

Simulated Field Trip on Ski Area Development¹

John J. Lindsay and Hubertus J. Mittmann ^{2/}

Abstract: Not too long ago winter sports facilities were small and simple. As more people participated in winter sports and technology advanced, the impact on the land increased not only from the standpoint of actual facilities needed for winter recreation but also from associated facilities. In many instances winter sports areas developed into full fledged tourist oriented communities with a multitude of services. Although these areas were initially only winter sports oriented, it soon became apparent that the summer recreationists could enjoy them as well. To make the areas attractive to people, the visual appearance became a key factor in planning, design and construction. Because of this, it was realized that the visual resource management system should be applied to all alterations of the landscape.

INTRODUCTION

In 1978 there were 706 fully operating ski areas in the United States with the combined capacity of serving close to one million skiers per day. Eight percent or 12.8 million people actively participated in skiing during the 1977-78 season. A use increase to approximately ten percent per year is anticipated in the future. Approximately one-third of the total acres are on federal lands.

Ski areas range in size from less than 100 acres to more than 9000 acres. If we assume an average size of 1000 acres including surrounding land development we can estimate a total average allocation to ski areas in the United States of approximately three-quarters of a million acres.

Ski areas are long term commitments of capital and land resources. Their impact on the landscape is permanent and extensive and involves many different environments from the center of ski communities to the base and top of the mountains themselves. They are constructed on a variety of soil and vegetation types that may include critical watershed and wildlife habitats. As you will see, they make significant impressions on our mountain landscapes.

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^{2/} Associate Professor - Recreation Management, The University of Vermont, Burlington, Vt. and Regional Landscape Architect, Forest Service, USDA, Rocky Mountain Region, Denver, Colo.

SKI AREA DEVELOPMENT IN THE EASTERN UNITED STATES

Mountains in the eastern region are below 6000 feet in elevation and most are well below timberline. They are completely covered with dense forest, making them considerably different from mountains in the West.

A typical eastern mountain forest cover includes pioneer species at the base, northern hardwoods at mid-elevations and northern boreal species at upper elevations. Trails cut through this dense forest cover leave sharp, distinctly visible edges.

Ski areas in the East are located on the relatively narrow Appalachian Mountain Band and are visible from great distances across valleys and flat lands.

In the process of converting a mountain from natural to ski area conditions, several changes are brought about that affect the visual nature of that mountain and proximate areas. These impacts may be classified into the following categories: (1) roads, trails and parking areas; (2) mountain hardware; (3) mountain buildings; (4) satellite construction and (5) community impact.

Usually, new major access roads have to be constructed to the base of the ski area. These roads wind up foothills involving steep grades and deep road cuts through the countryside.

One major step in the early development is bringing power to the mountain.

Trail construction requires the following operations: (1) trail clearing, (2) stump removal, (3) rough grading and (4) land filling and leveling, all of which cause mass transformations in the mountain landscape.

During these operations massive machinery must be employed which also causes a major visual impact. Because of lower levels of snow fall in the East, trails must be converted from forest to sod-covered soil to insure maximum stump-free snow depths. Lack of proper trail construction and maintenance can cause unsightly gully erosion and sheet erosion resulting in massive scars on the landscape. Loss of soil and exposure of bedrock result in loss of snow from the slopes because the insulating effect of the soil is lost and reflective radiation from the rock surface is increased. Severe surface erosion transforms clear mountain stream, high on the watershed, into discolored slit-laden rivulets rapidly advancing stream

and lake sedimentation further down the watershed. Large land areas must be cleared and leveled for automobile parking near the base facilities. Auto-filled parking lots can be barren, metallic wastelands in an otherwise natural mountain environment.

Mountain hardware that includes lift towers, cables, chairs, gondolas, bull wheels, ski jumps, lighting, snowmaking and grooming equipment further disfigure the mountain with man-made clutter. Line, form, color, texture and scale are all visual impact factors associated with mountain hardware which must be carefully planned and fitted to the landscape. Not only should the color of lifts and other equipment be compatible with its winter environment but also with that of other seasons as well. To help maintain the esthetics of the area and skier comfort, lifts should be designed with a low profile with construction not exceeding tree height where at all possible. Power lift equipment contains massive, mechanical components which occupy large spaces at the base and top of the lift lines.

The average annual snowfall on eastern mountains is considerably less than most western ski areas. As a result, more emphasis must be placed on snow-making equipment. Snow guns and waterlines are other objects that add to the long list of mountain machinery. Snow surfaces must be constantly groomed in the East to prevent icy conditions and to make maximum use of available snow. For skiers' information, convenience and safety, many signs of varying color, shape and size are utilized throughout the ski area. Unless properly designed and located they can be obtrusive.

One of the largest mountain buildings requiring careful architecture and landscaping is the base lodge. Not only is the lodge the center of winter activity, having many services for skiers but it must be designed to fit other seasonal landscapes for year-round recreation activity. Tennis courts are one example of ski areas' attempts to expand to four-season recreation centers. Maintenance and storage buildings should be built with the same esthetics in mind as any other obvious mountain structure. Mountain-top buildings should be conservatively built below the mountain's profile so as not to offend other outdoor recreation enthusiasts such as hikers. Ticket booths and first aid stations are other types of mountain buildings that must be attractively designed, well located and functional.

Satellite developments such as condominiums, hotels, motels, and chalets also have great visual impact on the landscape at great distances from the mountain. Mountain communities can be nicely adapted to the

mountain landscape or very poorly designed and out-of-place with no feeling for the site and its natural beauty. Lodges, hotels and other large buildings, if not properly landscaped, can appear offensive and unaesthetic in a non-winter landscape. Condominiums cover large areas proximate to the slopes. Because of this building density and accompanying traffic and activity, they must be built not only to please the vacationing skier, but must also be compatibly planned to fit natural terrain features

Ski chalets can be contemporary or traditional but should always be matched to the site. Signs in the ski community can be attractive and blending or unattractive and cluttering on an otherwise attractive landscape. State tourist information systems along with state sign control programs can provide the necessary tourist information to the skier thereby reducing the need for private roadside advertising.

Ski area impact on rural communities can be significant in such activities as real estate sales and development, vacation home construction, increased development of entertainment facilities, contracting and equipment sales and rentals.

The impact of a ski area on a community is highly visible. The increased need for basic services such as fire and police protection, sewer and water, create the common community growth and planning problems usually associated with urban communities. Rural communities can become tinsel-towns in the rush to attract skier dollars.

Each phase of ski area development has the potential for causing major changes in the landscape. These impacts can be minimized through careful planning and development procedures.

SKI AREA DEVELOPMENT IN THE WESTERN UNITED STATES

The western mountains are characterized by rugged terrain, high elevation, severe climate and very fragile ecosystems which can easily be damaged. Unless special precautions are taken, recovery from damage usually takes a prolonged period of time. The elevation of these areas is between 6,000 and 13,000 feet.

The following discussion will elaborate on landscape alterations necessary in the development of winter sports areas and the precautions that need to be taken to protect the visual integrity of the area. It should be pointed out at this time that in the West

many winter sports areas are also complete summer resorts. This puts a special emphasis on visual resource management.

When dedicating a portion of land to the intensive use of a winter sports area with its associated developments, major visual impacts have to be expected at different degrees during the construction period and after the main construction is accomplished. In the West this type of intensive development can create a major problem because of the difficult land base. It is, therefore, imperative that specific data be gathered and analyzed for consideration of the visual resource during the planning and design process.

A seen area map will have to be prepared to analyze where the area can be seen from, by how many people, time of observation and what type of area it can be seen from such as a highway, a wilderness area or perhaps a summer home site. This map should also include distance zones, sensitivity levels and variety classes of the area. From this information, Visual Quality Objectives can be established according to the Visual Management System used by the Forest Service, USDA.

Another map needs to be prepared which delineates the visual absorption capability of the area. For this we need a combination of data based on slope, aspect, vegetation, soil fertility, erosion potential, mass movement potential and other physical inventories of the area which are pertinent for each individual project.

These are the data which will be considered from the visual resource management standpoint during the planning and design process.

For the more specific discussion of visual resource management in the West we will divide a winter sports area into three major components; the mountain, the base area, and surrounding areas. Within those we will examine landscape alteration from three standpoints; vegetative manipulation, soils manipulation, and structure introduction.

The mountain is probably the most visible aspect of any ski area and because of trail clearing, road construction and structures, its visual impact needs to be very carefully considered. Trail clearing has to take advantage of the fall line, vegetative composition and species which will adapt to drastic change. Width and character of the trails will depend largely on type of terrain, skiers expertise and wind exposure.

To avoid excessive clearing, initially only a narrow trail should be cleared and based on use and possible maintenance needs, successive vegetation removal should be initiated. If a trail follows the fall line of the land it will usually appear more natural. To blend better visually, a trail needs extensive edge effect work to be done over an extended period of time through selective removal or planting of vegetation. A vegetative management plan should be developed for each ski mountain to ensure the visual appearance of the mountain for the future in the summer or winter.

To visualize the trail or other clearing, computer programs such as Mosaic, Scope, or the Perspective Plot program can be used very effectively during the design stage. Necessary changes are then only made on paper.

Once trails have been cleared, the actual skiing surface must be treated to remove undesirable obstacles, provide proper surface drainage and re-establish basic ground cover vegetation, mainly native grasses. Roads on the mountain should be held to a minimum and they should be designed with as little soil disturbance as possible. In the past when helicopter construction and pumping of concrete was not used, roads had to be built to every tower site. The visual impact became unacceptable and so did the maintenance of trails because of excessive erosion.

From the most recent experiences we can conclude that if the mountain alterations are blended as much as possible with the established landscape, the visual appearance will be acceptable and the maintenance cost will be lowered considerably in the long run although initial construction cost may be higher. If it should be necessary that the runs have to be graded, special precautions must be taken to save the topsoil and initiate rehabilitation immediately. Temporary watering may be necessary until grasses are established.

Structure introduction can create a visual impact of great magnitude if not properly handled. Lift structures and buildings, as an example, will probably have the greatest impact. Location, architectural style, colors and vegetative treatment can make the structures negative focal points, or they can harmonize them with the landscape if properly designed from the visual standpoint. The colors used should be dark earth tone colors such as dark brown, dark olive or dark grey, dark blue or other similar shades which blend well into the landscape.

The base area is a completely different story because many facilities and structures are involved. The type of base areas we have in the West range from that of smaller day-use areas to full-fledged winter and summer resort areas. From the visual standpoint planning, design, and zoning controls are the key to success. Many day-use or weekend-use areas usually are not used during the summer and will not treat their area as effectively from the visual standpoint as those areas which are also used as summer resorts.

Basically we need to consider four aspects; transportation and utilities, architectural styles, zoning controls, and landscape treatment. All transportation connected features such as parking areas, roads, trails, bus terminals, or signs can have a major effect on the visual appearance and should be well coordinated to achieve the desired positive visual effect. Utilities such as transmission lines, microwave stations and reflectors, water storage facilities and gas or water lines should either be buried or designed in such a way that they will blend well into the surrounding area. The architectural styles in base areas can either unify the area visually or create the appearance of disarray. Use of colors, architectural styles and materials must be well controlled.

Coordinated planning is the key based on the type of zoning which fits each winter sports area best. To achieve the total unification of either small day-use areas or complete resort areas, landscape treatment has to be effectively applied. Grading, planting of grass, flowers, shrubs and trees or saving existing vegetation or water courses can make an area most pleasing and unify it. People like to be in pleasant surroundings and the long-range success of an area can be measured by how well people like it.

There is one other aspect of winter sports area planning from the visual standpoint which is usually considered separately but really should be considered as part of the resort area because the resort is the generator. This is the planning of utilities and the necessary transportation system. The visual impact of utilities and roads is usually major and extends for miles affecting large geographical areas. The major utilities are electric transmission lines, microwave installations, pipelines for gas and water, and highways which either need to be built or widened. From these examples it can be seen that planning of these resort areas has to consider not only the site where the resort is located, but also where the utilities are coming from and what visual impacts they create on the landscape.

Although only major points were touched in this presentation, it is readily apparent that winter sports resorts have a major impact on the visual resource and that planning, design and construction need to consider carefully many aspects which directly relate to the visual perception.

CONCLUSION

Ski areas have emerged from a very primitive start to an all encompassing business serving approximately 13 million people per year and requiring multi-million dollar in-

vestments for development by individuals and corporations. The scale of impact and the complexity of area development have increased steadily and require thorough interdisciplinary involvement during planning, design and construction stages as well as in the continuous management process. Because of the landscape orientation and the high visibility of ski areas, visual resource management is gaining in importance in area development. Systems and techniques of visual resource management have been developed over the past ten years and with the addition of computer programs, they should be a major tool in planning, design, and construction to ensure the visual integrity of ski areas.