

## Appendix C – Design Features, BMPs, and Mitigation

Design features, BMPs, and mitigation that are common to all action alternatives (B–D) are presented for each resource with one exception. Silviculture design features can be found in Appendix D – Implementation Plan.

**Table 111. Alternatives B, C, and D design features, best management practices, and mitigation**

Design Criteria No.	Description	Purpose		
		Forest Plan Compliance	Specialist Recommendation	Comment or Purpose
Aquatics				
A1	See Soil and Water: SW1 to SW 34 and Fire Ecology: FE2			
Botany				
B1	Follow forest plan direction for special areas including botanical areas and research natural areas.	X		Preserve special features and meet intent of designation.
B2	Determine potential occurrences and habitat of Southwestern Region sensitive plants in potential activity areas when planning for implementation. Identify potential species and survey the area to be treated before implementation.	X		Complies with FSM direction 2670. Manual direction (FSM 2670.5(19)) emphasizes that management actions should avoid or minimize impacts to sensitive species.
B3	Mitigate negative effects from management actions on Southwestern Region sensitive plants during design and implementation.	X		Complies with FSM direction, minimizes impacts to Southwestern Region sensitive plants.
B4	Prohibit slash pile construction within populations of Southwestern Region sensitive plants. Construct slash piles at least 10 to 20 feet away from known populations of Southwestern Region sensitive plants. Place slash piles on previously used locations such as old piling sites, old log deck sites, or other disturbed sites to avoid severe disturbance to additional locations where possible. Monitor slash pile sites after burning and control noxious or invasive weeds (see FE10).		X	Mitigates effects of disturbance and burning. Reduces loss of native seed bank, limits extent of severe disturbances, and reduces severely disturbed sites that are more prone to invasion by noxious or invasive weeds.

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B5	Prohibit temporary road construction and reconstruction, tracked vehicles, and pits within populations of Southwestern Region sensitive plants.		X	Eliminates direct loss of plants.
B6	Prohibit construction and reconstruction of log landings in identified populations of Southwestern Region sensitive plants.	X		Mitigates effects of disturbance. Follows management plan guidance of the management plan for <i>Hedeoma diffusum</i> (Flagstaff pennyroyal).
B7	Follow the guidance of the “Arizona Bugbane Conservation Assessment and Strategy, Coconino and Kaibab NFs” (1995) when planning activities near Arizona bugbane populations. An example of mitigation for this species includes preservation of shade and cool microsites for existing populations. This may require special attention in upland areas near canyon edges.	X		Mitigates effects to Arizona bugbane, a FWS candidate species. Follows guidance of conservation assessment and strategy and complies with policy.
B8	Manage fire severity in all entries in or near Arizona bugbane populations to minimize tree mortality.	X		Preserves the shady, mesic environment and overstory needed for Arizona bugbane.
B9	Follow the guidance of the management plan for <i>Hedeoma diffusum</i> (Flagstaff pennyroyal) when working in suitable habitat for this species. Examples of mitigations include restrictions on distance for building temporary roads near existing populations.	X		
B10	Deferrals and groups may include Southwestern Region sensitive plant groups where practical, using areas not occupied by the plants as interspaces.		X	Provide protection and shade needed by the sensitive plants while allowing for the least impact on clump/group/interspace design and layout during implementation and help mitigate impacts to Southwestern Region sensitive plants.
B11	Survey springs and channels for Southwestern Region sensitive plants before implementation and identify locations. Inform the forest botanist if new locations are found and mitigate effects to plants and populations. Mitigations include avoiding plants, altering designs, or including plants	X		Protects populations and habitat of Southwestern Region sensitive plants. Protects sneezeweed since it grows in ephemeral stream courses, springs, ponds, stock tanks,

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	in enclosures. Incorporates buffer strips along drainages. See soil and water SW8.			and meadows.
B12	Survey springs and channels for Bebb's willow before implementation and identify locations. Inform the forest botanist if new locations are found and mitigate effects to plants and populations. Mitigations include avoiding plants, altering designs, or including plants in enclosures. Identify opportunities to enhance Bebb's willow where plants are decadent or dying. Manual grubbing of grasses may be used to increase the likelihood of planting success.	X – Coconino NF only		Protects populations and habitat of Bebb's willow. Bebb's willow stands would be enhanced by using cuttings, planting locally cultivated plants, and fencing existing or newly planted willows.
B13	Manage prescribed burns to promote native species and to hinder weed species germination.	X		Promote healthy native plant communities and reduces the risk of noxious or invasive weed invasions.
B14	Fire lines would be placed around Bebb's willows and dead branches within the clumps would be removed before prescribed burning adjacent areas to reduce the risk of fire impacting willows. Also see FE5.		X	Aids in restoring Bebb's willow which is a Southwestern Region sensitive species for the Coconino NF and a rare species on the landscape for both forests.
B15	Follow the guidance in appendix B of the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, Coconino, Kaibab, and Prescott NFs within Coconino, Gila, Mojave, and Yavapai Counties, Arizona" including: (1) surveying the treatment area and evaluating weeds present before implementation; avoiding or removing sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds; (2) treating weed infestations within treatment units before implementing treatments; (3) managing prescribed fires as an aid to control of existing weed infestations and to prevent the spread of existing weeds; and (4) monitoring slash pile sites after burning and control noxious or invasive weeds.	X		Provides guidance and mitigation for noxious or invasive weeds and complies with amendment 20 of the Coconino NF forest plan and amendment 7 of the Kaibab NF forest plan.

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B16	Incorporate weed prevention and control into project layout, design, alternative evaluation, and project decisions. Prevent spread of potential and existing noxious or invasive weeds by vehicles used in management activities by washing vehicles and equipment prior to entering the project area and when moving from one area to another. Review timber sale contract clauses for vehicle cleaning and incorporate appropriate clauses. Also see SW4 for timber sale clauses and FE10 that addresses preventative measures for weeds from prescribed burning.	X		Mitigate effects of management actions on existing and potential noxious or invasive weed infestations; measure is complementary to timber sale contract clause CT WO-C/CT 6.36 and watershed best management practices.
<b>Fire Ecology</b>				
FE1	Burn unit size, as well as strategic placement, would be a consideration in designing units and implementation prioritization (Finney et al. 2003).		X	Arrangements of large treatment areas are more effective at reducing fire behavior than arrangements of smaller ones. Larger burn blocks, when possible, would also be mitigation for emissions by increasing the potential number of acres that could be burned in a burn window. Larger burn units would produce more smoke when prescribed fires are implemented, but for a shorter duration.
FE2	Prescribed fire (pile, broadcast, and jackpot burning) would occur in accordance with ADEQ requirements. Coordination with ADEQ would take place through the Kaibab and Coconino NF Zone Dispatch Center and the prescribed burn boss.	X		Regulatory requirement.
FE3	Emission reduction techniques (ERT) (see FE8) would be utilized when possible to minimize impacts to sensitive receptors of burn unit(s). Project design for prescribed fire and strategies for managing wildfires should incorporate as many emission reduction techniques as feasible, subject to economic, technical, and safety criteria, and land management objectives. Decision documents (which define the objectives and document line officer approval of the strategies chosen for wildfires) should identify smoke sensitive receptors, and include objectives and		X	ERTs are recommended by the ADEQ as techniques that can be effective for minimizing impacts to sensitive receptors.

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	courses of action to minimize and mitigate impacts to those receptors as feasible.			
FE4	As needed, the burning of hand piles or machine piles would occur when conditions are favorable and risk of fire spread is low. Piles would be located far enough away from residual trees and shrub patches to minimize canopy scorch or damage to ponderosa pine or large oak (>6" d.b.h.) where it is not desirable. Individual piles or groups of piles may have fire line cut around them if necessary to meet objectives.		X	Prevent undesirable impacts.
FE5	Fire line construction may consist of removing woody and/or herbaceous vegetation, removing surface fuels, pruning, or cutting breaks in fuels by hand, ATV (drag lines), or a dozer as needed; (2) fire line width would be determined as adjacent fuels and expected fire behavior dictate, as well as compliance with the requirements of cultural, wildlife, and other resource areas; (3) constructed fire lines would be rehabilitated, which may include pulling removed material back into the lines, hand constructing water diversion channels and/or water bars, laying shrubs or woody debris in the lines following burning, or other methods appropriate to the site.		X	Facilitate broadcast burns or pile burning operations.
FE6	Mechanical treatments following broadcast burns would occur after surface vegetation has recovered sufficiently to minimize impacts from the mechanical treatments (generally 1 to 3 years). Prescribed fire treatments following mechanical treatments would occur after there has been adequate surface vegetation recovery that fuel loads are sufficient to meet the objectives of a prescribed burn.		X	Minimize impacts from mechanical treatments on vegetation and soil.
FE7	Prescribed fires may be conducted before or after mechanical treatments. The sequencing of prescribed fires and mechanical treatments would be decided on a site-specific basis, depending on the site, burn windows, available resources, thinning schedules, etc.		X	Increase the flexibility for implementing both prescribed fire and mechanical treatments.
FE8	The following ADEQ ERTs would be used when practicable to minimize impacts to sensitive receptors: pre-burn fuel removal, mechanical		X	Reduce emissions from prescribed fire.

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	processing, increased burning frequency, aerial/mass ignition, high moisture in large fuels, rapid mopup, air curtain incinerators, burn before greenup, backing fire, maintain fire line intensity, underburn before litterfall, isolating fuels, concentrating fuels, mosaic/jackpot burning, moist litter and duff, burn before large activity fuels cure, and utilize piles.			
FE9	Mitigation and design features for smoke impacts include: (1) Reducing the emissions produced for a given area treated, (2) Redistributing/diluting the emissions through meteorological scheduling and by coordinating with other burners in the airshed. Dilution involves controlling the rate of emissions or scheduling for dispersion to assure tolerable concentrations of smoke in designated areas, and (3) Avoidance uses meteorological conditions when scheduling burning in order to avoid incursions of wildland fire smoke into smoke sensitive areas. Also see FE8 for ERTs.			Reduce emissions from prescribed fire.
FE10	When prescribed burns are conducted in areas with, or near known populations of invasive weeds, followup monitoring would be conducted. Also see Botany B4.		X	Detect new weed infestations before they spread.
FE 11	See Rangeland Management: R1, R4, and R5.		X	Prevent damage or loss of infrastructure.
FE12	When practicable, damage or mortality to old trees and large trees would be mitigated by implementing prescription parameters, ignition techniques, raking, wetting, thinning, compressing slash, or otherwise mitigating fire impacts to the degree necessary to meet burn objectives and minimize fire line intensity and heat per unit area in the vicinity of old trees. Trees identified as being of particular concern (e.g., trees with known nests or roosts for herons, eagles, osprey, or other raptors, occupied nest cores, or critical areas in PACs) would be managed in accordance with wildlife design features (see wildlife). Prepare old trees 1 year or more before a burn if possible.		X	Old trees and large trees are rare components and are underrepresented across the analysis area. Implementing mitigation measures when possible is a critical component of restoration on a landscape scale. Large trees that are not old are not as susceptible to damage from fire. Mitigation measures that can be implemented a year or more before a burn, such as thinning or raking, may improve the health of the tree, improving its response to fire.

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FE13	Mitigation measures and design features for wildlife species including MSO, golden eagle, bald eagle, pronghorn, northern goshawk, bats, northern leopard frog, turkey, deer, and other wildlife can be found in the wildlife section.			
FE14	Aspen, Gambel oak, pine-sage: fire effects would be managed primarily by implementing prescriptions and ignition techniques to meet objectives in pine-sage systems. In Gambel oak, avoid lighting near the bases of large oak boles.		X	To meet burn objectives.
FE15	Concerned/interested public will be given as much warning as possible in advance of prescribed burns via notices, press releases, email lists, public announcements, phone lists, or other notification methods as appropriate.		X	To provide advanced notice for publics concerned about potential impacts from emissions resulting from prescribed fires.
<b>Heritage Resources and Tribal Relations</b>				
HR/TR-1	The forest would comply with the NHPA for all ground-disturbing undertakings. Effects to cultural resources would be determined in consultation with the SHPO and other consulting parties. Potential effects would be addressed through site avoidance strategies and implementing the site protection measures listed in the Southwestern Region programmatic agreement (PA), appendix J and in the 4FRI heritage strategy and section 106 clearance report.	X		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO.
HR/TR-2	Consult with Native Americans in compliance with NHPA, AIRFA, EO 13007, EO 13175, and other applicable Executive Orders and legislation, particularly when projects and activities are planned in sites or areas of known religious or cultural significance.	X		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO.
HR/TR-3	Project undertakings would be inventoried for cultural resources and areas of Native American religious and cultural use.	X		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO.

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HR/TR-4	Eligible, or potentially eligible, cultural resources would be managed to achieve a “no effect” or “no adverse effect” determination whenever possible, in consultation with the SHPO and ACHP (36 CFR 800).	X		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO.
HR/TR-5	Monitoring during and after project implementation would occur to document site protection and condition. Also see FE5.	X		Forest plan compliance.
HR/TR-6	See Recreation and Scenery RS3 and RS5 for mitigation related to historic roads and trails.	X		Forest plan compliance.
HR-TR-7	Prior to initiating project-specific task orders, the forests would consult with federally recognized tribes to identify traditional use areas and, if necessary, develop project-specific mitigation measures to accommodate traditional use of the forest by tribal members.	X		
HR-TR-8	When areas are selected for treatment, detailed maps of the area would be presented to tribes through ongoing tribal consultation to determine if other sensitive areas of tribal importance could be potentially impacted.	X		
HR-TR-9	Treatment timing would be adjusted to coincide with seasonal plant gathering and ceremonial use.	X		
HR-TR-10	See FE 5	X		
<b>Rangeland Management</b>				
R1	Historic range monitoring sites including witness trees/posts, 1” angle iron stakes, and any other site location markers would be protected. These sites would not be excluded from treatment but care needs to be taken to avoid loss of these site markers. These sites would not be used as locations for temporary access roads, skid trails, landing areas, or large slash piles.		X	Avoid site damage.



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R2	The sale administrator would work closely with the district range staff to determine pasture use during harvest activities.		X	Avoid infrastructure damage, and retain allotment and pasture fences within a harvest area.
R3	All fences in the cutting area would be protected from harvest activities. Skid trail layout would keep equipment on one side of the fence to avoid having to cut fences. Temporary cattle guards would be installed on all haul roads where gates exist within active grazed pastures. All cattle guards on harvest haul roads would be maintained throughout hauling activities.		X	Protect infrastructure.
R4	Burning often damages/destroys wood stays and h-brace posts in existing pasture/allotment fencing. Protection of these fences is critical for implementation of planned grazing systems and is important to reduce the costs of replacing these items. Even with protection, wood stays and h-braces would be damaged by the fire. The cost of prescribed burning would include fence protection measures and replacement/reconstruction costs for burned wood stays and h-braces. Fire personnel will look at using the fence lines as burn area boundaries whenever possible to reduce these impacts.		X	Limit the numbers of pastures affected by the fires in a given year. Protect fences that are critical to the implementation of planned grazing systems and reduce the costs of replacing these items.
R5	Fire personnel would coordinate with district range staff to schedule main pasture burning to limit impacts to allotment grazing management. The general goal would be to limit burns to no more than one main grazing pasture/year/allotment in allotments with a less than, or equal to, six pasture grazing system. The general goal would be to limit burns to no more than two main grazing pastures/year/allotment in allotments with a greater than six pasture grazing system. Main pastures are pastures that are large enough to hold the allotments livestock for more than an average of 20 days per year. This is a general rule of thumb; however, each allotment has specific situations that would need to be addressed.		X	Minimize disruption to grazing.

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R6	Restrictions in grazing of livestock would primarily occur after prescribed fire in a pasture. Post-fire grazing may resume within a pasture when soil and perennial plants, that would likely be grazed, would not be permanently damaged by livestock. The range management definition for this is range readiness. Plants are ready for grazing when at least one of the following characteristics is present: (1) seed heads or flowers, (2) multiple leaves or branches, and/or (3) a root system that does not allow plants to be easily pulled from the ground. These characteristics provide evidence of plant recovery, high vigor, and reproductive ability. An estimate of this restriction is not available because each pasture and burn is unique. Climatic conditions, soils, vegetation, burn intensity, burn amount, and pasture management can vary greatly from year to year or from pasture to pasture.		X	Assessment of post-fire range readiness.
R7	The removal or exclusion of livestock water would be mitigated with alternative water sources, providing lanes to the water, or piping water to a livestock drinker.		X	Provide alternate water sources.
<b>Recreation, Trails, Scenery, and Special Areas</b>				
RS1	<b>Edges of Individual Units:</b> (a) Edges of treatment units would be shaped and/or feathered to avoid abrupt changes between treated and untreated areas; (b) where the treatment unit is adjacent to denser forest (treated or untreated), the percent of thinning within the transition zone (150–250') would be progressively reduced toward the denser edges of the unit; (c) where the treatment unit interfaces with an opening (including savanna and grassland treatments, and natural openings) the transition zone would progressively increase toward the open edges of the unit; (d) soften edges by thinning adjacent to the existing unit boundaries. Treat up to the edges; do not leave a screen of trees. Favor groups of trees complying with the prescribed treatment that visually connect with the unit's edge to avoid an abrupt and noticeable	X	X	Compliance with forest plans.

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	change; (e) treatment boundaries should extend up and over ridgelines to avoid the “mohawk” look; and (f) avoid widely spaced individual trees that are silhouetted along the skylines.																																							
RS2	<b>Unit Marking:</b> (a) Avoid using trails as boundaries and (b) avoid abrupt changes between treatment units. Use the techniques suggested for edges of treatment units (above).	X	X	Compliance with forest plans.																																				
RS3	<b>Road, Skid Trail, and Landing Construction:</b> (a) Utilize dust abatement methods during haul of logs on the following roads shown in the table during the season when dust is likely and funding is available. Coordinate with Coconino County on the application and timing of application of dust abatement on road segments that have county maintenance responsibilities: <table><tr><th>Road Number</th><th>Beginning Milepost</th><th>Ending Milepost</th><th>Segment Length</th></tr><tr><td>556</td><td>0.734</td><td>1.245</td><td>0.511</td></tr><tr><td>418</td><td>0.004</td><td>1.004</td><td>1</td></tr><tr><td>418</td><td>1.697</td><td>2.372</td><td>0.675</td></tr><tr><td>0716B</td><td>0</td><td>0.76</td><td>0.76</td></tr><tr><td>140</td><td>5.657</td><td>6.158</td><td>0.501</td></tr><tr><td>141</td><td>3.134</td><td>3.431</td><td>0.297</td></tr><tr><td>141</td><td>14.303</td><td>14.963</td><td>0.66</td></tr><tr><td>141</td><td>31.487</td><td>33.968</td><td>2.481</td></tr></table> (b) Where new temporary roads and skid trails meet a primary travel route, they should intersect at a right angle, then curve after the junction to minimize the length of route seen from the primary travel route; (c) Log landings, temporary roads, and skid trails should be minimized within sensitive viewsheds; (d) Highest emphasis would be placed on foreground (up to 300 feet) of	Road Number	Beginning Milepost	Ending Milepost	Segment Length	556	0.734	1.245	0.511	418	0.004	1.004	1	418	1.697	2.372	0.675	0716B	0	0.76	0.76	140	5.657	6.158	0.501	141	3.134	3.431	0.297	141	14.303	14.963	0.66	141	31.487	33.968	2.481	X	X	Compliance with forest plans.
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	developed recreation sites, private homes or communities, and concern level 1 roads (paved roads and passenger car level roads); (e) Log landings, skid trails, and temporary roads would be rehabilitated including restoring proper drainage and reseeding as needed with native species, and trails, especially those designated as national scenic, historic, or recreation trails; (f) GPS the log landings for post-treatment consideration for parking or dispersed camping; (g) To hasten recovery and help eliminate unauthorized motorized and nonmotorized use of skid trails and temporary roads, use physical measures such as recontouring, pulling slash and rocks across the line, placing cull logs perpendicular to the route, and disguising entrances; (h) Avoid using FS designated trails as skid trails or for temporary roads; (i) National scenic, historic, and recreation trails as well as forest system trails (motorized and nonmotorized) would not be used for temporary roads or skid trails. It is acceptable to make perpendicular trail crossings. The locations of crossings would be designated. Trail crossings would be restored to pre-project condition after use; (j) Crossing of the Arizona Trail would be done sparingly and only if no other alternative exists. These crossing locations would be coordinated with district recreation staff; and (k) Large, upright trail cairns used on Beale Wagon Road and Overland Trail must be protected. Locate cairns ahead of time. Logging operations would not damage the cairns.			
RS4	<b>Cull Logs, Stump Heights, and Slash Treatments:</b> Cull logs would not be abandoned on landings. Use cull logs for closing temporary roads and decommissioning roads. Cull logs may also be suitable to use as down woody material, but must be scattered away from the landings. <b>Stump heights</b> should be cut as low as possible, with a maximum height of 12 inches. In the foreground of sensitive roads, trails, recreation sites, private homes/communities, strive to make stump heights 6" or lower, with 12" heights as the exception, and rarely occurring. <b>Slash</b> must be	X	X	Compliance with forest plans.

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	treated or removed. In the seen area immediate foreground of sensitive places (within 300' of the centerline of concern level 1 roads or trails, or 300' from the boundary of a recreation site or private land/communities) where whole tree logging occurs, machine piling may occur to the back of log landings. If conventional logging is used and trees are delimbed and topped in the forest, machine piled slash should be placed at least 300 feet away from the centerline of roads and trails, developed recreation sites, or private land/communities. In these instances, piles should be burned as soon as possible or within 3 years. Root wads and other debris in sensitive foreground areas would be removed, buried, burned, or chipped. If materials are buried, locate in previously disturbed areas where possible. Beyond sensitive immediate foreground areas, it is acceptable to scatter these or use them to help close temporary roads or skid trail. If slash is not removed in grassland treatment areas, it is acceptable to create machine piles 300 feet away from the centerline of sensitive roads and trails, developed recreation sites, and private land/communities, and place project-generated slash outside of permitted utility line and pipeline rights-of-way; do not interfere with utility corridor management.			
RS5	<b>Fire Control Lines:</b> (1) Generally restore control lines to a near undisturbed condition in the foregrounds (within 300') of sensitive roads, trails, and developed recreation sites), (2) To hasten recovery and help eliminate unauthorized motorized and nonmotorized use of control lines in these areas, use measures such as recontouring, pulling slash and rocks across the line, and disguising entrances, and (3) Do not use motorized equipment on national scenic, historic and recreation trails, or other forest system trails if these are used for control lines. Coordinate with the district recreation staff regarding use of national trails as control lines.	X	X	Compliance with forest plans.

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RS6	Coordinate with landscape architect prior to implementing jackstraw, spring, and road restoration treatments. Also see SW37 and T8.	X	X	Maintain scenic integrity.
RS7	<p><b>Recreation and Other Trail Mitigation:</b></p> <p>a) Recreation Sites</p> <p>(i) Proposed mechanical treatments and prescribed fire adjacent to developed recreation sites must be reviewed and approved by the district ranger. Treatments may occur within Ten-X, Kaibab Lake and White Horse Lake Campgrounds. Work with the district recreation staff to determine boundaries or no treatment zones around constructed features that need to be protected in the campgrounds. Treatments around the perimeter of the campgrounds are encouraged. The timing of treatments must be worked out with districts. Treatment would generally occur in fall, winter, or spring. Activity slash must be piled in agreed upon locations, and treated as soon as possible. If campgrounds remain open into fall and winter, provide information about upcoming closures and management activities onsite, at FS offices, and FS Web sites.</p> <p>(ii) Thinning and burning is appropriate at Garland Prairie Vista and Oakhill Snowplay Area, but constructed features must be protected from damage. Work with the district recreation staff to establish boundaries to protect constructed features.</p> <p>(b) Provide public notice and information about treatment locations, timing, and the type of treatment occurring prior to and during vegetation and fire treatments.</p> <p>(i) Consider use of a hotline or link on our Web pages that would indicate closures or hazards that may be encountered, also use media and make sure frontliners are well informed</p>	X	X	Compliance with forest plans, inform public, and reduce impacts to recreational opportunities.

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	<p>about activities occurring on the districts and forests.</p> <p>(c) Place warning signs on all trail access points and along trails where treatment activities are occurring. It is also appropriate to place warning signs at developed recreation sites to inform visitors.</p> <p>(d) When mechanical treatment and burning are occurring along open trails, slash will be pulled back immediately within 100 feet of the centerline of the trail corridor.</p> <p>(e) If trails are temporarily closed due to harvesting, the trail tread will be cleared of all slash.</p> <p>(f) Character trees that have unique shape or form, and trees that define the trail corridor should be retained where feasible and should conform to the applicable prescription. Avoid lines of trees; strive to achieve a groupy appearance to avoid abrupt changes in the landscape character along the trail corridor.</p> <p>(g) Implement road closures, one-way traffic, and area closure restrictions as deemed necessary by forest officials for health and safety concerns during any operation, and</p> <p>(h) Prohibit treatment activities in specifically designated units and the forest system roads associated with these units during times of highest recreation use. The highest recreation use and associated traffic occurs during the weeks of Federal observed Memorial Day, July 4th, and Labor Day.</p>			
RS8	<p><b>In Semiprimitive NonMotorized ROS classes specifically:</b> (1) Temporary roads should not (generally) be built. If they are used, they would be restored to original conditions when projects are completed, (2) Strive to make stumps 6" or lower throughout the area, 12" stumps are the exception and rarely occur, (3) Slash must be treated or removed in these areas, and (4) Use existing barriers (roads) and natural barriers as control lines whenever possible.</p>	X		Compliance with forest plans.

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RS9	Cave and karst protection, see W40	X		
RS10	See SW21, SW37, W46, and W47 for additional fence mitigation.		X	
<b>Silviculture – See Appendix D, Implementation Plan</b>				
<b>Soils and Watershed</b>				
SW1	Implement best management practices prior to project implementation.	X		Minimize impacts to soil and water resources from project implementation, to minimize nonpoint source pollution, to adhere to the Clean Water Act, and to adhere to the intergovernmental agreement between the Southwestern Region of the Forest Service and the ADEQ.
SW2	Minimize mechanical operations when ground conditions are such that soil compaction can occur. All activities should be limited/restricted to when soils are dry or frozen. If compaction occurs, mitigate through ripping, seeding, and covering compacted areas with slash.	X		Minimize soil compaction, soil detachment, and sediment transport. To maintain long term soil productivity.
SW3	All fueling of vehicles would be done on a designated protected, upland site. If more than 1,320 of gallons of petroleum products are to be stored onsite above ground or if a single container exceeds 660 gallons, then a spill prevention control and countermeasures plan (SPCC) would be prepared as per 40 CFR 112.	X		Prevent contamination of waters from accidental spills.
SW4 has more info than BMP 4	The following applies to any personnel implementing ground-disturbing actions: Prior to moving off-road equipment onto a project area, contractor shall identify the location of the equipment's most recent operation. Contractor shall not move any off-road equipment that last operated in an area infested with one	X		Minimize the spread of nonnative species.



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	<p>or more invasive species of concern onto the sale area without having cleaned such equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds, and having notified the Forest Service, as provided in (iii). If the location of prior operation cannot be identified, then contractor shall assume that the location is infested with invasive species of concern. If the contractor has worked in areas where potential chytrid fungus could occur, contractor shall assume chytrid fungus is present and must disinfect equipment prior to work adjacent to water bodies.</p> <p>(i – intentionally omitted)</p> <p>(ii) Prior to moving off-road equipment from a cutting unit or cutting area that is shown on contract area or sale area map to be infested with invasive species of concern to, or through any other area that is shown as being free of invasive species of concern, or infested with a different invasive species, contractor shall clean such equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds and/or disinfect as necessary, and shall notify the Forest Service, as provided in (iii).</p> <p>(iii) Prior to moving any off-road equipment subject to the cleaning and disinfecting requirements set forth above, contractor, shall advise the Forest Service of its cleaning measures and make the equipment available for inspection. Forest Service shall have 2 days, excluding weekends and Federal holidays, to inspect equipment after it has been made available. After satisfactory inspection or after such 2-day period, contractor may move the equipment as planned. Equipment shall be considered clean when a visual inspection does not disclose seeds, soil, vegetative matter, and other debris that could contain or hold seeds. Contractor shall not be required to disassemble equipment unless so directed by the Forest Service after inspection.</p> <p>(iv) If contractor desires to clean off-road equipment on national forest land, such as at the end of a project or prior to moving to, or</p>			

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	through an area that is free of invasive species of concern, contractor shall obtain prior approval from contracting officer as to the location for such cleaning and measures, if any, for controlling impacts.			
SW5	If construction crews are to live onsite, then an approved camp and suitable sanitation facilities must be provided.		X	Protect surface and subsurface water from unacceptable levels of bacteria, nutrients, and chemical pollutants.
SW6	On areas to be prescribed burned, fire prescriptions should be designed to minimize soil temperatures over the entire area. High severity fire should occur on no more than 10 percent of the treatment area. Fire prescriptions should be designed so that soil and fuel moisture temperatures are such that fire severity is minimized and soil health and productivity are maintained. If containment lines are put in place, rehabilitate lines after use by either rolling berm back over the entire fire line, spreading slash across the fire line, or waterbarring the fire line. If line is only to be waterbarred, disguise the first 400' of line to discourage use as a trail.	X	X	Maintain long term soil productivity and minimize sediment delivery from containment lines.
SW7	On areas to be prescribed burned, manage for 5–7 tons per acre of CWD in ponderosa pine to maintain long term soil productivity outside of the buffers around private land. Within the pinyon-juniper cover type, snags would be managed for one per acre over 75 percent of the area and CWD would be managed for an after-treatment average of 1–3 tons per acre (Huffman personal communication 2012). Where available, a portion of the CWD would include two logs $\geq 10''$ and $\geq 10'$ in length.	X	X	Maintain long term soil productivity.
SW8	On areas to be prescribed burned, establish filter strips (also known as streamside management zones). These stream reaches would be designated as protected stream courses. The following are recommendations to protect stream courses.	X		Minimize sediment and/or ash delivery into drainages and maintain water quality.

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	<p><b>Riparian stream course:</b> Severe erosion hazard: 120' on each side of stream course. Moderate erosion hazard: 100' on each side of stream course. Slight erosion hazard: 70' on each side of stream course.</p> <p><b>Nonriparian stream course:</b> Severe erosion hazard: 100' on each side of stream course. Moderate erosion hazard: 70' on each side of stream course. Slight erosion hazard: 35' on each side of stream course. Do not ignite fuels within this buffer area. Some creep may occur into the buffer (also see SW31).</p>			
SW9	Complete all required permitting (404 permits) and water quality certification (if necessary) prior to project implementation.	X		Comply with Clean Water Act provisions.
SW10	Site rehabilitation on upland sites for stream channel and road rehabilitation projects where ground disturbance occurs: seed at 5 pounds per acre with native, certified weed-free seed mix. Potential vegetation for individual sites should utilize the Kaibab and Coconino NFs TES to identify species to be utilized. Where feasible, protect site with slash spread across the disturbed area to create microclimates and protect from grazing ungulates.	X	X	To minimize soil erosion and minimize noxious weed spread.
SW11	Site rehabilitation on upland sites for stream channel and road reconstruction projects where ground disturbance occurs: seed at 5 pounds per acre with native, certified weed-free seed mix. Potential vegetation for individual sites should utilize the Kaibab and Coconino NFs TES to identify species to be utilized. Where feasible, protect site with slash spread across the disturbed area to create microclimates and protect from grazing ungulates.	X	X	To minimize soil erosion and minimize noxious weed spread and mitigate severe erosion hazard.
SW12	Site rehabilitation on riparian sites for stream channel and road reconstruction projects where ground disturbance occurs: seed at 5 pounds per acre with certified weed-free native seed mix to	X	X	To comply with State and Federal water quality standards by minimizing soil erosion through the stabilizing influence

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	rehabilitate the site and minimize impacts of noxious weeds. Potential vegetation for individual sites should utilize the Kaibab and Coconino NFs TES to identify species to be utilized. Where feasible, protect site with a variety of methods (e.g., ungulate proof fence, spreading slash, etc.).			of vegetation ground cover. Minimize noxious weed spread.
SW13	Install silt fences and/or waddles downstream from ground-disturbing activities in stream channels to minimize the chance of sediment being lost downstream during construction and until revegetation is completed.	X		Comply with State and Federal water quality standards by minimizing soil erosion through the stabilizing influence of vegetation ground cover. Minimize noxious weed spread.
SW14	Provide site protection on newly disturbed soils (e.g., hydromulch, erosion mat, spread slash etc.) in channel restoration and road reconstruction sites on all sites as needed and where feasible.	X		To comply with State and Federal water quality standards by minimizing sediment delivery to drainages, minimize impacts on severe erosion hazard soils, to create microclimate for regeneration of grass/forb community, and minimize noxious weed spread.
SW15	Bring rock material from a local upland site to any headcut drop structures that may be installed in channel restoration projects.	X		Minimize disturbance in drainage systems and minimize sediment production within channel.
SW16	Site rehabilitation on disturbed sites and stream channel shaping on previously obliterated roads: site rehabilitation consists of several revegetation methods, such as, but not limited to: (1) Store sod removed from the initial ground disturbance and replace the sod from the top of the bank on the disturbed site; (2) Seed with a native seed mix (see BMPs above); (3) Protect site with slash spread across the disturbed area to create microclimates and protect from grazing ungulates. Slash placement would be limited to the upper two-thirds of the bank to limit transport downstream of woody material; (4) Fence out ungulates for 1 to 2 years (or until the site has reestablished); (5) consider the use of mycorrhizal	X	X	Comply with State and Federal water quality standards by minimizing soil erosion through the stabilizing influence of vegetation ground cover. Minimize noxious weed spread.

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	inoculum on severely disturbed sites where no topsoil is left; and (6) install erosion mat.			
SW17	Do not borrow road fill or embankment materials from the stream channel or meadow surface on road maintenance projects. End-load all material hauled onsite and compact fill.	X		Minimize disturbance in drainage systems and minimize sediment production within channel.
SW18	Where feasible, relocate roads out of filter strips into an upland position. If this is not feasible, use riprap or velocity checks to stabilize or disperse outfall on road maintenance projects when roads are located within filter strips.	X		Minimize sediment delivery into drainage, minimize disturbance in drainage systems, and minimize sediment production within channel.
SW19	At riparian stream reach restoration sites, restore riparian dependent grasses through (1) seeding of native species and (2) planting plugs of rushes, sedges, and spike rushes to improve success of regeneration efforts. Fence with ungulate proof fencing for 1 to 2 years (or until plants are established) if grazing is inhibiting regeneration efforts.	X		Comply with State and Federal water quality standards by minimizing soil erosion through stabilization of ground cover. Minimize noxious weed spread.
SW20	On areas that have had roads previously obliterated and the remaining roadbed will be removed, add slash/or erosion mat and seed to the disturbed areas.	X		Add surface roughness a to comply with State and Federal water quality standards by minimizing soil erosion through stabilization of ground cover and to diminish the impact of the first rain event and to speed recovery of the site.
SW21	At spring restoration sites, restore riparian dependent species through (1) seeding of native species and (2) planting plugs/cuttings of native plants to improve success of regeneration efforts. Fence with ungulate proof fencing for 1 to 2 years (or until plants are established) if grazing is inhibiting regeneration efforts. See W46 and W47 for additional fence mitigation.	X		Comply with State and Federal water quality standards by minimizing soil erosion through stabilization of ground cover. Minimize noxious weed spread.

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SW22	Do not blade roads when the road surface is too dry. If the road surface is too dry, a water truck can apply water or the project can be scheduled for when adequate moisture occurs to complete the project.	X		Minimize sediment detachment and to minimize impacts on severe erosion soils.
SW23	In grassland restoration sites, limit skidding and designate skid trails if wood is to be removed. Where material is not to be removed, do not skid logs in meadows, and lop and scatter is the preferred method of treating slash. Do not machine pile within meadows. If skidding has to occur across a riparian or nonriparian stream course, designate any crossing prior to skidding.	X		Minimize impacts to streams and soils in meadows from tree harvesting operations.
SW24	Skid trails and obliterated roads would have slash placed on the trail or cross-ditched (waterbarred) to break the energy flow of water. Placing slash on skid trails is the preferred method to dissipate the energy flow of water. Waterbars are only to be implemented with equipment with an articulating blade (no skidders) or by hand.	X		Minimize soil erosion and maintain soil productivity. Minimize impacts on severe erosion soils.
SW25	Landing locations will be in upland positions out of meadows and riparian and nonriparian filter strips.	X		Minimize sediment delivery into drainage and minimize impacts on severe erosion soils.
SW26	Mechanical harvest or mechanical fuel treatment are only allowed on cinder cones greater than 25 percent slope with designated skid trails and slash mats placed on the skid trails. On other sites, mechanized harvesting can occur up to 40 percent slopes.	X - Coconino NF only		Maintain long term soil productivity on slopes with severe erosion hazard potential.
SW27	Designated skid trails and log landings would be required within the Integrated Resource Service Contract (IRCS) (BMP 24.18 in FSH 2509.22) on all cutting units. Skid trail design should not have long, straight skid trails that would direct waterflow. Skid trails should also be located out of filter strips (exceptions are at approved crossings).	X		Minimize the number of acres disturbed and minimize impacts on severe erosion soils.

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SW28	Felling to the lead would be required within the IRSC to minimize ground disturbance from skidding operations (BMP 24.18).	X		Felling of timber should be done to minimize ground disturbance from skidding operations and to minimize impacts on severe erosion soils.
SW29	The IRSC outlines the timing and application of erosion control methods to minimize soil loss and sedimentation of stream courses. Seed mix can include any of the following certified weed-free native species at a minimum of 5 pounds per acre pure live seed. Potential vegetation for individual sites should utilize the Kaibab and Coconino NFs' TES to identify species to be utilized. Corresponding BMPs from FSH 2509.22 to minimize soil loss and sedimentation include 24.13, 24.21, 24.22, 24.23, 24.24, and 24.25. The preferred erosion control method on the skid trails in the harvest areas would be by spreading slash. Other acceptable erosion control measures include, but are not limited to, waterbarring (waterbars should not be more than 2' deep and need at least a 10' leadout). Waterbars are only to be implemented with equipment with an articulating blade (no skidders) or by hand to remove berms, seed, mulch, and cross-rip. Erosion control after skidding operations must be timely to minimize the effects of log skidding.	X		Minimize soil loss and sedimentation of stream courses from skidding operations. Minimize noxious weed spread and reestablish native vegetation. Minimize impacts on severe erosion soils.
SW30	Road drainage is controlled by a variety of methods (BMP 41.14) including rolling the grade, insloping, outsloping, crowning, water spreading ditches, and contour trenching. Sediment loads at drainage structures can be reduced by installing sediment filters, rock and vegetative energy dissipaters, and settling ponds. Design of roads is included in the transportation plan of the IRSC and T-specs.	X		Minimize soil movement, maintain water quality, and minimize impacts on severe erosion soils.
SW31	Road maintenance (BMP 41.25) through the IRSC should require pre-haul and post-haul maintenance on all roads to be used for haul.	X		To minimize soil movement, maintain water quality, and to minimize impacts on severe erosion soils.

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SW32	<p>The designation of filter strips (also known as streamside management zones) minimizes onsite soil movement from timber harvest activities along stream courses (BMP 24.16). These stream reaches will be designated as protected stream courses.</p> <p>Locations of protected stream courses are included in the individual task order maps and will be designated with a protected stream course designation. The following are recommendations to protect stream courses within the proposed tree harvest units in relation to riparian and nonriparian stream courses. The guidelines for filter strip designation are as follows:</p> <p><b>Riparian stream course:</b>            Severe erosion hazard: 120' on each side of stream course.            Moderate erosion hazard: 100' on each side of stream course.            Slight erosion hazard: 70' on each side of stream course.</p> <p><b>Nonriparian stream course:</b>            Severe erosion hazard: 100' on each side of stream course.            Moderate erosion hazard: 70' on each side of stream course.            Slight erosion hazard: 35' on each side of stream course.</p> <p>Accepted harvest activities within riparian and nonriparian filter strips include mechanical and conventional tree felling and limited skidding on designated skid trails and not across stream courses. Landings, decking areas, machine piles, and roads (except at designated crossings) are planned outside of riparian and nonriparian filter strips.</p>	X		Filter sediment and/or providing bank stability on all stream courses and to minimize impacts on severe erosion soils. To implement the Oak Creek E. Coli TMDL and Lake Mary Region Mercury TMDL and to filter sediment and/or provide bank stability.
SW33	Manage for 5–7 tons of CWD per acre in ponderosa pine.	X		Promote long term soil productivity.
SW34	Mechanical crushing of lopped slash can only occur on 0–25 percent slopes.	X		Incorporate slash into the soil to promote long term soil productivity.



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SW35	Identify landings, staging area for heavy equipment, and sites for any in-woods processing sites outside of filter strips and meadows. Sites would be rehabilitated after use by methods such as, but not limited to: (1) ripping to remove compaction, (2) seeding with certified weed-free native seed to 5 pounds per acre. Potential vegetation for individual sites should utilize the Kaibab and Coconino NFs' TES to identify species to be utilized, and (3) spreading of slash to disguise the site and provide for a mulch for seeds.	X		Minimize and mitigate impacts from activities that compact sites, restore long term soil productivity, and minimize impacts on severe erosion soils.
SW36	<p>The TSC outlines the timing and application of erosion control methods in BT6.31, BT6.6, BT6.63, BT6.64, BT6.65, CT6.6, CT6.601, and CT6.602 to minimize soil loss and sedimentation of stream courses. Seed mix can include any of the following certified weed-free native species at a minimum of 5 pounds per acre pure live seed:</p> <ul style="list-style-type: none"> <li>• Arizona fescue (<i>Festuca arizonica</i>)</li> <li>• Screwleaf muhly (<i>Muhlenbergia virescens</i>)</li> <li>• Western wheatgrass (<i>Elymus smithii</i>)</li> <li>• Mountain muhly (<i>Muhlenbergia montana</i>)</li> <li>• Purple geranium (<i>Geranium caespitosum</i>)</li> <li>• Western yarrow (<i>Achillea millefolium</i>)</li> <li>• Pussytoes (<i>Antennaria marginata</i>)</li> <li>• Arizona peavine (<i>Lathyrus arizonicus</i>)</li> <li>• Fringed sagebrush (<i>Artemisia frigida</i>)</li> </ul> <p>The seed mix can contain a mixture of all or some of these suggested species, but should not contain all of these species and should include at least one grass species. The seed mix depends on the availability of these species.</p> <p>Corresponding BMPs to minimize soil loss and sedimentation of streamcourses include 24.13, 24.21, 24.22, 24.23, 24.24, and</p>			Minimize soil loss and sedimentation of stream courses from skidding operations. Minimize noxious weed spread and reestablish native vegetation.

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	24.25. Erosion control on the skid trails in the harvest areas would be by spreading slash. Other acceptable erosion control measures include, but are not limited to, waterbarring (waterbars should not be more than 2' deep and need at least a 10' leadout). Waterbars are only to be implemented with equipment with an articulating blade (no skidders) or by hand. Erosion control after skidding operations must be timely to minimize the effects of log skidding.			
SW37	For spring restoration actions, no decking or piling of material within 100' of spring source or outflow would occur. Protect Bebb's willow from prescribed burn (if it occurs). Design any fencing to minimize impacts to wildlife (including avian species) and provide bats and other desirable wildlife passage; mitigate any cultural resource concerns through avoidance of sites; prevent the spread of noxious weeds through any management activities by prescribing equipment cleaning; prevent chytrid fungus spread at spring sites by prescribing chytrid prevention methodologies. Work with landscape architect to design structures that reduce impacts to scenic quality. See W42, W43, W46, and W47 for additional fence mitigation.	X	X	Minimize and mitigate impacts from activities.
Transportation				
T1	Utilize accepted engineering practices and manual direction for maintenance and reconstruction practices.	X		Maintain a safe and economic road system.
T2	Coordinate any road use in association with the El Paso and Transwestern High-Pressure Natural Gas pipelines. Hauling can occur at designated crossings with sufficient pad material. No hauling is proposed down these gas pipelines on Forest Roads 160, 796, 6796, 09007P, 09008P, 09228D, 09229Y, and 09231Q.		X	Prevent damage to high-pressure gas pipelines.
T3	On areas to be prescribed burned, if decommissioned roads are to be used as fire lines, return decommissioned roads to that condition post-burning. Rehabilitation of the surface should refer			Discourage use on previously decommissioned roads and maintain a safe and economic road system.

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	to the soil and water BMPs for rehabilitation of fire lines and disturbed areas.			
T4	Utilize road safety signage with any project road activities that are related to project implementation.			Provide for user safety.
T5	See SW22			
T6	Utilize the closest material source that has the specified material type for all road maintenance/reconstruction/relocation to projects.			Minimize energy use for road maintenance/reconstruction/relocation activities.
T7	Road maintenance through the timber sale contract or stewardship contract should require pre-haul and post-haul maintenance on all roads to be used for haul.			Provide for a safe travel surface and provide for access to the project area.
T8	Utilize mitigation measures for soil and water, recreation, cultural resources, timber/silviculture, wildlife and botany/noxious weeds in project design to minimize resource impacts from the transportation system. Work with landscape architect to design structures that reduce impacts to scenic quality.			Minimize resource impacts from the transportation system.
<b>Wildlife</b>				
W1	Bald eagle winter concentration areas, retain the tallest snags >18" d.b.h.	X		Bald eagle winter concentration areas.
W2	No vegetation treatments would occur within a buffer up to ½ mile (2,500 ft.), unless mitigated by topography, of an occupied bald or golden eagle nest between March 1 and August 31 (there are 3 bald eagle nests and 19 golden eagle nests within a ½ mile of the project analysis area). Other project activities will be assessed by the district biologist and limited activities may be acceptable.	X		Bald or golden eagle nests.

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W3	No mechanical treatments would occur within a 300' radius of bald eagle nest trees (there are three bald eagle nests within 300' of the project boundary).	X		Bald eagle nest trees.
W4	No project activities would occur within 500' of confirmed bald eagle communal roosts from October 15–April 15. There are currently 19 confirmed roosts in the project area.	X		Bald eagle communal roost sites.
W5	Raptor nests located during project surveys would be monitored prior to project activities. Known nest trees for any raptor species would be prepped prior to prescribed burning. Buffers will be provided if nests are active.	X		Raptor nests.
W6	Burn plans within subunits 1-1, 1-3, 3-5, and 5-2 would be coordinated with the district wildlife biologist to insure nesting eagles will not be adversely impacted from smoke.		X	Bald and gold eagle nest sites.
W7	Forest plan direction would be followed for buffers surrounding raptor nests. Currently, that includes a no mechanical treatment buffer of 10 acres around occupied sharp-shinned hawk nests.	X		Sharp-shinned hawk nests.
W8	Forest plan direction would be followed for buffers surrounding raptor nests. Currently, that includes a no mechanical treatment buffer of 15 acres around occupied Cooper's hawk nests.	X		Cooper's hawk.
W9	Forest plan direction would be followed for buffers surrounding raptor nests. Currently, that includes a no mechanical treatment buffer of 20 acres around osprey nest sites (occupied or unoccupied). Use site specific analysis to determine no-treatment zone around nest site and all logging activities will be restricted within ¼ mile of active nests from March 1–August 15.	X		Osprey.
W10	Forest plan direction would be followed for buffers surrounding raptor nests. Currently, that includes a 50' no-treatment buffer around other occupied raptors nests.	X		Other raptors.

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W11	Great blue herons – no dominant or codominant trees would be cut in rookeries. Known sites would be prepped prior to prescribed burning, fire can enter roosts but do not ignite within roost stands. Timing would avoid mechanical tree harvest while birds are in the nest. Activities will be coordinated with the local biologist.	X		Great blue heron.
W12	See appendix D, sections A-B, for MSO habitat design features.	X		
W13	MSO surveys in the project area the year of implementation or 1 year prior to determine if new areas are occupied by owls.	X		MSO restricted and protected habitat.
W14	Pre- and post-treatment habitat monitoring would occur as specified in the MSO recovery plan.	X		MSO restricted and protected habitat.
W15	Spring restoration inside PACs would not occur during the breeding season (March 1–August 31) if occupied in Rocktop, Sawmill Spring, Red Raspberry, and Weimer Spring PACs (i.e., 4 out of 78 proposed spring restoration sites).	X		MSO protected activity centers.
W16	Ephemeral stream restoration would not occur inside PACs during the breeding season (March 1–August 31) if occupied in Bear Seep, Clark, Holdup, Coulter Ridge, and Meadow Tank MSO PACs.	X		MSO protected activity centers.
W17	Road construction, obliteration, relocation, and maintenance would not occur inside PACs during the breeding season (March 1–August 31) if occupied.	X		MSO protected activity centers.
W18	No treatments would occur in PACs within a ¼ mile of core area (potentially adjusted by topography) during the breeding season (March 1–August 31) if occupied.	X		MSO protected activity centers.
W19	Hauling would not occur within PACs during the breeding season (March 1–August 31) except where specific analysis has documented that impacts would not lead to adverse effects.	X		MSO protected activity centers.

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W20	No new wire fencing would be constructed in PACs. Other alternatives would be used for aspen, seep, spring, and ephemeral drainage restoration enclosures. Alternatives would be coordinated with other specialists. If suitable alternatives cannot be identified, restoration work would be postponed.		X	MSO protected activity centers.
W21	Coordinate burning spatially and temporally to limit smoke impacts to nesting owls, particularly for PACs with nests in draws and canyons (effective March 1–August 31).	X		MSO protected activity centers.
W22	Fire line associated with preventing fire from entering PACs and/or core areas would be constructed outside the nesting season (alternatives B and C).		X	MSO protected activity centers.
W23	Implementation would be phased in across the landscape so that not all MSO Habitat would be treated in 1 year.	X		MSO habitat.
W24	Prescribed burn plans would be designed and implemented to minimize smoke impacts to nesting birds and minimize loss of nest trees.	X		Goshawk nest stands.
W25	Not all harvest activities would occur in occupied PFAs during the breeding season. However, work could potentially occur on a case-by-case basis through coordination with the district biologist if pre-treatment surveys determine they are not occupied.	X		Goshawk PFAs.
W26	Spring and ephemeral drainage restoration projects would not occur in the Barney Spring, Tree Spring, Schultz Pass, Squaw, Marteen, Coxcombs, Pumphouse, Walnut, Faye, Marshall Mesa, Newman, Cherry Canyon, and Monument 36 PFAs during the breeding season (March 1–September 30) if occupied. However, work could potentially occur on a case-by-case basis through coordination with the district biologist if pre-treatment surveys have determined they are not occupied or impacts will not affect nesting birds.	X		Goshawk PFAs.

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W27	Logging trucks would not exceed 25 m.p.h. when traveling through PFAs during the nesting season (March 1–September 30).		X	Goshawk PFAs.
W28	Road construction, obliteration, relocation, and maintenance would not occur inside PFAs during the breeding season (March 1– September 30) if occupied.		X	Goshawk PFAs.
W29	Because of declining trends in populations, defer logging activities between May 15 and August 31 in fawning habitat as identified by the ADGF.	X		Deer habitat.
W30	Avoid thinning and burning within the known pronghorn travelway on the Williams RD during the first major snowfall of a given year to allow for seasonal migration.		X	Pronghorn habitat.
W31	Do not create interspaces and openings where hiding cover exists near dependable waters identified by the ADGF (e.g., stock tanks, lakes, and riparian stream reaches) and through implementation of watershed BMPs.		X	General.
W32	Protect snags and logs wherever possible through site prep, implementation planning, and ignition techniques to retain snags >18" d.b.h. and ≥ three logs with >12" mid-point diameter. Do not directly ignite snags. In general, manage for 5 to 7 tons of CWD and at least three logs per acre except in areas with identified WUI treatments.	X		General.
W33	Protect snags and logs wherever possible by placing landings in existing openings or in areas where snags and/or logs and old trees would be minimally impacted.		X	General.
W34	Retain trees with dead tops, cavities, and lightning strikes wherever possible to provide cavity nesting/foraging habitat (i.e., the living dead).		X	General.

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W35	Emphasize retention of snags exhibiting loose bark to provide habitat for roosting bats.		X	Bat habitat.
W36	No thinning or direct ignition within ¼-mile distance from tanks or designated along logical topographic breaks. (See the wildlife report for a list of location/sites within ¼-mile buffers). The district wildlife biologist may work with implementation teams to determine the habitat protection buffer boundary.	X		Northern leopard frog designated occupied/ critical breeding sites (six sites).
W37	Seasonal restrictions (April 15–September 15) for all proposed activities would be implemented within a 200' buffer (or along logical topographic breaks) at all designated important water sites (i.e., 10 sites in RU 1) (see wildlife report for a list of locations and sites). The district wildlife biologist may work with implementation teams to determine the habitat protection buffer boundary.	X		Northern leopard frog potential breeding sites.
W38	In subunits 1-2, 1-4, 1-5, and 1-6, a 200' protection zone (100' either side of the stream) would be established around designated stream courses (see northern leopard frog travel linkage zone in within subunits 1-2, 1-4 and 1-5 in wildlife report for more details). There would be no thinning and no direct ignition of prescribed burning within the protection zones. Designated skid trail crossings through the buffer zone are allowed. Fall burning and burn plans should be coordinated with district wildlife biologists.	X		Northern leopard frog dispersal habitat.
W39	Mechanized equipment would avoid wetted soils in northern leopard frog habitat unless decontamination practices for Chytrid are employed first.		X	Northern leopard frog designated, potential, and dispersal habitat.
W40	A 300' no mechanical treatment buffer would be designated around cave entrances and sink hole rims (i.e., karst) to protect cave ecosystems from siltation, protect human health and safety, and reduce potential disturbance to roosting bats. Existing roads	X		Protect bat habitat: caves, karst, and sink holes.



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	could be used for mechanical harvest but no new skid trails would be created. The intent is to avoid changing the cave/karst microclimate, (including altering vegetation near the inside and outside of the entrance/rim) and hydrology while reducing surface fuels. Ignition and other prescribed fire techniques would maintain existing vegetation patterns and forest plan guidance for snags and logs while reducing fuel loads and protecting cave and karst ecosystems from post-treatment sediment deposition.			
W41	Prairie dog surveys would be completed prior to mechanical treatment in documented prairie dog towns within treatment areas to determine if towns are active. If active towns form a large enough complex to support ferrets, black-footed ferret surveys would be completed prior to implementation within prairie dog towns. Coordinate with local biologists.	ESA		Black footed ferret; prairie dog towns.
W42	Attach bird flight diverters (as provided by ADGF) to exclosure fencing around springs, channels, and aspen stands to avoid wildlife collisions.		X	General.
W43	Avoid fence (i.e., exclosure) construction in PACs and PFAs during the respective breeding seasons (March 1–August 31 and March 1–September 30).		X	General.
W44	All stands included in the proposed mechanical treatments for 18 MSO PACs would be marked for harvest by hand and marking would be coordinated with the FWS.		X	
W45	In MSO restricted and protected habitat, trees greater than 24” would not be cut.	X		

Design Criteria No.	Description	Purpose		
		Forest Plan Compliance	Specialist Recommendation	Comment or Purpose
W46	Fences should be designed, modified, or removed to minimize impacts on wildlife movement. For example, road right-of-way fences should be located 1/8 mile from roads, and lay-down fences, etc., should be designed to minimize restriction to pronghorn movement.		X	Provides consistency with draft Coconino NF forest plan.
W47	Construction of additional fences should be minimal. Fence maintenance should be prioritized in threatened, endangered, and sensitive species habitat and important movement corridors, and should occur as needed. Fences that are no longer needed should be removed.		X	Provides consistency with draft Coconino NF forest plan.
W48	“Snags would be managed for at least two per acre $\geq 18$ inches, CWD would be managed for 5 to 7 tons per acre, and downed logs would be managed for at least three per acre $\geq 12$ inches.”		X	Provides consistency forest plans.
W49	Contractors will be advised of the possibility of California condors in the project area. Should a condor land near project activities, contractors will be instructed not to haze condors.	X		The mitigation measures (W-51 to W-55) for condor were developed and recommended by the Arizona condor working group. Although not specifically written as presented, the measures meet the intent in the Coconino and Kaibab NFs forest plans of recovering listed species.
W50	All contractors would be instructed to avoid interacting with condors and to immediately contact the appropriate FS personnel if occurs in the project area. Sighting locations will be forwarded to the Peregrine Fund and the FWS.	X		
W51	Any project activity that may cause imminent harm to condors will temporarily cease until permitted personnel determine the correct course of action.	X		

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W52	Project-related work areas will be kept clean (e.g., trash disposed of, scrap materials picked-up, etc.) in order to minimize the possibility of condors accessing inappropriate materials. The FS will complete site visits to ensure cleanup is adequate.	X		
W53	A hazardous material spill plan will be developed and implemented with details on how each hazardous substance will be treated in case of leaks or spills.	X		
W54	Pesticide use will follow the guidelines for California condors as described in the April 2007 Recommended Protection Measures for Pesticide Applications in Region 2 of the FWS.	X		

