ESTHETICS AND LANDSCAPING

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Aspen is valued for its scenic beauty. One indication of this is the trips to the "high country" that many forest visitors make to view the autumn color changes (fig. 1). Another is the frequency with which aspen is planted in urban and suburban areas. Subjective generalizations about the esthetic uses of aspen, although reasonable, provide only rough guidance for management of scenic quality. They can not be used to compare the relative beauty of different scenes, or to determine how much scenic beauty changes as the physical characteristics of the scene change, either naturally or as the result of management activities. Unfortunately, there has been almost no documented research specifically measuring the relative scenic beauty of different aspen scenes. Therefore, this chapter discusses, in very general terms, the scenic beauty of aspen settings and the use of aspen in landscaping.

Esthetic Attributes in the Natural Landscape

The "Visual Management System" (VMS) (USDA Forest Service 1974a) used by the Forest Service and other land management agencies systematically deals with visual attributes of the natural environment. Landscapes are defined and differentiated based on their unique combinations of visual features (such as land, vegetation, water, and structure) in terms of form, line, color, and texture. Each set of combinations is referred to as a characteristic landscape. Characteristic landscapes are further described as panoramic, feature, enclosed, focal, canopied, detail, or ephemeral. Aspen may play a major role in many of these.

In the "panoramic landscape" of the high mountain meadow, aspen often forms the dominant or co-dominant vegetative cover. Its soft pale green, autumn gold, or winter gray color gives a distinct appearance to this expansive landscape. A "feature landscape" is dominated by an object or group of feature objects. Although usually more dramatic in nature, this can be created by a cluster of aspen in an otherwise treeless plain, or by a lone patch of brilliant autumn aspen on a hillside of conifers. "Enclosed landscape" is defined by walls of vegetation or earth forms. Although aspen is not as effective at creating enclosure as conifers, it can create significant spatial enclosure in some situations. Space enclosed by any deciduous tree is transient, varying with the seasons. This changing scene gives an added dimension to enclosed landscapes. "Focal landscapes" occur where the observer's eye is led to a point of convergence. A feature terminus, such as aspen contrasted against darker foliage at the convergence point, emphasizes the focal nature of the view. Aspen is somewhat ineffective at creating a "canopied landscape," because of the open nature of most aspen stands, its relatively short stature on most sites, and its deciduous nature.

Figure 1.—Autumn gold of aspen leaves against a clear blue western sky. (Photo by Mary E. DeByle)

Three variable factors—season, motion, and light—affect how the "dominance elements" of aspen are perceived. The seasonal variable has been discussed. The trembling motion of aspen leaves, perhaps second only to their autumn color, is probably the trait most commonly positively associated with quaking aspen. Lighting has a special effect on aspen; other trees are subject to two conditions—sunlit or shaded. The translucency of aspen's thin leaf provides an added dimension with back lighting, which creates the illusion of internally illuminated leaves, especially striking during autumn coloration.

The dominance elements and variable factors of aspen appear in varying degrees, depending upon the viewing distance. "Distance zones" or "classes" are divided into foreground, middle ground, background, and very distant (USDA Forest Service 1973, 1974; Buhyoff et al. 1982). The foreground is defined by the VMS as the zone in which details can be perceived. Aspen's line, texture, and color all contribute at this distance, as do the variable factors of season, motion, and light. Middle ground extends approximately 3 to 5 miles (5–8 km) from the viewer. At this distance, aspen primarily contribute color and texture (fig. 2); motion becomes imperceptable. As a background element, where texture is seen as groups or patterns of trees, the color dominance of aspen often is the only variation in an otherwise uniform distant vista. Season becomes an even more important variable, because of its effect on color, where other dominance elements and variables become insignificant.

Aspen may perform an important rehabilitative role on the landscape. Aspen's extremely rapid growth and spread can provide valuable visual rehabilitation of areas denuded by natural or artificial causes. In some situations, buffer plantings of aspen may be appropriate (see the REGENERATION chapter). Once established, a dense aspen stand will screen or soften undesirable visual impact, even in the leafless state.

Because of public interest in the scenic beauty of aspen, aspen management objectives generally have focused on maintaining the more sensitive (e.g., more visible) aspen stands in a healthy condition. Where this objective requires harvesting to regenerate a stand, landscape architects can help to design harvest area contours and can suggest harvesting practices to minimize the visual impact of the harvest (see the HARVESTING chapter).

Assessing Scenic Beauty

There are two landscape management-oriented approaches for assessing scenic quality: (1) expert judgment, and (2) public preference (Daniel and Vining 1983). The expert judgment approach utilizes evaluation by skilled observers with training in either art and design, or ecology and resource management. Usually, decisions about sensitivity, relative visual quality of existing scenes, and relative scenic beauty of management alternatives have been based on expert judgment about esthetic matters and educated assumptions about public preferences. The VMS is an expert judgment method.

The public preference approach relies on the judgment of non-experts about the scenic beauty of whole scenes. Public preference studies have been applied to both urban (Anderson and Schroeder 1983) and rural (Daniel and Boster 1976) scenic beauty. Although no public preference evaluations of scenic beauty have focused on aspen, studies of other forest types provide clues for aspen landscape management.

The public preference evaluations of forest scenic beauty have been restricted largely to either near-view or vista scenes. Near-views contain mostly foreground and some middle ground aspects (Brown and Daniel 1984); vistas contain distant peaks and slopes (Buhyoff et al. 1982). Variables specific to vegetation type have not been included in the preference evaluations of vistas; hence, they have not provided information specifically about aspen scenic beauty.

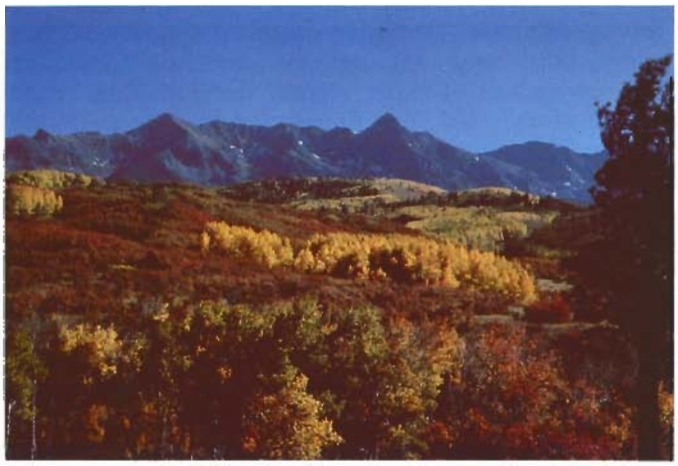

Figure 2.—Aspen in full autumn coloration highlights the middle ground distance zone of this southern Colorado setting.

Of the near-view studies, only one (Schroeder and Daniel 1981) assessed the relationship of aspen to scenic beauty. Among other parameters, they included the number of aspen present per acre to statistically predict relative scenic beauty in the ponderosa pine type. Most scenes did not contain aspen; those that did represented a range of conditions where aspen was intermixed with other overstory trees. Their regression model showed that aspen made a positive contribution to scenic beauty; as did large ponderosa pine, fir, juniper, Gambel oak, and herbage. Small and medium sized pine and slash decreased scenic beauty. Although they supported the positive effect of aspen on forest scenic beauty, their models were not sufficiently oriented to aspen to facilitate design of patterns of aspen and other vegetation types.

Landscaping

Quaking aspen has increased in popularity as a landscape plant in urban and suburban areas in the Rocky Mountain States. There are several reasons for this. Aspen grows rapidly, which gives a planting composition an acceptable "finished" quality within a few years after establishment (Sutton and Johnson 1974). Group plantings of aspen bring to the suburban home or to the urban setting a wildland character because of its form, bark, trembling leaves, and autumn color. Aspen trees are readily available throughout most of the Rocky Mountain States. With proper care, aspen can be grown and transplanted relatively easily (see the REGENERATION chapter).

The potential uses for fast growing, medium sized trees, such as aspen, in urban and suburban areas are both esthetic and functional. Esthetic landscaping uses include specimen, display, accent, spatial enclosure, and view enframement. Functional landscaping uses include visual screening, noise abatement, erosion control, and microclimate amelioration. Aspen, either planted alone or in combination with other plant material, is potentially suitable for many of these uses. Many planting designers prefer to combine a native tree, such as aspen, with other naturally associated plants (Eaton 1964).

Quaking aspen has unique qualities that affect landscaping schemes. First, the root system sends up sprouts every growing season. These can be a nuisance in lawns and gardens, but can be a positive attribute if an aspen clump or grove is desired. Deep mulching or mulching with plastic may control suckering somewhat. Second, aspen grows fast but doesn't live relatively long (perhaps 40–60 years) in an urban setting. Its life may

be shortened further by one or more of the many diseases and insects that attack this species (see the DISEASES and INSECTS AND OTHER INVERTEBRATES chapters). Third, other diseases detract from the tree's appearance. Leaf blights, for example, often turn leaves brown or black in late summer and do not allow development of the expected autumn coloration in planted and irrigated aspen. Failure of expected fall coloration in aspen planted in the urban setting, where the tree's environment is much different than in the nearby mountains, can result from other physiological causes, also. Fourth, although natural aspen in the West grows in genetically identical clones, there is a great genetic and phenotypic variation among clones (see the GENETICS AND VARIATION chapter). This variability can be used to select and develop better aspen planting stock.

Esthetic Uses

Specimen plant.—Individual aspen trees, when planted alone, do not develop very effectively into specimen plants, because they usually lack the necessary strong characteristic form (Wyman 1970). However, some aspen trees possess strong characteristic form. This quality could be utilized for landscaping by vegetatively regenerating stock from these selected clones (see the REGENERATION chapter). Specimen aspen trees send up many root suckers, which must be removed if the individual tree character is to be retained.

Accent planting.—The form, texture, color, and density of a plant influence its usefulness for accent purpose. Plants, such as aspen, which have pronounced seasonal changes in leaf color, flower, and fruit frequently are used for accent purposes. The early spring catkins, bright green foliage, trembling leaves, and interesting bark color and texture are all attributes of aspen that make it an excellent plant where accents are desired. Aspen are most striking when seen against a dark background (e.g., dark buildings, coniferous trees, or the dark green foliage of other decidious species). More subtle effects, particularly in winter, can be achieved when aspen are displayed against a light background or are silhouetted against the sky.

Space definition.—For centuries, plant materials have been used to define exterior space—to define ownership boundaries, to create privacy or to create spatial compositions. Trees are capable of displacing and defining exterior space when used alone, or to modify the quality of exterior space defined by landforms or architectural elements, such as buildings, walls, and fences (Robinette 1972). The physical qualities of aspen make it useful in defining exterior space, particularly where light, airy, effects are desired.

Aspen are most useful where a naturalistic plant scheme is being employed. They often are used as a facer planting in conjunction with more dense conifers. However, aspen from most clones are of little value for defining formally structured exterior space where uniform trunk spacing is required, because of their inconsistent form and tendency to sucker. Because aspen self-prune their lower branches, clumps of trees are more effective in defining space than are single rows. Aspen's rapid rate of growth makes it desirable in designs where a quick spatial effect is desired. The seasonal richness of aspen provides quality and variety in plantings for defining both foreground and middleground views. The use of aspen in the urban or suburban setting for defining views of mountainous landscapes is particularly effective because visual associations to the tree in its native habitat.

Sound.—The sound created by breezes passing through aspen leaves is an added amenity. The characteristic whispering sound of quaking aspen leaves is of particular benefit in more intimate spaces and over or adjacent to walkways or other areas where people will be near the trees.

Functional Uses

If urban growth continues in the Rocky Mountain West, the need for plant materials to solve functional problems that accompany this growth will increase. Typical problems include undesirable views, noise, and undesirable microclimatic alterations.

Visual screening.—The attributes of a good deciduous tree for screening purposes include dense foliage; low, dense, and uniform branching; and a long period of leaf retention. Aspen are most effective for screening where adequate space is available for planting clumps or multiple rows, or when combined with other plant material. Single rows of aspen by themselves are too open in character, particularly when fully grown, to make good visual screening trees. However, when they are combined with appropriate shrubs or conifers, excellent screening can result. Aspen's rapid growth provides screening within a few years after planting.

Noise abatement.—The most effective plants for noise abatement are tall, dense, and uniformly branched (Cook and Van Haverbeke 1971). Aspen are effective for noise abatement in urban environments only where ample space is available for massive plantings, or if they are used in conjunction with other species. Because they are deciduous, they lose most of their noise abatement qualities in winter.

Climate control.—The climate of the developed valleys in the Rocky Mountains is characterized by dry summers and snowy winters. The extremes of this climate frequently are exaggerated in urban areas, where buildings and paving create new and often undesirable microclimates.

Tree canopies intercept solar radiation. Shaded spaces may be as much as 10°F (6°C) cooler, and light intensity may be reduced from 60% to 90% (Robinette 1972). During the growing season, aspen has sufficient foliage density to intercept much solar radiation and

provide a pleasing, shaded, cool environment. When foliated, aspen also helps reduce glare caused by light reflected from buildings, walks, automobiles, etc. In winter, the open branching pattern of aspen allows sun penetration.

Aspen is not very effective for windbreaks, because it does not branch close to the ground or have dense foliage and branching, and because it is somewhat brittle. However, where adequate space is available for massive plantings of mixed species, aspen can be used effectively in windbreaks and shelterbelts. There, its characteristic suckering may be an advantage for replacing broken or lost overstory plants and for providing a wind-filtering understory.