Final Design Features for the Aspen Forest Health and Restoration Project – June 2009

Vegetation – Prescriptions

1. Viable small-diameter sapling and pole size aspen (<5" DBH) found in clumps will be protected and left on site where feasible. These clumps should be retained to provide size class diversity and residual stocking across an otherwise clearcut area. Damaged small diameter conifer and aspen(<5”->2” Dbh) will be slashed by the purchaser.

2. Wildlife/Visual or Sapling size clumps will be left in or adjacent to the clear-cut harvest units and comprise 10-15% of the unit acres. These reserve clumps will function as snag and wildlife habitat, contain conifer that is undesirable to aspen harvest or serve as a visual screen to breakup clear-cut appearance near well traveled forest roads.
    a. Wildlife reserve clumps should be a group of live and/or dead trees, aspen or conifer, a minimum ½ acre is size but larger groups of 2-5 acres are recommended. Favor i) live and/or dead large diameter (>15”) aspen or conifer with evidence of cavities, rot, broken tops, dead tops or lightning strikes, and ii) a basal area of 100 or greater. Locate clumps strategically to take advantage of existing conifer pockets, or pockets of large aspen trees, small-scale boggy areas or rocky soil, otherwise distribute evenly.
    b. Visual reserve clumps – see visual quality below.
    c. Sapling clumps – see #1. above.
    d. Clumps of trees at entrance of temporary roads from main roads (where they occur) to screen and prevent travel on the temporary road.

3. Douglas Fir and Ponderosa pine will be retained for residual stocking in aspen clear-cut units as regeneration is more questionable in lower elevation SAD stands. Conifer at higher elevations (Engelmann Spruce, Blue Spruce and Subalpine fir) may be harvested on an individual unit basis if regeneration looks promising and conifer volume is adequate.

4. Slash from the tops of the trees and rotten log segments may be left in the harvest units in a random fashion, and lopped to within 2 feet of the ground. The objective is to leave 15-20 tons per acre of slash in order to provide nutrient cycling, habitat for wildlife, and soil protection. Whole tree skidding will be allowed if the slash objective can be met.

5. The mastication cutting in aspen should leave 2-3 snags/acre 12 inches DBH and greater and taller than 15 feet. Snags may be left as individuals or in clumps. Also, avoid cutting patches of healthy aspen regeneration.

6. To insure optimal regeneration in harvest units and limit the amount of browse from cattle, range conservationists on the District will be informed on progress of harvest on aspen sales. This information will be shared with the cattle permitee’s on various allotments that have recent aspen harvest. Permittee’s will be requested to herd cattle throughout the pasture and/or allotment to minimize grazing within harvest units for 5 years after harvest.

7. If a browse concern is identified during monitoring, in clearcut harvest or mastication units, hinge-cut trees to create barriers around the perimeter.

8. In units 7, 10 and 82 of the Turkey Cr sale area bordering the Turkey Cr subdivision, locate and reserve clumps of live aspen, saplings or conifer that would screen these private homes from FSR roads 385 and 386. Also obliterate all unnecessary roads that might encourage cross country access to these homes through forest lands.

Vegetation – Timing of Harvest

1. Normal Operating season for these SAD aspen sales will be June 10 thru Nov 15th. On units with a majority of dead, units may be required to be logged during a fall season (leaf off) of 9/15 thru 11/15 to promote aspen suckering during a leaf off time period. These units will not be more than 25% of the sale acres.

2. On harvest units accessed by the West Mancos Rd (FSR 561) and the Echo Basin Rd (FSR 566) , to prevent conflicts with winter recreation on groomed snow trails there will be no logging operations permitted from December 15th to April 15th.Winter snow plowing to facilitate logging operations would conflict with these uses. In other areas that do not have high winter recreation usage, winter logging should be an option, as sprouting following winter harvest may be more successful.

3. A few timber-sale units border or surround the Morrison trail, a popular ATV route in the Spring Creek area. During logging operations on these units, the trail will be posted closed for public safety reasons, and a re-route sign to divert traffic along roads will be posted by the Forest Service . The Timber Sale Administrator will inform the District recreation staff on purchasers operating plan and timing for those units affected. Portions of the Morrison trail that lie in the harvest unit will not be used as skid trails (protected improvement) and skid trails across this trail will be limited and approved by the TSA. Slash located on the Morrison trail will be removed and trail will be left as it was found by the purchaser. Trail will be re-opened upon completion of logging operations. A closure order for this trail will be filed at the Dolores Public Lands Office.

Vegetation – Landings, Skid Trails, Temporary Roads and Forest Roads

1. Minimize the size of landings because they tend not to readily regenerate by sprouting. Rip landings to a depth of 6-8 inches, following use to encourage coppice regeneration and reduce compaction. Slash on landings is to be lopped and scattered to within 2 feet of the ground, and residual debris volume should range from 15 to 20 tons per acre. The overall objective will be that 40-50% of the landing area has exposed mineral soil, or that on 40-50% of the landing, slash does not block sunlight from reaching the ground surface. Pile landing slash or redistribute back into the harvest unit if necessary to meet this objective.

2. Location of skid trails shall be agreed upon by the Forest Service prior to their use.

3. Existing, nonsystem roads, located in or adjacent to harvest units would be used as temporary access roads to facilitate harvest of timber, where long skidding distances would otherwise cause unnecessary resource impacts. Normal average skidding distances of 400-800 feet can be expected and longer distances usually require some use of temporary roads.

4. Where no roads and long skid distances exist, new temporary roads are needed for an estimated 2-3 miles, ranging in length from 1/8 to 1/3 mile.

5. All temporary roads used by the contractor would be decommissioned following harvest. Decommissioning would include outsloping (if possible), constructing non-driveable waterbars, scarification of the road surface to a depth of approximately one foot, seeding of the roadbed for the entire length and width with the seed mix listed below, and removal of all culverts to restore the stream channel to approximately its original plan and profile. The non-driveable waterbars shall be located according to the spacing chart in the transportation plan. None of these temporary roads will be added to the Forest Service road system

6. Final determination of need, location and length of temporary roads is requested by the timber-sale contractor, and approved by the Forest Service Timber Sale Administrator.

Vegetation - Seeding

1. Temporary roads, landings, skid trails, firelines and any ground disturbance over 15' in diameter should be seeded with one of the mixes below. Rates reflect broadcast seeding; they should be halved if drill seeded. If some species are not available or are cost-prohibitive at the time of purchase, contact the Ecologist for substitutions. Each mix should cost approximately $210/ac at the broadcast rate.

Pure Aspen Mix

Common Name	Scientific Name	Variety	Rate (PLS lbs/ac)
Arizona fescue	*Festuca arizonica*	Redundo	0.7
Nodding brome	*Bromopsis anomalus*	VNS	4.0
American vetch	*Vicia americana*	VNS	1.0
Blue wildrye	*Elymus glaucus*	Elkton	7.2
Canada wildrye	*Elymus canadensis*	VNS	4.2

- if American Vetch is not available at time of order, remove from mix
-

Lower Elevation Aspen Mix

Common Name	Scientific Name	Variety	Rate (PLS lbs/ac)
Slender wheatgrass	*Elymus trachycaulus*	San Luis	3.5
Arizona fescue	*Festuca arizonica*	Redondo	1.3
Muttongrass	*Poa fendleriana*	VNS	0.5
Western wheatgrass	*Pascopyrum smithii*	Arriba	3.2
Tufted hairgrass	*Deschampsia caespitosa*	VNS	0.1
Thickspike wheatgrass	*Elytrigia dasystachyum*	Critana	2.2
Junegrass	*Koelaria macrantha*	VNS	0.2
Nodding brome	*Bromopsis anomalus*	VNS	3.9

VNS = variety not specified, ask for the most local variety

Wildlife

1. Goshawk surveys will be conducted prior to any treatments in the analysis area.
2. If an active goshawk nest is found during layout, a ¼ mile no-activity (mechanical treatment) buffer will be placed around the nest site from March 1 – August 15, and a 30 acre no-cut buffer will be also placed around the nest. If active nest is found post sale award, wildlife biologist will be notified, nest will be surveyed and proper mitigation will be determined.
3. No aerial burn ignition near active goshawk nests during the nesting period (March 1 – August 31).
4. Burn personnel should consult with wildlife personnel prior to burning through active goshawk nest stands. Goshawks can be aggressive and attack humans during certain periods of nesting. Biologists will notify burn personnel when that threat is high.
5. Personnel involved in timber marking and burning should be trained in raptor nest identification. This will allow project personnel to become familiar with raptors and to conduct nest searches during burn project layout activities.
6. Leave a 150 foot mature aspen buffer between cutting unit, and meadows that contain purple martin nesting colonies
7. Surveys for purple martins will be conducted in analysis area prior to any treatment of units that border meadows and ponds. If nests are found outside of the 50 m buffered area, the buffered area will need to be extended to include the nest trees.
8. To retain potential habitat for the Northern Leopard Frog, buffer wetlands a distance equal to 2 times the maximum diameter of the wetland up to 150 feet.

Cultural Resources

1. Any 'Eligible' or 'Need Data' sites within the project area would be avoided by project activities.
2. Sites containing structures, wooden features, or other sensitive sites would be protected from prescribed fire by the use of hand lines or other appropriate methods.
3. If any additional cultural resources are discovered during project activities, activity at that location would cease and the District Archaeologist would be notified. The discovery would then be recorded and assessed, and the appropriate mitigations and consultations would be completed. The decision on whether to continue implementation at that location would be based on this assessment and consultation.
4. During Marking and Cruising of the clearcut harvest units, layout of the mastication unit or pre-monitoring of the landscape burn areas, notify the District archaeologist if any historical (50+ year old) arborglyphs are found. The District archaeologist will determine if the glyph is of historical interest and if so record the site and the trees will be protected from harvest activities.
5. Newly constructed temporary road segments that lie outside the harvest units will require cultural clearance before construction.

Air Resources

1. Prescribed burning would require preparation of a written Burn Plan and a Smoke Management Plan that complies with State and Montezuma County Air Quality

2. Burning would be conducted under wind/weather conditions designed to rapidly disperse smoke and minimize drift into populated areas.

Public Health/Safety

1. Safety signing and other warning measures will be required during logging operations to protect the public and administrative personnel and to prevent accidents. Purchasers are required to follow all traffic laws and can be issued citations if they do not.
2. During burning, unauthorized personnel would not be allowed to access the area.
3. Prior to prescribed burning:
    a. A burn plan would be created by the Fire Management Officer at the DPLO.
    b. A smoke permit would be obtained from the State of Colorado.
    c. Firebreaks, either natural (creeks) or man-made (roads, line) would surround the burn units to keep the prescribed fire contained.
    d. Fire Managers would monitor field conditions until the area is within a specific prescription for burning.
    e. Fire Managers would ensure that available resources would be on scene to manage the prescribed burn safely and patrol the burn as long as necessary.
    f. Inform public in local communities of potential for smoke
4. When evaluating conditions and creating burn plan for the landscape burns, consider the timing of hunting season. Notify the outfitter guide that is permitted to take hunters on the Dolores District prior to initiating the burn.

Rangeland Resources

1. **Spring Creek Allotment – Coppinger Pasture – Cut Units Spring Creek E.A Unit 83, 37, 77, 15, 20 and 23.** During the upcoming analysis for the North Mancos Range Allotments consider the forage condition and availability in the Coppinger Pasture where 41% of the pasture will receive regeneration harvest under this project and the Turkey Knolls project. Consider opportunities to use alternative allotments if necessary during all or part of the time Coppinger Pasture would normally be grazed.

2. **Jersey Jim Allotment - Upper Big Pasture - Cut Units Turkey Creek Units MB1, U1 and U3**. This is a spring use pasture and is used for approximately 10 days. Treat these units (clearcut or mastication) after June 10 (actual date must be coordinated with the rangeland management specialist).

3. **West Mancos Allotment – Box Canyon pasture – Box Canyon Prescribed Burn Unit** In the West Mancos Allotment, on the year when Box Canyon Pasture is grazed early in the season (every other year), the fire manager should evaluate burning conditions and upon approval from the Manager, Dolores Public Lands Office, conduct fall burn if weather, burn conditions etc. are acceptable. The following spring, this information should be discussed with the term grazing administrator prior to the permittee meeting. The annual operating instructions would address options needed in order to provide for no cattle grazing (rest) the year following the burn. Options would be explored to utilize any vacant allotment. Use the same process the following year to discuss switching pastures so the Box Canyon Pasture is

4. **West Mancos Allotment – T-Down pasture – Rampart Prescribe Burn Unit;** After the Rampart Hills burn, switch pastures so that T-Down pasture is grazed last in the rotation for two years following the prescribed burn. Cattle use in the burn area is not expected to be heavy because of the location of this burn area relative to water sources so complete rest is not required.

5. **Jersey Jim – Horse Pasture** – **Cut Units Spring Creek E.A. Unit 80.** This pasture is grazed season-long with horses needed for the cattle operation. The permittee will need to re-locate the permitted horses. Coordination with the Rangeland Management Specialist and grazing permittee before and during treatment is especially important.

6. Do not place salt in recently regenerated aspen units because salt may cause cattle to congregate, browse and trample aspen sprouts. Avoid salt in or adjacent to these areas for 5 years after harvest.

7. Loggers will be required to keep fences in good repair during operations. Wherever possible, the purchaser should use existing gates for access to cutting areas. No fences are to be cut unless absolutely necessary and agreed to in writing by the timber sale administrator. In most cases where fences lie within cutting units, design skidding patterns to be parallel to fence lines, to pull timber away from fences, or to go through existing gates. In the event temporary roads and skid trails are needed to cross fences at other than existing gate locations, these breach points must be double H-braced on each side of the cut and closed with wire or a metal gate. Any fences damaged by loggers will be the responsibility of the timber purchaser to repair immediately.

8. Pasture gates will remain closed when cattle are in or adjacent to affected pastures. The timber sale administrator will coordinate with the Rangeland Management Specialist on rotation schedules.

9. Protect range structures through lighting procedures, or fire line.

Noxious Weeds

1. When units are identified on the ground during layout, overlay those mapped units with known weed locations in GIS. Conduct pre-harvest or pre-burn inventory in selected areas. In addition, presale and fire personnel would be trained in noxious weed identification and would document all sightings of weed establishment.

2. Based on the type of weeds identified, weed treatments may be conducted by the District weed crew prior to harvest or burning. This would likely be for small populations of high priority species with a high potential for spread.

3. After the timber sale closes, use KV funds to inventory and treat noxious weed located within the sale area (either inside cutting units, along roads, or anywhere in the sale area).

4. After the landscape burns, the weed crew would inventory and treat weeds as funds allow for 1-3 years following the burn.

5. Hydro-axes or mastication equipment will be cleaned at an offsite location prior to entering the project area. Logging equipment will be subject to contract clauses for equipment cleaning. Pickup trucks and passenger vehicles are not subject to this requirement. If mastication equipment is removed from the project area, it will again be cleaned at an offsite location prior to re-entering the project area.

Visual Quality

1. All treatment units are designed to have irregular clearing edges and shapes to blend with the natural landscapes.

2. When locating leave clumps for wildlife habitat, also consider their location related to visual quality and strive to minimize the visible scale of the clearcut units. Treatment units should have sufficiently large clumps of residual trees or shrubs located within the treatment unit to reduce the apparent visual scale of the overall unit and achieve a more natural and attractive appearance in the short and long-term.

3. In addition to leave clumps in the interior, foreground views from main arterial and collector roads and system trails, and from recreation areas, should be designed with sufficient groups of residual trees and uncut islands in a manner that avoids unattractive views of large, continuous openings. This will reduce apparent size of unit, provide visual diversity, and achieve a more natural-appearing treatment area (see list of units below)

4. Within 66 feet of recreation sites such as campgrounds, picnic areas, and trailheads, slash if chipped, should be substantially disposed of unless used as mulch, mud control or path/pad surfacing; stumps should be low cut or flush-ground; slash should be substantially reduced; and treatment units should be designed to enhance scenic qualities within the viewshed.

5. Fire control lines should be restored to a natural appearance in areas within view of main collector roads and system trails. Work should be accomplished within 3 years of completion of burn.

6. Temporary slash or chip piles, log decks, or landings should be avoided within the immediate foreground of main arterial and collector roads, system trails and developed recreation sites. The immediate foreground varies by terrain and vegetation. Oftentimes landings could be located approximately 1 chain (66 feet) from the main road and meet this criterion if vegetation and topography screened its location.

7. Limit amount of paint and flagging on boundary trees visible from main roads, system trails and developed recreation sites. When landscape architects are available, seek their input during layout and marking of units in visually sensitive areas.

Treatment Unit	**VQO**	**Notes specific to units.**
Haycamp Area		
3	PR	Foreground of FR 566; design with visual diversity, incorporate vista creation if possible.
22	PR	Foreground of FR 566; design for visual diversity.
47	PR	Blend visually with adjacent stands.
49	PR	Blend visually with adjacent stands.
Spring Creek Area		
62	Mod	Design to meet long-term Partial Retention as viewed from the adjacent system trail.
52	Mod	Design unit to avoid the appearance of a straight line at the private land boundary.
41	Mod	Design unit to avoid the appearance of a straight line at the private land boundary.
20	Mod	Design unit to avoid the appearance of a straight line at the private land boundary.
Caviness		
4	PR	Design to blend with adjacent areas, create vista if feasible, enhance visual diversity.
39	PR	Design to blend with adjacent areas, create vista if feasible, enhance visual diversity.
36	PR	Design to blend with adjacent areas, create vista if feasible, enhance visual diversity.
Rampart		
18	Mod	Design to meet long-term Partial Retention as viewed from the adjacent Road. Design to blend with adjacent areas, create vista if feasible, enhance visual diversity.

Soil and Water – Box Canyon Watershed

1. Box Canyon Watershed: Prescribed Burning - Box Canyon Watershed: Prescribed Burning - In an attempt to keep the sum of severely burned soil and detrimentally compacted, eroded, and displaced soil to no more than 15% of the Box Canyon Watershed, and to keep percent disturbance of the watershed at a reasonable level, prescribed burning should occur no sooner than 2 years after sale closes or 2 years prior to sale award. Only hand lines and existing authorized roads and trails will be available as control lines. Hand lines will be reclaimed according to item 9 below. Lighting techniques will place fire above the two draws so fire backs into them. It is understood that these burns need to occur when burn plan prescriptions can be met, likely during late fall conditions when dry enough for burning, however, avoid soil moisture conditions that would result in extensive areas of high soil burn severities. Objectives are for a mosaic. It is recommended that the Box Canyon pasture be rested for 2 growing seasons (1 full year, and 1 growing season) after burning

2. Box Canyon Watershed: (Rampart T.S.) - Timber Harvest – The District Hydrologist will conduct field reviews during layout and at that time, the District hydrologist will recommend the location of silt fences or erosion control waddles along Forest Service roads. The cost of these erosion control items will be figured into the Timber Sale appraisal. Tentative locations of possible temporary roads will be discussed. After the sale is sold, and during the course of the timber sale, if/when the contractor requests a temporary road or the Forest Service identifies a temporary road, the Timber Sale Administrator with consult with the District hydrologist on the location of the road prior to approving its location and use. At that time, the District hydrologist would approve the location of the temporary road and describe any needed silt fences or waddles. The cost and labor for erosion control items will be covered by KV funds and Forest Service labor. Only those roads that have not been obliterated through the Total Maximum Daily Load (TMDL) process will be available for re-opening (map available).

Soil and Water Design Features for Root Ripping

1. Ripping would occur on the dry upland soils around parent trees in areas ranging in size from 1/8th of an acre to ~3 acres. Rip along contour. This would be a single-pass tractor-ripping technique and should be done when leaves are off. District Hydrologist would be consulted on location and timing of project. Fell trees or install fence around perimeter to discourage browse. Survey for goshawk nests or Purple Martin colonies prior to any tree felling. Example area is Chicken Lake wetland or other similar areas.

Soil and Water Common to All Clearcut, Mastication, or Burning Activities

Harvest and Mastication

1. Buffer perennial streams and wetlands by 100ft or by the mean height of mature dominant late-seral vegetation, whichever is greater (see also Leopard Frog criteria)
2. Include hydrologist field review input when designing buffers, marking boundaries, and reconstructing roads. Field review by hydrologist during layout may result in additional project design.
3. Restrict hydro-mowing and timber harvest activities during periods of spring snowmelt and periods of heavy rain when soils are too wet. Soils are too wet when the moisture content exceeds the plastic limit. If soils within 6 inches of the surface can be rolled into threads 3 millimeters in diameter without breaking or crumbling, they are too wet.
4. Do not drive machinery in riparian areas. Do not reduce/mechanically treat riparian-wetland vegetation.
5. Do not cross water conveyance structures such as ditches, pipelines, flumes, etc unless temporary crossings are used. Remove temporary crossings when project work is complete. Repair any damage to water conveyance structures.
6. Temporary roads must be scarified, reseeded, covered with debris, and effectively blocked after treatment.
7. Reserve clumps may be located in swales if they meet other objectives.

Prescribed Burning

1. Pull soil, duff, slash and rocks onto fire lines following completion of the project.
2. Install water bars on fire line where slopes are greater than 20%.
3. Re-seed dozer and ATV created fire lines if mineral soil is exposed.
4. Re-install drainage features in roads used for fire management if disturbed by implementation.
5. Scatter brush/limbs onto roads used upon completion of prescribed fire implementation that are not intended for public use afterwards.
6. Temporary roads and landings used for fire management should be scarified, re-seeded, covered with debris, and effectively blocked within one season after their intended use.
7. Prohibit ATV use in riparian-wetland areas.
8. Avoid ATV use on slopes greater than 30%.
9. Limit ATV stream crossings to the minimum number necessary to treat a unit. Cross streams perpendicular to the direction of flow and do not cross stream if banks exceed 30% slope.