, often traverse private forests, which the law generally declares to be open to public recreational use.*
>
> *The German forests are beautiful by nature, but they stay beautiful by design, a design which incorporates sensitive forest practices and reasonable laws. Owners and the public seem to accept these laws as expressions of their common goal of maintaining an attractive environment.*

Individual freedom or aesthetics?

If the "average educated person" in Germany knows what is beautiful, does the average American have the same sensitivity? In general, Americans have the same reactions (consensus) to visual experiences but it is less likely that the consensus is translated into custom or law.

In Colonial America, restrictions on the use of private property contained many European concepts that had developed in the crowded Europe of the Enlightenment and Industrial Revolution that followed the Dark Ages.

And while Americans have retained much of the culture of Europe, land use regulations were considered unnecessary in a country with abundant land. If a family didn't like the way a neighbor was using land, it could move farther west or wait for the neighbor to move away. Similarly, inner cities became home to poor immigrants as established Americans sought "a higher quality" environment further from the city's center. Developing a neighborhood aesthetic standard was not a priority.

A strong sense of individual freedom underpinned the lack of regulation. Regulating land use was (and often still is) viewed as an infringement on property rights.

A different standard today

In the context of land use regulation, the axiom "beauty is in the eye of the beholder" was used to justify a preference for individual freedom rather than responsibility to the community.

But in the 21st century, with a population of several hundred million people, there is no escaping the reality that the behavior of each American impacts many other people. Land use is a particularly dramatic example of this principle. Motivated by concerns about urban sprawl, "Smart Growth" legislation in Wisconsin and similar legislation in other states was designed to address the issue. The breaking of land into parcels and property tax increases bring the issue home for forest landowners.

Land use planning and other public policies that relate to aesthetic values must be balanced with constitutional protection of private property rights and evolving community norms. "Beauty is in the eye of the beholder" is not a legitimate defense for avoiding discussion of such public policies. Not surprisingly, there is remarkable consensus on what is beautiful and what is ugly.

Beauty is not synonymous with wild or natural. Brush found that managed forests in Massachusetts were rated more beautiful than unmanaged forests. A forest with a small field to provide a vista was rated highest of all.[10]

Of course, there are visual preferences but consensus overrides the variation among viewers. Research on the attractiveness of private lakeshore settings in Wisconsin found that a large set of visual images elicited similar positive or negative responses from different groups of people. The age of the groups varied from college students to retirees but age didn't influence preferences. Property ownership didn't seem to affect responses either.[11] Robert Ribe at the University of Oregon conducted a major review of 88 scientific studies and published his synthesis in an articled entitled "The Aesthetics of Forestry."[12] Ribe concluded that synthesis with these words:

> *A number of findings are reconfirmed in different studies and are evidently quite general. They serve to demonstrate the validity of scenic value in certain forest characteristics against the view that aesthetic forest products are largely subjective and capricious.…They include findings that big trees are attractive, moderately stocked open stands are preferred, ground slash and other signs of harvesting are disliked, ground vegetation enhances forest scenes, evidence of fire detracts from beauty and species variety enhances the same.*

Within that general public consensus, Ribe did note some differences as listed below:

1. Foresters prefer tall straight trees, and environmentalists prefer expansive trees.
2. Wildlife professionals prefer scenes with more shrubbery for its habitat potential.
3. The low beauty rating for young forests is related to the stand density, which reduces visual penetration (the distance one can see into the forests).
4. Certain species are perceived to be more appropriate in different settings. British respondents preferred conifers in mountain areas and deciduous trees in agricultural areas.
5. Britons find plantations aesthetically acceptable if they are not planted in rows and include mixed species, which are planted in clumps rather than in alternate rows.
6. Some forest users require less scenic beauty than others. While landscape architects had higher aesthetic standards than other natural resource professionals, U.S. Forest Service landscape architects showed standards closer to local groups sympathetic to forest harvesting than to Californians and local environmentalists.
7. In France, young men, older people, rural people, farmers and industrial workers were more likely to prefer scenes of forest managed for timber than were young women and more educated Parisians.

While the results of forest beauty studies are generally consistent, researchers have not used the same techniques to measure attractiveness. The most broadly used technique is probably the Scenic Beauty Estimation (SBE) method developed by the U.S. Forest Service, which has funded many of the studies.

From Scenic Beauty Estimation or other methods it is clear that natural beauty is perceived somewhat differently by different cultures, by gender, by philosophy (utilitarian/conservation/preservation), by professional allegiances, and by geography or upbringing and experiences. "Splitters" emphasize these differences. However, "lumpers" maintain that the variance occurs within a broad consensus regarding attractive forests, less attractive forests, sometimes even ugly forests. In a Massachusetts study, landowners and forestry students (groups that might be expected to have divergent ratings) had consistent evaluations.[13] It appears that forest beauty is not "in the eye of the beholder."

Chapter 4

Components of aesthetic quality

Species coloration, shape and texture

In summer the differences among species are obscured by green foliage. The leaves and needles of all species are various shades of green. A landowner may prefer a certain shade of green or a mix of shades. But overall, the forest coloration is the least variable in summer when the edge of the forest projects a visual green wall. If the top of that green wall varies with trees of different heights, the scene is more visually interesting than a top that looks like a crew cut.

During the other seasons the color, shape and texture of tree trunks and branches are highly variable. White birch is the most dramatic and often the preferred species aesthetically. The light gray to light green of quaking aspen also stands out in a hardwood forest or in a mix with conifers. Bigtooth aspen offer tan trunks often as big as the gray, brown or black bark of northern hardwood species.

The smooth bark of birch and aspen provides contrast to the deeply furrowed black bark of white pine and the oaks. The bark of sugar maple, ash and basswood is more symmetrical with shallower furrows. Soft maples are smooth and gray in adolescence and flake in old age. Red pine is flaky and red throughout life.

Branch patterns also provide diversity and differential interest. Examples include gnarls, burls and den holes of any species, the umbrella shape of elm, the ballerina form of pin oak, the staghorn form of Kentucky coffee trees, and the nearly horizontal broad branches of oak and maple that began their life in open or nearly open conditions. Spruce provide nearly perfect green pyramids. And what can compare with a landscape tree—a white oak or bur oak growing with extended arms under open conditions or a white pine spreading its wings above the canopy. A tree has the potential to write its signature on the landscape for hundreds of years.

A tree has the potential to write its signature on the landscape for hundreds of years.

Together these characteristics are used to identify species—a skill that enhances enjoyment of woodland. They also add diversity and visual interest to the forest. Mixed species forests generally provide higher aesthetic value than a forest with only a single species. Small pure stands, sprinkled inside a mixed species forest, can be especially attractive.

Color by season

Autumn leaves are so dramatic that sightseeing trips and community festivals are organized around the peak of the colors. The soothing greens of summer become the exciting reds, oranges and yellows of fall. Many species contribute to the parade—each in its turn with substantial overlap. If sumac are ignored (hard to do), the maples are first in line and the most dramatic with bright red and heavy yellow. Birch and quaking aspen add a golden highlight. The oaks wait, as they did in spring, and then quickly turn red, maroon and bronze. The tamarack gets dressed for Halloween in fine gold silks. Finally the willow, a shade of yellow-green all summer, turns even more yellow and hangs on until Thanksgiving or beyond.

A few species hold their fruits and nuts after they drop their leaves. Catkins and seedpods provide close-up visual interest into winter. Hemlock and jack pine are continuously adorned. The colorful cones of red cedars (juniper) can also be enjoyed through much of the year. White pine display their cones on their top boughs all year and drop most for ground viewing on the snow in late winter if the red squirrels have not cut them down earlier.

Winter color can be monotonous and leafless in mature maple/basswood/beech stands. But mixed stands including birch, oak and pine can be very attractive especially when combined with fresh snow and bright sunshine. Oak, especially young trees, sheltered from the wind, will retain their bronze leaves for much or all of the winter. Since young oak often grow at the edge of the woods and along roadways, they are a very important component of winter aesthetics. When the large horizontal branches of oak or maple hold a curving mound of snow, the forest teases the imagination with snow snakes and other spooky creatures.

The biggest visual feast of the winter, however, is provided by snow-covered pine, especially the fine-needled white pine. The crystal clear blue sky and sunlight reflecting from every fresh white surface is the aesthetic dessert of winter—real competition for the peak fall colors.

Spring is underrated as an aesthetic treat. Some species start early; the purple haze of white birch twigs and the promising yellow of the willow often slip across the landscape before the snow is gone. About the same time, the maple offer their sap and at select places on the landscape, the maple (with help from a small ban of addicted biophiliacs) offer the picturesque scene of tapping and boiling maple sap into syrup. The maple leaves come out early—red for an instant before green chlorophyll takes charge. The aspen in delicate Nile green turn a hillside subtle as a pastel painting. And finally the bold oak leaves, that have waited until the chance of hard frost is past, are born, as they will die, in shades of heavy red. Before farmers listened to the weather radio, corn planting was determined by the size of oak leaves. When the oak leaves were the size of a squirrel's ears, it was safe to plant frost-sensitive corn.

All trees produce flowers. Most flowers are only subtly different from the foliage already on the tree. Other trees flower before they leaf out to provide more aesthetic interest. A few trees like serviceberry, black cherry, "wild apple" and wild plum produce attractive blooms visible at a distance. To develop a crown of flowers and be seen, these trees need open sunlight. In spring, budding trees complement a whole host of spring ephemerals that quickly replace the thawing snow and capture the sunshine before hardwoods block out the light. Trees, like basswood, also treat the nose to pleasant smells.

Summer can be perceived as less interesting than the other three seasons in the humid regions of the country where everything is green. However, there are differences in shades of green. Most importantly, the pervasive green sends a reassuring message that the land is fruitful with crops and food and trees for all of us.

Texture of the forest edge

If the landscape forms a quilt of different land uses, then the forest edge is the ruffle between the patches. Landowners and citizens alike see the forest edge much more frequently (usually from a public road) than they see the forest interior.

The edge is the visual enhancement zone for aesthetic management. Edge texture is created by a whole set of dimensions:

- The height of the tallest (dominant) trees.
- The density of the dominant trees.
- Proximity of dominant trees to the edge.
- The presence and density of other vegetative stories under the canopy of tall trees.
- The species of trees, especially the mix of conifers and deciduous trees.
- The presence and density of younger trees in front of older trees feathering toward the mature forest through natural reproduction or carefully staged planting.
- The irregularity of the forest edge and topline.

In general, the greater the variation in these dimensions, the greater the "ruffle effect" and the more visually interesting the forest edge will be. A forest with natural reproduction and a mix of species and ages is the easiest to manage for texture and color. By spacing juvenile trees through initial thinning and subsequent stand improvement, the vision for the forest edge will have timeframes of 5, 10, 20 and 50 or even 100 years. And such management manipulation is possible without being obvious to anyone viewing the forest edge from a distance.

Internal lighting

Texture is also important to people viewing the forest from inside the forest. Many of the same dimensions that are relevant for forest edge aesthetics are relevant to the forest interior. However, their relative importance changes. Inside the forest the diameter of dominant trees may be more noticeable than their height. Variability in diameter may be valued more than variability in height. Density is curvilinear—too few trees or too many trees both detract from visual interest.

All these dimensions are dynamic—depending on the season and the amount of light inside the forest. And, of course, all these factors are related. The amount of light in the forest depends on the canopy closure, which depends on the height, density and species of trees. Mature sugar maples have the ability to shade out most other species in the understory. While the sparse understory limits certain types of wildlife, such a forest facilitates both visual and physical penetration. And when those maple leaves turn yellow in fall, the inside of the forest glows like a Chinese lantern.

Hemlock also grow in shade and as adults create such a closed canopy that the forest is almost dark at high noon. Yellow birch and white ash can grow in shade but don't darken the forests as the ancient hemlocks did. Oaks usually allow greater light into the forest and thus support an understory of young trees, shrubs and forbs if the soil is rich enough to support them. The lower vegetation captures and diffuses sunlight creating a serene sense of growth.

Finally, pines create special dynamic lighting effects. A stand of tall trees with full crowns allows little sunlight to any specific spot of ground. However, narrow beams of sunshine provide a light show that moves as the trees sway and the sun angles overhead.

Topography

A rolling landscape with topography created by glaciers or water erosion in driftless areas is more visually interesting than flat terrain. The vistas from ridge tops are especially attractive.

While most woodland owners cannot and would not want to change the existing topography of their land very much, forest practices can enhance or diminish the aesthetic value. Planting trees in front of a scenic overlook will eventually create a green wall with little visual interest. Conversely, precise thinning or harvesting can create a vista by opening downslope view lanes.

Land use diversity

Wisconsin is blessed with a variety of natural and cultural landscapes. Numerous lakes, streams, wetlands and glacial features break the forest cover of the Northwoods. Each break widens the angle of viewing and enhances visual interest. Public land ensures some intact broad forest landscapes.

In central and southwestern Wisconsin, forest and farmland co-exist in roughly equal acreages. They complement each other visually especially when traditional farm buildings or grazing cattle are added to the scene.

In southeastern Wisconsin, agriculture and urban sprawl dominate but woodlots and even individual trees provide visual punctuation to the landscape.

Age and size structure

The eye, like the hand, is more comfortable with images that can be grasped at one time. A small cornfield in a setting of other crops, pastureland or forest is attractive. Full sections of continuous corn are boring. Plantations of red pine can be fit into an agricultural landscape in a pleasing manner. However, large plantations are just as boring as large cornfields. In Finland, birch plantations on tiny patches of land incapable of growing agricultural crops appear artful.

The same principle holds for the size and age of trees within a given forest. Small homogenous stands add interest to the larger forest as long as it is easy to physically or visually move to other stands. Mixed stands in between homogenous stands make that transition easier (like synchronized slide projectors and images that fade into each other). In a sense, a forest with mixed species, ages and sizes is even more diverse if it contains pockets of red pine, quaking aspen, white birch or some other species likely to develop in small pure stands. Such forests are easiest to manage for aesthetic benefits since almost any individual tree, group of trees, or small stands can be integrated into a mosaic.

Basal area as surrogate for aesthetic preferences

Basal area is a measurement of the total surface of wood that would be exposed if all the trees in an acre of land were cut off at breast height—4.5 feet above the ground. Basal area is thus a function of both the size and the number of trees. Both are correlated with scenic preferences. However, the relationship may be positive or negative. Because both visual penetration and size diversity are low, many small stems are not attractive. Visual scores increase as basal area increases provided the stand contains large diameter trees; the aesthetic optimum for early thinning of uneven aged northern hardwoods, when only trees with diameters larger than five inches are measured, is 75–80 square feet of basal area per acre. Incidentally, that basal area is close to the post-harvest basal area recommended for future saw log production by researchers at the USDA Argonne Experimental Forest in northern Wisconsin.

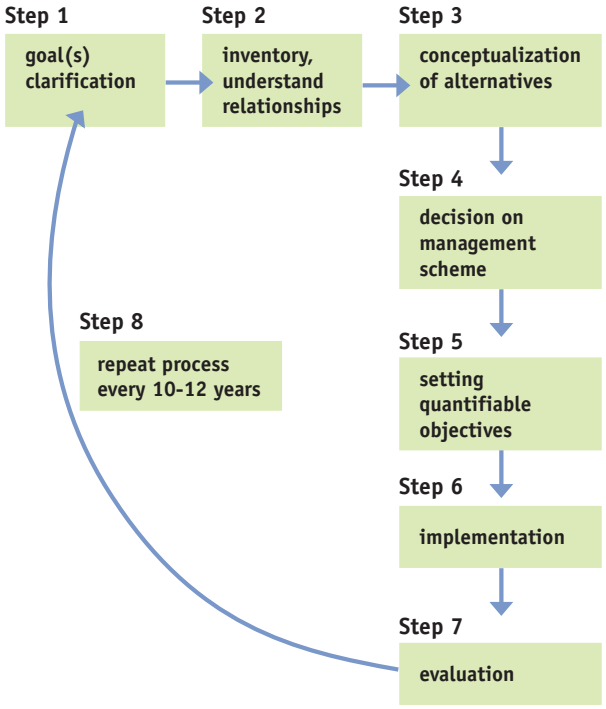
However, the aesthetic optimum increases as the stand ages and trees become larger. That suggests that the absolute number of large trees rather than total basal area determines the optimum. For a given number of trees, Ribe concludes, "scenic beauty always increases with overall basal area suggesting that once smaller stems are harvested or thinned, the residual larger stems produce more perceived beauty."

Chapter 5

Managing for enhanced scenic beauty

One of the meanings of "manage" is "to achieve one's purpose." That is the meaning most appropriate to woodland management. Management includes all the planning, implementation and evaluation steps shown in the diagram below.

Woodland management process



Clarification of goals is the most important step. It answers the *why* question. Without a clear answer here, none of the other steps make any sense. Only the landowner can answer this question.

Step 2 answers the first *what* question by obtaining data on the physical resource (inventory) and learning about silviculture and related sciences (understanding relationships in the forest). Most landowners will need professional help doing the inventory and understanding the silvicultural relationships. However, landowners can and should develop an understanding of basic silviculture.

Step 3 answers the second *what* question by providing a full set of alternative management schemes to meet the goals set out in Step 1. Professional assistance will generally be needed to develop all the options and likely scenarios.

Step 4 answers the third *what* question—what management scheme should be selected from the alternatives. The decision on what to do is the clear prerogative of the landowner. Professional assistance is not appropriate in Step 4. Even a recommendation from a professional interferes with the motivation of the landowner to learn about the forest and to enjoy the fruits of his/her own decisions. And then the landowner cannot blame someone else if outcomes are disappointing.

Step 5 answers the final *what* question by listing the expected results of management in terms of a given quantity by a specific date. Here are two examples:

1. Create five one-acre wildlife openings in Stand 2 by January 1, 2004.
2. Increase the visual diversity of the west side of Stand 3 (visible from River Road) by reducing the red maple component from 60% of stems to 30% of stems by April 2, 2005.

Step 6 is the core *how* component. It includes all the management activity of the landowner, consultants and contractors. It also includes all the record keeping and financial transactions. If implementation includes harvesting, a professional should be involved in execution of the sale.

Step 7 answers the question: *How well* did we do? It is often perceived to be difficult. It is not difficult if the objectives in Step 5 are clearly defined. It is easy to evaluate the two examples provided earlier:

1. How well did we do in getting five one-acre wildlife openings created in Stand 2 by December 31, 2004?
2. How well did we do in reducing the red maple stems on the west side of Stand 3 from 60% to 30% by April 1, 2005?

Step 8 merely recognizes that the process is continuous and should be consciously repeated at appropriate time intervals. Refinements are also likely between those intervals.

The do-nothing option

Management does not always involve manipulation. If the decision to do nothing is made on the basis of the landowner's goals with full understanding of the likely consequences and rejection of other alternatives, "doing nothing" is a legitimate management scheme.

The keys to this scheme are the knowledge of silviculture, the likely aesthetic results and the timeframe. However, "doing nothing" is not management if the landowner simply ignores the woodland and does not go through the eight steps outlined earlier. Unfortunately, such absence of management is very common.

Plantations: planting and thinning with a vision

In Wisconsin and Minnesota (and in many other states east of the Mississippi River) planting is usually done to convert marginal farmland to more productive woodland. The land was usually forested prior to being cleared for crops. Occasionally a private landowner will attempt to convert an existing forestry type to a different forest type. One method of conversion can be underplanting with intermediate shade tolerant species such as spruce, white pine or red pine in areas with significant openings in the canopy. A second method is the use of herbicide to control regrowth of recently harvested deciduous species and thus encouraging (releasing) existing pine to flourish. A third method involves planting of conifers (usually red pine) and using a herbicide to kill all other vegetation.

Plantings can enhance visual interest by increasing land use diversity and providing a visual focus. They can also reduce visual interest by decreasing land use diversity, destroying vistas and reducing visual penetration, especially from public roadways.

Plantations also vary in visual interest by age and spacing. A field of small pine or spruce can be beautiful and provide significant wildlife habitat. By the time plantation trees are pole-sized they have constructed a green wall and a "crew-cut" level ceiling with little value for wildlife or aesthetics. A well-thinned, mature plantation again allows visual penetration and interest.

Landowners, who want aesthetic value as well as saw timber value from their plantation, can do several things to balance those values. A list of management tips are provided in the summary chapter.

In general, planting fewer trees, thinning more trees and leaving more trees behind after the final harvest improves visual quality. Aesthetics can also be improved by planting diverse species, spacing carefully and controlling the thinning/harvesting intensity.

There are two important caveats for these recommendations. First, while the recommendations will generally enhance visual interest, the resulting stand will take more effort to harvest and provide less timber value. Second, some landowners may prefer a "productive" looking image, such as rows of corn or swaths of hay. Traditional planting and thinning schemes are designed to maximize productivity and do provide such an image.

Finally, trees destined to be saw logs must be close enough to each other during the mid years of the rotation to form straight boles. As they mature, the trees' own crowns have the effect of pruning lower branches if other trees are close enough to reduce sidelight.

For landowners, who have less interest in timber values, planting techniques can be modified dramatically. Clump plantings of mixed species in a random pattern over many years will produce a more natural looking forest. If the early plantings are made on the contour along an existing tree line, they will mimic natural reproduction quite nicely. Some jurisdictions in Europe require this type of feathering when converting agricultural land to forest land.

Underplanting with a vision

The primary reasons for understory planting is to enhance visual attractiveness and to produce higher value timber in the next generation. For example, if an aspen stand is clear-cut, it will probably regenerate to aspen. If the landowner prefers to convert the site to pine or if the site is too low in productivity to support good stands of aspen but is better suited for pine, white pine can be planted under aspen. In aspen stands with a mostly open canopy, red pine is also an option. If a harvest is conducted before underplanting, a minimum amount of basal area should be left to partially shade the ground and reduce aspen sprouting. If a natural white pine seed source is present, scarification to expose mineral soil will enhance pine regeneration. In many situations this succession occurs naturally. Whether natural, induced by scarification, or planted, the conifers add color and visual interest to the stand. The remaining aspen (or white birch) component visually complements the younger pine. Planting pine under oak or encouraging that natural process is also an option.

Converting other hardwoods to red pine or jack pine would require cutting virtually all trees to completely open the canopy and suppress deciduous growth by use of herbicides. This practice is also costly.

Where overpopulations of deer browse pine, white spruce can be underplanted to add the same color patterns. However, planted spruce may remain stunted (root checked) for several years after planting.

Planting deciduous species like oak under a pine canopy is also difficult during times of excessive deer numbers. Planting acorns or watching squirrels and blue jays do the job is an option for small areas. Oak will provide attractive visual contrast with pine especially in autumn and winter.

White birch complements both oak and pine. White birch is hard to regenerate after a harvest without drastic treatment such as a fire. However, birch tends to regenerate naturally where most valuable—along treelines and roadways. The issue then is whether public policy should be to cut all the trees in the right of way or allow the fringe of the corridor to harbor trees and birds. Birch prefer moist conditions with shade to protect their shallow roots when they are young and cannot provide that shade themselves. Later they flourish if given full sunlight. White birch planting is usually done for ornamental purposes on lawns where they are attractive but susceptible to birch leaf miner and bronze birch borer. Woodland owners sometimes plant birch in special places for “a splash of white.”

Planting deciduous species under a deciduous canopy is rarely practiced and offers less visual diversity than conifers under deciduous species or deciduous species under pine.

Tolerance is a term used by forest ecologists to describe a tree species’ ability to develop and grow in the shade of other trees that are competing with it. Shade tolerant species will generally grow under older trees that are less shade tolerant. Intermediate species, such as red/black oak and white pine, will alternate growing under each other.

Envisioning how to thin a natural stand

If the goal of forest management is to produce the maximum amount of cellulose for pulp, thinning is not cost effective. The trees will compete to capture the maximum amount of sunshine and thin themselves. Manual thinning will create temporary holes in the canopy and thus reduce the amount of sunlight captured by the trees. However, if quality timber and visual attractiveness are the goals of management, thinning can be an effective tool. If the landowner has the time and skills to conduct this labor-intensive practice, thinning is much more feasible from an economic perspective.

Traditional timber stand improvement is oriented solely to producing high quality logs in the final harvest. The most common species managed for saw logs are red pine, white pine, red oak, white ash, yellow birch and sugar maple. When several of these species are present in a mixed stand, they will provide complementary color and texture as well as saw logs. Even the more common situation of a few pine or spruce scattered through a hardwood forest offers visual amenity.

Thinning has great potential for aesthetic enhancement if such values are integrated into the plan and its execution. In general, pockets of white birch (and sometimes aspen) can be favored where they can withstand competition from shade-tolerant species. Birch adds dramatic color in all seasons of the year. The saw log species are often favored for both beauty and enhanced economic return. While thinning is labor intensive, it can be very rewarding work for a landowner who has a vision of how the forest landscape might look for many years based on his/her work. Thinnings leave a long legacy—a signature on the land.

Thinnings are a work of art more than a science. Choices are made by the minute much like an artist deciding into which paint to dip the brush. But the painting is never done. The landowner must return regularly to continue to implement the preferred species mix and the shape of the trees. If thinning is heavy, the remaining trees will spread out and produce larger crowns, bigger lateral branches and larger trunks. If thinning is light, trees will grow straight, tall and very slender with few lower branches, producing clearer saw timber with fewer knots. The understory will be sparse with minimal reproduction.

With each cut of the chainsaw the painting changes. Without a vision for the painting, the cuts may do more visual (and timber) harm than good.

With a vision, each decision about whether or not to cut a tree is a rewarding stroke of creativity. Forest edges facing a road are especially important because the road is the art gallery. The artist should frequently step out onto the road to observe how the edge will look if individual trees are cut.

I have read many definitions of what is a conservationist and written not a few myself, but I suspect that the best one is written not with a pen but with an axe. It is a matter of what a man (person) thinks about while chopping or while deciding to chop. A conservationist is one who is humbly aware that with each stroke (of the axe) he is writing his signature on the face of the land. Signatures of course differ whether written with an axe or pen, and this is as it should be.

—Aldo Leopold, A Sand County Almanac *(1949)*

Shade tolerance of Lake States trees

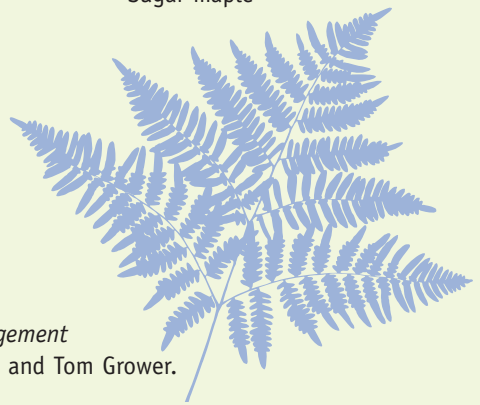
Very intolerant
- Aspen
- Jack pine
- Cottonwood
- Tamarack

Intolerant
- Butternut hickory
- Black cherry
- Red pine
- Black ash
- Black walnut
- Paper (white) birch
- White ash

Intermediate
- American elm
- Bur oak
- Red oak
- Shagbark hickory
- White oak
- White spruce
- Black oak
- White pine
- Yellow birch

Tolerant
- Basswood
- Box elder
- Northern white cedar
- Silver maple
- Black spruce
- Ironwood
- Red maple
- Slippery elm

Very tolerant
- American beech
- Hemlock
- Balsam fir
- Sugar maple



Adapted from *Woodland Management* (Summer 1997) by Jeff Martin and Tom Grower.

Chainsaw art: harvesting with a vision

As a stand matures, thinnings merge into harvests. A commercial thinning focused on aesthetics removes trees that interfere with the development of the landowner's vision. If a hardwood or pine/hardwood stand is managed for beauty and for sustainable high quality saw log and veneer log production, thinnings will remove declining mature trees for saw logs and poorer quality trees for pulp, firewood or specialty uses. This method is referred to as "cutting from below" because it leaves the best trees to grow into higher quality logs.

Save trees versus cut trees

Under crop tree silviculture, wildlife and aesthetic considerations can both be enhanced by stand improvement thinnings and commercial thinnings. Dead and den trees are left for both visual and wildlife values. Dead trees provide a home for insects which feed downy and piliated woodpeckers that create holes used by gray squirrels and pine martin. If mast producing oak and hickory trees are not abundant, they might be left even after they begin to decline. Deer, turkeys, squirrels and blue jays would be most appreciative. Wolf (extra wide crown) trees and snag trees with unusual shapes add visual interest. Species that are rare in the stand should rarely be cut. Species that are abundant should be most frequently cut if the vision includes diversity as a goal.

Rotation time

Adding aesthetics to the set of management values will generally increase rotation time because more visual value is put on larger trees. Longer rotations also yield greater scenic flows over time since the negative impacts of harvesting occur less frequently. The trend toward longer rotation times is also occurring as silvicultural research shows that even after maturity the rate of growth declines very slowly. Thus mature trees, while not as productive as middle-aged trees, produce more and higher quality wood than young trees.

Harvest type

In his comprehensive review of research on aesthetic preferences, Ribe concludes: "Not surprisingly, the most essential and obvious finding regarding harvest perception is that the greater the proportion of trees removed, the lower the scenic value of the result."

Many hardwood stands date from the initial heavy harvest and are thus almost even-aged. These can be slowly converted to uneven-aged forests by a series of thinnings accompanied by the creation of canopy openings. These openings encourage regeneration of a variety of species and thus preserve diversity.

Facilitate conversion of even-aged stands to uneven-aged stands by cutting all trees within circular plots at a few sites scattered throughout each acre. Repeat the process periodically, usually during subsequent harvests. Save trees that are unusual in the forest by moving the plot.

If even-aged stands are desired, some hardwoods can be regenerated by shelterwood cuts. Most trees are cut but individual trees are left for partial shade and sometimes as a source of seeds. Traditionally the large "nurse" trees are cut in a final harvest to create an even-aged stand. Recently, they have more frequently been left to provide structural diversity.

Clear cutting has the most negative connotation even though it is most efficient for some species and essential for others. *Some* hunters and wildlife managers prefer clearcuts because they tend to enhance future hunting opportunities for certain game species.

These even-aged forests, which lag uneven-aged forests in attractiveness through most of the rotation, become more attractive at maturity because of large numbers of large trees and high visual penetration.

A landowner's choice of harvest type is not open-ended. It is constrained by the existing plant and animal communities, soil capabilities, microclimates and economics. These constraints should be discussed with one or more resource management professionals.

New Hopestead home recipe

The author manages an uneven-aged mixed hardwood and pine forest with at least 20 species of trees. He uses the following management regimen on sandy loam soil in cental Wisconsin.

Aesthetics are of paramount concern since the woodland faces a public road used daily by the author and his family. The woods are viewed from both the road and the family home across two five-acre fields separated by a lightly wooded intermittent stream.

1. Because of their special aesthetic interest, remaining white birch are being released from nearby maple to prolong their lives. However, where large numbers of red maple are already as tall as the birch, it is very difficult to save the birch. Most of the effort to favor birch is directed at the young trees near the forest edge where competing red maple saplings are cut to release the birch.
2. White and red oak are being released by cutting nearby red maple for firewood, pulp and logs. Oaks are preferred because of their wildlife value (acorns), visual attractiveness, potential for commercial logs and inability to regenerate under a maple canopy. Usually maple are smaller than the oak but are growing up from underneath to steal sunlight from lower branches of the oak. Red oak are common enough to eventually cut—some for high-priced veneer logs. Because white oak survived earlier pasturing, are more wilt resistant, have unusual shapes and are more rare, they will not be cut. Oak reproduction has stopped due to intense deer browsing.
3. If solid enough to produce a saw log, black and pin oak are harvested since they usually die before their 100th birthdays. Oaks with heart rot are left for wildlife unless they shade an aesthetic save tree or timber crop tree. In those cases the black and pin oaks are cut for firewood.
4. Yellow birch are partially released. They are shade tolerant and branch out if given too much room. The general rule of clearing seven feet around the crown to encourage growth of hardwoods has been reduced to about five feet. Because they are: 1) rare; 2) unable to reproduce due to the lack of exposed mineral soil for their small seed and because deer love to eat them; 3) visually striking; and 4) very valuable as veneer logs, they get special care when other trees are cut.
5. Hemlock are also being partially released. The species is shade tolerant and has interesting short needles. Deer densities in the past ten years have precluded any regeneration. Great care is taken to protect 10- to 30-year-old hemlocks when nearby trees are cut. A single seed tree has produced several hundred saplings and pole-sized offspring in a circumference of 200 feet.

   Because hemlock stands are rare in the region, they receive priority during thinning and will probably never be cut while the woodlot is under current ownership.
6. Bigtooth aspen tower above the maple with their distinctive tan bark and late fall foliage. Their small numbers, unusual height and large diameter dictate no cuttings.
7. Quaking aspen are harvested because they are a short-lived species and are declining. The openings created in the canopy are primarily used by oak and white pine. Because the quaking aspen are scattered, canopy holes are small, and because remaining basal area is above 70 square feet per acre, no reproduction of aspen is occurring from root sprouts.
8. The largest red maple are saved because they already have rotten heartwood, make good den trees, produce abundant maple sap, and add a bulky, shaggy texture to the woodlot.
9. Poor quality red maple are cut for firewood and occasionally for pulp. Annual cutting for firewood produces only small holes in the canopy. Treetops and low quality red maple provide more than enough firewood for domestic use. Red maple with solid, moderate-sized trunks are cut for saw logs to release other species and to thin homogenous red maple areas to about 80 percent crown cover and about seven feet between remaining crowns.
10. Sugar maple trees are left for future growth unless decline is evident or the tree has poor form. Sugar maple that are shading trees with high scenic value—pines, oaks, birches or hemlock—are also cut. Small sugar maples constitute the dominant species of the future forest. As valuable saw timber and maple sap producers, they are protected during the harvest of other trees and lightly thinned to favor the straightest stem. Self-thinning is more significant.
11. White ash are also reproducing. They are protected during harvesting of other trees because they represent high quality future saw logs.
12. Red pines are rare and not able to reproduce due to insufficient sunlight. Existing individuals are offered as much sunlight as possible by cutting surrounding maple.
13. White pine are tolerant enough of existing shade to reproduce, but deer browse heavily on seedlings in late winter. Terminal buds are capped with paper hats each winter to protect them. Young pines are protected during harvesting because they can grow in partial sunlight and eventually grow above the canopy of hardwoods. They also possess the most symbolic value in the Lake States. White pine saplings and poles are released from taller red maples and ironwood and are thinned if necessary. Mature white pines are rare and are not cut unless they are clearly dying from forces like lightning or wind. White pine with heart rot are left for wildlife. Tall white pines furnish the most visual magnetism throughout the year and are easily observed from the road and the house.

This recipe guides the author's chainsaw artistry on a tree-by-tree basis. Of course, a different owner with different goals on a different site with different exposure, slope, soils and a different history of harvesting and pasturing might select a different management regime.

Size and shape of harvest plots

The disturbance from a careful harvest that maintains 80 percent crown cover in an uneven-aged stand will not even be noticeable from a distance.

With clear cutting harvesting systems, size and shape of plots are critical aesthetic variables. Prescriptions vary depending upon how much harvesting efficiency the landowner and logger are willing to sacrifice for a better-looking result. Typically, landowners with smaller acreages or with high visibility sites are willing to sacrifice more potential stumpage value because of the high value they place on visual amenities.

The landowner and logger must find a mutually acceptable balance between efficiency and beauty. A landowner who sets too many restrictions on harvesting may not find a willing logger. A logger who insists on efficiency at the expense of beauty may not get many logging contracts.

Recognizing that balance, the techniques in the sidebar are likely to minimize the aesthetic costs of harvesting under all regeneration methods, especially clear cutting.

Techniques to minimize the aesthetic cost of harvesting

1. Keep plots small.
2. The edges of the plots should be irregular and follow the contours of the land.
3. If vegetative buffers between harvesting and public roads are used, they should be substantial. (Thin screening may actually insult the viewer and be worse than no screening at all.)
4. Harvesting in riparian areas (near lakes and streams) and near wetlands should conform to Best Management Practices with setbacks, winter harvesting and engineered stream crossings.
5. The appropriate harvest system and equipment is used consistent with all the landowner's objectives.

Save trees

The concept of "save trees" is premised on the attractiveness of individual trees. The select trees may be the trees with the best potential for producing a valuable log. They may be trees with special visual interest. They may be trees essential for wildlife, or old trees that survived 20th century logging and the fires that followed—trees that many landowners will leave to die where they stand. Because of their unique beauty or visual interest, some trees are never cut. The crop they produce is beauty.

Den trees have cavities that can be used by wildlife for nesting and shelter. Most forests have only a limited number of such trees. In addition to providing habitat for birds and furbearing mammals, they are aesthetically interesting. In a forest managed for multiple values, including wildlife and natural beauty, den trees should be saved during harvests.

Snag trees have a variety of unusual shapes. Their "disfiguration" may be caused by damage from a previous harvest, from a neighboring tree that fell from natural causes, from an ice storm or from the work of porcupines. If twisted trees are prevalent, as they often are with Scotch pine, there may be a genetic determinant.

While snag trees have little timber value, they do provide visual interest. However, a whole stand of misshapen Scotch pine has few redeeming qualities, especially since Scotch pine is not a native species and has few uses in this country except for Christmas trees. Since Scotch pine is an aggressive invader of abandoned farmland, it actually represents a threat to native species.

Wolf trees are trees that developed in an open area, spreading out laterally before other trees grew up around them. They are attractive in areas that are still open or in savannas where trees (usually oak) are interspersed with prairie. In a forest where reproduction of other trees has occurred around and sometimes through wolf trees, they provide visual interest both in size of trunk and breadth of crown. However, if future timber values are important to a landowner, such trees can be carefully cut to open the canopy for several understory trees of potential commercial value.

Signature trees are often white pine or white oak left over from an earlier harvest. Because they have long life spans, these trees have the potential to continue to stand alone or above the rest of the canopy for a long time. Thus they have very high aesthetic value and rarely should be cut if natural beauty is a management goal.

Also spared the chainsaw are rare trees that are uncommon on the property or in the area. For example, a pocket of yellow birch or hemlock would be unusual in southern Wisconsin. Both have distinctive visual qualities. In the 1990s, too many deer coming to dinner resulted in poor reproduction, even in northern Wisconsin.

Residual damage

If trees are felled carelessly or harvesting equipment scrapes the trunks and roots of future crop trees, the economic value of the forest will be reduced. The amount of capital earning interest in the forest bank will be lower for a very long time.

But damage to residual trees does more than reduce future economic return; it damages short- and long-term aesthetic value. Such damage is a vivid example of the worst traditions of the logging industry. Landowners may react by deciding never to allow loggers in the woodlot again. Many landowners feel a sense of loss and helplessness not unlike the feelings associated with the injury or death of a pet—some much worse. For the many landowners who have an emotional attachment to their trees, logging scars on the residual trees are painful reminders of a harvesting decision that they now regret.

Involving a forester in a timber sale and visiting the site frequently during the logging can usually help avoid this painful situation.

If the focus of harvesting is on "what is left" rather than "what is taken out," visual penetration will increase and the residual trees will look bold and healthy with room to grow. The landowner and the logger can both be proud of such a result. The use of horse logging at the low-tech end and mechanical processors with articulating booms at the high-tech end can both produce this result.

Treatment of slash

Where firewood is in high demand, slash is a resource and its management is part of the harvest. Slash is also a nutrient resource for the life cycle of many organisms, including residual and future trees. Large limbs contribute coarse woody debris to the forest floor and sustain ecological processes and biodiversity; for example, habitat for the spotted salamander.

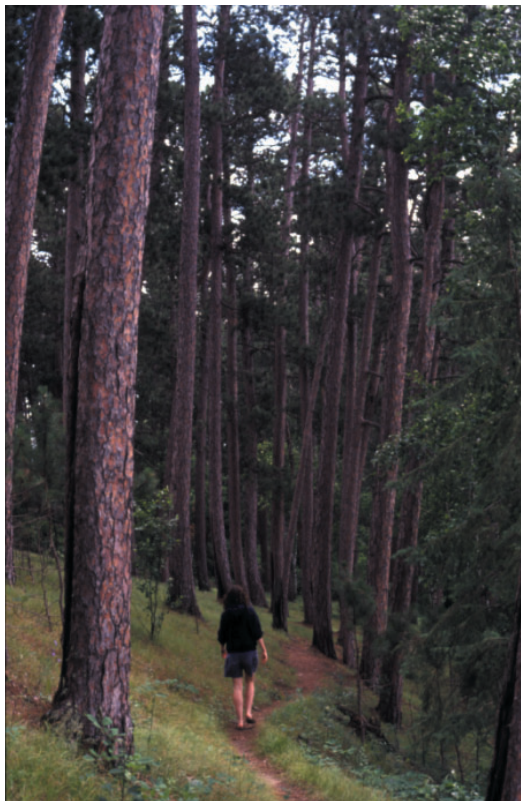
Aesthetically, slash is a double-edged sword. Most landowners want slash cut down to reduce its visibility and hasten the rotting process. On purely aesthetic grounds, removing all slash may be preferable but such a practice is not healthy for the biological system or economical for a logger.

Coarse woody debris on the ground is also left by storm damage or the death of individual trees. Downed trees can be embraced as part of nature's recycling and are often considered beautiful—visual evidence that natural processes are sometimes, in some places, allowed to run their own course.

The same scenario may be perceived as wasteful and untidy and thus have a generally negative connotation. Cultural differences clearly influence the perception of dead trees lying on the ground in various stages of disintegration. Some European cultures value a "clean" woods and the efficient use of all parts of a cut tree.

Forest roads and landings

Well-constructed and maintained forest roads can be a visual and recreational asset. A gently winding road without scarred banks and trees portrays a sense of balance between environment and economics. The view line first draws attention and then inspires curiosity about what is around the bend.



In contrast, logging roads are often left with ruts, steep unvegetated banks, frequent contours crossings, and continuing erosion. Such roads diminish recreational potential, property value and environmental security as well as aesthetic value. Non-integrated practices thus violate other values in addition to aesthetics. But unfortunately, common sense prescriptions are often violated in the name of short-term efficiency.

Logging yards also carry the potential for serious detriment to aesthetic values. *A Guide to Logging Aesthetics*[14] published by the Northeast Forest Resources Extension Council opens the section on "Landings" with these words:

> *There is seldom adequate forethought given to the impact of merging men, mud, and machinery in these openings in the woods.*

However, with forethought, landings can be screened from roadways while active and left as assets rather than liabilities. Landings provide wildlife openings that can develop with pioneer species that need the open sunlight. Thus, they can add species and visual diversity to a mature forest. If they are maintained with a dense cover of native grasses or by mechanical means, landings can serve as focal points for forest-based recreation. If properly protected from erosion, they are available for reuse in subsequent harvesting.

Regeneration

No other consequence of harvesting will have as much long-term impact on visual values as the regeneration that occurs as a result of harvesting.

On fertile soils, light thinnings and partial harvests will push a forest toward regeneration of climax species that can grow under shade: sugar maple, balsam fir and hemlock. On less fertile sites, white pine and several oak species seem to grow together or in shifts.

Shelterwoods are used to regenerate species like oak that like to start life in partial shade, but then get full sun when the shelter is cut in the follow-up harvest.

White birch, difficult to systematically regenerate, often find hospitable conditions at the forest/field edge, or forest/road edge where seedlings grow in partial shade and the saplings break through or out of the shade by twisting and turning.

Clear cutting promotes the return of pioneer species—especially aspen. Jack pine, red pine and oak species prefer fire to expose mineral soil and to open cones (jack pine).

Red maple is opportunistic. It grows under a wide variety of conditions and regenerates from seeds or coppice sprouting from stumps.

The time of harvest also impacts regeneration, the eventual composition of species, and the long-term visual quality. Harvesting on frozen ground and before leafout tends to increase aspen root sprouting although good

Rx for forest roads

1. Use published Best Management Practices to minimize soil erosion and protect water quality.
2. Utilize soil surveys to identify problem soils. Seek assistance from the County Land Conservation Department or the USDA Natural Resource Conservation Service if necessary.
3. Follow wetland regulations and use a geotextile mat where wet spots must be crossed.
4. Obtain a state permit before crossing streams.
5. Fit roads to the contours of the topography.
6. Avoid long level sections that will not drain.
7. Avoid long and steep grades.
8. Determine proper slopes for cut and fill operations.
9. Stay out of the woods if soils are waterlogged (especially heavy soils).
10. Install culverts to preserve drainage patterns or use temporary bridges.
11. Confine harvesting on wet soils or high erosion-prone areas to the limited months when ground is frozen.
12. Avoid transporting logs in the woods or on the public roads during "breakup" (mud season). Abide by weight limits all year.
13. Locate winter roads on the north slope or in the shade of conifers to minimize thawing and rutting.

suckering reproduction often follows spring or summer cutting as well. (Popple peeling of the bark is only possible when the bark is loose in spring.)

In central and southern Wisconsin spring and summer harvesting of a forest containing oak might result in killing the residual oak through oak wilt. Harvesting when the ground is not frozen and skidding the logs will expose some mineral soil that will encourage regeneration of pine and birch. However, short hauling logs that are cut to length in the woods will reduce the damage to residual trees and reduce erosion.

Roadside tree management

Landowners often own and pay taxes on the land over which a local public road runs. The governmental unit owns the right of way or has a broad easement to manipulate the roadbed, the shoulder, the ditch and far shoulder of the ditch. A four-rod (66-foot) right of way is common for local roads.

Trees on the far shoulder are often important to landowners and other users of the road as an aesthetic resource. Roadsides are particularly important to break up monotonous fields, screen residential development and provide habitat for birds. Trees that wrap over a road are especially highly valued.

Often landowners, some of whom don't even receive notice before their roadside trees are cut, feel helpless to defend their aesthetic interest. However, natural beauty can be integrated with the legitimate safety, drainage and liability concerns of local highway departments. Local legislative bodies have broad discretion and are not liable for decisions regarding their roadside tree policy or for other legislative decisions such as where to place stop signs. They incur liability if they fail to implement a policy they have adopted; for example, failing to replace a stop sign knocked down by a snow plow or failing to cut specified trees in the right-of-way after adopting such a policy.

Therefore, landowners, other citizens who enjoy roadside trees, and local officials have a great deal of flexibility in managing roadside trees in which all parties have an interest. Reduced speed limits and special designation of more rustic roads can be part of such agreements to integrate individual security (safety), economics of road maintenance, and aesthetic values.

Using wood aesthetically

The natural beauty of the forests can be transformed into beautiful wood products: from log homes to hardwood floors, to bowls, to many other artisan and industrial products. Firewood not only looks warm but physically feels warm three times: first, when harvested; second, when split and moved; and third, when burned.

Relationship to recreation and wildlife management

Positive impacts on aesthetic quality are usually associated with positive impacts on recreation and wildlife management. Conversely, negative impacts are also correlated. Thus integrated planning and management for all three values is logical.

Of the three values, aesthetics is the most general. While outdoor recreation and wildlife usually have a strong aesthetic component, natural beauty can also be enjoyed passively from a park bench or a car. All three can be enjoyed vicariously on videos or television. Even some hunters, who go to the woods in pursuit of game, report that experiencing the natural beauty, silence and solitude of the woods is more important than how many animals they bag.

Of course, the correlation is not perfect. Some popular species of wildlife find more food and cover in brushy and young forests that aren't rated as aesthetically high as more mature forests. And outdoor recreationists with motors (snowmobiles and four-wheelers) can damage the aesthetics of the forest from both physical and psychological standpoints.

Chapter 6

Related values

Beyond recreation and wildlife habitat there are other values related to aesthetics that are usually not included in surveys, much less in management plans. These values are not included in social research because researchers may not recognize them. When they are recognized, researchers are wary of trying to measure such nebulous concepts. Landowners may not recognize them either. And if they do recognize these values, landowners may not want to publicly acknowledge them because they are so personal.

Many forest landowners will freely admit that they love their woods and that they act according to a land ethic.

Though difficult to pin down, these values have a special significance. For some landowners, they may actually be the primary reason for owning forestland. They are included here with aesthetics because of their very high correlation with scenic beauty, because of their potential significance to many landowners, because they are rarely included as goals in management plans, and because universities seldom include them in the training of professionals or in the preparation of educational materials for forest landowners.

Kinesthesia

This word refers to an experience everybody has when walking in the woods. Walking in the woods is usually more aesthetically pleasing than walking down the highway or a sidewalk. For a physically able person, walking in the woods is always more kinesthetically pleasing than walking on smooth pavement in a straight line.

Movement of the muscles, tendons and joints triggers kinesthesia. These body movements stimulate a positive reaction in the brain. This sensory experience, called kinesthesia, is usually not consciously recognized because the concept is not well known and the sense is subtle.

A walk, run or ski in the woods requires more frequent muscle movement than walking down a street. The woods experience includes turns which change the weight placed on each foot; even slight changes of speed in each foot as the outside foot travels slightly faster and farther to make turns trigger kinesthesia.

A walk or ski in the woods usually includes changes in elevation. As the topography changes, speed changes and different muscles are stimulated while ascending a hill than when descending a slope. Stepping over deadfalls and around standing trees and understory obstacles requires major non-repetitive muscle movement. The greatest kinesthetic benefit is experienced when the whole body has to bend to avoid overhanging branches or to jump across a stream or crevice.

Some cities and private developers will leave trees in the path of a sidewalk or trail to force people to walk around them. Special aesthetic and kinesthetic benefits are experienced when cross-country skiing after a heavy snow. The body has to regularly bend, duck and swerve to avoid branches or boughs weighted down over the trail by snow.

A few developers and park managers build sidewalks or trails under trees with large overhanging limbs that require people to bend down to get under them. While such conscious management choices usually enhance aesthetics, they clearly enhance kinesthesia.

Forest landowners can also enhance the effects of kinesthesia by walking through the woods on random routes rather than on trails. If hiking trails are constructed to reduce impact on the vegetation and eliminate most obstacles, trees and low hanging limbs can be left in the path to require some differential use of muscles, tendons and joints. If hikers, joggers and skiers use existing logging roads, the curving nature of such roads still provides kinesthetic pleasure. If management of harvesting activities follows an integrated management plan, the logging roads can be laid out to enhance both future aesthetic and kinesthetic values as well as future movement of forest products.

Emotional security

Many people have difficulty discussing and expressing emotions. Engineers and scientists use data, not emotions, to drive their decisions. But goals are the basis for planning and decision making. Data only become relevant after the goals are articulated and clarified. Goals answer the questions: "Why do we want to do this?" Goals are heavily value laden, making emotional security a primary value of woodland planning and decision making for private landowners.

With the peculiarly American emphasis on individual freedom and individual security, independence is usually considered the optimal state for our country or for us as individuals. But independence, for either a country or a person, is only the second step in achieving maturity.

Appreciating and managing forests for scenic beauty

A young person depends on parents or other adults to provide food and shelter and the full range of other physical, psychological and social necessities. The child's emotional security is largely based on the love (and attendant behavior) of adults. The dependent child's focus is on "you" (the people who provide emotional security).

As a child matures, independence develops from tying shoes to opening a checking account to driving a car. The focus of an independent person is on "I—I am financially independent. I make my own decisions."

But the process of maturing is not complete until the person (or country) recognizes interdependence. This interdependence takes many forms. For a country it may be international trade or environmental security. For an individual, interdependence is expressed in many relationships at work, at home and in the community. The focus of mature individuals, who recognize their interdependence, is on "we." For example, "We can achieve great things through teamwork as a family or as a community."

Forestland (often with a cabin), like lakeshore property with a cottage, can nurture relationships between family and friends, whether the experiences on the land are as active as cross country skiing or as passive as appreciating the aesthetics of changing leaf colors.

Families and friends are especially fond of such places where there are fewer career and family tensions. Times spent together in the woods or at the cabin provide peasant memories—a foundation for emotional security.

Forestland provides the context for a second type of emotional bond—the bond between people and a specific piece of the land. Over several years or decades or generations, the attachment grows. As the land begins to show the results of previous management activity, the attachment can include emotions similar to those of parenting. Planting trees and watching them candle each year and stretch toward the sky has parallels to watching a child grow. Many forest landowners, especially late in life, will freely admit that they love their woods and that they act according to a land ethic. The land is part of the landowner's sense of community—a sense of interdependence.

The sense of community may even extend back in time to previous landowners who left a mark on the landscape. Sometimes the landowner made conscious decisions for the future of the woods by saving certain trees or managing certain stands in an unusual

way. Other times the result was not planned. A tree left in a pasture to provide shade for cows grew broad lateral limbs. Later that tree, surrounded by new regeneration of trees in the middle of the woods, can still evoke images of the farmer collecting the cattle for milking and the homestead children climbing the tree, perhaps playing "hide and seek" in lieu of watching TV. The woods are part of a landowner's emotional security.

Spiritual dimensions

To say that woodlands are part of a landowner's spirituality seems even more unusual than to say woodlands provide emotional security. But spirituality related to nature is not inconsistent with or mutually exclusive of the spirituality related to religion and theology. While humility, serenity and awe are part of both types of spirituality, the belief systems operate in different and compatible spheres.

A towering white pine, an oak with massive lateral branches, an old sugar maple with a trunk blackened from escaping sugar, a mature grove of mixed hardwoods, and almost any old growth stand inspires humility. The recognition that these trees have experienced many human lifetimes and might experience more is humbling. Even people who pursue active harvesting of other trees on their property often consider such trees sacred.

Awe is related to humility but adds a touch of wonder and reverence. Single trees sometimes are inspirational but awe is more commonly the combined effect of numerous large trees. The sight and sounds of water nearby heighten this reaction.

Serenity is less related to the size of trees than to a sense of isolation from the pressures and noise of modern civilization. If a lightly used stream or lake complements the forest, serenity is enhanced further.

The spiritual dimension is rarely the only or most important reason to own forestland. However, it is possible to integrate the spiritual dimension with other goals in management plans. And management practices can diminish or enhance spiritual value. The first management prerequisite is to reserve special places from harvesting. In some cases a thinning or light harvest may benefit the value but usually these sites need preservation.

Trails for other uses, especially motorized vehicles, should be routed away from such sites. Most types of signage would also detract from the experience. The spiritual dimension, whether experienced alone or in groups, is the most fragile goal of all. Treading lightly in all activities is probably the best management advice if spiritual dimension is an important consideration.

Physical security: a double-edged wooden sword

For Robin Hood and his merry band of thieves the Sherwood Forest provided physical security. In other contexts, in other centuries, the woods provided food, shelter and protection. The woods had a positive connotation as part of "individual security."

But the woods have the opposite image as well. In the American context, the forest was more often considered dangerous or at least a barrier to travel, to farming and to the establishment of communities.

For the landowner, this double-edged sword is mostly of historic interest. However, landowners should be aware that many urban dwellers, possibly including their own relatives and friends, might be uncomfortable in the woods—especially by themselves. They might fear getting lost or meeting a bear. Accompanying them or providing a map may help them enjoy the woods more. Enjoying the woods from the outside is not the same as enjoying them from the inside.

Forested wilderness: the call of the wild or escape from civilization

Forested wilderness usually refers to large tracts of public land. Few landowners can accumulate or afford the 5,000-acre minimum used as the standard by the federal government in the Eastern United States.

However, many landowners feel a sense of wilderness when they are in the far reaches of their property and have left the sounds of the highways behind. They are escaping, at least for a little while, the most obvious aspects of civilization.

But the woods are a magnet as well as a refuge. The pull may be active recreation such as skiing under the quiet spell of falling snow or activity as mellow as listening to avian love songs on a spring dawn before the rest of the world awakens.

Chapter 7

Enhancing the community's quality of life

Everyone on the planet is ultimately affected, usually without being aware of it, by the positive and negative impacts of forest management. Private property rights are a strong expression of individual freedom—especially in the United States. Recreation is a major use of public and private forestland. The economic opportunities presented by woodlands are vitally important to workers in the forest products and hospitality industries and to the communities where those industries employ many people. But of all the important values that trees and woodlands provide to communities, aesthetic quality affects the largest number of people on a daily basis. That does not make aesthetic values more important. Since all primary needs must be met, priority setting is irrelevant. Balance is relevant and essential.

Integrated management of private woodland should enhance community goals. The word "should" is used for two reasons. First, the activities of private and public forest landowners do not always contribute to the quality of life in the community.

And second, private landowners have a responsibility to do their part to contribute to that quality of life. They are interdependent with the community as a whole and with its individual members—most of whom do not own woodlands.

Biophilia for the public

All the values offered by woodlands are important to the community. Since natural beauty can be appreciated from a distance, aesthetic value can be shared without providing physical access or dealing with unauthorized use of the property. People seldom trespass to get a better view of the woods.

Everytime I drive by a stand of trees that I persuaded the owners to spare, or hear the breeze at night in young trees I planted myself, I realize that I can do something about the climate, and if a thousand years from now people are a little happier, then it's partly because of me.

—Uncle Vanya (1897), The Plays of Anton Chekov

Appreciating and managing forests for scenic beauty

Though they will usually not trespass to obtain an aesthetic experience, members of the public have the same need for natural beauty as landowners. Cities can be designed to respond better to that need but the countryside will continue to be viewed, literally, as the best place to have contact with nature. Europeans have recognized this for centuries. Public and private forests there are laced with well-used trails. Most landowners in Europe welcome, and indeed cannot prohibit, hiking on their land. Some landowners even provide benches for their urban neighbors to enjoy a vista from their field or forest.

An attractive landscape is one of the hallmarks of a good place to live and work and raise a family. In Wisconsin and other Eastern states, private woodland owners have a central role in providing that attractive landscape. Indeed, it is a social obligation.

To meet that obligation, special attention should be paid to the aesthetics of forest edges that face public roads or waterways. These are the places where the public enjoys or is enraged by the managerial practices of the landowner. These are the places where public perception of forestry practices is most likely to be developed. That perception will facilitate or inhibit the ability of the landowner to continue to use the forest for other values—especially harvesting.

Humility

To the extent that forests—especially forests with big trees—demonstrate the wonder and power of nature, forests facilitate the internal workings of communities.

Arrogant citizens are not good citizens. They are not willing to work for the common good—to set aside, at least for awhile, their own self-interest. Their arrogance may even prevent them from engaging in discussion of the common good of the community or from serving in elected or appointed public office.

Mighty forests and other examples of the power of nature, such as spectacular landscapes, violent storms and pounding ocean waves, serve notice that people do not control everything. With these brakes on the human tendency toward arrogance, the community will function better and provide its citizens with a higher quality of life.

Chapter 8

Fulfilling a woodland vision: Quick tips and summary

A vision of beauty can be translated into a forest of beauty. Working in concert with the soil, slope, microclimate and existing vegetation, a good stewardship plan can become reality. Most landowners will need assistance from professionals in preparing the plan and, especially, in executing a commercial harvest. However, a landowner should never abdicate the responsibility to set the goals and make all decisions.

A stewardship plan emphasizing aesthetics should be bold and communicated up front. While such plans usually also promote biodiversity, the landowner should develop a species preference list and indicate the strength of the preference for the species on top of the list. If large trees are desired, that should be stated clearly.

The most critical time affecting the future beauty and general quality of a forest is when it is slated for commercial harvesting. A timid landowner is likely to be a sorry landowner. A forester, working for the landowner who appreciates aesthetic values, should assist with the sale, layout, contact provisions, logger selection and supervision of the sale. The landowner should also be on the scene to discuss the vision for the woods with the logger and to inspect work in progress.

All plans need specific objectives as well as general goals. The objectives guide implementation and provide the basis for evaluation. Objectives might include targets for a number of different species in a stand or number of stems per acre of regeneration or number of trees per acre over 20 inches in diameter or specific basal areas. However, aesthetics cannot and should not be fully quantified. Fulfilling a natural beauty vision is about visual impressions—not bean counting.

Quick tips: Aesthetics of pine plantations

1. Don't plant rows perpendicular to roads.
2. In larger fields, stage plantings beginning at the edge of the existing forest.
3. Thin earlier and harvest more heavily if regeneration of other species is the goal.
4. Thin harder close to roads. Stems per acre should be lowest close to the road to allow visual penetration and gradually build to standard stocking.
5. Leave an irregular pattern of trees after commercial trimming.
6. Reduce size of harvest plots.
7. Extend rotation time.
8. Leave some large trees to break up the visual monotony of the next rotation.

Where aesthetics is the major concern

9. Plant at a lower density.
10. Plant mixed species
11. Plant trees in clumps by species or in a mix of species.
12. Plant irregularly (no pattern).

Quick tips: Aesthetics of aspen forests

1. Refrain from mowing or using herbicide at the edges of fields to encourage natural feathering by sprouts from roots exposed to open sunlight.
2. Accent another color or two in parts of a young stand with space thinning, that releases minority components: birch, pine, oak or spruce.
3. Harvest in small, irregular blocks.
4. When cutting, leave den trees, conifers, oak and clumps of healthy bigtooth aspen.
5. Retain no more than 20 square feet of basal area per acre of residual trees if aspen regeneration is desired.
6. Stage cutting to develop a series of even-aged stands.
7. Where white spruce or white pine are seeding in under aspen, consider converting the site to principally conifers by natural mortality of the aspen or by a series of light harvests that maintain a basal area too high for aspen sprouting or sprout survival.
8. To develop an aspen/conifer mix, harvest the better aspen areas and plant conifers under the poorer quality aspen.

Quick tips: Aesthetics of mixed hardwoods/ pine forests

1. In even-aged stands, facilitate age, species and structure diversity by allowing succession into fields.
2. Understand the shade tolerance, soil needs and micro-climatic requirement of different species; for example, red pine requires more open canopy than white pine.
3. Space saplings by thinning out individuals of over-abundant species.
4. In all thinnings, favor species (e.g., birch, pine) or individual trees that are especially valuable for aesthetics and other management goals. This includes:
   - Snag trees
   - Wolf trees
   - Old trees
   - Den trees
   - Rare trees
   - Colorful trees
5. To reduce incidence of tip weevil laying its eggs on the sunny tip of a white pine leader, reduce shading around white pine gradually as the tree grows.
6. Prior to the first commercial harvest (firewood/pulp/saw logs) identify crop trees that will be reserved for future integrated benefits. These trees should be clearly identified to protect them from harvest or injury.
7. Provide for deep visual penetration along at least part of the forest edge and parts of the forest interior by either retaining a tighter canopy in some areas to prevent growth on the forest floor or by having your forester identify areas to open the canopy by intense cutting of view lanes or "sun spots."
8. Maintain a strong component of large and low-risk trees after harvest.
9. Avoid mechanical damage to residual trees during harvest; avoid risk of oak wilt in central and southern Wisconsin by not harvesting from April–September in a forest containing oak.
10. Avoid soil compaction that will damage tree roots and ground vegetation. Harvests should be restricted to frozen or dry ground especially on heavy soils.
11. Avoid soil erosion that will steal nutrients and ground vegetation, scar the landscape and damage the understory.

Quick tips: Aesthetics of northern hardwood forests

1. As an even-aged stand matures, encourage diversity of age, species and structure by cutting all trees in several circular plots per acre
2. Understand the shade tolerance, soil needs and micro-climate requirements of different species; for example, hemlock roots need full shade to stay moist. Thus, hemlock must grow under other trees until its own boughs can shade the roots.
3. Maintain diversity by assisting survival of less shade tolerant species.
   - Cut out maple that are challenging oak or big tooth aspen.
   - Release white birch from the competition of nearby trees if the birch have a chance to compete.
   - Allow the forest to spread into old fields to provide more options for shade intolerant species.
4. Release trees that are unusual in the forest:
   - Snag trees
   - Wolf trees
   - Den trees
   - Old trees
   - Rare trees
   - Colorful trees

5. Vary spacing between trees when thinning.
6. Provide for deep visual penetration along at least part of the forest edge and in parts of the forest interior by either retaining a tighter canopy in some areas to prevent growth on the forest floor or by having your forester open the canopy by intense cutting of view lanes or sun spots.
7. Maintain a strong component of large trees after harvest.
8. Avoid mechanical damage to residual trees during harvest; avoid risk of oak wilt in central and southern Wisconsin by not harvesting from April–September in a forest containing oak.
9. Avoid soil compaction that will damage tree roots and forest floor vegetation, especially seedlings and spring ephemeral flowers. Harvests should be restricted to frozen or dry ground especially on clay soils.
10. Avoid soil erosion that will steal nutrients, scar the landscape and damage the understory.

Quick tips: Aesthetics of wetland forests

1. Recognize the poor soil stability, frost danger and low pH of many wet soils.
2. Generally allow wetland species (ash, tamarack, cedar, balsam fir, white birch, river birch and red maple) to find their own micro-conditions for reproduction.
3. Appreciate the random texture of the forest edge as viewed from roads, waterways and sedge meadows.
4. For specific purposes at select places, increase visual penetration by cutting discrete corridors and by thinning.
5. Harvest during winter, if at all. Retain large swamp oak to stabilize the forest.

Summary: Seven Key Points to creating a woodland vision

The key points to remember about creating a woodland vision when developing a forest management plan follow.

1. Humans have a need for contact with nature. That contact is most frequently visual. For landowners, visual contact with their woods is often their primary contact with nature.
2. Private landowners own woodland for many reasons. Scenic beauty, wildlife and recreation are the most common reasons. Timber production is not the primary motivation for most woodland owners.
3. There is general consensus on visual quality and thus general principles of aesthetic management can produce positive results for both landowners and the community.
4. Visual quality of woodlands relates to the characteristics of the land (topography and water bodies), the characteristics of surrounding land use and especially to the diversity of tree species, their age and their size.
5. The vision of the landowner will influence the scenic beauty of the woodland and the larger landscape for generations to come. That vision should be expressed in a management plan and implemented through integrated planting, thinning and harvesting practices or the conscious decision to do nothing.
6. The values of kinesthesia, emotional security and a spiritual dimension are closely related to aesthetics and can be enhanced through conscious management.
7. The attractiveness of the landscape is an important part of the quality of life in a community. Landowners have an opportunity, and an obligation, to make a special contribution to that quality of life for the community as well as themselves.

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