Applied Landscape Management in Plant Control[1]

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Highlight

Plant control results in drastic abrupt changes in the dominating landscape of a site. To lessen this impact and create a pleasing aspect, the land manager must use his ingenuity in applying techniques that will result in coordinating basic data, soils, wildlife needs, esthetics, and range to arrive at an action plan that will maximize all resources and activities. Perhaps the most difficult land resource value to assess, maintain, and manage, is natural beauty. Thus, the application of a plant control project is a challenge in landscape management application. Experience has shown that, through a joint effort by all disciplines, it is possible to apply a practical form of landscape management that results in the retention and even enhancement of the natural beauty while accomplishing the basic resource objectives desired in a plant control program.

Grazing by domestic livestock in the Southwest dates back to its introduction by the Spanish in the 1600's. By the beginning of the twentieth century, low value forage plants—pinyon, juniper, mesquite, chaparral, and in some cases pine, began to invade natural grasslands. The invasion progressed very rapidly.

At present, there are 2,500,000 acres of formerly open grasslands that have converted to low value forage plants in the Southwestern Region of the Forest Service. This change in vegetation has resulted in deterioration, loss of forage production, inferior wildlife habitat for certain species, and a change in the hydrologic water balance in affected sites.

Accelerated invasion by woody plant species has now progressed to the point where mechanical or chemical treatment must be applied. Control by these methods results in dramatic changes in the landscape. Now that there is so much concern by so many people about the environment, the land manager, particularly the public land manager, must place high priority on developing techniques and procedures which make environmental change acceptable to the public. Plant control treatments must be esthetically pleasing. The natural beauty of the landscape cannot be marred. Landscape management has become another of many responsibilities of the land manager, to be fitted into all plant control projects along with range, watershed, and wildlife considerations.

Project Planning and Objectives

The first step in accomplishing a plant control project is assembling basic resource data. Range analysis, soil classification maps, wildlife habitat inventories, sediment studies, and other hydrologic data should be considered. These collectively determine the sites where plant control can be applied to provide overall benefit. Through joint effort with the landscape architect and other specialists, it is possible to blend this basic resource data with the concepts of wild land landscape management. This develops an overall plan that will fulfill all of the multiple use management objectives. Experience shows that the quality of the end product is directly related to the quality of the planning effort. A sound plan cannot be built on assumptions. It must be based on facts and proved theory.

The Ranger District Multiple Use Plan sets the coordination requirements and management decisions that apply to the management unit in which the control work is to be carried out. Soil scientists provide soils information. The wildlife biologists can point out key areas and predict what the effects of plant control will be on wildlife. Watershed specialists can tell what work is necessary to reduce soil loss and improve the hydrologic condition. The range manager can evaluate the existing situation, plan the necessary livestock controls during the action program, and define the management procedures necessary to maintain the site once a grassland type is restored. The landscape architect should provide the artistic perception to insure the natural appearance of the finished project. This last mentioned skill has not always been considered as necessary in plant control project planning. As a result, we have many horrible examples which continue to haunt us and are hindering the overall program because of adverse public opinion (Fig. 1). Natural beauty must be a primary objective in plant control project planning and must be considered in all aspects of multiple use management of wild lands. Landscape management in plant control activities becomes the application of many variables to a procedure that results in a completed project that enhances all multiple use values (Fig. 2).

Soils

A detailed soil survey will identify the soils with forage production potential and the areas that should not be treated. Where soils are highly variable, adhering to soil information will often produce ideal patterns. Where soils are homogeneous, large, open patterns could develop if all treatable soils are worked without considering other on-site values.

Wildlife

Wildlife habitat needs frequently are very critical in areas where plant control is being considered.

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FIG. 1. Layout on this plant control area was not coordinated with soils, wildlife needs and esthetics to arrive at a pattern that would maximize all resources and activities present.

This is especially true in the pinyon-juniper type of the Southwest. Cover, as well as food supplies must be considered. Where large expanses are worked without concern for wildlife cover, much acreage is lost from a wildlife point of view even though overall wildlife forage is improved. If cover is left at irregular intervals, not greater than ¼ to ½ mile apart and edges undulated, acreage can be added to the wildlife habitat. Small game and songbird species should not be neglected when prescribing plant control, although they often are. Scattered brush piles—one per acre or less—or individual tree carcasses will often meet the needs of these species and improve their habitat while not detracting from the esthetic value. Large, randomly spaced trees scattered throughout the project will aid in providing spring forbs and grasses which are extremely important to wildlife habitat in the Southwest (Fig. 3). At the same time, these trees provide a pleasing aspect to the landscape.

Watershed

Much plant control work is undertaken to increase water production. One study in the chaparral type in Arizona has indicated about 3.0 inches more water per year as a result of brush control. (Pase and Ingebo, 1965). Increased water loses much of its value if the quality has deteriorated as a result of soil mismanagement. On some sites, removal of the over-story and exposure of the soil surface becomes a catastrophe from a soil stability point of view. These untreatable areas can be used effectively in arriving at the final esthetic patterns. The opposite may also be true. By removing low value woody species and establishing a grass cover, active erosion can be arrested and soil stability developed. Gullies and polluted water detract from the esthetic values of the land.

Range

In range management the objective of a plant control project is to develop the range resource to its maximum, consistent with other Multiple Use values.

To blend these values, a range environmental analysis must be available. The analysis provides areas of high priority for plant control and the plant species requiring control for range management purposes, and location for potential structural improvements, fences, and water developments that will be needed for management of livestock during and after the control program.

Most plant control projects are carried out on areas where livestock are presently grazing. This makes the development of a feasible, overall range management plan necessary before beginning a

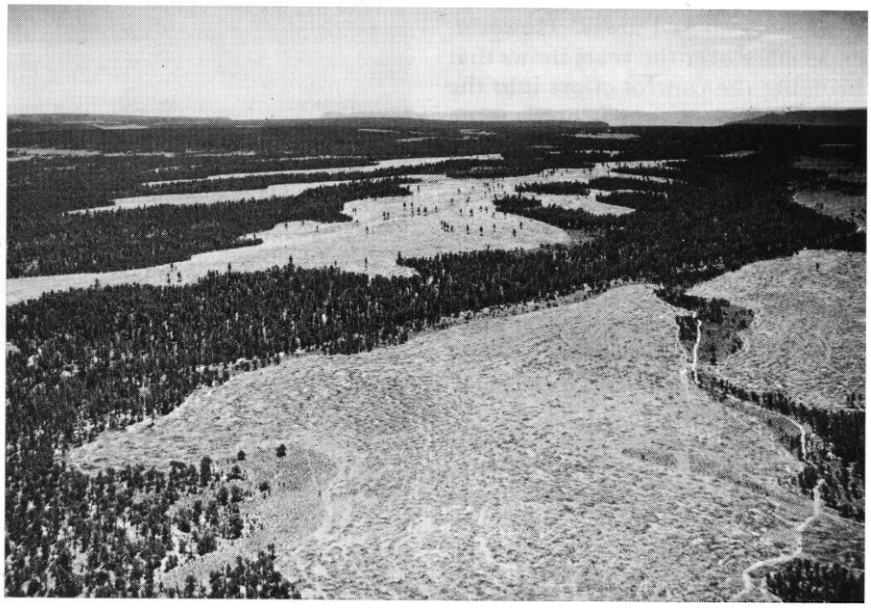

FIG. 2. A pinyon-juniper control project that maximizes all resources and activities and retains the natural beauty of the landscape.

FIG. 3. Shows large randomly spaced trees left to provide spring forbs and grasses and depict a pleasing aspect to a landscape where pinyon-juniper control has been accomplished.

plant control project. The analysis and management plan becomes the basic range data to use in coordinating and planning a plant control program.

Natural Beauty

Until recently, natural beauty was not a major consideration. An example of this is in the plant control work in travel influence zones.[2] Earlier plant control efforts left buffer strips for screening between roads and worked areas. However, experience over the years shows that bringing the control effort into the travel influence zone is much more pleasing than leaving a buffer zone along roads. By having this arbitrary leave area, a false impression is left to the casual viewer, and draws attention to the control area. Many times when control work is brought into the travel influence zone, the casual viewer will not be aware of the vegetative change.

In this day of air travel, the pattern as presented from an aerial view must also be considered. A considerable acreage is seen and observed by more people from the air than is ever seen via the ground route. Viewed from the air, straight edges and rectangular clearings are examples of objectionable patterns. However, if other guidelines are followed, the aerial view will be pleasing to the eye.

Existing vegetative distribution provides evidence of natural openings that once were present. Many times this existing pattern will coincide with the desirable pattern.

Where other factors do not create undulation in edges, it should be done artificially. Land patterns, in areas of varied ownership, must be supervised to hold straight lines to a minimum. Many times it will be necessary to coordinate new work with old work done under different standards.

Feathering can be accomplished in layout by taking advantage of various stand densities, or it can be created artificially. Feathering is perhaps one of the hardest practices to apply in pattern layout.

When applying these practices, it is very important to continually be aware of the dimensional aspects that are inherent in plant control work. Finished projects are viewed from all angles and should present the desired characteristics from any direction. A well broken up pattern from one view can become a wide open expanse from another angle, thus detracting from the natural beauty.

We have dwelled at length on the layout aspects of plant control as this is what determines success in a

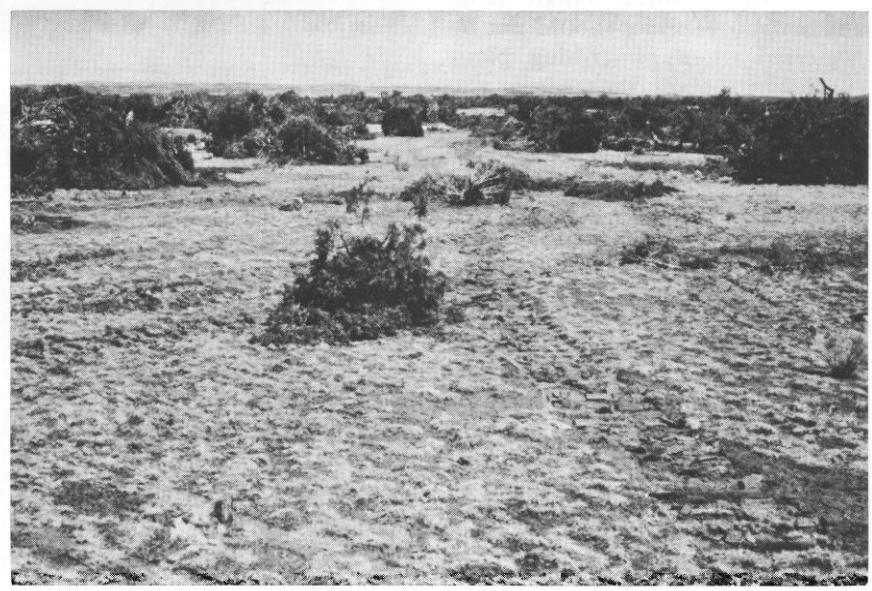

FIG. 4. A pinyon-juniper control area where esthetic values were not considered. Cleanup will increase available forage and improve esthetic.

[2] Travel Influence Zones are defined as areas in which beauty of the landscape and other esthetic values are an important part of the outdoor environment. These offer significant opportunities for existing, planned, or anticipated recreational use and enjoyment by people visiting or traveling through the zone.

FIG. 5. Completed pinyon-juniper project where feathering technique has added to the edge effect. Grass establishment is a result of seeding in conjunction with control effort.

project from a landscape point of view. Cleanup of debris often provides the finishing touches. Failure to clean up often results in criticism and adverse publicity for an otherwise successful project (Fig. 4). There are many methods of control, with no one best method that can be applied to all projects. It is important to consider cleanup requirements in initial control method planning. Frequently, cleanup restrictions will dictate the control method.

A pinyon-juniper control project is an example of how cleanup is structured into the overall project effort. Control of pinyon-juniper can be accomplished by pushing. Through development of a burning plan, fire can be used to remove the tree carcasses. (Southwest Interagency Fire Council, 1968).

By using a helicopter, broadcast seeding can be accomplished. To prepare the seedbed, cover the seed, and smooth up the rough edges left from the burning, an anchor chain can be dragged over the area (Fig. 5). The results will be an esthetically pleasing project that meets the overall objectives. In some cases, trees are piled or windrowed prior to burning to insure a greater consumption of debris.

When using fire in the cleanup sequence, it is extremely important to time burning so that air pollution is held to a minimum. Many times other means of disposal will have to be used to prevent air pollution.

Control and cleanup can be done in one operation with the "tree crusher" (Fig. 6). Such a machine uproots and crushes the trees in one operation. This control method has been extremely successful in dense, rock-free mature pinyon-juniper stands and especially where air pollution can be a factor.

Each species requires different approaches to the cleanup task. Each stand or site can also require a different approach. The important thing is to accomplish cleanup to a degree that is pleasing to the eye. Complete cleanup could result in a conflict with the determined needs of a basic resource. When this occurs, a coordinated level must be reached that will minimize all aspects of the cleanup phase.

The importance of keeping the public informed about plant control projects can't be forgotten. This can be done through a well planned and coordinated public information program. Of utmost importance in this approach is presenting the objectives clearly, describing the intermediate steps, the time element involved, and how the finished project will fit into the total environment.

FIG. 6. Tree crusher in action—control and cleanup is accomplished in one operation. Readily available fuel wood is a side benefit of this technique.

Summary

Most of the factors involved in a successful multiple use plant control project have been discussed. How are these meshed together into a simple set of clear-cut guidelines that will guarantee the desired results in all situations? Experience shows that this is not possible. Each and every site has its own characteristics and must be treated individually.

How then are guidelines for individual projects prepared? First, a multiple use survey and report is developed. This gives the line officer insight into the plant control proposal and evaluates the effects that alternatives of location, design and standards will have on existing and potential resources and activities. It goes on to accurately define the coordination opportunities to be included in the action plan to enhance beneficial and minimize adverse aspects of the proposal. Once this is accomplished, guidelines can be developed that achieve the desired coordination.

Plant control itself will alter the ecosystem that is currently on the site. The land manager must be in a position to insert offsetting influences if he is to retain accomplishments. These influences can and should be built into the management practices applied to the area following plant control.

Plant control projects go on after the initial on-the-ground work is done. There must be management and followup maintenance to insure that benefits are retained. All too often interest lessens with the completion of the plant control sequence. When management has not been pre-planned and related development work, waters, and fences programmed and accomplished simultaneously with plant control, the users cannot take the full advantage of the benefits, nor does the administrator fulfill his obligations.

A project is complete and successful only when a management plan is activated and followup action assured, resulting in the perpetuation of the acquired benefits. The critical factor of overall planning cannot be neglected if landscape management in plant control projects is to be successful.

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