1983

Aspen Management Guidelines for the Grand Mesa, Uncompahgre and Gunnison National Forest

Aspen Management Task Force

ASPEN MANAGEMENT GUIDELINES

for the

GRAND MESA, UNCOMPAHGRE AND GUNNISON NATIONAL FORESTS

Prepared by Aspen Management Task Force

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Forest Supervisor

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I. OVERVIEW

A. Task Force and its Purpose

A task force was formed in late April 1983 for the purpose of developing guidelines for Aspen Management on the Grand Mesa, Uncompahgre and Gunnison National Forests. An interdisciplinary team approach was utilized in development of the guidelines with the following individuals being primary members of the Task Force:

Mike Ward	Task Force Leader	Forester	Paonia R.D.
John King	Task Force Member	Forester, Silviculturist	Supervisor's Office
John Oien	Task Force Member	Landscape Architect	Supervisor's Office
Steve Carpenter	Task Force Member	Forester, Silviculturist	Norwood R.D.
Charlie Richmond	Task Force Member	Range Conservationist	Grand Junction R.D.
Elaine Zieroth	Task Force Member	Wildlife Biologist	Cebolla, Taylor River R.D.s

Other Personnel from the Forest were involved as more specific expertise than that available through Task Force Members became necessary. The Forest Management Team was involved in guideline direction, review and approval.

A secondary purpose for the Task Force was to assist in implementation of the guidelines through establishment of district Aspen Unit Action Plans.

The guidelines are intended to be dynamic so that they can be responsive to changes made necessary over time. The catalysts which could cause these changes might include:

a. budget fluctuations
b. priority shifts
c. research findings
d. market opportunities
e. public demands

B. Aspen Guideline Relationship to Forest Land Management Plan

These guidelines are intended to be a logical step between the Forest Land Management Plan and implementation of individual Aspen Unit Action Plans. They fall within the scope of aspen management as discussed in the FLMP. However, these guidelines provide more specific direction for use in developing individual Aspen Unit Action Plans.

In the five-year period of fiscal years 1978 through 1982, commercial aspen sales averaged 1165 MBF per year. Approximately 64 percent of this was sawtimber and 36% was roundwood products - primarily poles and firewood. In addition, a significant amount of aspen firewood is utilized each year under personal use to individuals. No firm figures are available but it is estimated that this use amounts to approximately 200 MBF per year, and the demand is increasing. This increasing demand presents some opportunities to accomplish aspen treatment through firewood utilization.

B. <u>Aspen Silviculture</u>

Quaking aspen (Populus tremuloides) has the widest geographical distribution of any tree in North America. It occurs from coast to coast and from the Artic Circle in Alaska to south of the Mexican border (Fowells, 1965). As indicated by this range, aspen is an extremely adaptable species and grows under a wide variety of climatic and edaphic conditions. It can be generally described as shade-intolerant, cold-tolerant and usually found on relatively moist sites (Strothmann & Zasada, 1957).

In the west, aspen regeneration is almost entirely vegetative, with vigorous root sprouting usually following major site disturbance (i.e., fire, clear-cutting, etc.). Some reproduction from seed does occur (Fowells, 1965). (In 1982 the Taylor River District documented the presence of aspen seedlings in the 1980 Spring Creek Burn in the Taylor Park area of the Gunnison National Forest.) However, because of the brief seed viability and climatic and site conditions that are generally not conducive to seedling germination and survival, reproduction from seed has virtually no management significance (Daniel, 1980).

The almost exclusive vegetative regeneration habit of aspen has resulted in clones of trees which are genetically identical to the parents. While this characteristic virtually assures reproduction following removal of the overstory it also restricts opportunities for genetic improvement of the stand.

Root sprouting is controlled by a phenomenon known as apical dominance. Auxins produced by the aerial portions of the tree suppress sprouting in root buds. When the overstory is removed the auxins are no longer a controlling factor, and the increased light intensity and soil temperature trigger prolific sprouting. It is not uncommon to have in excess of 20,000 stems per acre at the end of the second or third growing season following overstory removal (Daniel, 1980).

The quantity and quality of sprouting is affected by both genetic characteristic of the "parent" stand and the timing of the disturbance. While the question of the effect of timing on regeneration is still somewhat open, most research on the subject indicates that removal during the dormant season results in the most rapid and vigorous sprouting (Strothmann & Zasada, 1957, Fowells, 1965).

Aspen is affected by a large number of insects and diseases. Because of the thin bark it is quite susceptible to wounds which then serve as entrance courts for canker and decay organisms.

Animal damage is significant in many stands. Bark gnawing by elk results in severe damage in some stands, primarily by providing entrance for disease organisms as noted above. Browsing by livestock and big game can cause extensive damage to aspen regeneration; in the most severe cases regeneration can be destroyed. While aspen can recover from occasional such instances, repeated removal of the sprouts will eventually deplete the carbohydrate reserves in the roots, causing the stand to die out (Daniel, 1980). For this reason it is recommended that aspen clearcuts be of sufficient size to "absorb" grazing pressure to where enough stems will survive to perpetuate the stand.

Aspen is generally considered a seral species which occurs in evenaged stands and is not likely to maintain itself in the absence of major disturbance. However, stands do exist which contain two or more age classes and appear to be regenerating themselves without disturbance. On some sites, and in the absence of more shade-tolerant species, aspen may form a virtual climax. The reasons for this uneven-aged condition are not fully known, but it may be due to genetically controlled factors such as increased shade tolerance or a lower level of auxin production in the overstory. Such stands will, however, respond to disturbance in the same manner as non-self-regenerating stands.

The characteristics of aspen dictate clearcutting as the primary timber management method. Because of aspen's strong tendency toward self-thinning the value of intermediate cuttings is not yet known. Although growth of individual trees can be increased somewhat, there may be little long-term difference in total stand volume. Also, partial cutting almost invariably results in some degree of mechanical damage to the residual stand. This, along with the tendency toward sunscald which often follows severe stocking reductions, will make the stand much more susceptible to disease (Daniel, 1980), frequently causing a significant deterioration in both quality and quantity. In addition to the guidelines for size of cutting unit and the season of cutting, some studies suggest that aspen regeneration may be quite sensitive to even moderate amounts of soil compaction (Gullion, 1977). Therefore it would be desirable to conduct logging operations, to the degree possible, during weather conditions which will minimize compaction.

C. Wildlife

The aspen ecosystem is very important to Colorado wildlife. Not only do trees themselves provide a variety of food and cover sources, but the grass, forb and shrub understories also provide a summer food supply with many times the forage of conifer stands (Patton and Jones, 1977).

Aspen trees and branches under six feet in height are primary big game browse especially sprouts extending above deep snows. Deer generally move out of aspen areas during critical winter periods when snow is over 18" deep, so most winter use is by elk (Olmsted, 1979). Aspen leaves, buds and bark are good sources of protein, phosphorus and crude fat. Aspen browsing in the fall can put deer on winter range in better physiological condition and aid reproduction, lactation and growth in the spring (Aspen Task Force, USDA, 1977).

Aspen is good summer thermal and hiding cover, especially where stands are scattered throughout grasslands and sagebrush ranges. Cover patches should be at least 5 feet tall, have crown densities of 75 percent and be 2-5 acres or larger in size to benefit big game (Thomas, 1979). Aspen provides excellent food and cover for elk calving and deer fawning (Betters, 1976). Aspen-forb stands are usually ideal early spring habitat for black bears and cubs.

A given acreage of clearcut in aspen generally produces much less additional water over a given period of time than the same acreage clearcut in conifer. Several reasons for this are: 1) Aspen sprouts grow rapidly following treatment, reducing evapo-transpiration savings to negligible amounts after 5 to 10 years; 2) Aspen, which is a deciduous tree, loses its leaves in fall. With the loss of leaves aspen stands are relatively open allowing snow to blow and move through the stand. Snow may not redistribute in the aspen clearcuts to the same extent as in conifer stands, however studies have shown that redistribution may still be significant in aspen. (Hibbert, 1979)

G. Recreation and Aesthetics

Aspen is used by recreationists for its scenic and aesthetic qualities. These qualities include experiencing the aspen canopy, its sound in a breeze or strong wind, its bark color and line, and its summer and fall leaf color. It helps to create landscapes with unique vegetative variety for the recreationist to camp (dispersed), picnic (dispersed), hike, photograph, view, hunt, and fish.

The visual characteristics of aspen range from sapling or small pole-sized stands (often these are somewhat scrubby "off-site" stands) through mixtures of various sizes of aspen with conifer species to extensive stands of pure sawtimber size aspen. Of these, the mixed aspen-confier stands have the greatest visual variety. This variety results from the strong contrasts in foliage color, density and texture, bark color, and tree form.

Aspen trees are not generally considered as individual "specimen" trees; single trees occur rather infrequently and usually do not offer striking visual opportunities in their form and texture. When viewed collectively they present very strong, line dominated foreground viewing and, in the fall, strong color contrast when viewed in middleground. New designs are often created on the autumn landscape by the variety of red and yellow hues.

The small sapling or pole stands seldom offer outstanding foreground landscapes. However, when combined in the middleground with unique landforms or rock forms, they may be very desirable visually. In these situations the foliage color and the strong landforms or rock forms tend to complement each other; this is especially true during the fall.

Mixed aspen-conifer stands offer outstanding foreground landscapes with strong lines, color contrast, and shading elements. When viewed in the middleground they present strong color and texture contrasts.

The most visually desirable middleground condition is a mix of pure aspen, aspen-conifer, and pure conifer stands. The effect is further enhanced by natural openings, which develop into strong compositional landscapes of landform, rock form, and vegetative patterns.

Pure stands of mature aspen, although lacking species diversity, offer outstanding foreground landscapes with strong line and shading elements. The forest floor is usually open and park like. These stands seldom offer outstanding middleground landscapes, but may be enhanced by a variety of natural openings.

III ASPEN MANAGEMENT

A. Goals and Objectives

1. Goal

To manage aspen over its range of multiple uses, while providing diversity of size and age classes and perpetuating the species.

2. Objectives for Establishment and Approval of Guidelines:
(Complete tasks a-g by 9/30/83)

a. Identify and catagorize the aspen resource, forest wide, into the Timber Land Use Classifications shown in Forest Service Manual - ID #73, 2/10/83-2413--8.

b. Prepare guideline for use in conducting a multi-resource inventory to collect pertinent data on the aspen resource.

c. Provide direction for setting priorities for aspen treatments based on stand condition and resource needs.

d. Develop a range of treatment recommendations which integrates multiple uses of aspen areas.

e. Develop guidelines for coordinated access system planning and implementation where the transport system is commensurate with management needs of the area.

f. Establish a monitoring sytem to compare results of treatment methods and to relate results back to objectives.

g. Integrate the objectives listed above into an approved set of guidelines.

3. Objectives for Implementation of Guidelines:

a. By 9/30/83: Have a district Aspen Unit Action Plan approved which implements the Aspen Management Guidelines. (Terror Creek - Paonia)

b. By 9/30/84: Have two additional District Aspen Unit Action Plans approved, which implement the aspen management guidelines. (Cebolla, Taylor River)

c. By 9/30/85: Each district will have at least one Aspen Unit Action Plan approved which implements the aspen mangement guidelines.

d. By 9/30/85: Each district will have delineated Aspen Units covering the entire aspen resource within that district and showing preliminary use emphasis within the unit.

e. By 9/30/86: All aspen management projects will be covered by an approved aspen management unit action plan.

3. Objectives for Implementation of Guidelines: (Continued)

f. By 9/30/93: Complete an aspen inventory forest wide on all aspen which has a potential for management.

g. On-Going: Establish additional Aspen Unit Action Plans throughout the forest which will implement the aspen management guidelines and respond to demand, needs, and financial capabilities.

h. On-Going After 9/30/83: Initiate an inform and involve program to appraise the public regarding aspen management and planned treatments.

i. On-Going: Investigate opportunities for commercial utilization of aspen as a means of meeting aspen management objectives.

B. Management Requirements

1. Proposed actions, as stated in Aspen Unit Action Plans, will be based on Forest wide programs and targets.

2. Needs and priorities stated in District Aspen Unit Action Plans will be utilized in developing annual target and work programs.

3. Aspen management projects will be based on adequate inventory data as identified by the Aspen Management Guidelines. Where adequate data is not available, a project-specific inventory will be done prior to beginning the project. The intensity of the inventory will be commensurate with the complexity of the project.

C. Guidelines

The following guidelines have been developed to insure coordination of the Aspen Unit Action Plans with the Planning Development and Budget Process. These Aspen Guidelines are to be implemented through Aspen Unit Action Plans prepared at the District level.

1. Identifying Treatment Units

Each district will identify and delineate Aspen Units which collectively will cover the entire aspen resource within that District.

Aspen Unit Action Plans will be prepared for those units where treatment is anticipated.

The following are suggested guidelines to consider in unit delineation:

a. Does the area form a logical, manageable unit?

b. Are boundaries easily definable?

c. Are resource goals and objectives compatible with one another and with prescriptions within the FLMP?

d. Are other administrative units involved? (i.e., wilderness areas, District or Forest boundaries, natural areas, etc.)

(1) Identify and locate aspen stands on aerial photographs and maps, including comparison between recent aerial photos and older photos (where available) to locate areas of significant change.

(2) Compile currently available information (i.e., Stage II, range analysis, wildlife habitat surveys, etc.)

(3) Determine what further information is needed. This will depend on management objectives for the area and management direction as stated in FLMP. To determine what further information is needed:
Break down into capable and non-capable components.

(a) <u>Capable</u>

(i) Suitable

Level IV Stage II. (If not already done) Additional information will be needed as to whether stand is self-regenerating or not. (Level IV is presently required by regional direction. However, in view of low product values and species characteristics, Level III may be more appropriate in some situations.)

(ii) <u>Capable - Not Suitable</u>

Minimum of Level II Survey to verify classification and determine whether stand is self-regenerating. More intensive surveys may be needed depending upon complexity of stand conditions and management objectives.

(b) <u>Not Capable</u>

Minimum Level II Survey needed to determine whether stand is self-regenerating. (Where this is not a significant management consideration, Level I may suffice. Such situations should be documented.)

(4) Additional information which may be needed depending upon management direction and management objectives:

(a) Plant Association (R-2 Plant Association Classification)

(b) Treatment needs:

(i) Potential for treatment through commercial wood harvest.

(ii) Cost of non-commercial treatment.

(iii) Damaging agents potentially affecting stand vigor.

(c) Wildlife Habitat

(i) Species using the stand. (Check for threatened and endangered species)

(ii) Critical habitat.

(iii) Needs for forage and cover.

(iv) Location of water.

(d) Range:

(i) Forage production capability

(ii) Range improvements

(e) Soil and Water

(i) Needs and potential for water yield augmentation

(ii) Unstable soil areas and/or high water tables

(iii) Need for water quality measurements

(f) Access needs, availability and conflicts

(g) Recreation and esthetics

(i) Current use and condition

(ii) Projected demand

(iii) Developed facilities

(iv) High sensitivity travel routes

(h) Mineral information

(i) Existing leases or claims

(ii) Current and projected mineral development

(i) Cultural resources

(j) Fuel conditions (Potential for prescribed burning)

(k) Site conditions affecting management. (i.e., topographic position, aspects, windthrow potential)

b. <u>Identifying Regeneration Characteristics</u>

The following information is derived from Gordon Gullion's letter of September 30, 1978 to the Region 2 Division of Range and Wildlife, and from personal communication with Wayne Shepperd and Glenn Crouch (June, 1983) of the Rocky Mountain Forest and Range Experiment Station.

regenerating stands have two or more age classes throughout the stand. This uneven-aged condition has probably resulted from some disturbance or environmental factor which has triggered a sucker response.

Self-regenerating clones will probably maintain themselves indefinitely, but are not optimal for fiber production. However, they provide ideal habitat for wildlife species requiring vertical diversity.

There seems to be little danger of losing these stands in the foreseeable future so there is no urgency for treatment to maintain them on the sites they occupy. However, they can be converted to an even-aged condition by clearcutting.

Clones which are deteriorating show a rough or stippled texture on leaf-on (summer) aerial photography. Single large trees can be easily identified on stereoscopic coverage. Uneven-aged clones can be identified on a walk-through survey by the presence of a noticeable understory or second crown class.

Even-aged clones (non-self-reproducing) may have some seedling-saplings in the understory, but these will for the most part be poorly formed and unevenly distributed. Shepperd suggests that 300 aspen seedlings/saplings per acre in itself is not conclusive in saying a stand is self-reproducing, but 1000 well distributed seedlings and saplings per acre probably is a good indication that the stand is self-regenerating.

Non-self-regenerating clones are essentially single-storied and even aged, with little if any sucker regeneration persisting within the stand. If these clones are isolated from others they can be ringed by young growth spreading into adjacent, unoccupied land. But where clones adjoin other clones in unbroken stands there is likely to be no aspen understory growth at all over an extensive, almost park-like stand.

Non-self-regenerating stands probably developed from dense root sprout regeneration following fire or other major disturbance within recent history, and have grown under intense competition. Typically the trees are of relatively uniform diameters and usually of one narrow age class. Their growth probably truly represents both the genetic potential of each clone represented and of the site upon which they are growing. These are commercially the most valuable stands of aspen but they also are the stands which are most likely to be lost if they are not regenerated at the proper time.

On leaf-on (summer) aerial photography non-self-regenerating clones and stands have a very smooth, unbroken appearance. It is difficult to identify individual trees and nearly impossible to determine from photography one's location on the ground under a stand of this type. Nor can a valid judgement of the condition of these stands be made from aerial photo interpretation. An uneven-aged stand with a closed canopy will present a similar appearance on aerial photos, so ground verification will be needed to determine stand condition.

There is not necessarily a direct correlation between diameter and age class. In even-aged stands, however, the portion of the total stem length occupied by live crown is an indicator of relative clone age. Mature clones usually have live crowns occupying less than one third of the total stem length, while intermediate aged clones usually have approximately half of the stem length occupied by live crown, and young clones will have two-thirds or more of the total length in live crowns. (Wayne D. Sheppard, personal communication, June 1983).

Aging trees within a clone is the most accurate method to determine whether the stand is even-aged or not; however, due to time constraint during inventory and the difficulty in aging trees which have a high percentage of defect this solution is not always practical.

A factor to keep in mind during photo-interpretation and on-the-ground surveys dealing with the regeneration catagory is that stands generally tend to be small and usually include one or more clones. It will not be practical to catagorize all clones within a stand by their regeneration capability. Treatment will generally be determined by the condition occupying the majority of the stand area.

Further information on clone delineation can be found in Wayne Shepperd's memo 1630, of 7/27/83. (Appendix C)

4. Setting Priorities for Stand Treatment

Criteria used for determining treatment priorities for units will also apply to individual stands within a unit.

A stand treatment priority schedule should be displayed in each Aspen Unit Action Plan.

Additional criteria for determining stand priorities include:

a. Financial capability (i.e., a non-commercial stand scheduled for treatment in a certain year can be treated in that year only if financing is available.)

b. Stand conditions in terms of vigor and growth rate.

c. Commercial harvest opportunities.

5. Treatment Recommendations by Resource

Treatment recommendations listed below are generally optimum for the resource being discussed. It must be recognized that there may be conflicts between resources and that such conflicts must be resolved in light of overall management objectives.

a. Timber

(1) Clear cutting is the recommended harvest method.

(2) Intermediate cuttings are not advisable.

(3) A 5 acre minimum size clearcut is recommended.

(4) The most desirable harvest time is in the dormant period when feasible. However experience on the forest has not shown significant regeneration problems regardless of the time of cut.

(5) In order to minimize soil compaction it is desirable to log during dry or frozen periods. Logging when soils are wet should not be allowed.

(6) Rotation age should range between 80-120 years with optimum for timber production generally being 80-100 years.

(7) Capable non-suitable lands within a unit should be regulated if treatment is likely to result in a suitable stand in the future. Non-suitable lands with little or no potential for conversion to suitable component should be scheduled for treatment based on other resource needs.

(8) To ensure good regeneration remove all aspen over 1" DBH. (Gullion, 1978)

(9) Tractor pushing or similar treatments in aspen should be used with caution until research results using this technique are available.

b. Wildlife

(1) The size and distribution of aspen treatment areas will depend on the expected browsing pressure and the priority and need for treatment. Treat at least 10 acres in any unit in one year; more in heavily used winter range. If big game density on winter range is 11-20 animals per square mile, cut 20 acres, if 21-30 per square mile treat 40 acres. (Graham, 1963)

(2) Leave at least 3-5 snags or live recruitment snags per acre in treatment areas. (Thomas, 1979) Sign the snags with wildlife tree signs where public firewood cutters will be in the area.

(3) Plan treatment areas to maximize edge, habitat diversity, and variety of age and size classes. (Betters, 1976) Look at management of the entire unit to determine the rotation of treatment, cover and forage needs, resource needs and distribution of treatment areas.

(4) In areas where overbrowsing or trampling potential is high, leave the cut stems on the ground for 1-2 years to protect new sprouts. Leaving stems may impede livestock and wildlife movement. (Olmstead, 1979)

(5) Removal of down material after regeneration is established is discouraged. However there are instances where removal

can be allowed which will not significantly damage regeneration. Such cases exist where low to medium volumes of material are removed by fuelwood gatherers without the use of mechanical logging equipment (cats, skidders, etc).

(6) Rotate aspen treatment over 25-35 years for maximum production of browse. A shorter rotation may reduce the vigor of the stands and root stock (Patton and Jones, 1977).

(7) Beaver population management may be needed in riparian areas where aspen stands are being cut too frequently.

(8) If aspen is to be regenerated for winter browse, give priority to heavily barked stands, south and southwest exposures, low snow areas (less than 18" deep) and aspen stands with herbaceous understory which lack browse. (DeByle, 1981a)

(9) Aspen stands retained for deer and elk hiding cover should be at least 5 feet tall, with 75 percent crown density and be 2-5 acres or larger. Optimum ratio is 40 percent cover and 60 percent forage well distributed throught each unit. Retain screening cover along highways and around other areas of human activity. (Thomas, 1979) Aspen is of primary value for thermal cover on summer range when leaves are present.

(10) Much of the aspen on the Forests is important spring-fall and calving and fawning range. Treatment of known calving and fawning areas should be timed to avoid disturbance during the calving period (approximately May 1 to June 15).

(11) Treatment of spring-fall ranges often takes pressure off big game winter range.

(12) Clones showing signs of heavy bear use, should be carefully analyzed prior to treatment. (Tom Beck, letter of 7/31/83 - Appendix B)

c. <u>Range</u>

(1) Aspen stands with conifer invasion should receive high priority for treatment, since conifer types produce considerably less forage than aspen. (Reynolds, 1969)

(2) If an allotment is at or near capacity, then it is advisable to include forage improvement projects in combination with aspen treatment. (These improvement projects can include burning of oakbrush, sagebrush, or aspen, spraying, chaining, roto-beating, seeding)

(3) If range forage improvement projects will significantly reduce browse on big game winter range, aspen treatment can serve to replace this browse.

(4) Aspen stand rotations of 100-120 years are preferred on cattle ranges. Years 60-120 are the most productive forage years. Rotations of 60-80 years are preferred for sheep - since forbs begin to go out after 60 years. (Region 2 Aspen Task Force, 1977)

(5) If stands regenerate at higher densities, 20,000 to 30,000 stems per acre, controlled livestock grazing may be used to reduce stocking to a more optimal level.

(6) Falling and leaving aspen stands limits travel through the area by livestock as well as humans. Where stands are important for livestock forage production this practice should be used sparingly.

(7) Range improvements should be protected and stockponds and livestock trails should be kept open.

(8) Coordinate aspen treatments with range allotment rotation. Treatments can be planned so that livestock are not in a treated unit in the year following cutting to allow healthy sprouts to become established. It may be advisable to cut stands during periods when livestock are not in the area to reduce disturbance to livestock.

(9) Work closely with the livestock permittees to insure coordination with their operation.

d. <u>Water and Soil</u>

(1) In each aspen treatment unit, the potential for increased water yield and resulting impacts should be considered. Calculations may be done using the Region 2 HYSED water resource analysis procedure.

(2) Stand rotations of 10-15 years are optimum for increased water yield. This rotation would provide only pole size timber, and may not be feasible where sawtimber is desired and pole markets are not adequate. (Hibbert, 1979)

(3) Elevations, ranging from 8500 to 11,000 feet are the best for increasing water yield. In elevations under 8000 feet precipitation is generally not sufficient to increase water yields significantly. Evaporation rates are also high at lower elevations.

(4) In planning a treatment unit to increase water yield, aspect and slope should be considered, since north slopes have the greatest potential for supplying additional water. South facing slopes have higher soil moisture losses from receiving more solar energy, thus more evapotranspiration. Shading charts are available to help evaluate size and shape of cutting units for water yield.

(5) Consider soil stability and the potential for soil stability problems after treatment.

(6) Consider erosion hazard especially on steep slopes or high risk soils.

e. Recreation and Aesthetics

(1) Where feasible, do not locate recreation facilities in aspen stands.

(2) Prepare a vegetative management plan for all developed recreation facilities in aspen stands.

(3) Recreationists desire to experience aspen, its canopy, its sound in a breeze or strong wind, its bark color and line, and its leaf color. Vegetative treatment should be managed to maintain a majority of stands large enough to provide a canopy adjacent to areas of concentrated recreation use.

(4) Falling and leaving aspen limits travel through the area by people as well as livestock. This type of treatment should not be used in or adjacent to areas of concentrated recreation use.

(5) Aspen stands with some conifer invasion, especially spruce-fir, provide vegetative variety and contrast. Manage to maintain or encourage this variety where viewed along sensitivity level 1 travel routes and areas of concentrated recreation use.

(6) Plan treatment areas so that they are natural appearing and blend with characteristic landscape, utilizing the National Forest Landscape Management System.

(7) Manage aspen areas which are or may be viewed from sensitivity level 1 travel routes and areas of concentrated recreation use for aesthetics. This should include A) providing vista openings; B) treating areas along travel routes starting in the background or middle ground view and moving toward the travel route with sucessive treatments after regeneration has reached 6' high; C) make natural appearing treatment areas with irregular shape.

f. Transportation System

(1) The Aspen Unit Action Plan should include a transportation analysis which covers the anticipated needs of the entire unit and adjacent areas.

(2) Roads will be constructed with minimum standards necessary to meet objectives of the project.

(3) Temporary roads will be used for aspen treatment unless other resource needs dictate higher road standards. The need for higher standard roads will be documented in the Aspen Unit Action Plan.

(4) All new roads will be closed following treatment unless otherwise justified in the transportation analysis. Signs will be used, as each road is built, to inform the public of the planned closure.

(5) During initial road layout, points at which roads can be effectively physically blocked will be sought near the beginning of each road.

(6) Physical closure of roads will be accomplished through activities such as tank traps, ripping, scattering debris back in roads and by burying logs in the fill portions of water bars. Revegetation of roadbeds will accompany road closures.

6. Integrating Resource Recommendations

The majority of aspen treatments will affect more than one resource. Therefore it is essential that all resources are considered when projects are being planned and funded. Planning of the entire unit and attempting to meet overall objectives of the area is crucial. Opportunities may exist for funding from both within and outside the Forest Service. The following are examples of differences among individual resource recommendations.

a. Rotation ages

b. Disposal of cut material (Leave it vs. remove it)

c. Acceptable levels of browsing on aspen sprouts

d. Access - permanent-temporary or none desired

e. Aesthetics - Visual impacts of treatments

f. Scale of project - size of project in relation to objectives of unit and adjacent areas

g. Distribution of diversity and cover

h. Conifer retention vs. aspen retention

7. Initiation and Implementation of Inform and Involve Program

a. Prepare a press release which will discuss Aspen Management Guidelines and benefits derived from aspen management. This could entail a series of articles on different uses of aspen.

b. On a district by district basis, take advantage of opportunities to provide information to the public concerning aspen.

c. During preparation of the Aspen Unit Action Plan the district will:

(1) Contact concerned publics (i.e., range permittees, landowners, industry, other agencies) and provide show-me trips where appropriate.

(2) Inform the general public of proposed action.

(3) Be responsive to feedback from the public.

(4) Identify in the plan opportunities for treatment interpretation where this action is appropriate.

(5) Follow up with project specific public information where there is public concern identified and on major or unique projects.

8. <u>Initiating and Implementing Monitoring System</u>

Intensive treatment of western aspen has been very limited to date, and the body of knowledge is therefore correspondingly limited. Proper monitoring and record-keeping is essential in order that results can be evaluated and used in designing and improving future treatments. In order to accomplish this, a multi-resource project file should be established and maintained for each Unit Plan.

It is important to measure aspen stand characteristics prior to treatment and to compare these to results measured periodically after treatment. The following are examples of measurements which can be taken to monitor the results of aspen treatment:

a. Quantity and quality of regeneration.

b. Wildlife utilization on aspen or aspen understory vegetation.

c. Number and distribution of big game pellet groups.

d. Livestock utilization and damage of aspen sprouts and understory.

e. Slash treatment alternatives, effects of leaving stems or sprouts on the ground.

f. Comparison of size, shape and location of treatment areas.

g. Cost/benefit analysis.

h. Forage production and species composition in treated areas versus adjacent untreated areas.

i. Effect of wildlife and livestock grazing on plant succession.

j. Monitor for damaging agents.

k. Monitor water yield and quality when appropriate.

l. Monitor adminsitration of the Unit Action Plan for compliance and update as necessary.

m. Test new techniques and treatment methods.

n. Compare stand characteristics prior to treatment with those following treatment.

IV APPENDIX

A. Outline for Developing the Unit Action Plan

1. Identify and delineate aspen management units over the entire district.

2. Establish preliminary management objectives for each unit.

3. Set priorities for aspen management units.

4. Design and conduct inventory for the selected unit based on management objectives for the unit.

5. Use inventory information to set priorities for treating individual stands within the unit.

6. Use the NEPA process in preparing the Unit Action Plan, including a transportation analysis; i.e., the NEPA document and the Unit Action Plan can be one and the same.

7. Implement the Unit Action Plan.

8. Prepare a multi-resource project file to document treatment and monitor results.

B. Communication from Tom Beck, Colorado DOW, 7/31/83

C. Communication from Wayne Shepperd, Rocky Mountain Experiment Station, 7/27/83

C. Bibliography

Comments to Mike Ward regarding value of aspen for black bears
Prepared by Tom Beck 7-31-83

¶ The overwhelming value of aspen (*Populus tremuloides*) for black bear habitat is its role in ameliorating the surface environment to provide a better site for the development of forbs. The aspen canopy, unlike the coniferous forest, allows enough light to reach the forest floor for the development of a lush herbaceous understory. The partial shading maintains a cooler, more mesic site than in the openings and this probably enhances forb development more than grasses. Preferred forbs for bears are plants of the following genera: *Heracleum*, *Vicia*, *Lathyrus*, *Angelica*. *Osmorhiza*, *Hydrophyllum*, *Ligusticum*, *Claytonia*. These forbs do well under the aspen canopy and can reach productivity levels exceeding 2,000 pounds/acre (air dry weight)

¶ In cool, wet springs the aspen tree is also used as a food source by black bears. Our observations of such use has always been in May and are coincident with delayed emergence of succulent forbs. The bears feed on the aspen buds soon after the buds burst. The feeding technique involves climbing the trunk, chewing large limbs off close to the trunk, then returning to the ground to snip the buds off. Such feeding activity is recognizable from the abundance of old bear claw marks going high up the trunk to the canopy level and the fact that usually all the trees in a particular clone have been used for feeding. Such clone specific feeding may be due to early bud burst by a specific clone. Also, the ruffed grouse literature indicates the grouse actively select male aspen clones for bud feeding in late-winter and spring. It is quite possible black bears also do the same as the feeding clones don't appear to be significantly ahead of neighboring

¶ Regarding silvicultural practices, aspen clones showing signs of bud feeding should probably not be clearcut as this would eliminate a spring food source for probably 25-30 years. A thinning effort combined with clearcutting a buffer around the preferred clone would probably promote suckering and thus stabilize the clone.

¶ Management of aspen stands to maintain the herbaceous understory probably involves grazing management more than silviculture. Small clearcuts are more practical and generally promote aspen regeneration better than partial cuts. The herbaceous understory does change after cutting but if aspen regeneration is adequate the forbs will come back as the stand develops. The principal concern is to control grazing by both livestock and wildlife to insure an adequate stocking rate of aspen. Such control can be accomplished by short-term fencing or leaving enough deadfall to impede travel through the cut by livestock and elk. Sheep grazing in aspen clearcuts would be very detrimental to both aspen and forbs.

Department of Agriculture Service Forest and Range Experiment Station Ft. Collins, CO 80526

Reply to 1630 Publications Date: July 27, 1983

Subject Identifying Aspen Clones in the Field

To Mike Ward, Paonia RD

With reference to our phone conversation on 7/26/83, there are a number of easily observable clonal characteristics which can be used in the field to help distinguish one clone from another. My research has indicated that some may be related to clonal vigor and growth. The growth-related characteristics are discussed in the Utah State University paper which I gave you when we were in Paonia, so I won't get into those management implications here.

Here are the things I use to identify clones:

1. Bark Color--This is perhaps the most obvious clonal characteristic to watch for. Bark color may range from pure white to dingy gray, or gray-green, and even occasionally orange-yellow. All ramets or stems within a clone will have the same bark color, however adjoining clones may vary so slightly that other clues need to be sought.

2. Bark Texture--Some clones will have odd looking bumps or folds in the bark, or large persistent knots on the stems which will distinguish them from their neighbors.

3. Stem Form--Watch for differences in the shape and forking of stems which may indicate a clonal boundary. Some clones have extremely straight stems, while others have crook, sweep, or multiple forks in their stems.

4. Branching Habit--Some clones are self-pruning, others retain their dead branches throughout the life of the stems. If adjoining clones have differing branching habit, the effect can be quite striking.

5. Structure--A self-reproducing clone with a noticeable second or third story in the crown is easily distinguished from its non-self-reproducing neighbors.

6. Distribution--While the stems in most clones are arranged in a very uniform pattern, occasionally clones occur with stems arranged in tight groups or clumps. Usually, the stems in these clones will also exhibit considerable sweep as a result of the crowding (this doesn't affect the growth, however).

7. Foliage Color and Texture--Subtle differences often exist in the color and shape of leaves during the growing season. These are apparent as differences in crown color and texture from clone to clone. This characteristic is best observed from the air, or at a distance with the sun at one's back.

These characteristics allow one to easily distinguish between clones in the field. However, defining exact clonal boundaries is a problem. Clones often overlap and intermix to some extent in a continuous stand, making it difficult to establish a precise line marking the beginning of one clone and the end of another. In fact, such precise boundaries often do not exist. The above characteristics are sufficient if the objective is to make sure that all the inventory plots are within the area encompassed by the clone you wish to sample, or that the cutting unit boundary includes most of the clone prescribed for treatment. More precise definition of clones requires sophisticated instrumentation and a great deal of effort.

All this sounds simple enough, but as usual, there are complicating factors. Other stand characteristics not related to clonal genetics can sometimes complicate clonal identification:

1. Stem Diameter and Height--Large stems growing next to small stems do not a clonal boundary make. Many clones growing near meadows periodically send out suckers into the meadow, resulting in a multi-aged clone that appears to be two or more clones. Also, it is not uncommon to find isolated large stems within a clone that do not appear to belong. Usually, these are remnants of an older age class, and not members of another clone.

2. Furrowed Bark--The presence of furrowed bark on the stems in a clone is related to age and not a genetic character useful in distinguishing clones. Animal damage can also cause callous tissue formation similar to furrowed bark.

3. Physiographic Factors--Microsite can influence the development of stems within a clone resulting in great differences in height and form. However, bark color and texture, branching, and pruning will remain consistent across a clone in these cases, giving the observer a clue to clonal position.

4. Disease--Insect and disease attack, along with frost damage can alter the appearance of stems within a clone, or alter the color and texture of the foliage.

I know this sounds a little complicated, but with a little practice almost anyone can learn to recognize clones throughout the year. Just remember that an aspen stand consists of a relatively few genetic individuals whose traits are expressed on a great many stems as opposed to a conifer stand where each stem is a genetic individual. Once this realization is made, a lot of these things will fall into place.

I hope this information will be of use to you. Let me know if I can be of further help.

Wayne D. Shepperd

WAYNE D. SHEPPERD
Silviculturist

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