**MMG Prep Considerations**

**MMG Unit Preparation**

Below are various considerations and design criteria to assist in the evaluation and preparation of units to be included in Forsythe II, Phases 5 and 6. Also included is an example format for providing feedback on layout.

Please note, the Forest Service is not asking for consensus recommendations or advice. Anyone has the opportunity to provide feedback on as few or as many units as they desire.

**Project Objectives**

* Reduce the severity and intensity of a wildfire within the wildland urban interface (WUI).
* Restore ponderosa pine/mixed conifer stands, aspen, and meadows/shrublands toward their characteristic species composition, structure, and spatial patterns in order to increase resistance and resiliency to future natural disturbance.
* Emulate natural disturbance in lodgepole pine dominated stands to mimic variable structural and spatial patterns across the landscape in order to increase resistance and resiliency to future natural disturbance.
* Provide private property landowners the opportunity to complete defensible space mitigation around their homes on adjacent NFS lands.

One project objective does not take priority over another. In some units we may be able to accomplish multiple objectives, while in other units we may only be able to accomplish one objective. When providing feedback, consider how treatment activities could achieve one, multiple or all objectives in any given unit.

**Unit Evaluation Considerations**

Forest Health

Is there an opportunity with this entry to build resilience to natural disturbances such as wildfire and insect and disease outbreaks?

Are there any resource concerns present in the unit that could be addressed with treatment activities?

Consider the erosion potential of the unit. Is additional ground cover needed to minimize the potential of erosion?

Consider retention of ground fuels for nutrient cycling.

What implementation method (manual or mechanical) will be the most efficient and most effective in order to meet the objectives of the project’s decision?

Can the preferred method be implemented given the unit’s vegetation cover type, access, slope (continuous maximum 35% slope for machinery), rock content, etc.?

Consider the Step Transect Summary data regarding stand structure and tree species associations and how that might inform treatment? For example, what size class of trees are most/least prominent? What is the mix of tree species? Are there opportunities to focus on a particular size class or species to meet one or more of the project objectives?

Are there limited aggregations in the unit such as mature trees, ponderosa pine regeneration, aspen, and/or meadow/shrublands that can be enhanced with treatment activities?

Wildlife

Consider the following questions to help determine what, if any, habitat concerns are present.

* Is there visible sign of previous treatment?
* Is the unit north or south aspect?
* What habitat types are in the surrounding area?
* What is the age class and species of the trees in the unit?
* What does this area provide on the landscape level?
* Which wildlife species would you expect here based on available habitat?
* What does this unit provide to these species (thermal cover, escape habitat, denning opportunity, snags, etc.)?
	+ Is the stand dense and closed canopy?
		- Think interior species: (marten, goshawk, nuthatch, etc.).
		- Is this an isolated stand? Can we link to similar stands?
		- Is this still serving as “healthy” interior habitat (maybe it’s gotten overgrown or is just beginning to show old growth characteristics)?
	+ Is the stand wide-spaced and open canopy?
		- Think generalist species and open-area obligates: (flammulated owl, elk, deer, bear, mountain lion, etc.).
		- Is this an isolated stand? Can we link to similar stands?
		- What is available in the form of browse, ease of movement, snag retention, etc.?
* Are there suitable nest trees for raptors, and is there adequate prey habitat in conjunction?
* What wildlife sign is present? Elk, moose, deer, bear scats? Visible nests? What birds are singing?
* How would changes here impact wildlife at the landscape scale?
* What treatment would best benefit wildlife in this stand? For example:
	+ Can we open the stand for understory development and complexity?
	+ What tree species and habitat features could we promote?
	+ What is the current snag retention? How would treatment/current DM design criteria impact this?
	+ How can we facilitate wildlife movement across the landscape?
	+ Can we bridge multiple forage opportunities (munching trails)?

Fire/Fuels

Consider existing fuel conditions such as surface fuels, ladder fuels, and crown bulk density.

Fire Suppression:

* What fire suppression opportunities exist in the unit, considering topography, stand density, species composition, aspect and slope steepness? Can suppression opportunities be improved or created by placement and design of fuel treatments?
	+ Location of patchcut/clearcuts in lodgepole pine
	+ Intensity of thinning for mixed conifer stands
	+ Proximity of aspen/shrublands to other treated areas
* Is there an opportunity to leverage prior treatments within or adjacent to the unit to increase overall effectiveness of planned treatments?
* Consider what values are at risk to wildfire within or adjacent to the unit? Is there an opportunity to reduce the risk through treatment design and placement?
* Consider how treatments could help establish adequate safety zones to engage a wildfire in the area.

Prescribed Fire:

* What opportunities should there be, if any, for prescribed fires in future decisions?
* Considerations for prescribed fires include:
	+ What is the desired stand conditions considering species composition, mid-story and over-story structure, and surface fuels?
	+ Can prescribed fire be implemented in the current condition without pre-treatment to meet desired conditions?
	+ Does stand density, species composition, ladder and surface fuels allow for acceptable mortality?
	+ Can control features be constructed or utilized to create low risk of fire escape within a manageable prescribed fire area?
	+ Do planned treatments allow for low-moderate prescribed fire behavior?

**Design Criteria**

Review Appendix C from the Decision Notice, also included below, to determine if there are there specific design criteria that need to be applied to the unit?

**Cover Type Considerations**

Mixed conifer stands (Units 52, 54, 55, 77, 80):

Can treatment be designed to create/maintain stand structure diversity spatially (horizontal/vertical) while minimizing ladder fuels that lead to continuous crowns of residual trees?

Are there breaks in the canopy or can they be created where individual or groups of trees may torch, but not lead to continuous crown fire potential?

In mixed conifer ponderosa pine cover types, will the post treated unit allow for natural regeneration of ponderosa pine (e.g. openings with nearby existing seed sources)?

Is there an opportunity to create a patchwork mosaic of openings, individual, and groups of trees?

Lodgepole pine stands (Units 23, 24, 29, 30, 31):

Are patchcuts located in the appropriate size class suited for the selected implementation method?

* Area with average lodgepole pine < 7” DBH – manual implementation treatment
* Area with average lodgepole pine > 7” DBH – mechanical implementation treatment

Can patchcuts be located adjacent to existing mixed conifer stands in order to expand potential prescribed broadcast burning area in the future?

Aspen stands and meadow/shrublands (limited aggregations) Units 53, 61, 81:

Are there opportunities to expand and enhance aspen in order to meet fire, wildlife, and forest health objectives?

**End Product**

Fill in table with applicable information

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Unit** | **Implementation Method** | **Basal Area Reduction** | **PC/CC Aggregations Flagged or GPS’d** | **Guidelines for Mixed Conifer Desired Treatment** | **Mixed Conifer****Sample Mark Area Identified** | **Aspen Buffers Identified** |
| Example999 | Mechanical | 40% / NA | Yes/No (Boundary | Favor ponderosa pine regeneration, remove overstory tree to achieve structural diversity | Yes (Located at intersection of FSR 357.1 and Magnolia Rd.) | Yes/NA |
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Identify implementation method (manual/mechanical) for each unit.

In lodgepole pine stands, identify desired location(s) of the patchcut/clearcut. Identify aggregations (if applicable). Please provide any pertinent information regarding preference for treating aggregations over lodgepole.

In lodgepole pine, option to provide an avenza polygon or flag boundaries of potential patchcut(s)/clearcut(s) or aggregations, if applicable.

In mixed-conifer stands, please provide a desired marking guidelines, including aggregations if applicable, for the unit.

Option to provide a ½ acre or more sample mark in mixed conifer stands with flagging to help us get a sense of the basal area reduction that is desired.

Option to flag the 30’ buffer from the edge of the aspen clone.

**Appendix C**

**Design Criteria**

In response to public comments and collaboration for this project and from analysis by the USFS resource specialists*,* project design criteria were developed to minimize the potential impacts the decision activities may cause. Experience has shown these project design criteria to be effective in other projects.

**All Treatment Areas**

1. Following project implementation, at least 70% effective ground cover should be maintained within mechanical and manual treatment units to lower the risk of soil erosion. Effective ground cover includes surface rock cover, pine needle cover, and cover provided by low lying vegetation and mulch.
2. In chipped areas, chip depth shall average less than 3”. Chip depth of up to 5” may occur over small areas (not to exceed 5% of the treatment unit). Chips shall be distributed in a mosaic pattern over no more than 30% of the activity area.
3. In masticated areas, chunks shall be distributed to avoid dense accumulations that could potentially impede growth of native grasses, forbs or seedlings.
4. All treatment areas will be reviewed by a USFS Landscape Architect prior to final unit layout. Unit boundaries shall be natural edges whenever possible and prevent the appearance of uniform tree spacing and straight line unit boundaries. Straight line boundaries shall be treated by ‘feathering[[1]](#footnote-1)’ and ‘scalloping[[2]](#footnote-2)’.
5. Minimize damage to aspen 8” DBH and larger.
6. Leave live and dead wildlife trees as individually designated by a USFS Wildlife Biologist and/or according to marking guidelines agreed to in coordination with a USFS Wildlife Biologist, Silviculturist, Fuels Planner, and prep crews. Leave trees may include trees with cavities, trees with large squirrel middens, and/or Abert’s squirrel nest trees.
7. Within treatment units where Rocky Mountain juniper occurs, leave an average of one large individual, or clump of three or more if available, Rocky Mountain Juniper per acre.
8. If a federally listed or USFS sensitive wildlife species is identified within treatment units or areas potentially impacted by proposed project activities prior to or during implementation, a USFS Wildlife Biologist will be contacted as soon as possible to ensure Forest Plan direction and Endangered Species Act requirements are met.
9. If raptor nesting activity (e.g. nesting behavior, nest sites, or fledglings) is detected within treatment units or areas potentially impacted by proposed project activities prior to or during implementation, a USFS Wildlife Biologist will be contacted as soon as possible to ensure Forest Plan direction for nesting raptor protection are met.
10. Retain a minimum of 5 of the largest available dead trees, in clumps where available, minimum 8” DBH for lodgepole and 10” for ponderosa pine and Douglas-fir, per acre, as an average across each treatment unit. Give preference to retaining ponderosa pine snags where available. Criteria for snag selection will be specified in the silviculture prescription with emphasis on retaining the largest diameter snags present. If the minimum number of snags is not available, then the largest available live, green replacement trees will be retained for future snags.
11. Retain a minimum of 5 logs and 100 linear feet per acre of existing down logs distributed randomly across each unit, with a minimum diameter of 8” for lodgepole pine and 10” for other conifer species. Do not cut live trees to meet this criterion, except where live trees will be cut according to the prescription in lodgepole pine patchcuts and clearcuts. Jackstrawed bole wood, created by treatment, 6” in diameter or greater and left in the unit must be scattered and be in contact with the ground. Individual boles of 6” or greater can be left unbucked.
12. Within flammulated owl territories:
	1. Thin small and medium sized trees to maintain large-open grown canopies.
	2. Retain live trees, 12” DBH and greater, including on ridgelines.
	3. In riparian areas, leave all trees with existing cavities and remove conifers less than 8” DBH except those with cavities.
13. All treatment units adjacent to existing raptor nests will be resurveyed the nesting season prior to implementation. This is to ensure that the birds have not moved their nests into an active unit.
14. Buffer known roost locations for Fringed myotis bat and Townsend’s big-eared bat from treatment activities during key activity times. Prescribed burning should avoid smoke saturation of roost sites during key activity times.
15. Sensitive plant species and species of local concern locations will be determined by a USFS Botanist and designated buffers will be applied.
16. All areas potentially impacted by proposed project activities that have not been surveyed for rare plants and that contain high-quality suitable habitat for sensitive and local concern plant species will be surveyed in such habitat prior to disturbance activities.
17. To minimize risk of noxious weed introduction and spread, require all equipment to be used for ground-disturbing activities for this project (not including service trucks or other vehicles that remain on roadways) to be cleaned, i.e., free of mud, dirt, plant parts, and seeds, or other debris that could contain or hold seeds, prior to entering the project area. All wheeled or tracked vehicles, including trailers, or other equipment entering constructed temporary roads shall be cleaned prior to entry to the project area. Equipment will be considered free of soil and other debris when a visual inspection does not disclose such material. Equipment shall be re-cleaned prior to transfer from a unit where noxious weeds are known to be present into a unit where noxious weeds are not known present.
18. For known weed occurrences and for any new noxious weed infestations found in or near units prior to or during implementation of vegetation treatment, implementation personnel will coordinate with USFS District Invasive Plants Coordinator to implement appropriate prevention measures, such as avoidance, treatment of weeds prior to fuels implementation, and/or additional equipment cleaning requirements, such as between infested and uninfested units.
19. Coordinate with USFS District Invasive Plants Coordinator to locate landings, staging areas, skid trails, burn piles, and other areas of severe soil disturbance to best reduce risk of spread of invasive plants.
20. Use non-agricultural mulch materials for revegetation and sediment/erosion control. Non-agricultural products include wood straw or shred and wattles made from excelsior, wood or other non-agricultural materials.
21. To avoid damage to the Boulder Gravity Line, driving across the line shall be avoided.
22. Consultation with Denver Water Board shall occur for any project activities occurring within the FERC boundary for the Gross Reservoir Hydroelectric Project.
23. There are several utility (electric, natural gas and communication) lines within the project area. Care shall be taken when working around these lines to avoid damage to them or their infrastructure.
24. All recreation facilities (NFS roads, NFS trails, recreation sites) and infrastructure (such as gates, fences, sign kiosks, picnic tables) shall be protected from damage from all treatment activities. Any damaged facilities or infrastructure shall be repaired, replaced, or reconditioned to the level of the existing condition, or greater, to provide safe public access, as needed. Consult with Recreation Staff and/or Specialist as needed.
25. High use public access portals (such as trailheads and highly traveled trail corridors) will not be used for fuels treatment project work or long term operations unless no other alternative exists. If used, safe public access on weekends will be provided. Fuels treatment work sites will be designed in a manner to allow safe public access even when occupied. Where this is not feasible, short-term forest orders closing fuels treatment areas to public access will be implemented, as needed, to ensure public safety, protect natural resources and improve effectiveness of project area objectives. Involve the Recreation Staff and/or Specialist through planning, implementation, and monitoring as needed.
26. Public notification shall occur prior to major project activities to raise public awareness. Local agency cooperators will be notified about the duration, intensity, and potential issues for the project work.
27. Knolls (small rounded hilltops) and geologic features (rock outcrops) will be excluded from treatment to maintain aesthetic values. These features are identified as the highest point in the local vicinity that have a few trees exhibiting characteristics such as stunted growth, irregular crown shapes, and mature bark attributes. Treatment exclusions will extend down from the peak of the feature to the area where mechanical equipment can operate, approximately 40%, or the point where the vegetation transitions into a meadow dominated by grass and forbs.

**Mechanical Treatment Areas**

1. No mechanical logging equipment (e.g. feller-bunchers, skidders, etc.) shall be permitted to operate within a 100 foot buffer from the edge of the water around perennial streams[[3]](#footnote-3), intermittent streams[[4]](#footnote-4), lakes, ponds, wetlands, fens, or wet meadows[[5]](#footnote-5). A no mechanical treatment buffer of 328 feet (100 meters) from the edge of the water shall be established around Winiger Gulch and the unnamed southern tributary to Winiger Gulch as shown in the attached map. Activities that shall be excluded from the buffer include:
	* Mechanical fuels treatment operations using heavy equipment
	* Machine piles
	* Vehicle service and fueling areas
	* Driving tracked or wheeled machinery except along existing roads, in the southwest corner of Unit 40 and the northeast corner of Unit 74 where they overlap mapped Preble’s meadow jumping mouse habitat.
2. For ephemeral streams[[6]](#footnote-6), equipment shall be excluded from the stream channel, except to cross at points designated by a USFS Contract or Sale Administrator(s).
3. Limit operation of heavy equipment to slopes of less than 30%. Slopes up to 40% may be considered on a site specific basis and will require evaluation by a Soils Scientist.
4. Slash take back will only be allowed on skid trails, in patchcut/clearcut units where it is needed to meet the coarse and fine woody debris retention criteria (see Patchcut/Clearcut Areas, 1a and 1b, in this document), or other areas designated as adversely impacted by a USFS Soil Scientist/Hydrologist/COR/Sale Administrator, for soil stabilization, and to a maximum depth of 18 inches.
5. A cultural resource inventory will be completed on all units that have been identified by a USFS Archaeologist in consultation with the SHPO. The survey and reports will be completed and sent to the SHPO prior to project implementation. Implementation will not begin until the SHPO has concurred with a determination of *no historic properties affected* or *no historic properties adversely affected*.
6. Sites located during the field inventory that are evaluated as eligible for the NRHP, will have a 50 foot buffer placed around the exterior site boundary. No mechanical treatment will occur within the site boundary and the 50 foot buffer. When treatment is necessary, eligible sites and the 50 foot buffer will be hand treated for hazard trees and accumulated fuel build up by hand felling trees. Slash will either be hand piled for chipping and/or bucked up by hand, and loaded onto rubber tired vehicles to be hauled to designated burn piles for burning. No thinning, pile burning, or other slash treatments will occur within these buffers unless determined to be appropriate by a USFS Archaeologist.
7. All NRHP eligible or unevaluated sites within the units proposed for mechanical treatments will be flagged on the ground for avoidance during implementation.
8. Previously undiscovered sites encountered during the course of project activities will be avoided until they can be evaluated by a USFS Archaeologist. If affected properties are discovered after project activities are completed, the USFS will document any damage and consult with SHPO and Council pursuant to the procedures in 36CFR Part 800.13(b).

**Manual Treatment Areas**

1. Tree cutting of conifers can occur to the edge of the stream bank for perennial, intermittent and ephemeral streams. No woody riparian vegetation (e.g. willows, alders, river birch, etc.) shall be cut. Trees shall be directionally felled away from stream channels where practicable.
2. Retain all existing down woody material 5” DBH or greater within and up to 100 feet of riparian areas. This applies to portions of Units 40 and 74 where they overlap Preble’s meadow jumping mouse habitat.
3. Lopped and scattered slash shall be removed from the stream channel of perennial, intermittent and ephemeral streams.
4. No tree cutting shall occur within wetlands, fens, or wet meadows. These features may not be mapped, and may only be discovered during unit layout.

**Mixed Conifer Areas**

1. Trees shall be marked as either leave trees or cut trees, whichever is most efficient, prior to any cutting.
2. Recognizing that not all units may have trees greater than 14 inches DBH, and to acknowledge the value of larger trees to the public, the diameter cut limit will be adjusted based on the existing condition while retaining 10% of the existing basal area in the largest diameter trees in each unit. The maximum diameter cut limit is 14 inches DBH.

**Patchcut/Clearcut Areas**

1. Retain coarse and fine woody debris (CWD and FWD) throughout clearcut/patchcut units to maintain long term soil productivity.
2. At least 8 tons/acre of CWD[[7]](#footnote-7), with preference for large diameter material (boles)
3. At least 4 tons/acre of FWD[[8]](#footnote-8)
4. Involve a USFS Wildlife Biologist during layout of patchcuts/clearcuts to determine needs for narrow areas and/or island exclusions for wildlife crossing and cover.
5. In general, locate openings away from system trails, or social trails that will be changed to system trails, once a Decision is made on the Magnolia Trails Project. A wildlife biologist shall approve locations of patchcuts and clearcuts in the vicinity of such trails.
6. In order to meet scenery standards within the proposed patchcut/clearcut lodgepole pine dominated units, three to five uncut islands of trees must be retained within patchcut/clearcuts greater or equal to 5 acres in size. These islands shall be at least ½ acre in size and total 25% of the appropriate patchcut/clearcut area within each unit. The acreage within the islands will not decrease the number of overall acres to be cut within a designated patch/clearcut unit. For example in unit 11 (20 acres), 30% or 6 acres of the unit could be cut utilizing a combination of patchcut/clearcuts. To equate to a one 6-acre clearcut that is treated, the boundary of the clearcut will encompass 7.5 acres to account for the 25% acre retention to be included without changing the intent of reducing the overall acreage by 30%.
7. Retain all areas of mixed conifer inclusions ½ acre or less in lodgepole pine stands. If the inclusion is larger, thinning as prescribed could be implemented. An exception is cutting trees for skid trails and landings.

**Old Growth/Effective Habitat/Interior Forest Areas**

1. In Management Area 3.5, exclude vegetation treatment from inventoried or discovered lodgepole pine old growth per Forest Plan standard. Exceptions may be made if the lodgepole old growth is considered non-functional at time of implementation. This determination of functionality is to be made for the stand as a whole within the treatment unit.
2. Where effective habitat occurs in treatment units, unit boundaries and/or canopy cover reduction may be modified as determined by a wildlife biologist, if needed to maintain these habitats.
3. Within mapped interior forest and within a 328 foot buffer around mapped interior forest, retain at least 40% canopy cover. Exceptions may occur based on involvement of wildlife biologist and silviculturist and use of updated USFS data.
4. Retain a minimum of 5 of the largest available dead trees, minimum 8” DBH for lodgepole and 10” for ponderosa pine and Douglas-fir, per acre, as an average across old growth retention and inventoried stands within a treatment unit. Give preference to retaining ponderosa pine snags where available. Criteria for snag selection will be specified in the silviculture prescription with emphasis on retaining the largest diameter snags present. If the minimum number of snags is not available, then the largest available live, green replacement trees will be retained for future snags.

**Slash Piles**

1. To the extent practicable, construct machine slash piles on landings. If machine piling is done off landings, conduct piling to leave topsoil in place and to avoid displacement of topsoil. Machinery that lifts and places material into burn piles is recommended over machinery that pushes or drags material into burn piles.
2. Hand constructed burn piles shall be located at least 50 feet from perennial streams, wetlands, fens, wet meadows, and aspen stands. For intermittent and ephemeral streams, burn piles shall be located 50 feet from the stream or outside the inner gorge, whichever is less. For Preble’s meadow jumping mouse, piles shall be located at least 100 feet from the edge of the water around Winiger Gulch and the unnamed southern tributary to Winiger Gulch. If it not practicable to locate piles sufficiently away from streams, or if doing so will violate other requirements (e.g. minimum spacing between piles, minimum distance from residual trees), do not cut the water adjacent trees, unless approved by a USFS Soil Scientist, Hydrologist, or Fish Biologist.



 **Inner Gorge:** Many streams exhibit a sharp increase in slope as

 the stream channel is approached. The first sharp break in slope

 on either side of the stream defines the inner gorge.

1. To minimize long term effects of pile burning, watershed, botany and/or implementation personnel will conduct surveys to identify if and where burn pile restoration actions are needed following pile burning activities. Any combination of the following restoration actions will be recommended if/where needed:
	1. Tilling/scarifying after burning to promote recovery by breaking up water repellent layers, increasing water infiltration, and mixing in organic material from areas adjacent to the pile.
	2. Weed treatments
	3. Seeding
	4. Covering with litter, duff and/or slash
2. Burn piles should be located out of sight of major viewpoints as designated by a USFS Landscape Architect whenever possible within the constraints of the contract.
3. In treatment units where slash is piled by hand, leave an average of 2 piles per acre for wildlife habitat, including any piles remaining from previous vegetation treatment, distributed randomly throughout the unit.
4. Minimum pile size, hand or machine created, shall be no less than 6 feet high by 6 feet wide.
5. Consult USFS Fuels Specialist during contract preparation for current maximum pile size and pile separation requirements as regulated by the Colorado Air Pollution Control Division.
6. Piles shall be constructed in a manner to minimize large air spaces and dirt within the piles. Piles shall not have material extending more than 4 feet in any direction beyond the pile perimeter and a minimum of 4 feet of separation from pile perimeter to surrounding down woody material to reduce unwanted fire spread.
7. Construct a minimum of a 6 foot wide control line, down to bare mineral soil, around each machine pile to create separation between piled material and surrounding slash mat. If piles are grouped, a single control line may be placed around the entire group rather than around individual piles. The scraped material must be moved outward to avoid a berm adjacent to the piles’ edge.
8. In machine units, reasonably gather and place activity slash material, 1” to 6” diameter, into piles. If more than 50% of a treatment unit has continuous slash depth greater than 6” after initial treatment, additional piling will be required.
9. In manual units, pile sound, existing and/or created slash material, 1” to 6” diameter and 2 feet or longer. Alternatively, any slash that must be moved more than 50 feet to meet minimum required pile size may be lopped and scattered to a maximum depth of 18”. Lopped and scattered material is expected to be a rare occurrence and most likely occur in very open grown areas where a few trees are required to be cut to meet spacing specifications, but not enough trees are cut to produce enough slash to create a minimum sized pile.
10. Locate machine piles a minimum of 150 feet and hand piles a minimum of 50 feet from any infrastructure or private property boundary.

**Broadcast Burning**

1. Limit total unrecovered burned area within the project area to no more than 340 acres.
2. Design and implement prescribed fire for low soil burn severity effects and rapid recovery[[9]](#footnote-9) of ground cover. Soil burn severity classes are defined in the Field Guide for Mapping Soil Burn Severity (<http://www.fs.fed.us/rm/pubs/rmrs_gtr243.pdf>).
3. Rehabilitate constructed fire lines by installing water bars, raking topsoil back over the line, covering with slash or other mulch materials; and seeding, if recommended by a USFS Botanist.
4. A 300 foot buffer shall be established around Winiger Gulch and the unnamed southern tributary to Winiger Gulch as shown in the attached map. No active ignition shall occur within the buffer. Fire will be allowed to back down into riparian areas and streamside zones. If needed to accomplish burn objectives or to provide for safety, establishment of control features (e.g. fire lines) or active ignition may occur within the buffer following consultation and agreement with a USFS Fish Biologist, Soil Scientist or Hydrologist.
5. Conduct burning operations so that no more than 10% of either stream bank area within riparian zones burns with high intensity (i.e. top kill of willow and/or aspen). Actively suppress fire if this 10% threshold is exceeded.
6. No active ignition shall occur within 25 feet of ephemeral streams.
7. In prescribed burn Units 38 and 44, choose individuals or clumps of three or more, if available, Rocky Mountain juniper to leave that are not ladder fuels for other conifers 12”+ DBH. Leave trees should be at least 300 feet away from property boundaries and prescribed burn containment lines.
8. Prior to prescribed burning in Units 38 and 44 within inventoried old growth, old growth retention, and identified old growth development areas, remove ladder fuels from around trees 12” DBH and larger to minimize fire moving into crowns of these larger trees. Where feasible, such as near firelines during mopup, moisten coarse woody material within root zones of trees 12” DBH and larger, to minimize root damage from smoldering material.
9. Prior to prescribed burning in Units 38 and 44, scratch fireline around and/or use other techniques to minimize fire impacts to at least 5 logs per acre totaling at least 100 linear feet. These logs should have a minimum diameter of ten inches if available, or largest down logs available.
10. A cultural resource inventory will be completed on all areas within prescribed burn units that have been identified by a USFS Project Archaeologist in consultation with the SHPO. This inventory may be completed after the NEPA decision has been made but prior to burn implementation.
11. All NRHP eligible or unevaluated sites located within prescribed burn units will be marked on the ground by the Project Archaeologist. A USFS Project Archaeologist and Fire Staff will design protection measures to remove the sites from the burn’s Area of Potential Effects. These protection measures will take into consideration the site type, environmental setting, and anticipated burn conditions. These protections may include, but are not limited to: fuel breaks, no treatment buffers, wrapping, foaming, wetting, black line, fire line (machine or hand dug), and raking.
12. All potentially ground-disturbing fire lines, staging areas, helispots, and all road improvement, construction or deconstruction, or designated ATV or vehicle routes/ways will be intensively (Class III) surveyed for cultural resources prior to project implementation; any NRHP-eligible cultural resources will be avoided by project design.

**Timing Restrictions**

1. Avoid treatment operations from May 1 through August 10 in flammulated owl territories. Avoidance areas will be determined by a USFS Wildlife Biologist based on survey results, flammulated owl territory size, topography, and vegetation. Prescribed burning operations may be conducted if determined to be appropriate by a USFS Wildlife Biologist. This applies to most units in the Winiger Ridge and South Winiger areas, and may apply to other areas if appropriate based on survey results.
2. Raptor nest areas, including species-specific buffers, will generally have no treatment activity from March 1 through September 15, depending on species, or until determined unoccupied by the wildlife biologist. Access through buffers during this period will be assessed by a USFS Wildlife Biologist.
	1. If known nests become unoccupied, additional surveys will be conducted during the breeding season prior to any project activity. The extent and timing of surveys will be determined by a USFS Wildlife Biologist.
	2. Units with suitable nest habitat will also be resurveyed for new nest locations prior to implementation. If a new active nest is detected during surveys or becomes known by other means, appropriate mitigations will be implemented.
	3. For northern goshawk nests including alternate nest sites, exclude treatment in up to a 30-acre area containing the nest tree. Site-specific exclusion areas will be determined by a USFS Wildlife Biologist based on topography, vegetation and other factors. Outside of the breeding season, generally from September 16 through February 28, limited thinning may be allowed within this area if determined necessary to help reduce the risk of losing the nest site to wildfire. A USFS Wildlife Biologist will help design and approve treatment.
3. Unless a site-specific exception is determined to be appropriate by a USFS Wildlife Biologist, avoid treatment from December 1 through March 30 in elk severe winter range and winter concentration areas. These areas are based on the most current available mapping data from Colorado Parks and Wildlife.
4. Project operations will not be conducted on Memorial Day, 4th of July and Labor Day holiday weekends and on Sundays. Operating times for heavy equipment and chainsaws shall be limited to the hours of 7 a.m. to 7 p.m.
5. Piles outside the 100 foot riparian buffer but within 328 feet of the stream channel may only be burned from November 1 through April 30 during Preble’s meadow jumping mouse hibernation. This applies to Units 40 and 74.

**Roads/Skid Trails/Temp Roads/Landings/Equipment Use**

1. Temporary roads, skid trails, landing areas, and equipment use in mechanical treatment units shall be subject to operating equipment restrictions to protect soil and water. Operate heavy equipment only when soil moisture in the upper 6 inches is below the plastic limit (a ball can be formed in the fist that holds together on gentle tossing or shaking) OR protected by at least one foot of packed snow or 2 inches of frozen soil. This may mean temporary restriction on equipment operation and travel within the treatment area in periods of heavy rains and snow or when soils are wet.
2. The USFS shall approve locations of skid trails and landings prior to treatment. Re-use existing skid trails as much as practicable to minimize new disturbance. Within mapped effective habitat, a USFS Wildlife Biologist will approve locations of skid trails and landings.
3. All temporary road construction, including skid trails, shall be obliterated within one year of completion of use, including pile burning. Project implementation, watershed, soil, and engineering personnel shall cooperate to determine appropriate obliteration methods.
	1. Temporary road surfaces, including skid trails and landings, shall be decompacted along the entire road/skid trail length or landing area unless waived by Soil Scientist. Roads that were constructed with cut and fill shall be partially or fully recontoured or pitted. Roads that were constructed on the natural ground contour shall be pitted, subsoiled, or ripped.
* Partial recontouring of the road prisms shall be utilized in areas where it is not feasible or beneficial to disturb soils previously unaffected by construction operations to stabilize a decommissioned temporary road. Factors such as steep slopes, large amounts of rock, or vegetation may impact a decision to utilize partial recontouring. Partial recontouring shall use available fill material from original construction. Fills shall be returned to, and compacted into, the cut removal area. No further ground disturbance involving cutting material shall occur. Handle soil to ensure that minimal segregation of materials occurs. Compaction may be by machine track or bucket. The recontoured surface shall be outsloped a minimum of 5% for the entire road prism width and no berms shall remain. Finished grades shall minimize drainage following the contour of the road, where necessary grade dips shall be installed along the grade to direct drainage off the disturbed area. Where high cut slopes are present, continue pulling up fill material and backfilling cut removal areas until no cut slope remains greater than 1:1 H:V in slope and two feet in height.
* Full recontouring of the road prisms shall be utilized in decommissioning temporary road segments where it is both feasible and advantageous to disturb soil previously unaffected by construction operations to completely recontour the road. Full recontouring shall include pull up of all fill material and place/compact into the cut removal area. Very little disturbance of the natural ground under the fill shall occur. The final slope area, over the entire width of the road prism, shall reproduce the pre-road natural slope. It shall blend in with the surrounding slope and no berms or windrows of any material shall remain.
	1. Where applicable, remove all temporary stream crossings and restore stream bed and banks.
	2. Restore natural drainage patterns across the road template.
	3. Provide effective closure at junctions with open roads and NFS trails to prevent unauthorized use. Effective closure techniques may include recontouring or pitting for site distance, fencing, gates, berms, barrier rocks of various sizes (median size of 2.5 ft. x 2.5 ft. x 2.5 ft. [1 ton], grouped in natural arrangements and 1/3-1/2 buried), plantings, and/or felled trees.
	4. Scatter slash on restored disturbance.
	5. Restore ground cover using native seed or plants, methods and timing, and soil amendments as practicable to meet revegetation objectives and in consultation with a USFS Botany Representative. Use government furnished seed when available.
1. Vegetation treatment implementation and related contracting will incorporate use of existing and/or previously used areas as much as possible for fuels treatment operations, in order to reduce the amount of new disturbance which usually leads to new “social” routes being created. Any non-system roads which are used for access to fuels treatment units shall be considered to be temporary roads and shall be obliterated following the design criteria for temporary roads.
2. Where topsoil depth exceeds 2”, topsoil shall be salvaged and stockpiled from all areas to be disturbed by construction of temporary roads and road improvements and shall be incorporated into the reclamation.
3. Temporary road construction shall be kept to the minimum construction possible to accommodate intended use and shall meet the following guideline.
	1. Roads shall not follow fall line of the land but shall traverse contours to minimize slopes. Generally, slopes of 10 percent or less shall be maintained, however reaches of 200 feet or less may be up to 14 percent in slope.
	2. Road alignment shall be selected to minimize cuts and fills to 2-foot maximum.
	3. Road widths shall be the minimum required for the equipment and shall not exceed 15 feet.
	4. Roads shall be outsloped where possible and rolling dips shall be constructed instead of ditches and culverts, wherever practicable, as necessary to control sediment and erosion. Drainage features shall not drain directly into streams. Best Management Practices shall be employed at the termination of drainage features to protect vegetation from sedimentation.
4. Construction of temporary roads and road improvements shall to the extent possible minimize ground disturbance, avoid crossings of drainages, provide buffers to drainages and sensitive areas, avoid steep slopes, avoid wet areas and swale bottoms, avoid unstable slopes, and shall minimize erosion potential and sedimentation of water ways.
5. If material will be imported for road base or other uses, developed borrow sources or pit-run material sources will be inspected for weeds, weed parts or weed seeds by either a Forest Service employee or other party approved by the Forest Service. Aggregate base or riprap sourced from commercial pits does not need to be inspected.
6. Planning, construction and maintenance of temporary roads shall include sediment and erosion controls as necessary to prevent resource damage. Such controls are to be maintained and supplemented as necessary through the life of the project.
7. Prior to the construction on NFS land of any egress route from Big Springs subdivision, the Forest shall approve locations, plans, best management practices, storm water management plans, and any other plans necessary to protect NFS lands and resources. Resource protection measures shall be installed and maintained during construction and for a sufficient time after construction until the site has stabilized.
8. System roads shall not be used during winter and wet periods when there is a reduction in the ability of the road or road structure to support traffic, provide drainage, or provide safe transportation. Examples of reduction in the support value or safety of the roadway include, but are not limited to, soil, mud, debris, or oversized rocks incorporated into the roadway that affect drainage, normal maintenance activities, or the strength of the surface structure; intermixing of slash or subgrade soil with aggregate base; severe alteration of drainage that leads to surface aggregate loss, changes in character of ditches or drainage structures, or concentration of water that harms streams or water sources; accelerated breakdown of asphalt surfaces.

If removal of snow from system roads for winter operations is allowed, provide adequate maintenance to maintain the road surface structure, drainage of the roadway, and safe passage for vehicles.

Snow storage areas shall be approved by the USFS. Avoid riparian areas, wetlands or streams for snow storage to the extent possible.

Space, construct, and maintain drainage holes in the dike of snow or berm caused by snow removal operations. Place drain holes to obtain surface drainage without discharging on erodible fills.

Perform maintenance work in a manner to preserve and protect roads and appurtenances, and prevent erosion damage to streams and other Forest values.

Any type of equipment to remove snow may be utilized provided:

* 1. The equipment is of the size and type commonly used to remove snow and will not cause damage to the road surface or structure.
	2. The use of plows or dozers to remove snow requires written approval by the USFS. Equip plows or dozers with shoes or runners to keep the dozer blade a minimum of 2 inches above the road surface.
1. Existing road conditions shall be assessed prior to implementation for all roads to be used for the project including County and private roads used to access National Forest lands. Roads shall be maintained in their existing condition through-out the project, if any widening or other improvements are required for the project these improvements shall be assessed at the completion of the project to determine if they are acceptable or need to be removed.
2. When the work is complete the existing roads shall be inventoried to ensure drainage is operational and road surface is intact.
3. Unless the condition of an existing road is suitable for truck and trailer traffic, mechanized equipment shall be ‘walked’ (travel under its own power as opposed to transported on a trailer) into any units where mechanical treatments is planned.
4. Coordinate all work and traffic that impacts County roads, including hauling, with the County ahead of the work commencing. Obtain County permits as necessary.
5. Coordinate with road users, who will be impacted by the work, obtain access as necessary and contact information for any temporary closures or other coordination.
6. All roads impacted by project activities shall have warning signs and traffic control as follows:
	* 1. In accordance with the “Manual of Uniform Traffic Control Devices.”
		2. Maintained for through traffic during felling, slash treatment, and/or removal operations.
		3. Left in an operational condition that will adequately accommodate traffic at the end of each work day.
		4. Have barricades erected and/or proper signs placed at any traffic hazards in or adjacent to the road at the end of each workday.
		5. All felled trees shall be decked or removed and slash piled or removed from the bladed, mowed, or brushed road corridor each day.
7. Linear woody material designated to remain from roadway clearing activities shall be placed outside the clearing limits in close contact with, and perpendicular to, the slope. All other available organic and inorganic debris shall be scattered evenly outside of the clearing limits.
8. Roads which have been authorized for private uses should remain available to those uses to the greatest extent possible. Any deterioration of the road should be repaired to a similar or better condition than before project activities occurred.
9. Treatment units that already have off-road impacts and/or the potential for new and increased off-road vehicular use impacts are generally in areas that have a moderate or low slope angle (35% or less), and enough terrain to use the vehicle (four-wheel drive or all-terrain vehicles included). These areas will be protected from further encroachment of motorized vehicles by creating a buffer zone of no treatment or modification of treatment between the road, open for motorized travel, and the treatment area by installing fencing or other barriers made from natural materials (rock or wood). Buffer zones should be wide enough (minimum of 100 feet from edge of road) to discourage attempts at creating new routes. These areas will be identified with input from recreation staff and unit layout personnel prior to final unit boundary designation.
10. NRHP eligible sites located during the field inventory will have a 50 foot buffer established around the exterior boundary of the site. No construction activities will take place within the site and the 50 foot buffer area.
11. All potentially ground-disturbing activities proposed for staging areas, road improvement, construction, or obliteration outside of planned treatment units will be intensively surveyed for cultural resources prior to project implementation. Any NRHP-eligible cultural resources will be avoided by project design.

Consultation with Native American tribes must be completed prior to the closure of roads to ensure that access to areas of cultural importance is not inadvertently removed.

1. To ‘feather’ would be to go from a clearcut or maximum thinned density to existing stand density in 50 to 200 feet

 in a gradual progression. [↑](#footnote-ref-1)
2. To ‘scallop’ would be to cut curvilinear edges of varying wavelength and amplitude for example, a short one

 followed by two long ones, and then a medium one, etc. [↑](#footnote-ref-2)
3. Perennial Streams: Streams that carry water year round. [↑](#footnote-ref-3)
4. Intermittent Streams: Streams that carry water for at least some period of time annually, sufficient to maintain a

 defined streambed. [↑](#footnote-ref-4)
5. Wetlands, fens, and wet meadows may occur within or adjacent to treatment units. These features may not be

 mapped and may only be discovered during unit layout. [↑](#footnote-ref-5)
6. Ephemeral Streams: Streams that carry water only during precipitation or runoff events. Ephemeral streams do

 have a defined streambed and do not support riparian vegetation. [↑](#footnote-ref-6)
7. Coarse woody debris is defined as material >3” in diameter [↑](#footnote-ref-7)
8. Fine woody debris is defined as material <3” in diameter [↑](#footnote-ref-8)
9. An unrecovered burn is one that has insufficient ground cover to reduce runoff, erosion, and sedimentation rates

 to pre-burn conditions. Typical recovery time is 2-4 years, but is highly variable with vegetation type and

 precipitation. [↑](#footnote-ref-9)