

Appendix C – Design Features, Best Management Practices, and Mitigation with Errata and Objection Resolution Modifications

Design features, best management practices (BMPs), and mitigation that are common to the selected alternative are presented for each resource with one exception. Silviculture design features can be found in Appendix D – Implementation Plan.

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Table 110. Selected alternative design features, best management practices, and mitigation

Design Criteria Number	Description	Purpose		Comment or Purpose
		Forest Plan Compliance	Specialist Recommendation	
Aquatics				
A1	See Soil and Water: SW1 to SW 43			
Botany				
B1	Follow forest plan direction for special areas including botanical 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.
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).

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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 U.S. Fish and Wildlife Service 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		Forest plan compliance.
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 in enclosures. Incorporates buffer strips along drainages. See soil and water SW8.	X		Protects populations and habitat of Southwestern Region sensitive plants. Protects sneezeweed since it grows in ephemeral stream courses, springs, ponds, stock tanks, and meadows.

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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 fires/burn to promote native species, hinder weed species germination, use as an aid to control of existing weed infestations, and to prevent the spread of existing weeds.	X		Promote healthy native plant communities and reduces the risk of noxious or invasive weed invasions.
B14	Review watershed BMPs for project area and incorporate mitigations for Arizona sneezeweed into BMPs.		X	Watershed BMPs often serve as good mitigations for Arizona sneezeweed since it grows in ephemeral stream courses, springs, ponds, stock tanks and meadows.
B15	Review various sites such as spring restoration for opportunities to introduce and restore Bebb’s willow to supplement existing locations on the forest and introduce young plants into areas where plants are decadent and dying. Bebb’s willow stands would be enhanced by using cuttings, planting locally cultivated plants, and fencing existing or newly planted willows. Manual grubbing of grasses may be used to increase the likelihood of planting success. 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.		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	X		Provides guidance and mitigation for noxious or invasive weeds and complies with amendment 20 of the Coconino NF forest plan.

Appendix C – Design Features, BMPs, and Mitigation with Errata and Objection Resolution Modifications

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	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.			
B16	Treat weed infestations within treatment units before implementing treatments.	X		Forest plan direction Amendment 20 Coconino National Forest Plan.
B17	Monitor slash pile sites after burning and control noxious or invasive weeds.	X		Controls weeds, reduces risk of invasion and reduces risk to native species by reducing weed competition.
B18	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.	X		Mitigates effects of management actions on existing and potential noxious or invasive weed infestations, Forest plan direction is complementary to Timber Sale Contract Clause CT WO-C/CT 6. 36 and watershed best management practices.
B19	Review Timber Sale contract clauses for vehicle cleaning and incorporate appropriate clauses.	X		Complementary to B18.
B20	Incorporate the Best Management Practices for noxious or invasive weeds as listed in appendix B of the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds into all management actions. See appendix F of the botany report.	X		Required by the forest plan (Amendment 20 of the Coconino National Forest Plan.
B21	Monitor the effects of treatment on Region 3 sensitive plants after treatments are completed.	X		Provides opportunities to obtain knowledge on local species that are often poorly understood. Allows for adaptive management in future treatments.

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B22	<p>Timing of prescribed fire and herbicide application in areas with leafy spurge will be determined by the District Fuels Specialist and District Weeds Coordinator at the time of implementation. The most successful herbicide treatments for populations of leafy spurge on the Coconino National Forest have been in the fall.</p> <p>However, the logistics of treating plants with herbicide in the fall after burning may be difficult. The above ground portions of the plants will be absent and resources would have been drawn into the underground storage structures of the plants. A spring herbicide treatment following a fall burn may be necessary to address help facilitate control but this issue will be addressed on a site specific basis.</p>		X	Allows prescribed fire to occur in our near existing populations of leafy spurge while providing for control of it. Allows on the ground, site-specific assessment and coordination of the prescribed fire and control of leafy spurge on a site-specific basis.
B23	<p>Fire should be excluded from leafy spurge areas where biological control insects for leafy spurge are active during the summer months generally from mid-May to August, except if monitoring and surveys fail to detect the presence of the biological control insects. Prescribed fire may be implemented during that time if the insects are absent from the site and there are no other resource concerns. Monitoring prior to implementation would be needed to confirm the presence/absence of the insects.</p>		X	Protects the financial investment and potential control provided by the biological control insects that have been released in the past and may be released in the future while allowing prescribed fire to be implemented in the affected areas.
B24	<p>Incorporate surveys for rare and endemic plants into surveys for Region 3 sensitive plants and/or noxious or invasive weeds prior to implementation. Survey needs will be dependent on known or potential occurrences in the treatment areas.</p>	X		Addresses the desired conditions for rare or endemic species in the Kaibab NF Plan (2014) and the Coconino NF plan (in revision).
B25	<p>Apply mitigations B2 through B 8 and B10 through B12 and B14 as needed to address the effects to rare and endemic plant species.</p>	X		Addresses management effects to rare and endemic species as well as to Region 3 sensitive plants.
B26	<p>Consult the Rare Plant Guidebook) in preparation) (if available) at the time of implementation.</p>		X	Guidebook is designed to provide identification aids, potential habitat information and potential risks to species for analysis and implementation.

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Fire Ecology				
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 Arizona Department of Environmental Quality (ADEQ) requirements.	X		Regulatory requirement.
FE3	Emission reduction techniques (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 courses of action to minimize and mitigate impacts to those receptors as feasible.		X	Emission reduction techniques are recommended by the ADEQ as techniques that can be effective for minimizing impacts to sensitive receptors.
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 (greater than 6 inch d.b.h.) where it is not desirable. Individual piles or groups of piles may have fireline cut around them if necessary to meet objectives.		X	Prevent undesirable impacts.

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FE5	Firelines would be used to facilitate broadcast burns or pile burning operations as needed: (1) Firelines may consist of natural barriers, roads and trails, or may be constructed as needed. 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) Fireline width would be determined as adjacent fuels and expected fire behavior dictate, assuming compliance with the requirements of cultural, wildlife, and other resource areas, (3) Constructed firelines 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, and (4) Fireline construction would be coordinated with wildlife and heritage.		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 emissions reduction techniques (ERTs) would be used when practicable to minimize impacts to sensitive receptors: pre-burn fuel removal, mechanical processing, increased burning frequency, aerial/ mass ignition, high moisture in large fuels, rapid mop-up, air curtain incinerators, burn before green-up, backing fire, maintain fireline intensity, underburn before litterfall, isolating fuels, concentrating fuels, mosaic/jackpot burning, moist litter and duff, burn before large activity fuels cure, and utilize piles.		X	Reduce emissions from prescribed fire.

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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.	X	X	See FE 9.
FE10	When prescribed burns are conducted in areas with, or near known populations of invasive weeds, follow-up 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 fireline 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 roots 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 are rare components and are under-represented across the project 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.
FE13	Mitigation measures and design features for wildlife species including Mexican spotted owl, golden eagle, bald eagle, pronghorn, northern goshawk, bats, northern leopard frog, turkey, deer, and other wildlife can be found in the wildlife section.	X		Forest plan compliance.

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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.
FE16	Range and fire managers will coordinate grazing schedules and prescribed fires on allotments within burn units to ensure there is sufficient surface fuel to allow burn objectives to be met. If grazing cannot cease long enough for sufficient fuel to build up to meet objectives, planned prescribed fires will be postponed until there can be sufficient fuel to meet objectives.		X	To improve the ability of prescribed fire managers to meet objectives when implementing prescribed fires.
FE17	Coarse woody debris will be managed to achieve forest plan direction, though it may take more than one entry when the current conditions are deficit (i.e. are below forest plan guidelines). KNF: 1 – 5 tons per acre in wildland-urban interface unless there are conflicts with other resource needs. (Refer to KNF revised forest plan page 98). Other areas in ponderosa pine on the KNF 3 – 10 tons per acre. CNF: 5 – 7 tons per acre in ponderosa pine.	X		To provide levels of coarse woody debris to address the need for habitat (cover), soils (organic material and limited areas of high burn severity), and fire (limited areas of high burn severity and a high resistance to control).
Heritage Resources and Tribal Relations				
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.

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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.
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 and during the heritage analysis for -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		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO. Forest plan compliance.
HR-TR-8	Fuels and other treatment timing would be adjusted as possible to avoid seasonal plant gathering and ceremonial use.	X		Continued coordination with tribes during implementation.
HR-TR-9	See FE 5			
HR-TR-10	In accordance with regulations (43 CFR 10) governing application of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), if human remains, funerary objects, sacred objects, or objects of cultural patrimony are inadvertently encountered, operations in the area must immediately cease and the Forest Archaeologist notified. The Forest Archaeologist will work to initiate consultation with the affected tribe (s) to implement any requirements listed in NAGPRA and the PA and develop a plan to mitigate for the effects to the find.	X		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO. Forest plan compliance.

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HR-TR 11	Should any previously unidentified cultural materials be discovered during project implementation, work must cease immediately and the Forest Archaeologist must be contacted to initiate the consultation process as outlined in the Advisory Council on Historic Preservation Regulations (36 CFR Part 800.13).	X		Regulatory requirement. Compliance with NHPA and Southwestern Region PA with AZ SHPO. Forest plan compliance.
Rangeland Management				
R1	Historic range monitoring sites including witness trees/posts, 1inch 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.
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.

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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.		X	Minimize disruption to grazing.
R6	Burns would be restricted 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 allotment’s 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.
R7	Restrictions in grazing of livestock will occur after significant burns in pastures. Livestock pasture rest after ground disturbing treatments (i.e. thinning, seeding, and aspen treatments) may occur. Line officers will evaluate annual range readiness monitoring (at a minimum) to determine when grazing may resume within a pasture. Grazing regimes may need to be altered based on ground conditions after treatments. Livestock use after treatments will be carefully and actively managed. The range management definition for range readiness is: 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. Other factors evaluated may include forage production, precipitation and fuel loading. An estimate of this restriction is not available because of each pasture’s response to ground disturbing treatments (including vegetation and prescribed fire) is unique. Climatic conditions, soils, vegetation, the severity of fire effects, burn amount, intensity of vegetation treatments and pasture management may vary greatly from year to year or from pasture to pasture.		X	Post ground-disturbing treatment assessment of range readiness.

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R8	Range, silviculture and fire managers will coordinate grazing schedules with vegetation and prescribed fire treatments that will occur on allotments (and within burn units) to ensure there is sufficient surface fuel to allow burn objectives to be met. Planned vegetation treatments and prescribed fires will be postponed until there can be sufficient fuel to meet objectives.		X	Post ground-disturbing treatment assessment of range readiness.
R9	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.
R10	Range readiness monitoring will be included in the appendix D implementation plan checklist. Annual monitoring typically includes measures for forage production, precipitation, forage utilization, livestock numbers, and livestock season of use. Condition and trend monitoring every 5 to 10 years measures plant canopy cover, plant frequency, and ground cover. By requiring inclusion of all design features and mitigation, appendix E, the biophysical and social monitoring and adaptive management plan, includes grazing-related monitoring.		X	To ensure range readiness is part of the annual compliance process.
Recreation, Trails, Scenery, and Special Areas				
RS1	Edges of Individual Units: (a) Edges of treatment units would be shaped or feathered (create gentle transitions from more to fewer trees or fewer to more trees) to avoid abrupt changes between treated and untreated areas; (b) where treatment unit is adjacent to denser forest (treated or untreated), the percent of thinning within the transition zone (150–250 feet) would be progressively reduced toward denser edges of the unit; (c) where treatment unit interfaces with an opening (including savanna and grassland treatments, and natural openings) the transition zone would progressively increase toward open edges of the unit; (d) soften edges by thinning adjacent to the existing unit boundaries. Treat up to edges; do not leave a screen of trees. Favor groups of trees complying with prescribed treatments that visually connect with the unit’s edge to avoid an abrupt and noticeable change; (e) treatment boundaries should extend up and over ridgelines to avoid “Mohawk” look; and (f) avoid widely spaced individual trees silhouetted along the skylines.	X	X	Compliance with forest plans.

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RS2	Unit Marking: (a) Avoid using trails as boundaries and (b) avoid abrupt changes between treatment units. Use the techniques suggested for edges of treatment units (above). Where feasible strive to have the minimal marking of trees within the Arizona Trail corridor.	X	X	Compliance with forest plans.																																				
RS3	<p>Road, Skid Trail, and Landing Construction: (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:</p> <table border="1" data-bbox="380 662 1020 1045"> <thead> <tr> <th>Road Number</th> <th>Beginning Milepost</th> <th>Ending Milepost</th> <th>Segment Length</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>(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 seem from the primary travel route; (c) Log landings, temporary roads, and skid trails should be minimized within sensitive viewsheds such as those next to developed recreation sites, private homes or communities, paved and passenger car level roads and trails; (d) Highest emphasis for slash treatment, temporary road closures and road decommissioning will be placed on foreground (up to 300 feet) of developed recreation sites, private homes or communities, and concern level 1 roads (paved roads and passenger car level roads) and trails, especially those designated</p>	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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	<p>as national scenic, historic or recreation trails; (e) Log landings, skid trails and temporary roads will be rehabilitated including restoring proper drainage, and reseeding as needed with native species; (f) To hasten recovery and help eliminate unauthorized motorized and non-motorized use of skid trails and temporary roads, use physical measures such as re-contouring, pulling slash and rocks across the line, placing cull logs perpendicular to the route, and disguising entrances, (g) Avoid using FS designated trails as skid trails or for temporary roads, (h) National Scenic, Historic, and Recreation Trails as well as forest system trails (motorized and non-motorized) will not be used for temporary roads or skid trails. It is acceptable to make perpendicular trail crossings. The locations of crossings will be designated. Trail crossings will be restored to pre-project condition after use, (i) Crossing of the Arizona Trail will be done sparingly and only if no other alternative exists. These crossing locations will be coordinated with District Recreation Staff; and, (j) Large, upright trail cairns used on Beale Wagon Road and Overland Trail must be protected. Locate cairns ahead of time. Logging operations will not damage the cairns.</p>			
RS4	<p>Cull Logs, Stump Heights, and Slash Treatments: 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. Stump heights 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 inches or lower, with 12-inch heights as the exception, and rarely occurring. Slash must be treated or removed. In the seen area immediate foreground of sensitive places (within 300 feet of the centerline of concern level 1 roads or trails, or 300 feet 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. Prioritize slash burning in these locations within one year or as soon as possible after treatment.</p> <p>If conventional logging is used and trees are delimbed and topped</p>	X	X	Compliance with forest plans.

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	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 trails. 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. Place project-generated slash outside of permitted utility line and pipeline rights-of-way; do not interfere with utility corridor management.			
RS5	Fire Control Lines: (1) Generally restore control lines to a near undisturbed condition in the foregrounds (within 300 feet) 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.
RS6	Coordinate with landscape architect prior to implementing jackstraw, spring, and road restoration treatments. Do not implement jack straw treatments within 1,000 feet of the Arizona Trail. Also see SW37 and T8.	X	X	Maintain scenic integrity.
RS7	Recreation and Other Trail Mitigation: Recreation Sites: (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	X	X	Compliance with forest plans, inform public, and reduce impacts to recreational opportunities.

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	<p>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>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>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 about activities occurring on the districts and forests.</p> <p>(a) 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>(b) 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>(c) If trails are temporarily closed due to harvesting, the trail tread will be cleared of all slash.</p> <p>(d) Character trees that have unique shape or form along the Arizona Trail should be retained where feasible within the applicable prescription. Avoid lines of trees; strive to achieve a grouped appearance to avoid abrupt changes in the landscape character along the trail corridor.</p> <p>(e) Implement road closures, one-way traffic, and area closure restrictions as deemed necessary by forest officials for health and safety concerns during any operation.</p>			

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	(f) Work with District Recreation specialists to ensure well marked and publicized detour routes for the Arizona Trail during operational closures within the project, and (g) 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.			
RS8	In Semiprimitive Nonmotorized recreation opportunity spectrum classes specifically (occurring on about 7 percent of the approximately 598,764 acres): (a) Temporary roads should not generally be built. If they are used, they would be restored to original conditions when projects are completed, (b) Strive to make stump heights 6 inch or lower, with 12 inch heights the exception, and rarely occurring, (c) Slash must be treated or removed in these areas, and (d) Use existing barriers (roads) and natural barriers as control lines whenever possible.	X		Compliance with forest plans.
RS9	Cave and karst protection, see W40	X		Compliance with forest plans.
RS10	See SW21, SW37, W46, and W47 for additional fence mitigation.		X	
Silviculture – See Appendix D, Implementation Plan				
Soils and Watershed				
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.

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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	<p>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 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>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>Prior to moving any off-road equipment subject to the cleaning and disinfecting requirements set forth above, contractor, shall advise</p>	X		Minimize the spread of nonnative species.

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	<p>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 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.</p>			
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 burn 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 feet of line to discourage use as a trail.	X	X	Maintain long term soil productivity and minimize sediment delivery from containment lines.

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SW7	On areas to be prescribed burned, manage for 5–7 tons per acre of coarse woody debris in ponderosa pine on the Coconino NF and 3–10 tons per acres in ponderosa pine on the Kaibab NF 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 coarse woody debris would be managed for an after-treatment average of 1–3 tons per acre (Huffman personal communication 2012). Where available, a portion of the coarse woody debris in pinyon-juniper would include two logs greater than or equal to 10 inch and greater than or equal to 10 feet 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. Riparian stream course: <ul style="list-style-type: none"> • Severe erosion hazard: 120 feet on each side of stream course. • Moderate erosion hazard: 100 feet on each side of stream course. • Slight erosion hazard: 70 feet on each side of stream course. Nonriparian stream course: <ul style="list-style-type: none"> • Severe erosion hazard: 100 feet on each side of stream course. • Moderate erosion hazard: 70 feet on each side of stream course. • Slight erosion hazard: 35 feet on each side of stream course. Do not ignite fuels within this buffer area. Some creep may occur into the buffer (also see SW31).	X		Minimize sediment and/or ash delivery into drainages and maintain water quality.
SW9	All burning will be coordinated daily with the Arizona Department of Environmental Quality (ADEQ). Burning will not take place on any portion of the project without prior approval from ADEQ. Coordination with ADEQ will take place through the Kaibab and Coconino National Forest Zone Dispatch Center and the Prescribed Burning Boss.	X		To ensure that smoke management objectives are met.
SW10	Complete all required permitting (404 permits) and Water Quality Certification (if necessary), prior to project implementation.	X		To comply with Clean Water Act provisions.

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SW11	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.
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 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.).	X	X	To comply with State and Federal water quality standards by minimizing soil erosion through the stabilizing influence 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.

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SW16	Site rehabilitation on disturbed sites and stream channel shaping on previously decommissioned 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 inoculum on severely disturbed sites where no topsoil is left; and (6) install erosion mat.	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.
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.

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SW20	On areas that have had roads previously decommissioned 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	As a condition of approval for use of a temporary road within a Timber Sale Contract or Stewardship Contract, temporary roads will be decommissioned by the purchaser/contractor immediately after use using the adaptive management actions listed in appendix A of the Transportation Specialist Report and BMPs for rehabilitation of ground disturbed sites in the soils design feature section.	X		To restore to desired conditions and ensure that temporary roads do not become de facto new roads.
SW22	Do not allow or approve new temporary road construction in filter strips. If feasible, avoid new temporary road locations in severe erosion hazard soils. If necessary to have a temporary road on severe erosion hazard soils, utilize BMPs outlined in the Soil and Water section to avoid affects from severe erosion hazard soils.	X		To minimize adverse environmental effects within stream filter strips and on severe erosion hazard soils.
SW23	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.
SW24	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.

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SW25	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.
SW26	Skid trails and decommissioned 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.
SW27	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.
SW28	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.
SW29	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 water flow. 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.
SW30	Felling to the lead would be required within the integrated resource service contract 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.

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SW31	<p>The integrated resource service contract 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.</p> <p>Other acceptable erosion control measures include, but are not limited to, waterbarring (waterbars should not be more than 2 feet deep and need at least a 10 feet 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.</p>	X		<p>Minimize soil loss and sedimentation of stream courses from skidding operations.</p> <p>Minimize noxious weed spread and reestablish native vegetation.</p> <p>Minimize impacts on severe erosion soils.</p>
SW32	<p>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.</p>	X		<p>Minimize soil movement, maintain water quality, and minimize impacts on severe erosion soils.</p>
SW33	<p>Road maintenance (BMP 41.25) through the integrated resource service contract should require pre-haul and post-haul maintenance on all roads to be used for haul.</p>	X		<p>To minimize soil movement, maintain water quality, and to minimize impacts on severe erosion soils.</p>

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SW34	<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>Riparian stream course:</p> <ul style="list-style-type: none"> • Severe erosion hazard: 120 feet on each side of stream course. • Moderate erosion hazard: 100 feet on each side of stream course. • Slight erosion hazard: 70 feet on each side of stream course. <p>Nonriparian stream course:</p> <ul style="list-style-type: none"> • Severe erosion hazard: 100 feet on each side of stream course. • Moderate erosion hazard: 70 feet on each side of stream course. • Slight erosion hazard: 35 feet on each side of stream course. <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.
SW35	<p>Manage for 5 to 7 tons (forest plan consistency) per acre of coarse woody debris in ponderosa pine sites that will be left on-site on all cutting unit sites except in areas of identified wildland-urban interface treatments. Within the pinyon-juniper cover type maintain the following where possible: 1 snag per acre and 1 to 3 tons of coarse woody debris (CWD) per acre (specialist recommendation). Where available, a portion of the coarse woody debris would include two logs greater than or equal to 10 inches and greater than or equal to 10 feet in length (specialist recommendation).</p>	X		Promote long term soil productivity.

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SW36	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.
SW37	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.
SW38	Within the pinyon-juniper cover type, snags would be managed for 1 per acre over 75 percent of the area and coarse woody debris (CWD) would be managed for an after treatment average of 1 to 3 tons per acre. Where available, a portion of the coarse woody debris would include two logs greater than or equal to 10 inches and greater than or equal to 10 feet in length (Huffman per. Com from Brewer, 2008).	X		To promote long-term soil productivity.
SW39	Provide soil and site protection on newly disturbed soils located on temporary roads on soils with severe erosion hazard as needed. Avoid locating temporary roads on soils with severe erosion hazard. Where unavoidable, provide soil protection through implementation of any of the following methods to control sediment and protect water quality. Methods may include, but are not limited to: wattling, hydromulching, straw or woodshred mulching, spread slash, erosion mats, terraces, blankets, mats, silt fences, riprapping, tackifiers, soil seals, seeding and side drains, and appropriately spaced water bars or water spreading drainage features. Temporary roads will be decommissioned and footprint obliterated and protected with any of the above methods.		X	To protect long-term soil productivity and water quality

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SW40	Defer mechanical thinning and prescribed fire activities in the Slide Fire (perimeter) until 5 years after the signed decision at the earliest.	X	X	To minimize impacts to Oak Creek (Arizona Unique Water) from sediment. This BMP will allow for adequate post-fire recovery of soil and vegetation resources and minimize the cumulative effects from the fire
SW41	Defer mechanical thinning and prescribed fire activities within the Slide Fire perimeter until adequate vegetative ground cover (plant litter, duff and basal area) is present (minimum of about 60 percent in ponderosa pine vegetation types) to filter and reduce sediment delivery into streamcourses.	X	X	To minimize impacts to the water quality of West Fork of Oak Creek and Oak Creek (Arizona Unique Water) from sediment. The BMP will assure streamside management zone is capable of filtering into connected perennial waters downstream.
SW42	Within the pinyon-juniper cover type, snags would be managed for 1 per acre over 75 percent of the area and coarse woody debris (CWD) would be managed for an after treatment average of 1 to 3 tons per acre. Where available, a portion of the coarse woody debris would include two logs greater than or equal to 10 inches and greater than or equal to 10 feet in length (Huffman per. Com from Brewer, 2008).	X		To promote long-term soil productivity
SW43	Provide soil and site protection on newly disturbed soils located on temporary roads on soils with severe erosion hazard as needed. Avoid locating temporary roads on soils with severe erosion hazard. Where unavoidable, provide soil protection through implementation of any of the following methods to control sediment and protect water quality. Methods may include, but are not limited to: wattling, hydromulching, straw or woodshred mulching, spread slash, erosion mats, terraces, blankets, mats, silt fences, riprapping, tackifiers, soil seals, seeding and side drains, and appropriately spaced water bars or water spreading drainage features. Temporary roads will be decommissioned and footprint obliterated and protected with any of the above methods.	X		To protect long-term soil productivity and water quality

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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 to the soil and water BMPs for rehabilitation of fire lines and disturbed areas.	X		Discourage use on previously decommissioned roads and maintain a safe and economic road system.
T4	Utilize road safety signage with any project road activities that are related to project implementation.		X	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.		X	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.		X	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.	X		Minimize resource impacts from the transportation system.
T9	As a condition of approval for use of a temporary road within a Timber Sale Contract or Stewardship Contract, temporary roads will be decommissioned by the purchaser/contractor when mechanical treatments are finished using the adaptive management actions listed in appendix A of the Transportation Report.	X	X	To restore to desired conditions and ensure that they do not become de facto new roads.

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T10	Do not allow or approve new temporary road construction in filter strips. If feasible, avoid new temporary road locations in severe erosion hazard soils. If necessary to have a temporary road on severe erosion hazard soils, utilize BMPs outlined in the Soil and Water section to avoid affects from severe erosion hazard soils.	X	X	To minimize adverse environmental effects within stream filter strips and on severe erosion hazard soils.
T11	Temporary roads locations should be located in existing openings out of filter strips and avoid removal of trees where feasible. If trees need to be removed, avoid old and large trees and oaks and aspen trees where feasible.	X	X	To minimize adverse effects to tree structure, filter strips and minimize road disturbance from temporary roads and need for fills in stump holes.
Wildlife				
W1	Coordinate and implement management activities within PACs to reduce potential disturbance and minimize the frequency and duration of operations within and immediately adjacent to these areas.	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W2	Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within the implementation area plus the area 1/2 mile beyond the perimeter of the proposed treatment area.	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W3	Establish a protected activity center at all new Mexican spotted owl sites located during project surveys.	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.

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W4	If new PACs are established in areas with planned or ongoing 4FRI activities then existing design features would apply to management activities.	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W5	All contractors associated with thinning and burning activities, transportation of equipment and forest products, research, or restoration activities would be briefed on the Mexican spotted owl, know to report sightings and to whom, avoid harassment of the owl, and are informed as to who to contact and what to do if an owl is incidentally injured, killed, or found injured or dead on the Coconino and/or Kaibab NF.	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W6	Meet annually with the U.S. Fish and Wildlife Service to discuss planned management activities, review past activities in Mexican spotted owl habitats, and report any known incidental take in the project area. These results will also be provided in a written annual report.	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W7	Implement the monitoring plan developed in coordination with the U.S. Fish and Wildlife Service designed to evaluate the effects of thinning and prescribed fire on owls as described in the Biological Opinion and the Mexican spotted owl Recovery Plan (see appendix E).	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W8	Trees greater than 24 inch d.b.h. would not be harvested in Mexican spotted owl restricted and protected habitat.	X		To minimize adverse effects to Mexican spotted owl habitat while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.

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W9	Pre-and post-treatment habitat monitoring would occur in Mexican spotted owl restricted and protected habitat to ensure retention or development of desired habitat conditions (see appendix E).	X		To minimize adverse effects to Mexican spotted owl habitat while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W10	In Mexican spotted owl PACs, spring restoration would not occur during the breeding season (March 1 to August 31), if occupied, in Rocktop, Sawmill Spring, Red Raspberry and Weimer Spring PACs (i.e., 5 out of 74 proposed spring restoration sites would be affected).	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W11	In Mexican spotted owl PACs, ephemeral stream restoration would not occur during the breeding season (March 1 to August 31), if occupied, in Bear Seep, Clark, Holdup, Coulter Ridge and Meadow Tank Mexican spotted owl PACs (i.e., 1.7 of 39 miles of proposed ephemeral channel restoration would be affected).	X		To minimize adverse effects to Mexican spotted owls while restoring Mexican spotted owl habitat, contribute towards the recovery of the owl, and meet forest plan (ESA) compliance.
W12	In Mexican spotted owl PACs, temporary road construction, obliteration, relocation, and maintenance would not occur during the breeding season (March 1 to August 31) if occupied.	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.
W13	In Mexican spotted owl PACs, no mechanical or prescribed fire treatments would occur in PACs during the breeding season (March 1 to August 31) if occupied.	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.

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W14	In Mexican spotted owl PACs, hauling would generally avoid PACs during the breeding season (March 1 to August 31) unless specific analysis has documented that impacts would not lead to adverse effects. Vehicles would remain greater than or equal to 0.25 miles from PAC boundaries during nesting season unless topographic features would limit noise; trucks would drive less than or equal to 25 miles per hour in PACs.	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.
W15	In Mexican spotted owl PACs, no new wire fencing would be constructed in PACs to minimize the risk of owls colliding with new fences. Other alternatives would be used for aspen, sensitive plants, springs, and ephemeral channel restoration exclosures. Alternatives would be coordinated with other specialists. If suitable alternatives cannot be identified restoration work would be postponed.		X	To minimize adverse effects to Mexican spotted owls and contribute towards the recovery of the owl while restoring Mexican spotted owl habitat.
W16	In Mexican spotted owl PACs, road maintenance would not occur during the nesting season (Effective March 1 to August 31).	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.
W17	All stands included in the proposed mechanical treatments for 18 Mexican spotted owl PACs would be marked for harvest by hand and marking would be coordinated with the US Fish and Wildlife Service.		X	To contribute towards the recovery of the owl, and continue coordination with the U.S. Fish and Wildlife Service during implementation.
W18	Fireline associated with preventing fire from entering Mexican spotted owl PACs and/or core areas would be constructed outside the nesting season in alternatives B D and E.	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.
W19	In Mexican spotted owl PACs nest trees would be protected in the design and implementation of prescribed fires.	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.

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W20	Coordinate burning spatially and temporally to limit smoke impacts to nesting owls, particularly for PACs with nests in low-lying areas (Effective March 1 to August 31).	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance.
W21	Implementation would be phased in across the landscape so that not all Mexican spotted owl habitat would be treated in 1 year	X		To minimize adverse effects to Mexican spotted owls and meet forest plan (ESA) compliance while restoring Mexican spotted owl habitat.
W22	In Mexican spotted owl PACs, target, threshold, and goshawk post-fledging family areas no old trees would be cut during the rehabilitation of temporary roads.		X	To protect/retain old trees and maintain or develop key habitat components.
W23	In northern goshawk nest stands, burn plans covering areas with nesting goshawks and/or known nest trees would include mitigations to minimize smoke impacts to nesting birds and nest trees would be protected	X		To minimize disturbance to goshawks while restoring goshawk habitat and meet forest plan compliance.
W24	Fuels in goshawk nesting areas would be evaluated and, if necessary, would be manipulated outside of the breeding period (March 1 to September 30) to ensure low severity fire effects from prescribed fire.	X		To minimize disturbance to goshawks while restoring goshawk habitat and meeting forest plan compliance.
W25	In northern goshawk nest stands mechanical treatments would not occur within nest stands, or within replacement nest stands.		X	To minimize disturbance to goshawks.
W26	In northern goshawk post-fledging family areas (PFAs), harvest activities would not occur in occupied PFAs during the breeding season unless specific analysis has documented impacts would not trend to listing or loss of viability. Individual PFAs can potentially be cleared for treatment an individual basis through coordination with the district biologist.		X	To minimize disturbance to goshawks while restoring goshawk habitat.
W27	Hauling will not occur within PFAs during the breeding season (March 1 through September 30) unless monitoring determines the PFA is not occupied. Exceptions are the Devil Dog PFA (030701015), Barney PFA (030701011), and Black Mesa Tank PFA (030701017) in which there would be no timing restrictions.		X	To minimize disturbance to goshawks while restoring goshawk habitat.

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W28	In northern goshawk post-fledging family areas (PFAs), 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 to September 30) if occupied. However, work could potentially occur on an individual basis through coordination with the District biologist if specific analysis has documented that impacts will not trend to listing or loss of viability.	X		To minimize disturbance to goshawks while restoring goshawk habitat and meeting forest plan compliance.
W29	In northern goshawk post-fledging family areas (PFAs), logging trucks would not exceed 25 miles per hour when traveling through PFAs during the breeding season (March 1 to September 30).		X	To minimize disturbance to goshawks while restoring goshawk habitat.
W30	In northern goshawk post-fledging family areas (PFAs) road construction, obliteration, relocation, and maintenance would not occur during the breeding season (March 1 to September 30) if occupied.	X		To minimize disturbance to goshawks while restoring goshawk habitat and meeting forest plan compliance.
W31	In northern goshawk post-fledging family areas (PFAs) created openings would not exceed 2 acres in goshawk PFAs		X	To minimize disturbance to goshawks while restoring goshawk habitat.
W32	In northern goshawk home range burn units would not include more than 5,000 acres of a goshawk pair’s home range as per applicable forest plan guidance.	X		To minimize disturbance to goshawks while restoring goshawk habitat and meeting forest plan compliance.
W33	In bald eagle winter concentration areas, retain the tallest snags greater than 18 inch d.b.h.	X		To minimize disturbance to goshawks while restoring goshawk habitat and meeting forest plan compliance.
W34	In bald eagle nest sites, no mechanical treatments would occur within a 300 foot radius of bald eagle nest trees (there are 3 known bald eagle nest within 300 feet of the project analysis boundary).		X	To minimize disturbance to goshawks while restoring goshawk habitat.

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W35	In bald eagle nest sites, no vegetation treatments would occur within a buffer of up to ½ mile (2,500 feet), 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 would be assessed by the district biologist and limited activities may be acceptable.		X	To minimize disturbance to goshawks while restoring goshawk habitat.
W36	In bald and golden eagle nest sites 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 would not be adversely impacted from smoke.		X	To minimize disturbance to eagles while restoring forest habitat.
W37	In bald eagle winter roost sites, no mechanical treatments would occur around confirmed bald eagle roost sites (300 feet radius around roosts).	X		To minimize disturbance to eagles while restoring forest habitat and meeting forest plan compliance.
W38	In bald eagle communal roost sites, no project activities would occur within 500 feet of confirmed bald eagle communal roosts from October 15 – April 15.	X		To minimize disturbance to eagles while restoring forest habitat and meeting forest plan compliance.
W39	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 would be forwarded to the Peregrine Fund and the U.S. Fish and Wildlife Service.	X		To minimize adverse effects to condors, contribute towards the recovery of the species, and meet forest plan compliance.
W40	Any project activity that may cause imminent harm to condors would temporarily cease until permitted personnel determine the correct course of action.	X		To minimize adverse effects to condors, contribute towards the recovery of the species, and meet forest plan compliance.
W41	Project-related work areas would 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 would complete site visits to ensure clean-up is adequate.	X		To minimize adverse effects to condors, contribute towards the recovery of the species, and meet forest plan compliance.

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W42	A hazardous material spill plan would be developed and implemented with details on how each hazardous substance would be treated in case of leaks or spills.	X		To minimize adverse effects to wildlife, including condors, contribute towards the recovery of the species, and meet forest plan compliance.
W43	Pesticide use would follow the guidelines for California condors as described in the April 2007 Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service.	X		To minimize adverse effects to condors, contribute towards the recovery of the species, and meet forest plan compliance.
W44	In turkey foraging and roosting cover, retain medium to high canopy cover in ponderosa pine stringers in the pinyon-juniper transition zone and retain clumps of large and old trees along ridges and slopes above the pine and pinyon-juniper transition zone. Target low severity fire to retain yellow pine and roosting cover.	X		To minimize disturbance to turkeys while restoring forest habitat and meeting forest plan compliance.
W45	No dominant or co-dominant trees would be cut in great blue heron rookeries. Nest trees would be prepped prior to implementing prescribed fire and ignition mitigations would apply. Timing would avoid mechanical tree harvest while birds are in the nest. Activities would be coordinated with the local biologist.		X	Minimize disturbance to rookeries while restoring forest habitat.
W46	Forest plan direction would be met for all raptor species (nest sites): 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 implementing prescribed fire. Forest plan buffers would be provided if nests are active: Sharp-shinned hawk: no mechanical treatment buffer of 10 acres around occupied nests; Cooper’s hawk: no mechanical treatment buffer of 15 acres around occupied nests; Osprey: no mechanical treatment buffer of 20 acres around nest sites (occupied or unoccupied) and all logging activities would be restricted within ¼ mile of active nests from March 1 to August 15; Use site specific analysis to determine no-treatment zone around nest site; restrict activities within ¼ mile of nest sites from March 1 to August 15; and,	X		To minimize disturbance to raptors while restoring forest habitat and meeting forest plan compliance.

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	Other raptors: 50 feet buffer around occupied nests would be left uncut.			
W47	In known deer fawning areas defer logging activities between June 15 and August 31 because of declining trends in populations.	X		To minimize disturbance to fawns while they are most vulnerable, restore forest habitat, and meet forest plan compliance.
W48	In pronghorn migration routes on the Williams RD, avoid thinning and burning within the known travel way during the first major snowfall of a given year to allow for seasonal migration. See appendix 8 of the wildlife report.		X	Minimize disturbance to migrating pronghorn in a key movement corridor while restoring ecosystem health.
W49	In pronghorn fawning habitat, prescribed fire in Garland Prairie would not occur during May when most fawning occurs.		X	Minimize disturbance to pronghorn fawns when they are most vulnerable while restoring grassland habitat.
W50	Prairie dog surveys would be completed 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.	X		Minimize disturbance to ferrets if undiscovered populations exist in the treatment area, increase information on status of prairie dogs, and meet forest plan (ESA) compliance while restoring grassland habitat.
W51	A 300-foot no mechanical treatment buffer would be designated around 34 cave entrances and around 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 could be used for mechanical harvest but no new skid trails would be created. Ignition and other management actions associated with prescribed fire would maintain existing vegetation patterns and follow forest plan guidance for snags and logs while reducing potential for undesirable fire behavior and effects. The intent is to avoid changing the cave/karst microclimate, (including altering vegetation near the inside and outside of the entrance/rim), hydrology, and prevent sedimentation while reducing surface fuels.	X		Minimize disturbance to fragile ecosystem components, maintain biodiversity, and meet forest plan compliance while restoring ecosystem health.

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W52	In tassel-eared squirrel nest stands, operators would avoid felling trees with active squirrel nests. Coordinate with local biologists.		X	Protect active squirrel nests while restoring forest conditions.
W53	In northern leopard frog designated occupied/critical breeding sites (6 sites), a no-treatment buffer (no thinning, no direct ignition) ¼ mile distant from tanks or designated along logical topographic breaks (appendix 16). In some cases, the district wildlife biologist may work with implementation teams to determine the habitat protection buffer boundary	X		Minimize disturbance while restoring forest conditions and meeting forest plan compliance.
W54	In northern leopard frog potential breeding sites, seasonal restrictions (April 15 through September 15) for all proposed activities would be implemented within a 200 feet buffer (or along logical topographic breaks) at all designated important water sites (i.e., 10 sites in restoration unit 1; appendix 16). In some cases, the district wildlife biologist may work with implementation teams to determine the habitat protection buffer boundary.	X		Minimize disturbance while restoring forest conditions and meeting forest plan compliance.
W55	In northern leopard frog dispersal habitat, a 200-foot protection zone (100 feet either side of the stream) would be established around designated stream courses (appendix 16). There would be no thinning and no direct ignition 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 in Subunits 1-2, 1-4, 1-5 and 1-6.	X		Minimize disturbance while restoring forest conditions and meeting forest plan compliance.
W56	In northern leopard frog designated occupied/ critical breeding sites (6 sites) mechanized equipment would avoid wetted soils in northern leopard frog habitat unless decontamination practices for Chytrid are employed first.	X		Minimize disturbance while restoring forest conditions and meeting forest plan compliance.
W57	In springs identified for restoration, springs would be surveyed for northern leopard frogs prior to implementation of restoration activities.		X	Minimize disturbance while restoring springs and spring habitat.

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W58	Do not use tanks for water sources that are known to have populations of northern and Chiricahua leopard frogs as water sources for prescribed fire activities. Activities in and around natural or constructed waters would use decontamination procedures to prevent the spread of Chytrid (Bd) fungus and other invasive aquatic species, unless an evaluation by a forest biologist determines it unnecessary.	X		Minimize disturbance while managing fire and meeting forest plan compliance.
W59	In Arizona black rattlesnake occupied den sites, avoid management practices with potential to cause impacts to hibernacula.	X		Minimize disturbance to a key habitat component while restoring forest conditions and meeting forest plan compliance.
W60	In Arizona black rattlesnake occupied den sites, avoid temporary road construction within 300 feet of identified hibernacula locations.	X		Minimize disturbance where the species congregates while restoring forest conditions and meeting forest plan compliance.
W61	Within ¼ mile of Arizona black rattlesnake occupied den sites, conduct prescribed fires from November 1 to March 31 (denning season) within ¼ mile of den sites to minimize impacts to snakes. Avoid prescribed fire within ¼ mile of dens outside the denning season.	X		Minimize disturbance where the species congregates while restoring forest conditions and meeting forest plan compliance.
W62	Within ¼ mile of Arizona black rattlesnake occupied den sites, ignite slash piles in winter or ignite from the exterior, lighting no more than a contiguous 25 percent of the pile’s edge to minimize impacts to Arizona Black Rattlesnake from April 1 to September 30.	X		Minimize disturbance where the species congregates while restoring forest conditions and meeting forest plan compliance.
W63	Do not create interspaces and openings where hiding cover exists near dependable waters identified by the Arizona Game and Fish Department (e.g. stock tanks, lakes, and riparian stream reaches) and through implementation of watershed BMPs.		X	Maintain hiding cover where wildlife congregates while restoring forest structure.
W64	Snags and Logs: 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		Maintain key but limited wildlife habitat components while restoring forest structure and meeting forest plan compliance.

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W65	Snags and Logs: Protect/provide snags and logs wherever possible through site prep, implementation planning, green tree selection, and ignition techniques to retain greater than 2 snags per acre greater than or equal to 30 feet high and greater than or equal to 18 inch d.b.h. + greater than or equal to 3 logs greater than or equal to 8 feet long and greater than or equal to 12 inch mid-point diam. + 5-7 tons of coarse woody debris (greater than 3 inch diameter) per acre in pine and pine-oak habitat.	X		Maintain key but limited wildlife habitat components while restoring forest structure and meeting forest plan compliance.
W66	Snags: Retain trees greater than or equal to 18 inch d.b.h. with dead tops, cavities, and lightning strikes wherever possible to provide cavity nesting/foraging habitat (i.e., the living dead) in ponderosa pine habitat.		X	Maintain key but limited wildlife habitat components while restoring forest structure.
W67	In pinyon-juniper cover type, snags would be managed for at least 1 per acre over 75 percent of the area (current direction is 1 per acre over 65 percent of the area) and coarse woody debris would be managed for an after treatment average of 1-3 tons per acre. Where available, woody debris would include 2 logs greater than or equal to 10 inches mid-point diameter and greater than or equal to 10 feet in length.	X	X	Maintain key wildlife habitat components while restoring forest structure and meeting forest plan compliance.
W68	Snags: Emphasize retention of snags exhibiting loose bark to provide habitat for roosting bats.	X		Maintain a key but limited wildlife habitat component while restoring forest structure and meeting forest plan compliance.
W69	Within Group Density (VSS 4-6): Manage mid-aged tree groups for a range of density and structural characteristics by thinning approximately 50 percent of the mid-aged groups to the lower range of desired stocking conditions, approximately 20 percent each to the middle and upper range of desired stocking conditions and approximately 10 percent remain unthinned.	X		Maintain a range of structure conditions (i.e., wildlife habitat heterogeneity) while restoring forests and meeting forest plan compliance.
W70	Within Group Structure (VSS 4-6): Enhance and maintain mid-aged, mature or old group structure by retaining individual and clumps of vigorous ponderosa pine seedlings, sapling and poles within the larger group		X	Maintain a range of structure conditions (i.e., wildlife habitat heterogeneity) while restoring forest conditions.

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W71	<p>For wildlife cover and stand heterogeneity in ponderosa pine cover type: Gambel oak, juniper and pinyon species would not be cut with the following exceptions: seedling/sapling, young and mid- aged pinyon and juniper up to 11 inch diameter at the root collar may be cut within a 50 foot radius of individual or groups of old ponderosa pine (as defined in the old tree implementation strategy); and when there is no other option to facilitate logging operations (skid trail and landing locations). Gambel oak, juniper and pinyon species greater than 5 inch diameter at the root collar (diameter root collar) may be considered as residual trees in the target group spacing and stocking</p> <p>Manage for large oaks (10 inch diameter at the root collar or larger) by removing ponderosa pine up to 18 inch d.b.h. that do not meet the “old tree” definition and do not have interlocking crown with oaks and occur within 30 feet of base of oak 10 inch diameter at the root collar or larger:</p> <p>In areas of savanna restoration and wildland-urban interface PJ mechanical treatment, seedling/sapling, young and mid-aged pinyon and juniper may be cut.</p>		X	Maintain a range of structure conditions (i.e., wildlife habitat heterogeneity) while restoring forest conditions.
W72	<p>Burn Plans and Ignition Techniques: Apply fire prescriptions to maintain forest plan levels of coarse woody debris and to maintain the sage in the understory community in pine-sage habitat.</p>	X (coarse woody debris)	X (Sage)	Maintain a range of structure conditions (i.e., wildlife habitat heterogeneity) while restoring forest conditions.
W73	<p>Burn Plans: Ensure that the potential cumulative effects of multiple fires burning in a given area do not produce negative effects to local wildlife; coordinate burning between administrative units and between wildlife and fire management to minimize potential disturbance.</p>		X	Minimize disturbance to wildlife while conducting restoration activities.

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W74	Mixed Conifer: 4FRI activities would not include mechanical or fire treatments in mixed conifer habitat. Mixed conifer stands occurring as inclusions within ponderosa pine forest would not be treated, (e.g., nest and roost buffers in Bear Seep and Red Raspberry PACs). Similarly, islands of pine occurring within mixed conifer forest would not be treated. For example, the Mexican spotted owl PAC on Sitgreaves Mt. was dropped from treatment consideration; although there are contiguous stands of ponderosa pine within the PAC, they are surrounded by mixed conifer forest.		X	Clarification that restoration treatments do not include mixed conifer forest.
W75	The stakeholder-developed old tree protection strategy would be incorporated into all action alternatives, the implementation plan and the monitoring and adaptive management plans.		X	Maintain a key but limited wildlife habitat component while restoring forest structure.
W76	Defer logging in a ¼ mile radius around known black bear den sites from April 15 to June 30.	X		Minimize potential for disturbance
W77	In goshawk habitat outside of PACs: Goshawk surveys will be done across the management analysis area prior to habitat modifying activities. Surveys will include areas ½ mile beyond treatment boundaries and exclude a ¼ mile buffer beyond PAC boundaries.	X	X	Conduct pre-treatment surveys while avoiding harassing owls by broadcasting calls of a potential predator and avoid potential disturbance to owls by survey crews.