Timber Management Simulated Field Trip[1]

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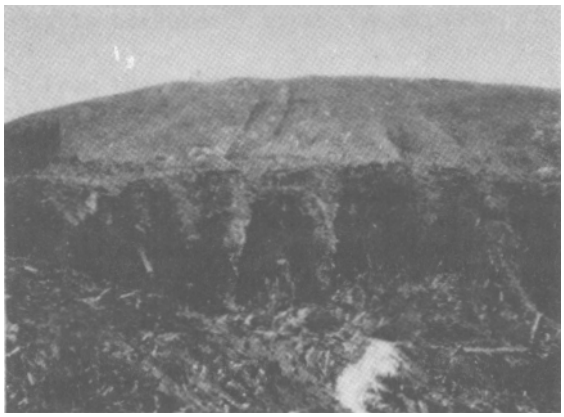
Abstract: Timber Management techniques are changing the appearance of our nation's wildlands. Standard harvest practices often result in harsh visual impacts and public outcry. In some cases, subtle harvesting has been done, but without adequate thought as to what the visual result will be over time. Better visual results can be obtained by careful harvest design which utilizes knowledge of biological and stand growth characteristics as well as landscape architectural design techniques.

Today's wildland landscape is woven with varying patterns of colors and textures. Over the years soils and climate, fires and insects, saws and axes have shaped the forest vegetation into patterns which today lend visual variety to forested landscapes. These landscapes take on meanings for people because of the visual variety and composition of patterns that exist there and we say the landscape is beautiful.

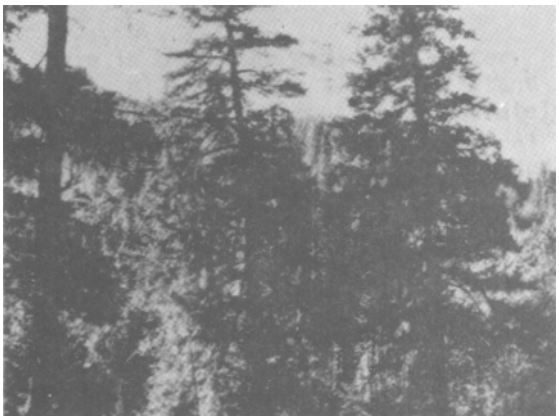
In recent years, man's activities have had a rapidly growing and profound effect on the face of our forested landscapes. Man requires wood for thousands of uses and be must cut down trees to get it.



Early day logging was certainly not pretty. Often the land was stripped bare and debris was left behind without regard for what it looked like. No one really seemed to care very much. There was always more forest over the next hill and everyone knew the wilderness nut West was endless.

After World War II, cutting in the western forests begun to accelerate rapidly. Logging roads made forest land accessible and people started to recreate in places they had not been before. Some began to complain about the mess and ugly scars left after clearcut logging. By 1960 when the Multiple-Use Sustained Yield Act was passed it was apparent that something had to be done about protecting some of the scenic qualities of our forest land.

As part of the implementation of the Multiple-Use Sustained Yield Act, the Chief of the Forest Service adopted the National Forest High Mountain Policy. A part of that policy established for the first time Landscape Management Areas and Travel and Water Influence Zones. These were generally nothing more than narrow buffer strips along roads and streams. For the most part, they were not successful because they only tried to hide visual problems behind a thin and often transparent screen of trees.



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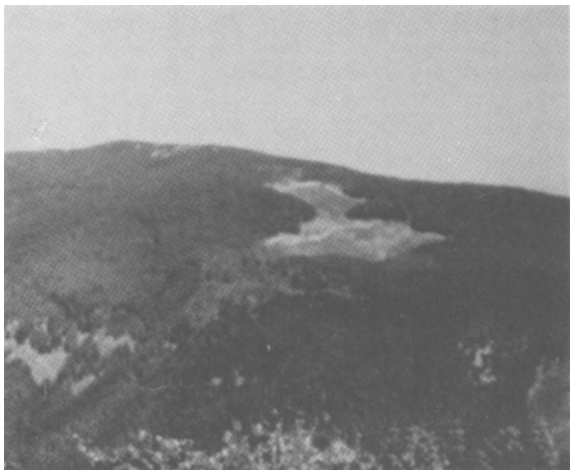
In 1969 at the first National Landscape Management conference the Chief of the Forest Service recognized the Visual Resource as a full-fledged forest resource and launched the National Forest Landscape Management Program.



Since that time the lion's share of the landscape management effort has been directed toward reducing visual impacts of timber harvest. Early efforts to create a clearcut that broke away from the traditional rectangular shape had a cookie cutter appearance but was considered by many to be a giant step forward.

Landscape architects have found themselves on unfamiliar ground when faced with silvicultural concepts, allowable cut quotas, logging equipment, and road building in steep terrain. This was a tough challenge for most. Landscape architects have had to invent new design concepts and learn how to use new tools such as computer programs to help them study clearcut slopes before they are cut. They had to learn capabilities of logging equipment. Most landscape architecture schools did not teach these subjects.

Another major problem is that there are not many people trained in landscape management to meet the demands of the timber sale programs.

Visual management of timber lands has been a major issue in a number of political and legal challenges in recent years. The Bitterroot and Monongahela National Forest controversies over clearcutting were two of those. There were probably other underlying reasons but the primary controversy in these cases revolved around the visual appearance of clearcutting. Slash on the ground after logging, skid trails where logs are dragged over the ground during logging, access roads and landings for logging equipment and the firelines scraped down to mineral soil around the unit to protect against fire spread are some other visual impacts common to clearcutting.

The recent National Forest Management Act and BLM's Federal Land Policy and Management Act both recognize the significant value of visual resource management and specifically direct the planning of timber harvest to meet aesthetic objectives and the blending of clearcuts with the natural terrain.

Today, landscape architects, silviculturists, logging systems engineers, and members of other disciplines are working together on the specific visual problems of managing various timber species. Each timber species presents somewhat different visual management problems closely associated with its growth characteristics. We will discuss a few of the major North American timber types.

PONDEROSA PINE

Envisioned characteristics which are important include large tree sizes, yellow plated bark with deep furrows, open park like stands, grassy ground cover on a relatively flat ground condition are historically accurate in most situations where ponderosa pine is a climax species and fires are permitted to ignite and burn. These low intensity, frequent fires eliminate most of the brush and young trees which inevitably become established under the low stand densities associated with mature pine stands.

Lack of fire and other cultural treatments has often allowed ponderosa pine and the more tolerant species usually growing with it frequently to be excessively dense, to the point of stagnation. This condition may retard height and diameter growth for decades, resulting in thickets which are nonproductive for wood fiber and of little value as a visual resource.

It is only when the tree diameter growth rate slows and the older bark is exposed to the weather that the anticipated yellow bark characteristics begin to appear.

Individual trees in open growth stands are deeply rooted and quite windfirm. This characteristic permits a wide latitude in management of harvest techniques, without significant danger of loss to windthrow. Such characteristics also allow harvesting without significant visual impact if carefully done.

Management of these sensitive stands has until recently not only kept fire out but also restricted treatment to cutting only the dead and dying trees. If these valuable visual characteristics are to be retained over time the land manager must consider creating and maintaining a balance of stands of many ages within a foreground in order to have replacements for the present old growth stands.

DOUGLAS-FIR

Douglas-fir as found in the Cascade Range of Washington and Oregon is chosen to represent a subclimax species which traditionally has been thought to be a very difficult species to manage in visually sensitive areas.

Climatically, the area is dominated by maritime weather patterns, causing a moist and relatively mild climate with long growing seasons. Severe winds often cause windthrow problems in the shallow rooted old-growth stands. Soils are generally well drained, deep and fertile.

The first impression of an old-growth Douglas-fir stand is one of continuous texture. Careful examination of any area of significant size, shows subtle differences in the canopy level. These are generally caused by higher or lower site productivity levels, natural variation in seedling density as a result of seed source, actual difference in age as a result of small fires that killed part of the stand, as well as age differences that reflect difficulty of

natural regeneration establishment after the catastrophe that eliminated the previous stand. There really is quite a bit of diversity in what first appears to be a continuous stand of old-growth Douglas-fir.

Present old growth Douglas-fir originated over 200 years ago, following natural events as windthrow, fire, and other phenomena. Where the species has grown beside long established openings such as roads and because of soil and climatic conditions, the growth is fairly open and the crowns are often quite long and full. This condition provides visually desirable tree forms in foreground and has a good screening capability for shelterwoods in middleground. It also creates fairly natural appearing edge effects for clearcuts.

However, in the majority of situations, Douglas-fir is typified by tall trees grown in dense stands. Severe light reduction in the dense stands causes the live crowns to be very sparse, occurring only in the top 30 percent of trees, 180 feet to 200 feet tall.

The long unbranched tree boles produce a very strong, unnatural edge effect in clearcuts and shelterwood overstory removals. This strong line at the edge emphasizes the harvest opening and makes a natural appearing effect more difficult to attain.

Soil disturbed to prepare the site for seed germination often produces a strong color contrast with surrounding untreated stands.

The management of Douglas-fir is limited by the species' silvical characteristics, particularly its susceptibility to windthrow and its intolerance to shade. These, together with the difficulty of logging large trees on the steep topography found over much of the species range, limit the treatment opportunities.

LODGEPOLE PINE

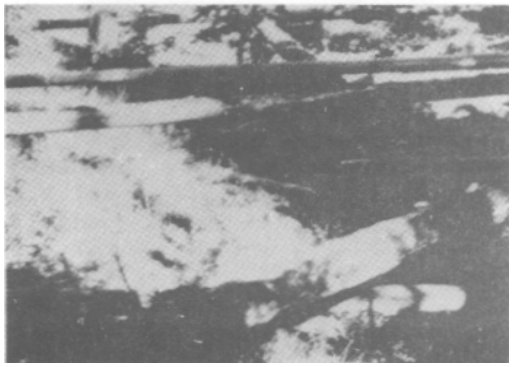
Lodgepole pine can dominate stands originating from wildfire or logging on many habitat types as described by the Daubenmires (1968) in northern Idaho and by Pfister et al (1977) in western Montana. The short-lived nature of these lodgepole stands limits the treatments that a manager, concerned with the visual resource, can use to manipulate the stand over time. On habitat types where lodgepole pine is a dominant seral species, stand decline is underway by age 100 and mortality is usually complete within 200 years (Pfister and Daubenmire 1973).

Lodgepole pine can establish itself so rapidly on disturbed areas that manageable numbers of other species are excluded. Seedling densities which exceed 100,000 trees per acre are common, creating stands which stagnate soon after they become established. Stagnated stands leave the manager little choice but to seek relief with some regeneration method.

Stands that are free to grow face dwarf mistletoe infection beginning at the seedling stage and continuing throughout the life of the stand.

By the time a free-growing stand reaches 80 years of age, it has attained high susceptibility to the Mountain Pine Beetle. Present at endemic levels in most lodgepole stands, this insect can build to epidemic numbers when stand diameters exceed 7 inches. Almost all lodgepole trees in such stands can be killed within several years.

Fuel accumulations from disease and insect mortality make treatment for retention and partial retention visual quality objectives difficult, if not impossible throughout the entire rotation.



On most habitat types where lodgepole is a dominant seral species, lodgepole stands can be converted to other forest types that offer greater treatment flexibility. Culturing lodgepole stands to meet visual quality objectives involves the manager in dealing first with the lodgepole dominated stand to a logical regeneration age, next with manipulating the new stand over time.

Some lodgepole stands have an understory of tolerant species like subalpine fir Engelmann spruce. In most situations it would be difficult to manage for this understory. Partial cuttings to release the understory would increase the susceptibility of the stand to windthrow. This, together with logging debris from the trees removed, constitutes a fire hazard that cannot be reduced without damaging the understory. Complete removal of the overstory would also produce considerable damage to tolerant understories which are susceptible to the effects of logging. Finally, there is doubt that a suppressed understory can be developed into a manageable stand over the long run. Subalpine fir and Engelmann spruce which have been suppressed for long periods of time will exhibit initial release, but it is difficult to sustain their growth to develop visually acceptable stands. These problems point to the importance of regenerating lodgepole dominated stands to new stands supporting more manageable species compositions.

The visual characteristics of lodgepole pine in dominant seral situations range from stands with outstanding variety to those with extreme sameness. The last situation can create visually monotonous landscapes when viewed extensively from off-site.

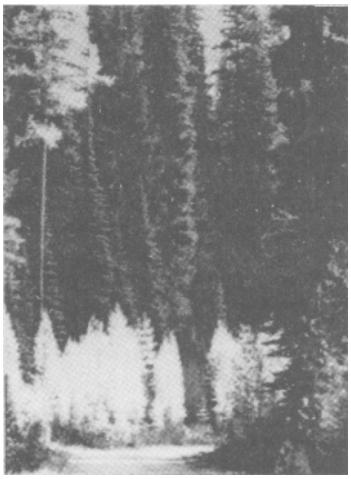
Lodgepole pine trees generally are not considered as individual "specimen" trees; their role is usually supportive in larger visual compositions. Individual trees usually do not offer striking visual opportunities in their form, texture, or color. When viewed collectively they present very strong, line-dominated foreground viewing.

The even growth and branching patterns are usually considered visually undesirable when viewed in the early growth stages; in this growth stage they are commonly referred to as "dog hair" stands.

As the stands are thinned and viewed with other contrasting seral species, such as larch, their visual contribution supports better visual conditions. In situations which allow more shade tolerant species, such as Engelmann spruce and alpine fir, to intermingle with stands of lodgepole pine and Western Larch a rich diversity of color, form and texture develops. The stand also begins to offer more vertical diversity.

On some habitat types, pure mature stands which lack strong species diversity can offer outstanding foreground landscapes with strong line and shading elements. The forest floor is open and park-like, sometimes with bear grass and occasional clumps of shade tolerant species.

When lodgepole pine is viewed in the middleground, it is most visually desirable when there are a variety of natural openings which develop into strong compositional landscapes of landform, rock form and vegetative patterns. Continuous landscapes of lodgepole pine mixed with larch offer striking short-term fall and subtle spring contrast situations.



A suggested process for converting a seral lodgepole pine stand to the more manageable species of Englemann Spruce and subalpine fir can be found in the forthcoming Landscape Management handbook on "Timber Management Applications."

Summary: This simulated field trip around the United States attempted to portray the physical, biological, and social problems and opportunities in managing vegetation to meet Visual Quality Objectives. Suggested conceptual solutions to a few of these timber type problems are illustrated in the solution statement. Others can be found in the "Timber Chapter" of the National Forest Landscape Management Handbook Series.

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